ASIAN INFRASTRUCTURE INVESTMENT BANK

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Sovereign-backed Financings

Approval Project Document
P000914 Kazakhstan: Transport Resilience and Connectivity Enhancement Project (Jezkazgan-Karagandy section of Trans-Caspian International Transport Route (Middle Corridor))

Currency Equivalents

As of August 30, 2024

Currency Unit – Kazakhstani Tenge (KZT)
USD1.00 = KZT482.12
KZT1.00 = USD0.0021

Fiscal Year

January 1 – December 31

Abbreviations

AADT	Average Annual Daily Traffic
AIIB	Asian Infrastructure Investment Bank
CRA	Climate Resilience Assessment
DBM	Design, Build and Maintenance
EBRD	European Bank of Reconstruction and Development
EIRR	Economic Internal Rate of Return
ES	Environmental and Social
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
EU	European Union
EV	Electric Vehicle
EWRP	East-West Roads Project
FM	Financial Management
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GoK	Government of Kazakhstan
HDM	Highway Development and Maintenance
IFI	International Finance Institution
iRAP	International Road Assessment Programme
km	Kilometer
km/h	Kilometer per hour
KPI	Key Performance Indicator
KZT	Kazakhstani Tenge
MDB	Multilateral Development Bank
MoT	Ministry of Transport of the Republic of Kazakhstan
NPV	Net Present Value
O&M	Operation and Maintenance
OHS	Occupational Health and Safety
OPBRC	Output and Performance-Based Road Contracts
PAA	Paris Agreement Alignment

PIU	Project Implementation Unit
POM	Project Operations Manual
PPM	Project-affected People's Mechanism
PT	Project Team
QAJ	"KazAvtoZhol National Company Joint Stock Company"
RAP	Resettlement Action Plan
RC	Roads Committee
SEP	Stakeholder Engagement Plan
SOE	State-owned Enterprise
SWRP	South-West Roads Project
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar
VOC	Vehicle Operating Costs
VOT	Value of Travel Time
vpd	Vehicles per day
WB	World Bank

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1. Summary Sheet

Project No.	P000914
Project Name	Transport Resilience and Connectivity Enhancement Project (Jezkazgan-Karagandy section of Trans-Caspian International Transport Route (Middle Corridor))
AIIB Member	Kazakhstan
Borrower	"KazAvtoZhol" NC" JSC (QAJ)
Guarantor	Republic of Kazakhstan
Project Implementation Entity	QAJ
Sector Subsector	Transport Roads
Alignment with AIIB's thematic priorities	Connectivity and Regional Cooperation; Green Infrastructure; Technology-enabled Infrastructure
Project Objective	Strengthen the resilience of transport systems in Kazakhstan through improving climate-adapted road connectivity along the Jezkazgan - Karagandy section of the Middle Corridor.
Project Description	The Project aims to improve selected sections of the Middle Corridor between Jezkazgan and Karagandy, focusing on improving road conditions and implementing climate-resilient standards. It will pioneer the use of integrated design, build, and maintenance contracts through the Output and Performance-Based Road Contracts (OPBRC) format to optimize value for money and encourage private sector participation. Additionally, the Project will enhance “Last Mile” connectivity with rural areas along the road corridor, improve road sustainability and safety measures, review national road design standards with a focus on climate resilience and road safety, and provide institutional capacity building support in the sector. The estimated total Project cost is around USD1.53 billion and will be co-financed by the World Bank Group (WB) and AIIB. Both financiers plan to contribute USD650 million each. The remaining approximately 15 percent of the Project cost will be covered by government counterpart funding. The Project comprises three components: • Component 1. Resilient and Safe Road Connectivity. This component accounts for 99 percent of the total Project cost. It will support the improvement of selected sections (around 498 km) of the Jezkazgan - Karagandy road corridor to climate-resilient and road safety standards and introduce the use of integrated design, build, and maintenance contracts to optimize value for money and foster private sector participation.

	Additionally, it involves the improvement of around 40km all-weather Last-Mile Connectivity to the rural areas along the corridor. This component will also support the implementation of road sustainability and road safety features, including electronic tolling facilities, rapid electric charging stations, and axle load management systems and road safety audit. • Component 2. Transport Systems Development. It includes (i) review of national road design standards and national motorization management practices and come out with recommendations and an approach to incorporate climate resilience, decarbonization and road safety measures into standards and practices; and (ii) identify actions to improve the functionality and efficiency of the Middle Corridor while reducing the carbon emissions. • Component 3. Project Management and Implementation Support. This component includes experts to assist QAJ in designing and implementing the performance-based contracts under the Project and other required consultancy service during implementation.
Implementation Period	12/31/2024 - 12/31/2031
Expected Loan Closing Date	6/30/2032
Size and Terms of AIIB Loan	JPY 94,441,800,000.00[1] (approximately USD650.00 million equivalent) The loan will have a maturity of 18 years, including a grace period of 3.5 years, with standard terms for AIIB sovereign-backed loans.
Financing Plan	Total Project Cost: USD1,529 million Proposed AIIB Financing: USD650 million WB Financing: USD650 million Government of Kazakhstan: USD229 million
ES Category (or AIIB equivalent, if using another MDB's ES Policy)	B
ES Category Comments	WB ES policies will apply
Risk (Low/Medium/High)	Medium
Conditions of Effectiveness	• The Co-financing Agreement has been executed and delivered between the Borrower and Co-financier; • The Co-lender's Agreement has been executed and delivered between the Bank and the Co-financiers; • The Borrower has prepared and adopted the Project Operations Manual to the satisfaction to the Bank and the Co-financier; • The Borrower has established a Project Implementation Unit ("PIU") to the satisfaction to the Bank and the Co-financier; and

[1] The Loan amount is denominated in JPY, however, the costs and funding in this report will still be presented in USD with the exchange rate applied of USD 1=JPY 145.295, the exchange rate agreed in the loan negotiation as of August 31, 2024.

	• The Partnership Framework Agreement between the Guarantor and the Co-financier has been executed and delivered.
Key Covenants	• The Borrower shall maintain at all times during Project implementation, a PIU to the satisfaction of the Bank and the Co-financier. • By no later than forty-five (45) days after the Effective Date, the Borrower shall modify accounting and reporting software to ensure that it supports the Bank and the Co-financier's financial reporting and accounting requirements under the Project, in accordance with terms of reference acceptable to the Bank and the Co-financier.
Conditions for Disbursement	NA
Retroactive Financing (Loan % and dates)	None.
Policy Waivers Requested	No
Policy Assurance	The Vice President, Policy and Strategy, confirms an overall assurance that the proposed Bank Financing complies with the applicable Bank operational policies.
Economic Capital (ECap) Consumption (USDmn)	USD64.4 million

President	Liqun Jin
Vice President	Konstantin Limitovskiy
Acting Director General	Konstantin Limitovskiy
Team Leader	Anzheng Wei, Senior Investment Officer
Back-up Team Leader	Yaxin Yan, Investment Officer
Team Members	Alberto Alcubilla Arribas, Senior Climate Finance Specialist Carsten Griese, Technical Advisory Consultant Drona Ghimire, Senior Environment Specialist Gulru Azamova, Senior Social Development Specialist Liu Yang, Project Counsel Mengmeng He, Finance Officer, Loan Management Nurzhan Serik, Investment Officer Yi Geng, Senior Financial Management Specialist Yunlong Liu, Senior Procurement Specialist Yuyou Guo, Project Assistant
Credit Officer	Young Bong Cho, Senior Sovereign Risk Officer

2. Context

2.1 **Country and Macroeconomic Overview:** The Republic of Kazakhstan is a large landlocked country located in Central Asia. It shares borders with China, Russia, Uzbekistan, Kyrgyz Republic, and Turkmenistan. Additionally, it has a significant coastline along the Caspian Sea. With an area of 2.7 million square kilometers, Kazakhstan is the ninth-largest country in the world. Despite its vast size, it has a relatively small population of around 20 million, resulting in one of the lowest population densities globally. The country is known for its abundant natural resources, being one of the world's most mineral-rich nations and having substantial oil reserves. In 2023, it exported over 70 million tons of crude oil and crude oil products.

2.2 Kazakhstan has made rapid economic progress over the past two decades, despite significant challenges such as economic and financial crises in 2008 and between 2014 and 2016. The economy has rebounded from downturns in 2020 and 2022 to achieve a Gross Domestic Product (GDP) growth rate of 5.1 percent in 2023, supported by fiscal expansion and rising oil production. However, the country's economic outlook still relies heavily on hydrocarbons and consumer spending, highlighting the need for further economic diversification. The country's commodity-driven economy and its physical and human geography have led to significant disparities in living standards and per capita income, particularly between urban and rural areas. These disparities are reflected in employment opportunities, educational attainment, healthcare access, and basic service provision. To achieve sustainable and inclusive growth, Kazakhstan needs to address these challenges, especially the regional and urban-rural divide.

2.3 **Regional Connectivity and Middle Corridor**. The country's strategic location at the crossroads of Eurasian connectivity presents opportunities for trade and investment. The Government of Kazakhstan (GoK) has made considerable progress in enhancing and expanding corridor connectivity to facilitate trade and transit. Investments in national road and rail networks, with support from international financial institutions, have improved infrastructure and developed key transit routes. However, significant gaps still exist which largely limit connectivity between regions, exports to neighboring and European markets, as well as the country's potential as an east-west transit corridor.

2.4 Existing international trade heavily relies on the "Northern Corridor" Asia-Europe trade route, which passes through the country to its north neighbor. Aware of the need to adapt to a volatile geopolitical context by diversifying trade routes and building economic resilience, the GoK has recognized the potential of the Trans-Caspian International Transport Route, known as the "Middle Corridor" as a multimodal trade route linking Kazakhstan to China, Azerbaijan, Georgia, Türkiye, and Europe. Improving the Middle Corridor is expected to generate significant economic benefits, diversify economic linkages, and enhance trade resilience to economic shocks. However, operational improvements and investments in ports, highways, and railway infrastructure are very much needed to fully unlock the corridor's potential and triple trade volumes by 2030[2].

[2] According to World Bank's analysis, with the operational improvement and proper infrastructure investment, the trade volumes on the Middle Corridor are forecast to triple by 2030.

2.5 Two parallel branches of the Middle Corridor run east-west through Kazakhstan: a southern branch via Almaty and a more northerly branch across central regions from Dostyk (near the China border) through Balkhash, Jezkazgan, and Shalkar, reaching the Caspian Sea port of Aktau. The Jezkazgan-Karagandy road forms a substantial portion of this route and runs parallel to the Middle Corridor railway line (Dostyk - Aktau). In addition to enhancing east-west connectivity, the Jezkazgan-Karagandy section serves as a critical north-south route, significantly contributing to national transport resilience.

2.6 **Regional Development**. In 2022, the central Karagandy Oblast in Kazakhstan was divided into two entities: Ulytau Oblast and a smaller Karagandy Oblast. The new Karagandy Oblast has a larger population (1.14 million compared to 0.22 million), a more extensive and diverse industrial base, and better connectivity to the major urban centers of Astana and Almaty, while both regions face challenges such as environmental degradation and outdated infrastructure. Ulytau Oblast, rich in green transition metals, lacks resilient connectivity with the rest of the country due to changing climate, exacerbating regional disparities. The inadequate infrastructure results in disproportionately high transport and logistics costs in the region, which affects the competitiveness of local industries, and constrains economic development and diversification.

2.7 **Road Sector Overview:** Kazakhstan has a sparse population spread across a vast land area, and one of the lowest road densities in the world. The country's existing road network spans 95,000 km, with 25,000 km designated as national highways, including over 3,000 km of toll road network. Much of the road network was built during the Soviet era and has deteriorated significantly, impacting safety and efficiency. The road network handles approximately 160,000 million ton-km of transit goods annually. Kazakhstan's transportation infrastructure also includes a 20,000 km railway system, major ports on the Caspian Sea, and the Khorgos dry port at the China border, supported by logistic centers and free-trade zones.

2.8 In the road sector, GoK has implemented reforms to enhance capacity and separate regulatory and operational functions. The Roads Committee (RC) and National Company KazAvtoJol JSC (QAJ), a state-owned enterprise, were established in 2013 under the Ministry of Transport (MoT). The MoT is responsible for high-level policy making for the road sector, while the RC is responsible for planning and setting strategic direction. QAJ serves as the national operator for the primary National Road Network, including international transit roads. Local and urban roads are managed by oblasts, local districts, and municipalities.

2.9 **Toll System**. In 2023, out of the 25,000 km national highways, toll systems have been introduced on 17 sections of roads, including 11 sections of category I roads and six sections of category II roads, with the total length of around 3,200 km. Information technology is widely applied in the road tolling system of the country. Tolling is based on a system that records vehicle passages through toll segments. Toll plazas are usually built at the ends of each toll road segment. Control arches equipped with recognition cameras are installed along the toll segment to record and identify vehicles. The toll fees charged depend on the distance traveled, the route and the type of vehicle. Drivers can pay the tariff online or cash payment at the toll plaza. Drivers who failed to pay the fees within seven calendar days will receive a fine according to relevant regulations, and the record will affect their annual vehicle inspection or cross-border inspection. The updating of the tolling rate mechanism is underway by the GoK, which will be linked with the inflation index. Several factors will be taken into consideration,

including road category, level of service, road operation and maintenance cost, vehicle types, weights carried, inflation, and affordability for local residents who live nearby and frequently use the toll road sections.

2.10 QAJ manages and collects toll revenue for the rapidly expanding toll road network through its KazToll portal. This portal is overseen by the Directorate of Toll Roads within the QAJ. The GoK plans to extend the toll system to more national roads, aiming for 11,000 km of roads by 2029. The GoK is pursuing to establish a self-sustained mechanism in which toll collection revenue is used to fund road maintenance and future improvement costs.[3] Currently, maintenance[4] of the National Road Network is handled by QAJService JSC, a wholly-owned subsidiary of QAJ. Middle Maintenance[5] of roads is outsourced to private players by QAJService.

2.11 **Addressing Key Development Challenges: Project Contributions.** Despite these efforts, there is still room for modernizing the governance of the road sector institutions, including the adoption of road asset management systems for investment and maintenance decisions, corporatization of road sector SOEs, development of financing mechanisms based on road user charges and using the tariff to fund the road operation and maintenance, promotion of public-private partnerships, and establishment of systematic management processes to address climate change challenges.

2.12 Moreover, road safety is a significant concern in Kazakhstan with a high number of fatalities and injuries. In 2022, there were 2,425 fatalities and over 19,000 injuries, costing around six percent of the country's GDP. Kazakhstan still has high per capita fatality rates, posing challenges in terms of productivity loss and social costs. In addition, gender inequalities persist in employment, income, and political representation. The road construction sector reflects this gender divide, with women occupying less than six percent of skilled technical roles. Overcoming challenges related to working conditions and societal norms is crucial for gender equality in the sector.

2.13 Zooming into the Ulytau and Karagandy Oblasts, they face challenges due to a harsh continental climate, including flooding, extreme temperatures, and other weather hazards that pose risks to road infrastructure. A comprehensive risk assessment recommended measures such as using durable road construction materials, improving drainage systems, implementing regular maintenance, improving the service on the road, and enhancing monitoring systems for early warning of extreme weather events. These actions aim to mitigate risks, protect infrastructure, and ensure the safety and reliability of transport routes in the region.

2.14 **Current Condition**. The existing two-lane Karagandy-Jezkazgan road has deteriorated significantly in recent years due to the changing climate, despite repeated rehabilitation works and routine maintenance. This presents a major obstacle to connectivity and the region's development. The road exhibits multiple defects and is beyond its serviceable life. As a result, average speeds are as low as 50 km/h in some sections, and the considerable distances

[3] According to the Order of the Acting Minister of Transport of the Republic of Kazakhstan dated September 15, 2023 No1, taking into account that funds for the maintenance of toll roads are not provided from the state budget, the maintenance of toll roads is carried out exclusively using revenue from toll fees.
[4] Ongoing minor repairs to the road and its structures performed year-round along the entire road.
[5] Periodic restoration of road surfaces and correction of structural damages. That is performed every 1 to 5 years based on road classification.

between urban centers translate into extended travel times and high vehicle operating costs. The road is also dangerous, with a substandard average iRAP rating[6] of 2.8 stars (one-star is the least safe and five-star is the safest) with multiple sections rated one-star. The sections with the one-star rating have a twentyfold higher likelihood of an accident with serious injury or death compared to the safest roads.

2.15 **Strategic Importance of the Project.** The national highway A17 runs through the heart of the country from the southwest to the northeast - connecting major cities including Kyzylorda, Jezkazgan, Karagandy, and Pavlodar. The Karagandy-Jezkazgan section as part of the A17, also serves as a vital road component for the Middle Corridor and is the primary east-west route across Karagandy and Ulytau oblasts. This highway is essential for the population's access to the rest of the country and supports economic development with its main freight being metals, manufactured goods, industrial equipment, and food.

2.16 Implementation of the Project can simultaneously achieve development goals at three levels: (i) improving connectivity between the two neighboring oblasts, including last-mile connections with local villages along the corridor, and stimulating economic growth by providing better and more climate resilient road infrastructure; (ii) enhancing national connectivity and promoting integration between Kazakhstan's southern commercial zone, centered around Shymkent and Almaty, and the national capital, Astana, through a strategic route linking Karagandy, Jezkazgan, and Kyzylorda; and (iii) improving international connectivity through the Middle Corridor.

2.17 **MDB Joint Efforts**. The 1,500 km A17 national highway runs southwest-northeast through the heart of the country, connecting the cities of Kyzylorda, Jezqazgan, Karagandy, Pavlodar. With financing from the European Bank of Reconstruction and Development (EBRD), the GoK has already commenced upgrading the corridor with a 219 km section already under construction in Kyzylorda Oblast (to the southwest of the Project). For the adjacent road section in Ulytau Oblast, procurement is ongoing for reconstructing a further 208 km long section, supported by the Asian Development Bank (ADB). The improvement of the corridor will be completed by the reconstruction and upgrading of the selected sections between Karagandy and Jezkazgan, which is part of this Project to be co-financed by AIIB and WB. Although these three MDB funded projects are in the same corridor, they are independent, and the economic viability of each project does not rely on the implementation or completion of the other. The synergy from the improvement of the entire corridor is expected to achieve in long-term perspective, especially after resolving key issues such as border crossing, transshipment between nodes and operational efficiency. In the short and medium-term, the majority of the traffic volume is expected to come from local sources, driven by industrial development of the two neighboring Oblasts, last-mile connection with local villages along the corridor and economic growth in the region.

[6] International Road Assessment Programme Rating

3. Rationale

3.1 **Project Objective.** Strengthen the resilience of transport systems in Kazakhstan through improving climate-adapted road connectivity along the Jezkazgan - Karagandy section of the Middle Corridor.

3.2 **Expected Beneficiaries.** The Project will have a positive impact on various stakeholders. It will primarily benefit the populations of Karagandy and Ulytau Oblasts, which together total 1.36 million individuals. Among this population, 51 percent are female. The majority of people in both oblasts reside in cities, towns, and settlements along the Jezkazgan - Karagandy corridor, with the highway being the main east-west route available to them. More reliable and resilient all-weather roads can potentially save time, improve road safety and increase transport access, options, and opportunities. Moreover, last-mile transport connectivity can also potentially benefit village resident lives and livelihoods (men, women and children), particularly given the rural-urban disparity.

3.3 As part of the Middle Corridor, road upgrading is expected to benefit operators and end-users of the international long-distance freight transportation using this route. Through improved road conditions, reduced travel times, decreased accident risks, lower operating costs, better access to education and public services, and increased resilience against road closures, a range of small and larger enterprises, (agricultural, logistics companies, businesses, and major industrial employers) along the corridor will benefit from the improved road conditions and service standards. Long-distance travelers will enjoy enhanced services, such as rest areas, improved sanitation, and emergency response facilities. Specific groups that will benefit the most include regular road users, communities and businesses near the corridor, and non-motorized transport users. Additionally, the Project targets increased female participation in the road sector.

3.4 The Project will establish an enhanced strategic link between Ulytau and Karagandy Oblasts, providing an alternative route and improving connectivity along the Middle Corridor. Additionally, the upgraded corridor will bolster the region's industrial potential and generate direct economic and social benefits by reducing road traffic accidents through improved safety measures and road design practices.

3.5 **Expected Results.** The Results Monitoring Framework is included in Annex 1. Project Development Objective Indicators are:

- 3.5.1. Reduced travel times along the Jezkazgan and Karagandy corridor (minutes)
- 3.5.2. Climate resilience measures incorporated in the Project roads (yes/no)
- 3.5.3. Road design standards improved to enhance resilience and safety (yes/no)

3.6 The proposed Intermediate Results Indicators are:

- 3.6.1 Roads rehabilitated, non-rural (km)
- 3.6.2 Grievance Redress Mechanism is in place and grievances are timely addressed in compliance with the established and agreed procedures (yes/no)
- 3.6.3 Local and connecting roads improved along the Jezkazgan - Karagandy corridor (km)

3.6.4 Share of females in high-skilled engineering and other similarly male-dominated high-skilled technical roles in selected road construction companies (percent)
3.6.5 Infrastructure for non-motorized users constructed (km)
3.6.6 Road safety improvements along the Jezkazgan - Karagandy corridor expressed as the iRAP rating (number)
3.6.7 Weight in motion axle load control mechanisms established
3.6.8 Project beneficiaries expressing satisfaction with improved travel experiences along the Jezkazgan - Karagandy corridor (percent)

3.7 **Strategic Fit for AIIB.** The Project is in line with the Bank's Corporate Strategy and Transport Sector Strategy. It responds to all four thematic priorities of the Bank: (i) *Connectivity and Regional Cooperation*: the Project supports a strategic road section of the A17 highway, which connects the south to the north of the country. It also forms a crucial part of the Middle Corridor, providing an alternative transport linkage between China in the east and Europe in the west; (ii) *Green Infrastructure*: The Project aims to improve the quality of the road by integrating climate-resilient standards in its design and implementation. This aligns with the Bank's thematic priority of promoting sustainable and environmentally friendly infrastructure; (iii) *Private Capital Mobilization*: The Project adopts an innovative approach by utilizing integrated design, build, and maintenance contracts through the Output and Performance-Based Road Contracts (OPBRC) format. This approach is expected to optimize value for money and encourage private sector participation, particularly in the performance-based maintenance phases; and (iv) *Technology-Enabled Infrastructure*: The Project incorporates advanced electronic tolling facilities using automatic number plate recognition technology for efficient and accurate toll collection. It also integrates weigh-in-motion systems for axle load management, which helps reduce pavement damage and improve safety. These features demonstrate the project's commitment to leveraging technology for efficient infrastructure development.

3.8 The Project also aligns with almost all priority areas listed in the Bank's Transport Sector Strategy: (i) *Trunk linkages*: The Project is a key section of the A17 national highway connecting the southern commercial zone around Shymkent and Almaty to the nation's capital Astana. The Project improves this trunk linkage and enhances connectivity between major economic centers; (ii) *Cross-Border Connectivity*: The Project is a vital part of the Middle Corridor, an international multimodal trade corridor that links Kazakhstan to China, Azerbaijan, Georgia, Türkiye, and Europe through Trans-Caspian Transport Route. By improving this section of the corridor, the Project enhances cross-border connectivity and facilitates regional trade and cooperation; (iii) *Transport Integration*: As part of the road network improvement, the Project includes enhancing connectivity between selective sections of the road network and rail stations. The capacity building component of the Project will also support the review of multi-mode transport integration challenges along the Middle Corridor and identify necessary actions; and (iv) *Upgrading of existing infrastructure*: The Project aims to reconstruct and upgrade an existing 498 km third category highway between Jezkazgan - Karagandy into a first category dual-carriageway highway. The upgrades will incorporate improved climate resilience and road safety standards, enhancing the quality and efficiency of the existing infrastructure.

3.9 **Strategic Fit for Kazakhstan**. The development of the Jezkazgan - Karagandy section within the Middle Corridor is integral to the National Program "*Strong Regions – Drivers of Economic Development*" and a key complementary element of the ambitious Government development plans to address the social, economic, environmental, and connectivity challenges of the newly established Ulytau Oblast**.** The "*Comprehensive Plan for the Socio-Economic Development of the Ulytau Region for 2022-2026*" seeks to harness public and private investments totaling USD3.2 billion to reconstruct water supply and sanitation systems, address environmental degradation, upgrade roads, railways, aviation and logistics infrastructure, and modernize health and education infrastructure. The Project will provide much-needed connectivity improvements to support the Government's development plans for the oblast. The Project is consistent with Kazakhstan's Nationally Determined Contribution and its mitigation goals, which include measures such as the development of sustainable transport, infrastructure for electric and gas vehicles, and smart traffic management systems.

3.10 **Paris Agreement Alignment (PAA) and Climate Finance**. In line with the methodology for assessing the alignment of AIIB investment operations with the Paris Agreement, the Project has been determined to be aligned with both the mitigation goals of the Paris Agreement (BB1) and the adaptation goals of the Paris Agreement (BB2) and thus, it is determined to be Paris Aligned. Please see full assessment in Annex 5.

3.11 Some Project components qualify as climate mitigation finance with the amount allocated to the project is USD73.2 million, equivalent to 11.27 percent of AIIB's investment. Due to its nature, objectives and outcome indicators, the Project can be also classified as climate adaptation finance under type 2 (enabling adaptation) being the climate adaptation financed allocated to the project USD161.33 million, equivalent to 24.82 percent of AIIB's investment (please see full details on Annex 5). The total climate finance of the Project (summing adaptation and mitigation) would be USD234.5 million equivalent to 36.1 percent of AIIB's finance.

3.12 **Value Addition by AIIB.** Given the scale, innovative contracting method and the expected impact of the Project, close collaboration among MDBs is crucial for successful and efficient implementation. In addition to providing financing to fill critical gaps, AIIB's participation enhances the project preparation and implementation in two key aspects: (i) *Technical Expertise and Knowledge Transfer*: AIIB brings valuable technical expertise and knowledge gained from its previous road projects in other Members. The Bank has a deep understanding of the complexities and challenges involved in upgrading road infrastructure, particularly in the context of the Output- and Performance-based Road Contracts (OPBRC) through previous investments in the Lao PDR. The PT has also engaged an experienced transport consultant with expertise in OPBRC and road engineering in west Asia. The PT is actively looking for other available resources which can be used to strengthen the client's capacity and enhance the quality of investment. AIIB's involvement is expected to strengthen the quality of the project's conceptual design and implementation; (ii) *Climate Adaptation Measures*: AIIB has its well-developed Paris Agreement Alignment (PAA) methodology that guides investment operations. This methodology is aligned with other MDBs' approaches in principle, with some variations in detail. AIIB's involvements ensures that sufficient climate resilient measures are considered and integrated into the design and reconstruction of the road. This aligns with AIIB's commitment to Paris Agreement climate goals and promotes the long-term resilience of the Project.

3.13 **Value Addition to AIIB.** The Project is AIIB's first non CRF SBF infrastructure project in Kazakhstan. Kazakhstan presents vast and diverse demands, aligning well with AIIB's mandate to support regional connectivity. The Project will enhance the partnership between AIIB and Kazakhstan, establishing a network in the country and expanding AIIB's experience in the region. The Project provides a reasonable scale and complexity to the PT to execute the integrated design, build and maintenance (DBM) contracts through the OPBRC format. PT plans to proactively involve in the project implementation, particularly in preparing the tender documents of the OPBRC contracts, reviewing road sector policies and standards, and supporting institutional capacity building. It is crucial that the PT should ensure the substance and quality of the Project meet the Bank's requirements. Implementation support missions will be conducted at least twice a year during the initial years and once a year thereafter. As a learning Bank, we are learning by doing. The PT aims to accumulate institutional knowledge and lessons learnt, which will be shared within AIIB for continuous improvement and applied to other similar projects. Additionally, the Project strengthens the collaboration with the WB, paving the way for future co-financing opportunities in the region for similar large and complex projects.

3.14 **Lessons Learned.** The WB has implemented two road sector projects in Kazakhstan of similar nature and context: South-West Roads Project (SWRP) and East-West Roads Project (EWRP). Both experienced significant time extension, which provides valuable insights for the design of this Project. The WB's SWRP has been active since 2009, with a revised closing date of December 2024, and the EWRP has been ongoing since 2012, with a revised closing date of December 2025.

3.15 The challenges encountered during their implementation offer important lessons for preparation of the Project and future similar projects: (i) traditional input-based contracting leads to changes and adjustment for such a large scheme road project, which eventually cause cost overruns; (ii) lack of incentives for timely completion, and (iii) insufficient maintenance of road assets by State-owned Enterprises due to state budget limitations. Building on these lessons learned, the Project is designed with an integrated design-build-maintain approach that includes built-in incentives to ensure the life-cycle quality of the assets, lump-sum cost, and the timely completion of the project activities. It also allows for the full engagement of the private sector throughout the project cycle, particularly in improving asset management by engaging the private sector through a performance-based construction and maintenance contract.

3.16 AIIB has experience in three road projects in the Lao PDR utilizing this design build maintain contract model with the OPBRC format. The project IDs are P000066, P000373 and P000618. Lessons learnt from these projects include: (i) the importance of readiness in pre-construction activities, such as conceptual designs with all technical and performance parameters, financial models, environmental and social (ES) works, utilities approvals, and land availability; (ii) the implementing agency's capacity needs to be strengthened through different means, to ensure the adequate knowledge and experience in managing the design-build-maintain contract with OPBRC format. Such measures include engagement of external expertise with OPBRC experience, well-designed OPBRC Supervision Monitoring Consultant contract, engagement of project management consultant, trainings, workshops and support from PT; (iii) increasing awareness and clarity during pre-bidding stage to enhance potential

bidders' understanding on the difference between OPBRC contract and traditional International Federation of Consulting Engineers input based contract; and (iv) in procurement aspect, possible measures including giving adequate weight to the quality of the technical response, strengthening the quality of the conceptual design, including the contractor's financial/payment model to present a business sustainability nature, and introducing the axle load management system.

3.17 The PT also reviewed the working paper titled 'Cross-Border Connectivity Projects in Central Asia'. This paper was developed by a consulting firm in May 2024, under the engagement of the Joint Working Team comprised of AIIB, Islamic Development Bank (IsDB) and Multilateral Cooperation Center for Development Finance (MCDF). The objective of the report is to identify priority cross-border connectivity projects for future investment consideration. The report provides an overview and rationale of priority projects in the five Central Asian countries. In relation to the Project, there are some notable highlights specifically related to Kazakhstan: (i) in Kazakhstan, the reduced capacity and quality of road and rail network pose a significant obstacle to regional connectivity; (ii) mobilizing joint efforts to support the development of the Middle Corridor is the national strategy and priority; and (iii) huge demand for financing and technical assistance for road, rail, port, logistics and border crossing facilities are there in the country. Together with MCDF and IsDB, AIIB has undertaken a series of analyses centered on the Middle Corridor, assessing the potential for improving cross-border connectivity (CBC). This Project has been identified as a priority project by the Government of Kazakhstan prior to the AIIB assessment.

4. Project Description

4.1 Components

4.1.1 **Component 1: Resilient and Safe Road Connectivity (USD1,518.91 million).** This is the major component of the Project, which includes the following sub-components:

(i) Sub-component 1.1: Corridor Connectivity (USD1,496.41 million). This sub-component will finance the improvement of selected sections (around 498 km) of the Jezkazgan - Karagandy road corridor to up-to-date standards in climate-resilient and road safety. It will introduce the use of integrated design, build, and maintenance contracts to optimize value for money and foster private sector participation. It will finance both civil works and the engagement of supervision and monitoring consultants who will oversee and monitor the progress in design, construction and maintenance phases, certify payments, and ensure the quality. The selected sections of the Project corridor will be designed, constructed and upgraded from a 2-lane secondary highway to a 4-lane first-category highway. The typical design is to offset the two 2-lane roads with a median strip of 70-130 meters where it is suitable, that will enhance road resilience by introducing redundancy against climate impacts. The need of road upgrading is driven by the deterioration resulting from climate changing events (e.g., floods from snow melt during spring) and will include, inter alia, new embankments with raised vertical alignment, construction of pavement layers, enhanced capacity of culverts and bridges, water outlets, intersections, and installation of side barriers, bus stops, road signs, markings and provide safety for the road slopes.

The corridor will also have enhanced climate resilience elements, including use of improved road pavement materials, snow barriers, and flood prevention measures. Flood prevention measures would include permeable rockfill embankment layers raising the vertical alignment of the road, enhance the capacity of culverts, and increasing the number of bridges, all with enhanced flow capacity in according to the extensive hydrological investigations and forecasts. Fully serviced rest areas and maintenance depots will be deployed along the road corridor with the improved sanitation system and services. It can also be utilized as emergency shelters and installed with equipment for early-warning systems during extreme weather conditions.

(ii) Sub-component 1.2: Last Mile Connectivity. This sub-component will finance short-distance access roads to rural settlements and agricultural producers along the road corridor, including improving the road-railways connections. It is envisaged to reconstruct and upgrade around 40 km of local unpaved roads and bridges into all-weather paved road. Additionally, at least 30 km of sidewalks and bicycle tracks are expected to be constructed for non-motorized road users in order to accommodate pedestrians and cyclists, especially between communities and bus stops along the highway, to make public transport more accessible.

(iii) Sub-component 1.3: Road Sustainability. This sub-component will focus on enhancing road sustainability and asset management through introducing modern tolling facilities, axle load management system and electric charging stations. The Project supports expanding the toll road network with advanced toll collection technology, which is in

line with MoT's plans to stimulate toll road network in the country and promote a self-sustaining model of using the toll revenue to support the road maintenance and improvement. By installing charging stations at selected points along the corridor is to encourage the use of electric vehicles (EVs) aligning with the NDC of the country. Introducing the weigh-in-motion systems coupled with application of the toll/fine electric payment system in the country will assist QAJ to address vehicle overloading issues to protect the pavement and improve safety, as well as mitigating the dispute in maintenance stage of the DBM contract.

(iv) Sub-component 1.4: Safety Audit. It aims to enhance and assess road safety for the new infrastructure. It will utilize the iRAP star rating system to evaluate road sections before and after improvements[7]. The iRAP star ratings measure the risk to road users based on over 50 road characteristics, providing an objective safety benchmark. The findings from using iRAP on proposed road section will be used to make recommendations for broader application in the country, enhance the QAJ's capacity in managing road safety systematically and prioritizing future investments.

4.1.2 **Component 2: Transport Systems Development (USD4.5 million).** This component will finance selected activities to strengthen the institutional capacity with focus on the road sector in Kazakhstan. It aims to through a systematic approach to improve the climate resilience and road safety in the road designs in the country and promote the decarbonization in road sector. It also supports identifying actions required to improve the functionality and efficiency of the Middle Corridor. Targeted technical assistance will be further developed based on the consultation with the MoT.

(1) Sub-component 2.1: Framework for Transport Resilience, Decarbonization, and Safer Roads. It is to support a review of Kazakhstan's national road design standards and practices, eliminating outdated methodologies, and recommending reforms aligned with current global practices in addressing the climate change and road safety challenges. Reform recommendations will be proposed with extensive stakeholder engagement. Additionally, the sub-component will support the MoT in developing a systematic approach in managing motorization involving updating vehicle and fuel standards, implementing scrappage programs, and accelerating the adoption of electric and hydrogen-powered vehicles. The sub-component will facilitate a coordinated policy-making process, assess data, and pilot differentiated road user charging based on vehicle emissions to reduce overall emissions in the road sector.

(2) Sub-component 2.2: Multimodal Middle Corridor Development. This subcomponent will identify the obstacles to multimodality of transportation and develop the strategy and actions to increase the functionality and attractiveness of Middle Corridor, and at the same time, by taking due consideration on carbon footprint reduction. A roadmap for developing a multimodal transport hub in Jezkazgan industry area is to be developed.

[7] The International Road Assessment Programme (iRAP) is a registered charity dedicated to saving lives by eliminating high risk roads throughout the world. iRAP works in partnership with governments, road authorities, mobility clubs, development banks, NGOs, and research organizations. https://irap.org

(iii) Component 3: Project Management (USD6.0 million). This component will help to establish and enhance the Project Implementation Unit (PIU) within QAJ through hiring required consultants to support and strengthen PIU technical capacity for project management and procurement, specifically with extensive experience in performance-based contracting, monitoring, financial management (FM) and ES activities, as well as other required areas for consultancy support during the implementation. Additionally, this Component will fund external financial audits and carry out result measurements as well as progress and impact assessments of the Project.

4.2 Cost and Financing Plan

Table 1. Project Cost Estimation and Financing Plan

Item	Project Cost (USD million)	Financing (USD million and %)		
		AIIB	**WB**	**GoK**
Component 1. Resilient and Safe Road Connectivity	**1,518.91**	**645.54**	**645.54**	**227.84**
Sub-component 1.1: Corridor Connectivity	1,496.41	635.98	635.98	224.46
Sub-component 1.2: Last Mile Connectivity	12.00	5.10	5.10	1.80
Sub-component 1.3: Road Sustainability	10.00	4.25	4.25	1.50
Sub-component 1.4: Safety Audit	0.50	0.21	0.21	0.08
Component 2. Transport Systems Development	**4.50**	**1.91**	**1.91**	**0.68**
Sub-component 2.1: Framework for Transport Resilience, Decarbonization, and Safer Roads	3.50	1.49	1.49	0.53
Sub-component 2.2: Multimodal Middle Corridor Development	1.00	0.43	0.43	0.15
Component 3. Project Management	**6.00**	**2.55**	**2.55**	**0.90**
Total Project Cost:	**1,529.41 (100%)**	**650.00 (42.5%)**	**650.00 (42.5%)**	**229.41 (15.0%)**
Front-end-fee (World Bank)	1.63	-	-	1.63
Front-end-fee (AIIB)	1.63	-	-	1.63
Grand Total:	**1,532.67**	**650.00**	**650.00**	**232.67**

4.3 The total estimated cost of the Project (exclusive of Front-end-fees) is USD1,529 million. AIIB will co-finance 42.5 percent of this amount, alongside the WB, which will also finance 42.5 percent. The GoK will contribute the remaining 15 percent as counterpart funding. The Front-end-fee and other potential capitalized fees will be further discussed and confirmed at loan negotiation.

4.4 **Co-financing Arrangements.** AIIB and WB are proposing to jointly co-finance the Project, with WB as lead co-financier. WB's policies and procedures on ES safeguards, procurement, FM, project monitoring, reporting and handling any complaints from Project-affected people will be used for the Project.

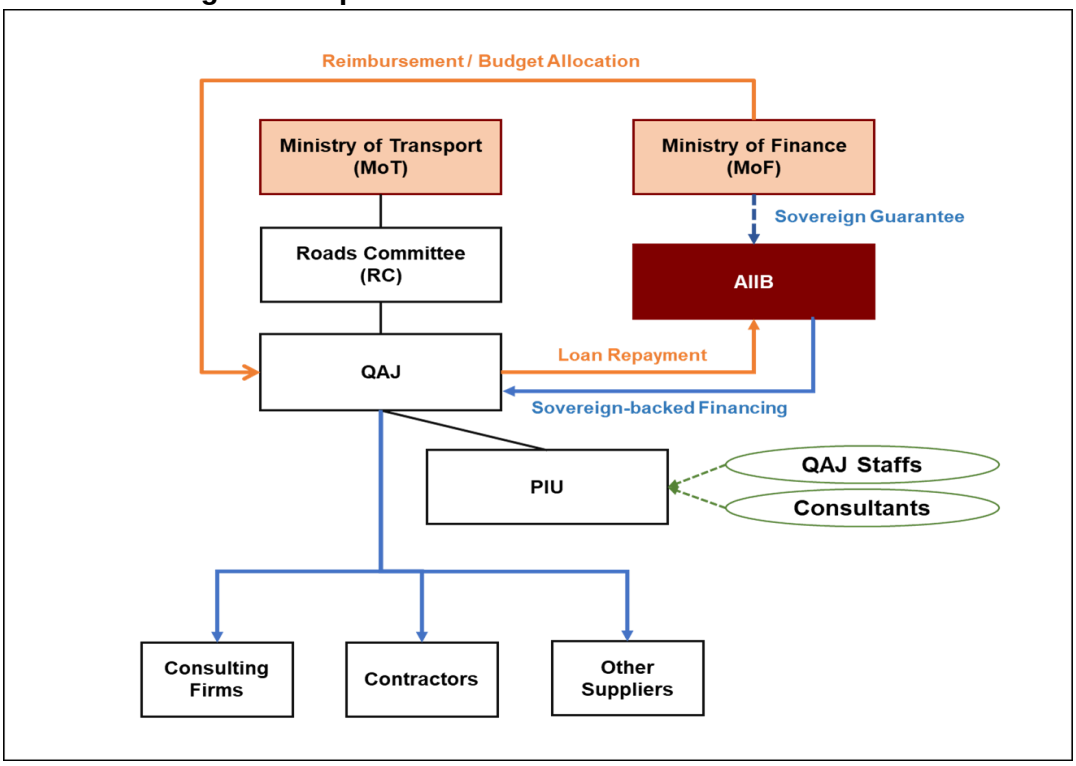
4.5 Implementation Arrangements and Readiness

4.5.1 Implementation arrangements.

(i) **Project Implementation Unit (PIU)**: "KazAvtoZhol National Company JSC" (QAJ), national road operator, will act as the Project Implementing Entity responsible for

delivering the Project outputs and outcomes. QAJ will establish a PIU to implement the Project. The PIU primarily implements project activities using contracts with civil works contractors, consulting firms and other suppliers as needed. The PIU will handle overall project implementation including procurement, contractual management, disbursement, financial management, monitoring, reporting and evaluation. Any project-post completion evaluation arrangements will be responsible by QAJ. QAJ through its PIU will ensure quality and compliance with the agreed requirements in the Environmental and Social (ES) instruments. The Implementation structure and funds flows are shown as below.

Figure 1. Implementation Structure and Fund Flows



(ii) **Procurement arrangements**: this Project is co-financed with the WB. As WB is the lead co-financer, the Project procurement will be conducted by the PIU under WB supervision and in accordance with the WB's Procurement Regulations for Investment Project Financing Borrowers for Goods, Works, Non-Consulting and Consulting Services, dated July 1, 2016 (revised November 2017, August 2018 and September 2023). The WB's Procurement Policy is materially consistent with the Core Procurement Principles and Procurement Standards of AIIB's Procurement Policy and therefore deemed fit-for-purpose and acceptable to AIIB. The Project will be subject to the WB's Anti-Corruption Guidelines, dated October 15, 2006 (revised in January 2011 and July 1, 2016).

(iii) The PIU will be responsible for procurement and contract management of the Project. PIU procurement and contract management staff will be allocated from QAJ and additional consultants will be hired to strengthen PIU procurement capacity as needed. The PIU has prepared a draft project procurement strategy for development (PPSD), which is in good shape and very comprehensive. The latest

version of the PPSD with the project procurement plan (PP) is satisfied by the WB as per WB Procurement Policy requirements. It is expected to be further discussed and concurred in the loan negotiations. It is expected to include an individual consultant with international experience in OPBRC to directly support and advise the PIU on technical and contractual matters and provide training to PIU staff, as needed.

(iv) **Financial Management (FM) arrangements:** QAJ will serve as the project management agency, overseeing daily implementation and assuming FM responsibilities. It will also act as the primary point for reporting to AIIB. QAJ has cumulated experience in managing ADB and EBRD financed operations. The Project's Interim Unaudited Financial Reports will be submitted to WB and AIIB within 45 days after the end of each calendar quarter. The audited annual project financial statements will be submitted to WB and AIIB within six months after the end of each financial year.

(v) **ES arrangements:** The PIU ES staffing and implementation arrangements have been discussed and agreed with QAJ but need to be confirmed before loan effectiveness. The PIU establishment and staffing acceptable to the Bank is considered as a legal condition for loan effectiveness. Additional ES and Operational Health and Safety (OHS) personnel are expected to be hired during the Project design stage and before the launch of civil works. At the PIU level, QAJ will hire at least one environmental specialist and one social development specialist by project effectiveness. These requirements have been reflected in an Environmental and Social Commitment Plan prepared for the Project.

(vi) **Project Implementation Plans and Project Operations Manual**: The Project will be implemented in accordance with a Project Operations Manual (POM), which will contain comprehensive details about the project implementation arrangements and processes, including procurement, FM, disbursements, and safeguards. A financial management manual, which will be part of the POM, will set out the FM and internal control policies and procedures, guide PIU FM staff, and minimize the risk of errors and omissions, as well as delays in recording and reporting. These written standards will also clarify responsibilities, including level of authority and clear control over cash and bank accounts, and will ensure timely and accurate financial reporting. Developing a POM that satisfies the Bank will be considered as a condition for the project loan agreement effectiveness.

4.5.2 **Implementation period.** The Bank's implementation period for the Project is expected to be around seven years, from December 2024 to December 2031, mainly covering the design and construction period, as well as the first couple of years of Project operation.

4.5.3 **Implementation readiness.**

(1) **Status of feasibility studies, procurement, land acquisition**: Feasibility studies on proposed road sections were prepared by national design institutes and have been approved by State Expertise with a conclusion issued in June 2024. The procurement for all seven road construction contracts adopts a prequalification

process. QAJ has launched the procurement process (prequalification stage) for all seven road construction contracts under the Project. The prequalification documents have been prepared by the individual consultant engaged by the WB and invitation for prequalification was published on the official website of QAJ as well as the external website of WB on June 27, 2024. AIIB is engaging WB to review the shortlist of the prequalification. Land acquisition will be handled by the relevant local government, the Akimat, once the detailed designs have been approved in the early years of Project implementation.

(2) **Required clearances/approvals for project implementation**: N/A.

4.5.4 **Monitoring and Evaluation.** QAJ will submit semiannual reports to the WB and AIIB detailing implementation status and significant issues within one month following the end of each reporting period. These reports will utilize the Result Monitoring Framework indicators as the primary tool for project assessment, monitoring fund disbursement, and providing updates on adherence to the ES standards, stakeholder engagement, and any complaints. Additionally, annual independent financial audits will be conducted. A midterm review of the Project will be carried out within forty-two months after project effectiveness, assessing the Project's implementation against the performance indicators and presenting an opportunity to make adjustments where necessary. The Project Completion Note will be compiled within six months after the loan closing date.

4.5.5 **AIIB's Implementation Support.** While the WB, as the lead co-financier, will take the lead in supervising the Project in accordance with WB's applicable policies and procedures, AIIB will work closely and cooperate with the WB in conducting due diligence, providing knowledge and expertise in executing OPBRC contracts and carrying out the monitoring and implementation support. AIIB team will conduct two implementation support missions per year during the design and procurement stage of the Project. Additionally, at least one implementation mission will be conducted after the completion of the Project's design and the commencement of construction along the entire alignment. The frequency of the implementation mission might be increased as needed. A Project Co-Lenders' Agreement will be signed between the two institutions detailing the arrangement of the cooperation.

5. Project Assessment

A. Technical

5.1 **Project Design.** The planned technical solution for the Jezkazgan - Karagandy corridor is deemed appropriate given its strategic importance of the corridor, the existing physical and human geography, and the need to significantly improve the resilience and safety of the road network. The existing Soviet era single carriageway road between Jezkazgan and Karagandy is in poor condition with an average roughness of 6.7 m/km according WB's review, indicating a lack of periodic maintenance over the last decade or more. Highway structures are also generally in poor condition and substandard. Given the age, capacity, and poor state of repair of the road, it is not economically feasible to continuing repair works only. Therefore, reconstruction and upgrading are necessary to bring it to a condition that can be sustainably maintained and meet future demand.

5.2 The decision to upgrade the selected sections of the road corridor to four-lane dual carriageway is based on projected traffic increases and the self-sustaining model of using the toll revenue to finance maintenance and future improvement. The traffic survey indicates a daily volume of over 10,000 vehicles near the city of Karagandy, with lower traffic in less busy western rural sections. Construction upgrading will be staggered and phased. The reference design proposing the separation of the two carriageways by 70 and 130 meters is feasible due to the low population density in the area and the predominance of state-owned land. This design offers safety and operational benefits by reducing the risk of head-on collisions and providing redundancy for connectivity in case of incidents, including extreme climate events, affecting one of the carriageways.

5.3 The existing road will be rehabilitated, and a new parallel carriageway will be constructed adjacent to the existing carriageway in settled areas and up to 70-130 meters away in rural areas to avoid impact on tree populations along the existing road. The upgraded highway will meet national standards for a category 1-B road, with two traffic lanes of 3.75 m width and shoulders of the same width. To improve safety and connectivity, twelve new grade-separated junctions will be introduced, along with overpasses for local and agricultural traffic. Pedestrian underpasses will be built in high-traffic areas near Karagandy, while underpasses will be constructed in other areas to facilitate the safe passage of domestic animals and wildlife. All existing drainage systems and bridges will be replaced to meet current load standards and increase water flow capacity, enhancing resilience against flooding. Additionally, the vertical alignment of the new and reconstructed carriageways will be significantly elevated to improve climate resilience by avoiding flooding of the road. Pavement will consider anticipated climate change effects and pavement materials will be used which are resilient to increased temperatures and frost-thaw cycles.

5.4 The Project aims to enhance the climate resilience and safety of roads in Kazakhstan by addressing outdated road design standards and incorporating international best practices. The current road conditions do not prioritize safety, as evidenced by designs that fail to encourage safe driving speeds, ensure good visibility, and provide adequate warnings of potential hazards. Additionally, the safety of all road users, including pedestrians and non-motorized road users, is not adequately considered in existing designs. To address these deficiencies, the Component 1 is designed to introduce considerations of all these important road safety

features in the design and construction of a physical investment along the corridor, whereas Component 2 will focus on the improving road design standards at the regulatory level. Recommended measures may include enhancing bridge capacity, raising embankments, and implementing measures to reduce snowdrifts. Review and promote the updating of current national standards and regulatory framework will contribute to longer-term resilience and sustainability of road infrastructure in the country.

5.5 There is an existing railway line in the same corridor connecting Jezkazgan to Karagandy, with the total length of 539 km. It was a single-track diesel-powered railway line built in the 1940s. Key large-volume cargoes in the Karagandy and Ulytau regions - the major copper producing regions in Kazakhstan – rely on this railway line and its direct links to production zones. This railway link gives priority to the heavy cargoes of copper ores and non-ferrous metals and lacks capacity to transport other freight and passengers. There are 4 passenger trains running between the cities of Jezkazgan and Karaganda, they are Jezkazgan - Astana (065 C), Kyzylorda-Pavlodar (117X), Jezkazgan - Astana (107 C), and Jezkazgan -Karaganda (609 C). Travel time is approximately 11 hours 30 minutes from Jezkazgan to Karagandy. There are 19 villages along the corridor, but only a few of them have passenger train stop stations nearby. The road is mostly used for transport of construction and repair equipment, supplies, and personnel, as well as providing a door-to-door transport service to local communities and villages. Road improvement will benefit regional development and contribute to Kazakhstan's exports volumes via rail as well. Both the road and railway infrastructure of this corridor have diminished capacity and are assessed to be in urgent need of improvement. Road improvement would not affect the modal shift of the corridor as rail traffic is mainly composed of heavy freight. Road and rail are very different transport modes in nature and providing different levels of services, and the relationship between these two in the Jezkazgan - Karagandy corridor is complementary rather than competitive.

5.6 **Operational Sustainability.** The GoK is fully committed to improving transport resilience, connectivity, and safety along the Jezkazgan - Karagandy corridor. This Project aligns with national plans to enhance the transport network by addressing deficient links and fostering a more equitable and resilient infrastructure. Upgrading this corridor aims to streamline the movement of goods and people along the corridor, reduce travel times and operating cost, enhance regional economic integration, and promote industry development and economic growth.

5.7 The Project also supports the GoK's shift towards modern road construction and maintenance approaches through introducing contracts with OPBRC formats, moving away from the traditional methods that often resulted in delays and underfunding. By involving the private sector through an integrated design, construction and long-term maintenance contracts, the Project aims to ensure the road's condition and functionality beyond construction.

5.8 **OPBRC approach** provides strong incentives for the contractor to implement innovative and advanced technologies to meet performance standards, leading to improved workmanship and maintenance practices. Emphasis on the end result and the strong linkage between quality of service and payments leads to better-quality roads that meet user needs and perform well over time. However, OPBRC requires detailed specifications which can be complex and requires detailed planning and preparation. Moreover, the envisaged shifting of

all risks to the contractor could complicate contract terms and execution and lead to higher upfront construction costs. During preparation of the bidding document therefore, it is important to ensure that the specification contains adequate performance indicators and service levels, which are specific, measurable, achievable and time bound. Risks should be allocated to the party which can best manage them. Unbalanced contract risk for the contractor that exceeds the anticipated return will potentially affect their willingness to bid and should be avoided.

5.9 Over the past decade, several countries have piloted OPBRC contracts, among others China, Georgia, Kyrgyz Republic, Mongolia,Tajikistan and the Lao PDR. Although OPBRC has not been used in the past in Kazakhstan, the Government is convinced of its benefits, especially in transfer technical, administrative and managerial procedures to the private sector and maintenance of the service quality and sustainability of the road network during its lifespan.

5.10 As the OPBRC concept will be implemented by the Project for the first time in Kazakhstan, the basic concept of OPBRC should be explained to the employer, contractors, and consultants. A key lesson learned from past and ongoing OPBRC projects is that it is important to provide explicit and detailed technical specifications at the time of bidding to minimize the risk of drastic changes in the final detailed designs presented by the selected design-build contractor, and the interpretation of performance standards. Contractors need to have the skills and capacity to fully understand the design and performance requirements. Supervision/Monitoring consultants should understand their role in the relation to control of service levels and assurance of overall technical quality without micromanaging. AIIB's additional support during pre-bidding, bidding and the implementation stage can help ensure that all parties understand their role and responsibility.

5.11 Performance standards consist of a performance indicator describing a specific defect and how to measure it, and an allowable threshold defining the acceptable values of the defect. For example, the typical performance indicators include the maximum number of potholes per kilometer of road, the maximum size of any pothole, and the maximum height of vegetation along the road, etc. Allowable thresholds are then added to define the performance standards, for instance determining that there may not be more than certain number of potholes per kilometer of road, that no pothole may be more than a certain diameter, and that vegetation may not be more than a certain height. Such performance standards are prepared for the different defects that can affecting different elements of the road, such as the pavement, shoulder, drainage system, structures, and right-of-way. A fixed payment is made if these performance standards are complied with and any existing defects do not exceed the allowable thresholds. The performance indicators and allowable thresholds will be tailored for each project based on the requirements of the Employer and service levels required. Lessons learned from past and ongoing projects in the region will be utilized to define performance standards and minimize the risk of failures in defining adequate performance standards.

5.12 The maintenance phase is the final stage of the OPBRC approach, offering an inherent incentive to the contractor to deliver higher quality initial construction to minimize future maintenance expenditure. This is achieved by establishing lifecycle responsibility and accountability for the facility's performance on the part of the contractor.

5.13 Introduction of tolling systems and measures to control overloaded vehicles will contribute to the road network's long-term financial sustainability and serviceability. Along the corridor, 11 traffic control gantries will be installed, equipped with advanced cameras to capture and recognize vehicle license plates. The gantries will transmit data to KazToll's existing information system to process and ensure real-time payments, in cash at the toll plaza or online. The deployment of traffic control gantries along the corridor will be further reviewed and adjusted (e.g. increasing the installations with shorter interval distance) depending on the traffic intensity and real traffic origin-destination features presented during the road operation. It is expected that toll revenues will provide funds for ongoing maintenance and future upgrades of the road, while strict enforcement of weight regulations will preserve the road infrastructure and prolong its lifespan.

B. Economic and Financial Analysis

5.14 **Economic Analysis.** The economic viability of the Project has been evaluated and the corridor was deemed economically viable with the Base Case Economic Internal Rate of Return (EIRR) and Net Present Value (NPV) estimated at 17.5 percent and KZT525 billion, respectively. A full economic analysis can be found in Annex 3.

5.15 Methodology. A Cost Benefit Analysis (CBA) was carried out to assess the economic viability of the Project comparing "with-" and "without-project" scenarios. The EIRR and ENPV were calculated based on a discounted cashflow analysis by comparing the project's economic and societal benefits with the project's cost over 20 years (2025 – 2044). The economic costs of the Project include the capital cost of road rehabilitation and construction and the associated O&M cost. The quantifiable economic benefits of the Project will mainly accrue from vehicle operation cost (VOC) savings for different types of vehicles using the road, value of time (VOT) saving for passengers and time value of working capital saving for cargo companies.

5.16 Traffic Demand Analysis. The traffic survey has been carried out by subdividing the road into five sections. The number of vehicles per day (vpd) number declined from 10,000 vehicles every day on the road section near the city of Karagandy to around 3,000 in the less busy western rural sections. The average estimation of vpd for the entire Project road in 2024 is 6,033, of which 78 percent are cars or buses, and the remaining 22 percent are trucks. This was estimated based on a traffic survey of five sections of the road corridor carried out by QAJ. Based on the composition of vehicle types, the number can be converted into an Average Annual Daily Traffic (AADT) of 10,295 passenger car units (pcu). Traffic demand forecasts were estimated based on a growth model with real GDP as the key explanatory variable. The average estimated traffic growth for all vehicles considered in the analysis is 2.6 percent per annum, which is a more conservative approach than the World Bank analysis (which assumed three percent constant growth throughout the evaluation period).

5.17 Results and Sensitivity. The robust EIRR demonstrates the economic viability of the Project. A Sensitivity Analysis was performed taking into consideration variations in the project expected benefits and costs. Even with a 15 percent increase in construction costs or a 15 percent decrease in benefits, the EIRR remains above 13 percent.

5.18 The estimated CAPEX of the Project is based on previous experiences of large MDB funded road projects in Kazakhstan adjusted for the Project characteristic. However, it worth to note that this is the first time to introduce the innovative contracting modalities, extended maintenance obligations, and requirements for private capital in road sector of Kazakhstan. There is uncertainty in the how the tenders from private sector will price these elements and associated risks. To test the soundness of the Project's economic viability in the scenario with the extreme high CAPEX resulted from the tendering, additional sensitivity analysis was conducted using an upper-bound capital cost of USD 2.2 billion. This scenario still resulted in an acceptable EIRR of 12.6 percent, should the Project require additional financing.

5.19 **Financial sustainability.** Sovereign-backed financing is deemed the most suitable approach for this significant road sector initiative. This Project is crucial for national cohesion, as it stimulates economic growth and employment in the Ulytau and Karagandy Oblasts, while also providing an alternative international transport corridor. Due to the sparsely populated areas and long distances along the corridor, there is insufficient traffic to make road upgrading and management concessioning attractive to the private sector investment. Public investment is therefore necessary. Additionally, the innovative nature of the OPBRC contract in the sector requires government intervention to address various issues such as road safety policy, climate resilience, and multimodal integration.

5.20 While the CAPEX of the Project road will be funded by the public budget, including MDBs' sovereign-backed financing, the OPEX of the road in the long term, following its completion, is expected to be self-financed through toll revenues collected throughout its lifespan. This self-sustaining model is promoted by the GoK for road maintenance and operations once the Project is completed. According to data provided by QAJ, in 2023, the total toll revenue collected from the category I toll roads (around 2,200 km country wide) amounted to approximately USD64 million. This demonstrates the capacity to support maintenance works at an average cost of USD29,000 per km of road. This average cost assessed falls within a reasonable range to support proper maintenance and ensure functionality and service of this category of road. based on the projected traffic intensity of the Project road, along with the estimated tariff rates and standard norms of maintenance and repair cost throughout the road's lifespan, the analysis shows that the toll revenue collected is sufficient to self-finance maintenance costs within the analysis horizon. It is important to note that the viability of this self-sustaining model heavily relies on the actual traffic intensity on the road. Sensitivity analysis has been carried out, which shows the model is self-sustained even under the extreme scenarios. To provide an additional safeguard, an integrated DBM contract has been introduced with a seven-year maintenance period after construction. It allows QAJ to secure sufficient funds in one integrated contract upfront for the maintenance cost of the first seven years following the road construction. It provides an additional time buffer for the traffic ramping up and enhances the self-sustainability of the road during its entire lifecycle.

C. Fiduciary and Governance

5.21 **Procurement:** In terms of the institutional capacity, QAJ has been an implementing agency for several ongoing MDB financed highway projects, including WB, ADB, and EBRD. QAJ also serves as a Project Management Consultant for the RC in the ongoing WB financed SWRP and EWRP projects. As such, QAJ is familiar with WB Procurement Policy

requirements. The PIU to be established for this Project will consist of staff/consultants with appropriate skills in project procurement and contract management. Therefore, it can be concluded that QAJ has enough procurement capacity to carry out procurement and contract management of the project with the necessary support of additional procurement consultants.

5.22 QAJ has developed the Project Procurement Strategy for Development (PPSD) informed by a comprehensive market analysis. This analysis was conducted based on the various sizes of procurement packages and responsiveness of the technical, financial and managerial capacity of the potential contractors from the market, leading to informed decisions on structuring works packages and lots to ensure robust tenderers participation. Consulting services contracts have also been packaged based on market research, with appropriate packaging in terms of the scope of services. A detailed Procurement Plan (PP) for the entire Project lifecycle has been prepared based on the PPSD outcomes.

5.23 According to the PPSD, the Project is expected to include (i) seven design-build-maintenance contracts using the OPBRC contract modality with a cost estimate of each contract ranging from USD140 million to USD400 million, and (ii) eight consulting services contracts with a cost estimate of each contract ranging from USD0.25 million to USD7 million, the bulk of which will be used for management and monitoring/supervision of the execution of the seven OPBRC contracts. WB standard procurement documents will be used with proper adaptations to ensure adherence to AIIB's regulations and requirements, if needed. According to market research, there should be sufficient competition for such large value contracts. In order to test the market, a prequalification process for all road construction contracts was launched, and the prequalified tenderers will be invited to submit tenders. The procurement process for all those contracts will be subject to procurement prior review by the WB team with proactive support of AIIB team.

5.24 The most challenging task is that this Project will introduce the first application of complex OPBRC contracting modalities for large-scale construction works in Kazakhstan. While the QAJ is experienced with traditional contracting methods, the new contract modality necessitates advanced operational design, complex procurement procedures and tender evaluation, and contract management skills. An assessment found several potential risks that may lead to potential implementation delay and unsatisfactory quality of contract deliverables, including (i) lack of experience with the new OPBRC contract modality which might affect the quality of the tender documents, (ii) potential low competition due to high qualification requirements, (iii) rejection of tenders exceeding cost estimates, (iv) lengthy government internal procedures for review and approval in both procurement and design, construction procedures, and (v) shortage of technical capacity for complex procurement. There is also an element of cost uncertainty as it is uncertain how potential contractors will estimate and price the contractual risks associated with OPBRC and private capital requirements.

5.25 To address these challenges, several proactive measures will be or have been taken, including (i) provisions for technical assistance and capacity building initiatives to enhance the implementing agency's capabilities, particularly in tender document preparation, (ii) extended market outreach to various contractor associations available and reachable in the market, (iii) implementation of a mechanism whereby a tender price exceeding the estimated cost, but in line with market prices, should be accepted, (iv) dedicating a detailed section to procurement in the Project Operations Manual (POM), (v) early engagement of qualified technical staff and

individual consultant(s) to prepare the Prequalification document, Specifications, evaluation criteria, (vi) implement effective procurement planning to account for anticipated delays, and (vii) use of experienced technical and project management consultants for supervision of OPBRC contracts execution.

5.26 **Financial Management:** According to the roles designated by RC of MoT, QAJ has been managing project implementation for ADB and EBRD financed operations for years, and has cumulated experience in financial management and disbursement, including budgeting, planning, accounting, and financial reporting. A recent assessment conducted by WB has found QAJ's procedures to be generally acceptable, and similar arrangements will be put in place for this project. Considering the workload, a financial management consultant will be hired to support the financial team in properly conducting the project financial management and disbursement work.

5.27 According to the Project cost estimation and financing plan, WB and AIIB will jointly finance 42.5 percent of each component, and the remaining 15 percent will be financed by the government funding. QAJ enters into a Trust Management Agreement with the State Property and Privatization Committee under the MoF and RC under MoT. This agreement allows QAJ to act as an agent to implement the rehabilitation and reconstruction of specific road projects on behalf of the RC. All expenses related to this agent service will be reimbursed from the government budget. QAJ will prepare annual investment plan to be approved by RC. Based on the approved annual plan (which can be adjusted once during the year), and the actual construction progress, QAJ will apply related co-share of counterpart funds from RC and make payment to contractors.

5.28 The PIU will comply with the Bank's audit requirements by appointing a private sector firm acceptable to the Bank to conduct annual audit and issue Management Letter for both the Project and the implementing entity. The Project and the Entity's financial statements will be audited as per the agreed Terms of Reference. Audit reports will be submitted to the Bank within six months after the end of the calendar year.

5.29 The following actions will be taken to further strengthen Project FM work:

- 5.29.1 Documenting the Project's FM-related arrangements, with a particular focus on internal controls, in the FM section of the POM.
- 5.29.2 Modifying existing automated accounting software to meet the Bank's financial reporting requirements.
- 5.29.3 Contracting a FM specialist or consultant with experience and qualifications acceptable to the Bank.

5.30 **Disbursements:** The loan proceeds will jointly finance various expenditures of goods, civil works, consultant services (including audit and training), incremental operating costs. Two Designated Accounts (DAs), each for WB and AIIB loan, will be established at a financial institution acceptable to the Bank. QAJ through its PIU will manage these accounts, with designated representatives authorized as signatories to ensure controlled and transparent handling of funds. Disbursement and Financial Information Letter will detail out the authorized signatories, ceiling of DA, threshold for each withdrawal application and supporting documents for disbursement requests.

5.31 **Financial Crime and Integrity (FCI) and Counterparty Due Diligence/Know Your Counterparty (CDD/KYC):** QAJ is a state-owned enterprise, which was established in 2013 under the MoT, serving as the national operator for the primary Republican Road Network, including international transit roads. The Know Your Counterparty and required due diligence have been carried out and no substantial issue identified at appraisal stage.

5.32 **Governance and Anti-corruption:** AIIB is committed to preventing fraud and corruption in the projects it finances. AIIB's 2016 Policy on Prohibited Practices (PPP) will apply. AIIB integrity covenants will be included in all bidding documents. WB will lead the investigation on any violation of prohibited practice related to the Project. AIIB will reserve the right to carry out investigation or audit on the violations and to take necessary measures to prevent and redress any issues in a timely manner, as appropriate. Detailed requirements will be specified in the Loan Agreement, Project Co-lenders' Agreement and the Project tender documents.

5.33 **Cybersecurity:** The infrastructure financed is not considered Critical Infrastructure.

5.34 **Domestic Legal Context.** Peer MDB experience in Kazakhstan suggests that a legal framework document – a Partnership Framework Agreement (PFA) between AIIB and the Republic of Kazakhstan is required for standalone sovereign-guarantee operations in Kazakhstan, in order for AIIB's policies and procedures to apply. AIIB has started PFA discussion with the government, and it is expected to take around two or more years to complete the process. In the case of this jointly co-financed Project, WB's procurement, ES will be applied as per AIIB's policies and the framework co-lenders' agreement with WB. Although PT has not had a chance to review the WB PFA, as it is still being finalized, the WB legal team has confirmed verbally that their PFA would apply to both WB standalone projects and the co-financed projects that apply WB's policies.

5.35 Based on the above analysis, it is assessed to be feasible for AIIB to implement this Project in the absence of an AIIB's PFA. AIIB requires the effectiveness of WB's PFA with the Government a condition of effectiveness of AIIB legal agreements. Further, as a standard condition of effectiveness set out in the AIIB General Conditions, the AIIB's Loan Agreement and the Guarantee Agreement will require a legal opinion from the Borrower and the Grantor to certify that the Loan Agreement and the Guarantee Agreement will be legally binding on the Borrower and the Guarantor respectively. This provides an additional reason for AIIB to be feasible to implement the Project in the absence of AIIB's PFA.

D. Environmental and Social

5.36 **Environmental and Social Policy and Categorization:** The Project will be co-financed with WB as the lead co-financier. To support a harmonized approach to addressing ES risks and impacts of the Project, and as permitted under AIIB's Environmental and Social Policy (ESP), the WB Environmental and Social Framework (ESF) and relevant Environmental and Social Standards (ESSs) are applicable for this Project in lieu of AIIB's ESP. The Bank has reviewed WB ESF and ESSs and is satisfied that (i) the ESF and ESSs are consistent with the Bank's Articles of Agreement and materially consistent with the provisions of AIIB's ESP, including the relevant ES Standards (ESS) and the Environmental and Social Exclusion List (ESEL), and (ii) the monitoring procedures that are in place are appropriate for the Project.

WB has assigned a substantial ES risk rating to this Project (equivalent to Category B as per AIIB's ESP) due to the scale and magnitude of ES impacts of this Project that can be avoided or mitigated by adhering to relevant ESSs, procedures, and guidelines.

5.37 **Environmental and Social Instruments**: A draft Environmental and Social Impact Assessment (ESIA) and an Environmental and Social Management Plan (ESMP) have been prepared and will be finalized as detailed design of the entire Project becomes available during early Project implementation. A draft Resettlement Action Plan (RAP) has been also prepared during Project preparation based on partial information available based on the preliminary technical designs. Potentially affected and interested stakeholders were identified as part of a Stakeholder Engagement Plan (SEP) preparation. Labor Management Procedures (LMP) have been prepared as part of the ESMP based on the proposed road upgrading works and estimated workforce requirements in past and ongoing projects. The above instruments were publicly disclosed by the Client the WB and consulted upon before Project Appraisal, and subsequently on the AIIB Project webpage. These management plans, including the ESMP and RAP, will reflect on and inform the final design options for each road section. They are expected to be finalized during the early Project implementation and are approved before the commencement of civil works. The final ESIA will also capture necessary measures to strengthen contractors' capacity, and the significance of incremental ES risks and impacts to sensitive receptors, if any. The ES Commitment Plan prepared for the Project sets out material measures and actions that the Borrower shall carry out or cause to be carried out, including, as applicable, the timeframes of the actions and measures, institutional, staffing, training, monitoring, and reporting arrangements, and grievance management. The PIU will be equipped with one environmental specialist and one social development specialist to manage the ES risks and impacts for the Project. Additional ES staff will be recruited as needed before the civil works commence.

5.38 **Environment Aspects:** The Project's potential environmental risks and impacts are associated with infrastructure activities (i.e., highway upgrading and supporting infrastructure) and potential capacity constraints within QAJ in terms of ensuring environmental and social compliance due to the large geographic scope of the proposed operations. Although the Project could potentially affect a small part of the Saiga antelope's winter migration range, the preliminary biodiversity assessment indicates that the A17 highway will not impact the antelope's primary habitat. The Project will not affect natural or critical habitats and species of ecological and conservation significance as the A17 corridor does not pass through known legally protected areas of high value and sensitivity, Ramsar sites, or Key Biodiversity Areas of the region. Saiga Tatarica, which, although previously classified as an endangered species, is no longer classified as a 'threatened' species by the Government. Other potential risks typical to road upgrading works include (i) increased pollution due to construction waste, (ii) generation of dust, noise, and vibration due to the movement of construction vehicles and machinery, (iii) operational or accidental spills of fuel and lubricants from the construction machinery, (v) traffic and road safety risks to workers, affected communities and road users as well as OHS issues, and (vi) improper reinstatement of construction sites upon completion of works. The impacts of anticipated road upgrading works are largely temporary, predictable, reversible, and can be readily mitigated, therefore the project has been categorized as 'B'.

5.39 **Social Aspects:** The proposed Project is expected to generate positive social benefits for the local population, including improved travel conditions and road safety, reduced

transportation costs, travel time, and congestion. The social risks and potential impacts are associated with land acquisition and restrictions on land use during construction, as well as community health and safety associated with potential labor influx. The Project does not anticipate major livelihood impacts related to land acquisition. The Project expects to affect around 260 land plots along the proposed corridor, consisting of 139 plots owned by households, 68 plots owned by legal entities (i.e., enterprises), and 53 plots owned by state agencies. Two local businesses will be physically displaced by the Project. The technical design to be finalized may require relocation of relevant utilities (power and telecom lines). Relevant mitigation measures are included in the ESIA/ESMP and will be cascaded to Contractors' ESMPs). The preliminary RAP prepared for the Project includes information about expenses related to land acquisition and resettlement and estimated budget allocations for RAP implementation. The PT will also closely oversee the implementation of the RAP to ensure that no land is accessed before compensation is fully paid.

5.40 Other social risks are expected to be residual due to poor construction practices, which could result in land use restrictions, property damage, pollution, road safety risks, and other disruptions. If not mitigated, such issues may generate grievances and adversely affect livelihoods, public safety, and public health. During the construction phase, the communities or villages connected to the A17 road may be exposed to health and safety risks associated with construction works, such as noise, waste, traffic safety, public safety (i.e., improper housekeeping, open excavation trenches, etc.), access restrictions to properties, etc. Labor influx may result in spreading communicable diseases due to overcrowding and poor living conditions that may affect the host communities if such risks are not contained. Since the majority of the villages are located at a distance of about 2 km from the road construction, the incremental impacts, like noise etc. are likely to be low. Sensitive receptors will be avoided as possible. Temporary barriers will be utilized for those a few areas where sensitive receptors are significantly affected during construction. The baseline noise level measurements and other parameters have been defined in the ESIA. In addition, the potential impact of Project activities on women in the community have been assessed as part of the ESIA. Measures were identified to prevent the potential negative impacts caused by the influx of migrant workers in the community and the risk of gender-based violence and included in the ESMP. These risks are expected to be mitigated through implementation of relevant measures incorporated in the ESMP and cascaded to the Contractors' ESMPs. The Contractors will prepare and implement a site-specific Noise and Vibration Management Plan, Community Health and Safety Plan, Traffic and Road Safety Plan and other plans as part of the CESMP detailing the procedures for noise and vibration monitoring and control, measures to prevent and manage SEA/SH and health and safety issues.

5.41 **Occupational Health and Safety (OHS), Labor and Working Conditions (LWC):** The Project will involve typical construction work-related OHS risks such as work-related accidents, hazards associated with the use of explosives and hazardous chemicals, electric shock, mechanical and load handling hazards, health issues from work environment (emissions, noise, vapors, extreme temperature, weather condition, contaminants, etc.); traffic and road safety, such as vehicular accidents, operations of machinery, road-crash kills to livestock, road detours etc. Relevant measures are formulated in the ESMP, and will be addressed in the Contractors' ESMPs, OHS Plan and Traffic Management Plan. Road upgrading works are expected to bring a substantial workforce of over 2,000 workers from different parts of the country and abroad. Construction-specific risks and impacts considered under the Project are

related to potential labor influx and consequent social tensions with the host communities. There could be potential issues on labor and working conditions due to sub-standard working practices. Further there could be community expectations for local employment that need to be managed. Potential risks related to labor influx may include crowding out of the existing basic services which could impact the host community, public health issues (including gender-based violence, and potential sexually transmitted diseases). Labor Management Procedures (LMP) prepared for the Project includes relevant procedures to be established and maintained to manage LWC risks and impacts during both construction and operation phases. The LMP to be implemented, monitored, and reported will address risks involving and affecting the significant labor force contracted for the Project. The Contractor's ESMP will be also updated to reflect relevant elements and findings of the final ESIA and include appropriate procedures to address labor and working conditions and the health and safety of both road construction and maintenance workers.

5.42 **Stakeholder Engagement, Consultation and Information Disclosure:** Consultations on the draft preliminary ESIA, ESMP, and RAP were carried out during these instruments' development. Potentially affected and interested stakeholders were identified as part of a Stakeholder Engagement Plan (SEP) prepared. The public consultations have resulted in incorporating a subcomponent on securing the last mile connectivity into the Project design. During the construction, the contractor will be required to regularly conduct consultations with the local communities and report to the Borrower monthly. The draft ES documentation was disclosed in English and the local languages (Kazakh and Russian) at the Borrower's[8] and lead co-financier 's websites[9] with subsequent disclosure on the Bank's website[10].

5.43 **Project Grievance Redress Mechanism (GRM):** The GRMs, respectively for project-affected people and workers, will be established in accordance with the requirements of the relevant WB's ESSs, including requirements on public consultation and disclosure of the GRM to Project stakeholders. The SEP includes the description of the Project-level grievance redress mechanism to be established at the national and regional levels. The Project will also utilize the existing grievance channels at the local levels through community leaders and district officials to escalate the complaints to project-level GRM.

5.44 **Bank's Project-Affected People's Mechanism (PPM):** The Bank has agreed that the WB's ESF will apply to this Project. Pursuant to the agreement with the WB, the WB's corporate Grievance Redress Service and its independent accountability mechanism, the Inspection Panel, will review all complaints relating to the WB's compliance with its ESF. In accordance with AIIB's Policy on the Project affected People's Mechanism (PPM), submissions made to the PPM regarding such complaints under this Project will not be eligible for consideration by the PPM. Information on the WB's corporate Grievance Redress Service is available at http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service. Information on the WB's Inspection Panel is available at http://www.inspectionpanel.org.

[8] https://www.gov.kz/memleket/entities/roads/documents/details/679908?lang=ru
[9] https://projects.worldbank.org/en/projects-operations/document-detail/P500565?type=projects
[10] https://www.aiib.org/en/projects/details/2024/approved/kazakhstan-transport-resilience-and-connectivity-enhancement-project.html

5.45 **Monitoring and Supervision Arrangements:** The Borrower will be responsible for coordination, supervision, and monitoring of Project in compliance with the WB's ESF and ESSs, and management of the project-level GRMs. Contractors will submit monthly construction monitoring reports, including on ES performance to the Borrower. The Borrower will submit semi-annual monitoring reports based on the agreed format to WB and the Bank. The PT, in collaboration with the lead co-financier's ES staff, will arrange for close supervision during the first two years to support the Client to finalize the ES package based on the detailed road section designs and to secure relevant mitigation measures are in place before commencement of any civil works. The AIIB ES team will retain its rights to conduct field supervisions.

E. Climate Change

5.46 **Climate Change:** The use of proceeds will finance three components, and primarily the reconstruction and upgrade of selected sections of 498 km of roads. These roads will have a capacity increase from a 2-lane carriageway to a 4-lane carriageway in selected sections of the corridor and thus cannot be considered Universally Aligned and the PT has performed a Specific Criteria assessment (SC) to determine its alignment with the mitigation goals of the Paris Agreement (BB1). The PT has also undertaken a comprehensive CRA during appraisal to determine its alignment of the first sub-component (Component 1. Resilient and Safe Road Connectivity) with the adaptation goals of the Paris Agreement (BB2). The other two sub-components (Component 2. Transport Systems Development and Component 3. Project Management) can be classified as aligned both for adaptation and mitigation due to their neutral impact on climate mitigation and the immateriality risk from the climate resilience perspective. The Project is determined to align with both the mitigation and adaptation goals of the Paris Agreement (please see Annex 5 for full assessment).

5.47 Some project components qualify as climate mitigation finance as they are included in the Joint MDB common principles list (i.e. electric charging stations, cycle lanes, etc.), being the amount allocated to the Project of USD73.2 million, equivalent to 11.27 percent of AIIB's investment. Due to its nature, objectives and outcome indicators, the Project can also be classified as climate adaptation finance under type 2 (enabling adaptation) being the climate adaptation finance allocated to the project of USD161.33 million, equivalent to 24.82 percent of AIIB's investment. The total climate finance of the Project (summing adaptation and mitigation) would be USD234.5 million, equivalent to 36.1 percent of AIIB's finance. (Please see Annex 5 for further details).

F. Gender Aspects

5.48 Gender-based occupational segregation is high in Kazakhstan, due to past exclusion of women from 287 occupations before Labor Code reforms in 2022. A 2024 sample of twelve road construction companies operating in the country indicated that the road construction sector exemplifies this gender divide. It remains male-dominated, with women occupying less than six percent of highly skilled technical roles such as road engineers, laboratory engineers, and surveyors. The challenges construction companies face in recruiting women are multifaceted and include working conditions, distance from homes, and prevailing social norms that discourage women from pursuing careers in construction. These need to be overcome before the sector can attract women. Activities undertaken for Subcomponent 1.1 will be used to tackle gender disparity in the road construction sector. The Project will assist

the Borrower in amending bidding documents for the civil works to require selected firms to develop and submit a gender action plan to improve female representation within their workforces. Each plan will explain how the firms plan to recruit local women in mid and high skilled technical roles both as interns and as employees and list concrete actions that it will put in place to build a more inclusive workplace that supports greater gender equality, including creating adequate working conditions, safe infrastructure, hygienic facilities, and confidential reporting mechanism to provide the interns and the employees with means to share their grievances free of retaliation in case of need. In addition, the Project will support QAJ with the design of a paid internship program, which will outline the key parameters of the program, including the theoretical and practical work that the host road construction engaged in the Project must adhere to. Relevant gender-sensitive indicators are incorporated into the Project's Results Monitoring Framework.

5.49 Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH) risks are assessed as moderate. While the national average of domestic violence prevalence in Kazakhstan is generally high, with 17 percent of ever-partnered women aged 18-75 having experienced physical or sexual partner violence (United Nations Women, 2017), a significant portion of the proposed road corridor is sparsely populated, except for major hubs such as Karaganda. Incoming construction workers will be accommodated on-site possibly at a distance from the existing towns and villages. Siting and design of workers camps will consider potential SEA/SH risks to the host community and among peer workers and require approval from supervision engineers prior to any construction. As part of the ESMP, SEA/SH prevention measures will be required from the contractors. These include establishment of referral and case-management procedures in cooperation with local service providers and/or a third-party organization; and/or SEA/SH-sensitive grievance management based on good international practices. Every project worker will sign a Code of Conduct on respectful behavior and be required to participate in relevant training prior to mobilization. The PIU will include a Social Development Specialist to manage GBV/ SEA/SH risks and impacts at the project level.

G. Risks and Mitigants

Table 2: Summary of Risks and Mitigating Measures

Risk Description	Assessment (H/M/L)	Mitigation Measures
Program/Project Preparation Risks		
Technical designs		
▪ Introducing the integrated design, build and maintenance contracts through the OPBRC format in the Member.	H	▪ An individual consultant with international experience in OPBRC has been engaged by the WB to directly support and advise the PIU on technical and contractual matters as well as to provide training to PIU staff. ▪ AIIB has engaged an experienced senior technical advisor to support the team in the preparation, assessment and monitoring quality of design, operational activities, implementation of critical aspects of performance contracting and contract management, as well as to provide advice and guidance to the PIU, as needed. ▪ PT is considering mobilizing available resources to enhance the quality of the tender document.
Program/Project Implementation Risks		
Implementation capacity		
▪ Lack of experience of design, build and maintenance contracts through the Output and Performance-Based Road Contracts (OPBRC) format.	H	▪ An individual consultant with international experience in OPBRC has been engaged by the WB to directly support and advise the PIU on technical and contractual matters as well as provide training to PIU staff. ▪ Close monitoring and training from Bank's specialist/consultant will be arranged during the preparation and implementation process.
Land acquisition and resettlement		
▪ Given the anticipated length of the corridor to be upgraded, the potential impacts are associated with land acquisition and restrictions on land use during construction	M	▪ A draft Resettlement Action Plan (RAP) has been prepared based on partial information on the preliminary road designs. The RAP will be finalized based on the final road designs and implemented before commencement of civil works.
Financial management		
▪ AIIB first infrastructure project in the country and the first collaboration with the QAJ.	M	▪ Project FM related arrangement will be documented in the Operational Manual, and the team will collaborate with WB to closely monitor project implementation.

Risk Description	Assessment (H/M/L)	Mitigation Measures
Procurement of large and complex packages		
▪ First time pilot application of a complex OPBRC contract modality in Kazakhstan may lead to procurement delay and unsatisfactory project quality of the project due to (i) lack of experience with OPBRC contracting; (ii) potential low competition due to high level of qualification; (iii) shortage of technical capacity.	H	▪ To address those challenges, the following measures have been/will be taken: (i) provision of technical assistance and PIU capacity building; (ii) extended market survey and outreach; (iii) engagement of qualified staff and experts to prepare the procurement document and administer the procurement process; (iv) effective procurement planning and strategy formulation in the early stage of the project; (v) supervision of all contract procurement by WB and AIIB through procurement prior review; (vi) hiring consultants experienced in OPBRC contracting to support procurement and contract management.
ES risks and impacts during construction and operation		
▪ Weak institutional capacity of Borrower to manage risks and oversee ES and OHS compliance	M	▪ At the PIU level, QAJ will hire relevant experienced ES staff and experts by the Project Effective Date. Additional ES and OHS personnel are expected to be hired by contractors before the launch of civil works.
Legal risks		
▪ Absence of the PFA between AIIB and the Government of Kazakhstan, while the WB's PFA is still being finalized.	M	▪ WB is following up closely on the progress of its PFA process. ▪ The effectiveness of WB's PFA with the Government will be a condition of effectiveness of AIIB legal agreements ▪ As a standard condition of effectiveness, the AIIB's Loan Agreement and the Guarantee Agreement will require a legal opinion from the Borrower and the Grantor to certify that the Loan Agreement and the Guarantee Agreement will be legally binding on the Borrower and the Guarantor respectively.

Annex 1: Results Monitoring Framework

Project Objective (PO):	**Strengthen the resilience of transport systems in Kazakhstan through improving climate-adapted road connectivity along the Karagandy-Jezkazgan section of the Middle Corridor**										
Indicator Name	**Unit of Measure**	**Base-line Data 2024**	**Cumulative Target Values**						**End Target 2031[11]**	**Frequency**	**Responsibility**
			YR1	**YR2**	**YR3**	**YR4**	**YR5**	**YR6**			
Project Objective Indicators: *(Outcome indicators measure each aspect of the PO statement and are to track progress toward the achievement of the PO)*											
1. Reduced travel times along the Karagandy - Jezkazgan corridor	minutes	0	-	-	-	-	-	-	95	Semiannual	QAJ
2. Climate resilience measures incorporated in the Project roads	Yes / No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Semiannual	QAJ
3. Road design standards improved to enhance resilience and safety	Yes / No	No	-	-	-	-	-	-	Yes	Annual	QAJ
Intermediate Results Indicators: (*To measure key intermediate results under each component that are necessary for showing progress toward achieving PO. They can capture outputs or short-term outcomes.)*											
1. Roads rehabilitated, non-rural	km	0	TBD	TBD	TBD	TBD	TBD	TBD	490	Annual	QAJ
2. Grievance Redress Mechanism is in place and grievances are timely addressed in compliance with the established and agreed procedures	Yes / No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Annual	QAJ
3. Local and connecting roads improved along the Karagandy – Jezkazgan corridor	km	0	TBD	TBD	TBD	TBD	TBD	TBD	35	Semiannual	QAJ
4. Share of females in high-skilled engineering and other similarly male-dominated high-skilled technical roles in selected road construction companies	%	6	TBD	TBD	TBD	TBD	TBD	TBD	11	Semiannual	QAJ

[11] The end target year is 2031, evaluations of the results will take place in 2032.

Project Objective (PO):	**Strengthen the resilience of transport systems in Kazakhstan through improving climate-adapted road connectivity along the Karagandy-Jezkazgan section of the Middle Corridor**										
Indicator Name	**Unit of Measure**	**Base-line Data 2024**	**Cumulative Target Values**						**End Target 2031[11]**	**Frequency**	**Responsibility**
			YR1	**YR2**	**YR3**	**YR4**	**YR5**	**YR6**			
5. Infrastructure for non-motorized users constructed	km	0	TBD	TBD	TBD	TBD	TBD	TBD	30	Semiannual	QAJ
6. Road safety improvements along the Karagandy – Jezkazgan corridor expressed as the iRAP rating	#	2.8	TBD	TBD	TBD	TBD	TBD	TBD	3.5	Semiannual	QAJ
7. Weigh in motion axle load control mechanisms established	Yes/ No	No	TBD	TBD	TBD	TBD	TBD	TBD	Yes	Semiannual	QAJ
8. Project beneficiaries expressing satisfaction with improved travel experiences along the Karagandy – Jezkazgan corridor	%	0	TBD	TBD	TBD	TBD	TBD	TBD	80	Semiannual	QAJ

Annex 2: Country Credit Fact Sheet

1. **Background**: Kazakhstan is an upper-middle-income country with a population of 20 million and income per capita of around USD13,120 (or 33,000 in purchasing power parity). Kazakhstan is among top 15 countries by proven oil reserves. The country is dependent on hydrocarbons, which account for about 15 percent of GDP, half of exports and a third of government revenues. Kazakhstan enjoys a geostrategic location with a potential to become a key logistical hub on the increasingly important trade route (the so-called Middle Corridor).

2. During the period of high oil prices Kazakhstan recorded high economic growth and large fiscal surpluses and has built significant asset buffers. However, the 2014 crash of oil prices resulted in a sharp decline in growth and a large increase in fiscal deficits. The authorities relied on borrowing and drawing assets from the national oil fund. Since then, Kazakhstan has been working on improving the macroeconomic framework and economic diversification by introducing various reforms.

3. For example, the authorities have introduced fiscal rules to strengthen sustainability, keep fiscal policy counter-cyclical while retaining space for development spending. Monetary policy has moved towards inflation targeting and improvements have been made to policy transparency, operations, and banking supervision.

4. While macroeconomic stability and policy frameworks have been strengthened, the dependency on hydrocarbons remains significant. Furthermore, state-owned firms have a large footprint in the economy.

Key Economic Indicators	2020	2021	2022	2023	2024*	2025*	2026*	2027*
Real GDP growth 1/	-2.60	4.10	3.30	5.10	3.50	5.65	2.16	3.72
Inflation (CPI, average) 1/	6.80	8.00	14.96	14.56	8.67	6.98	6.12	5.37
Fiscal balance	-7.04	-4.97	0.11	-1.53	-2.22	-1.91	-2.00	-2.13
Public debt	26.36	25.10	23.52	23.02	24.22	26.46	29.17	31.18
Gross public financing needs	8.6	6.3	1.5	1.8	3.4	3.1	3.1	3.6
Current account balance	-6.41	-1.36	3.14	-3.76	-3.00	-2.68	-3.20	-3.30
External debt	96.2	83.3	71.7	65.6	61.7	58.7	58.3	56.5
FX reserves (USD billion) 2/	35.6	34.4	35.1	36.5	37.1	38.2	38.9	39.3
Exchange rate, KZT/USD 2/	420.7	431.7	462.7	454.6	447.5	..		

Source: WEO April 2024; IMF Country Report 24/46; Press release no. 24/199 in percent of GDP unless indicated otherwise; '*' = projections.1/ percent change, year-on-year 2/ end-of-period, most recent data from central bank; as of Mar 7

5. **Recent Development**: Not unlike for other countries in the region, the impact on Kazakhstan of the geopolitical tensions, since 2022, has been limited despite close trade and financial links with Russia. The authorities reiterated the country's neutral position. There was a temporary disruption in the Caspian Pipeline, which carries around 80 percent of Kazakhstan's crude oil exports. Current account and fiscal balances improved significantly. Overall, growth in 2022 reached 3.3 percent, and further increased to 5.1 percent in 2023 thanks to accelerated growth in most segments of the non-oil sector, a strong recovery in the production and export of oil and due to strong private and public consumption and investment.

6. However, inflation has surged, to a peak of 14.7 percent in 2022, due to high commodity prices (especially food), some depreciation of the currency and high credit growth.

In response, the central bank significantly tightened its policy stance. Subsequently, inflation has receded (9.3 percent in February 2024), which prompted the authorities to already start easing.

7. In 2023, the government adopted a new climate policy strategy and intends to invest in joint ventures to foster the advancement of renewable energies and water-saving technologies. In May this year the President also signed a decree on measures to liberalize the economy which focusses on increasing competition and reducing the role of the state in the economy.

8. **Outlook and Risks**: Growth is expected to moderate in 2024 to 3.5 percent, mostly due to a delay in the Tengiz oil field expansion to end-2024. As a result, growth in 2025 is expected to be almost 6 percent. Subsequently, growth should revert to potential, estimated at around 3.0–3.5 percent. Inflation is expected to gradually decline. The moderation of global oil prices is expected to push the fiscal balance into a small deficit. The current account deficit is expected to increase somewhat also due to strong import growth.

9. The authorities' plan to reduce the non-oil deficit to five percent in 2030 would ensure ample fiscal space. The fiscal rule, temporary suspended, is to be reinstated in 2024, albeit a better enforcement of these rules is needed. A tax reform is being planned.

10. Monetary policy aims at a three to four percent inflation by 2025. Further efforts are needed to develop domestic financial markets and strengthen bank supervision.

11. Risks to the outlook include delayed reform implementation, declines in oil prices, potential setbacks in the Tengiz field expansion, disruptions in oil exports via the Caspian Pipeline, sluggish growth in trading partners, ramifications from geopolitical tensions and geo-economic fragmentation, and escalated social tensions hindering the implementation of the reform agenda.

12. Mitigating these risks are low and sustainable debt, large fiscal buffers (sufficient to cover all of public debt with a large margin), an adequately capitalized and profitable banking sector, and a degree of political stability following the re-election in late 2022 of the incumbent President, by an overwhelming majority, giving him the mandate to continue the announced reforms. Upside potential also includes higher oil prices, and higher-than-expected foreign investment in new sectors.

13. Kazakhstan is an investment grade country. Fitch (BBB) and S&P (BBB-) have affirmed their ratings throughout recent shocks, whereas Moody's upgraded Kazakhstan from Baa3 to Baa2 in August 2021. Fitch has kept the outlook at stable, whereas S&P a year ago raised the outlook back to 'stable', on account of less-than-expected impact from geopolitical tensions, while Moody's changed the outlook from 'stable' to 'positive' citing progress in reducing reliance on hydrocarbons which will support economic resilience.

Annex 3: Economic and Financial Analysis

I. Economic Analysis

1. **Overview.** A Cost Benefit Analysis (CBA) was carried out to assess the economic viability of the Project comparing “with-” and “without-project” scenarios, based on information provided by the Feasibility Study Report (FSR) prepared by the Kazakhstan Highway Research Institute (KazDorNII), QAJ and technical due diligence inputs. The Project will improve selected sections of the Jezkazgan - Karagandy road corridor to meet climate-resilient and road safety standards. It is expected to enhance road service and safety levels, reduce travel times for existing users compared with the ‘without-project’ scenario, thereby generating sustainable economic and environmental benefits.

2. The CBA focuses on Project Component 1 which represents approximately 99 percent of the total Project cost. Component 2 and 3 play a supporting role in the development of the transport system and project management, and are expected to generate broader benefits. However, quantifying these benefits poses a challenge. Since the investments in these two components are minor compared to Component 1, they have not been included in the CBA.

3. Overall, the Project exhibits a Base Case Economic Internal Rate of Return (EIRR) of 17.5 percent, with an Economic Net Present Value (ENPV) of KZT525 billion at an eight percent discount rate. The Project is therefore considered economically feasible.

4. **Methodology**. The EIRR and ENPV were calculated based on a discounted cashflow analysis by comparing the Project’s economic and societal benefits with the Project’s cost over 20 years (2025 – 2044). A Sensitivity Analysis was performed taking into consideration variations in the expected project benefits and costs.

5. The CBA compares the ‘without-project’ and ‘with-project’ senarios. The without-project scenario assumes that no construction cost is incurred for road improvement. Only minimum routine and periodic maintenance will be conducted. The existing road is expected to experience continued growth in traffic, resulting in higher VOC and longer travel times, due to reduced service level and increased congestion. In contrast, the ‘with-project’ scenario anticipates lower VOC, shorter travel times due to improved road conditions and increased capacity, thereby enabling higher speeds. The benefit is against the economic cost of new capex for the road improvement works under the Project, as well as up-to-standard maintanance and repair works to ensure the sustainbility and functionality of the road wihtin its life span.

6. The PT reviewed the excel-based CBA model in the KazDorNII FSR and concluded that the main structure and logic used in the model were acceptable practices in the preparation of highway projects. PT made necessary adjustments and improvements to the model to ensure its compliance with the requirements of the Bank.

7. **Project Road.** The Project road was subdivided into five road sections for the CBA analysis. The table below shows the length and basic characteristics of the road sections.

Table 1. Project Road Sections Length

Project Road	Road Section Name	Length (km)	Number of Lanes	Terrain Type
1	Karagandy-Jezkazgan Section 1	135.0	2	Flat
2	Karagandy-Jezkazgan Section 2	100.0	2	Flat
3	Karagandy-Jezkazgan Section 3	100.0	2	Flat
4	Karagandy-Jezkazgan Section 4	100.0	2	Flat
5	Karagandy-Jezkazgan Section 5*	63.0	2/4	Flat
Total		498.0		

* 4 km has four lanes

8. **Traffic Intensity.** Based on the traffic survey of five sections of the Project road carried out by KazDorNII, the estimated vpd on the Project road in 2024 is 6,033 on average, of which 78 percent is cars and buses, and the remainder 22 percent is trucks. Based on the composition of vehicle types, the Average Annual Daily Traffic (AADT) was estimated as around 10,295 passenger car unit (pcu).

Table 2. Project Roads Condition and Traffic

Project Road	Surface Type	Roughness (IRI, m/km)	Speed (km/hour)	2024 Traffic (vpd)
1	Paved	6.3	75	3,089
2	Paved	6.4	75	3,489
3	Paved	5.9	75	4,116
4	Paved	7.5	75	8,921
5	Paved	7.4	75	10,551
Average		6.7	75	6,033

9. Economic growth drives increased production, consumption, urbanization, and mobility, which directly translates into a higher demand for transport services across various modes and sectors. According to the IMF, the expected Kazakhstan's GDP growth between 2024 to 2029 is 3.2 percent per annum on average. Traffic demand forecasts were estimated based on a growth model with real GDP as the key explanatory variable. The elasticity of the road traffic growth to GDP growth was estimated at one and is expected to reduce in line with economic growth. The average estimated traffic growth for all vehicles considered in the analysis is 2.6 percent per annum, which is a more conservative approach than the World Bank analysis (assumed three percent constant growth throughout evaluation period). It is expected that the proposed higher-quality road will encourage economic development along and close to the corridor. The table below shows the traffic and road condition of the Project road.

Table 3. Traffic Forecast on the Project Road

Year	Car	Bus	Light Truck	Medium Truck	Heavy Truck	Tractor & Motorcycle	Total, vpd	Total, AADT
2024	4,298	415	768	371	172	9	6,033	10,295
2025	4,446	429	795	384	178	9	6,241	10,651
2029	5,006	483	895	432	200	10	7,026	11,992
2034	5,682	548	1,015	490	227	12	7,975	13,611
2039	6,378	615	1,140	551	255	13	8,952	15,278
2044	7,140	689	1,276	616	286	15	10,022	17,104

10. **Road Condition**. The Project road sections are in poor condition with an average roughness of 6.7 IRI (International Roughness Index), m/km, having received little or no periodic maintenance over the last 10 years. Project road sections are mostly two-lane roads that will be reconstructed and widened to four lanes with small improvements in alignment. The current average travel speed on Project road sections is 75 km per hour, which is expected to increase to around 90 km per hour after improvement works.

11. **Economic Benefits**. The quantifiable economic benefits of the Project will mainly accrue from VOC savings for different types of vehicles using the road, VOT saving of passengers and time value of working capital saving for cargo. Additional economic benefits are evident, however cannot be precisely quantified due to lack of comprehensive information. These include savings in accident costs and the positive impact on industrial development and economic growth resulting from improved road infrastructure.

12. Average speed and roughness. It is estimated that the reduction of travel time along the carriageway will be 1.1 hrs. compared with the 'without project' scenario (from 6.64 hrs. to 5.53 hrs.). Average speed on the carriageway will increase from 75 km per hour in the 'without project' scenario to 90 km per hour in the 'with-project' scenario. The roughness of 6.7 m/km in the 'without-project' scenario, will reduce to an average roughness of 3.12 m/km in the 'with-project' scenario. An 0.14 m/km annual increase in road roughness has been added to the calculation to estimate the benefits on a conservative basis.

13. Savings from vehicle operating cost. Based on the speed model and roughness model embedded in the FSR, together with the forecasted numbers of traffic by different vehicle types, the saving in vehicle operation cost has been estimated as the benefit. The model also assumed the road will receive up-to-standard maintanance and repair works during its entire lifespan. Increase in the benefits over time is influenced by two main factors: (i) traffic growth: as traffic volume increases over time, so do the benefits; (ii) road condition gap: the difference in road conditions between the "without-project" and "with-project" scenarios grows over time. Without the project, the road will further deteriorate due to lack of rehabilitation and maintenance. This widening gap leads to an accelerated increase the benefits.

14. Passenger time saving values. The model estimates the VOT for passengers in both with- and without-project scenarios taking into account estimated travel time savings and the unit time value of passengers estimated. Average monthly earnings in both Karaganda and Ulytau Oblast were used to estimate the unit VOT. VOT was estimated at KZT 2,391 per hour by KazDorNII and has been adjusted for inflation.

15. Time value of working capital savings for cargo companies. As the Project road will become an important transport corridor for cargo shipment, the economic benefit from saving of the time value of the reduced working capital of the freight companies led by the shorter transit time of cargo on the road was estimated. The average price of transported per ton in 2023 prices is estimated at KZT11,000 per FSR.

16. **Economic Costs**. The capital cost of improvement works on the Project road is estimated to be USD1,518.9 million or USD3.0 million per km. The Operation and Maintenance (O&M) costs are estimated at USD4.7 million per year starting from year 2036. As indicated in the aforementioned sections, the maintenance service of the first 7 years (2029

– 2035) will be provided by the contractor under the DBM contract, and the associated cost is already included the capital cost component. A standard conversion factor (SCF) of 0.8 has been used to convert the financial costs into economic prices.

17. Salvage value is considered at 20 percent of the economic cost at the end of analysis period and is treated as a negative cost. This would include salvage values for earthworks, culverts, bridges, etc. which will have a much longer life span than the Project.

18. **Emission and Social Cost of Carbon**. The GHG accounting assessment conducted by the WB estimates that there will be an increase in carbon dioxide (CO_2) emissions on the road with the Project. The total net and annual net CO_2 emissions for the Project roads are 1,599,939 tons and 79,997 tons per year, respectively. The increase in CO_2 emissions is attributed to the increase in fuel consumption with the Project due to the increase in vehicle speeds and the generated traffic on the Project road with the Project. However, the model does not consider the increasing use of EVs. Their substantial adoption over the next twenty years will significantly reduce carbon dioxide and other emissions.

19. The analysis has adopted the recommended shadow price (midpoint) of carbon provided in the AIIB Guidance Note on Cost-Benefit Analysis of Projects, which is USD67 per ton equivalent in 2025 increasing to USD102 per ton equivalent in 2044.

20. **Economic Cash Flow**. Based on the above cost and benefit calculation, the Base Case EIRR is computed as 17.5 percent while the NPV is estimated at KZT525 billion at an eight percent discount rate. The corridor is deemed economically viable. The undiscounted economic cash flow is shown below:

Table 4. Project Economic Cash Flow (KZT million)

Year	Cost			Benefits					Residual Value (3)	Net Benefits (2)-(1)+(3)
	Capex	O&M[1]	Total Cost (1)	VOC	VOT - Passenger	VOT - Cargo	GHG	Total Benefits (2)		
2025	57,288	0	57,288	0	0	0	0	0	0	(57,288)
2026	229,154	0	229,154	0	0	0	0	0	0	(229,154)
2027	229,154	0	229,154	0	0	0	0	0	0	(229,154)
2028	28,644	0	28,644	0	0	0	0	0	0	(28,644)
2029	4,092	(960)	3,133	39,775	61,462	678	(2,753)	99,162	0	96,029
2030	4,092	(745)	3,347	43,069	65,018	698	(2,829)	105,957	0	102,610
2031	4,092	(745)	3,347	46,597	68,772	719	(2,892)	113,196	0	109,849
2032	4,092	(745)	3,347	50,374	72,733	741	(2,957)	120,890	0	117,543
2033	4,092	(745)	3,347	54,263	76,699	763	(3,024)	128,700	0	125,353
2034	4,092	(745)	3,347	58,410	80,872	786	(3,092)	136,975	0	133,628
2035	4,092	(745)	3,347	62,830	85,263	809	(3,162)	145,741	0	142,394
2036	0	1,806	1,806	67,540	89,882	834	(3,233)	155,023	0	153,217
2037	0	1,806	1,806	72,557	94,742	859	(3,305)	164,852	0	163,046

[1] The negative O&M observed during the period from 2029 to 2035 is due to the fact that in the with-project scenario, the O&M costs will be covered by the DBM contractor. This results in savings compared to the without-project scenario.

Year	Cost			Benefits					Residual Value (3)	Net Benefits (2)-(1)+(3)
	Capex	O&M[1]	Total Cost (1)	VOC	VOT - Passenger	VOT - Cargo	GHG	Total Benefits (2)		
2038	0	1,806	1,806	77,898	99,854	884	(3,380)	175,256	0	173,450
2039	0	1,806	1,806	83,582	105,231	911	(3,456)	186,268	0	184,462
2040	0	20,688	20,688	89,630	110,885	938	(3,534)	197,920	0	177,232
2041	0	1,806	1,806	96,062	116,832	966	(3,613)	210,248	0	208,441
2042	0	1,806	1,806	102,901	123,085	995	(3,694)	223,287	0	221,481
2043	0	1,806	1,806	110,170	129,660	1,025	(3,777)	237,077	0	235,271
2044	0	1,806	1,806	117,893	136,572	1,056	(3,862)	251,658	114,577	364,429
Total	572,884	29,708	602,592	1,173,550	1,517,561	13,662	(52,564)	2,652,210	114,577	2,164,195

21. **Sensitivity Analysis.** Sensitivity analysis was conducted to test the robustness of the EIRR to different variations in project-specific parameters. The results are summarized in Table 5. The results show the robustness of the economic feasibility of the project under the normal and adverse sensitivity scenarios. The four scenarios are:

(i) Scenario I: Cost increased by 15 percent
(ii) Scenario II: Benefit decreased by 15 percent
(iii) Scenario III: Cost increased by 15 percent and Benefit decreased by 15 percent
(iv) Scenario IV: Project delayed by one year

Table 5. Sensitivity Analysis

Case Scenarios	EIRR (%)	ENPV (KZT billion)
Base Case	17.50	525
Scenario I: Cost increased by 15 percent	15.52	454
Scenario II: Benefit/ traffic decreased by 15 percent	15.25	379
Scenario III: Cost increased by 15% and Benefit decreased by 15 percent	13.38	307
Scenario IV: Project delayed by one year	16.92	447

II. Institutional Financial Analysis.

22. QAJ was formed in March 2013 on the basis of the Resolution of the GoK dated 1 February 2013. The Company's shareholder is the GoK, represented by the State Property and Privatization Committee under MoF (SPPC MoF). The state body exercising, on the basis of the relevant acceptance certificate, the right to own and use 100 percent of the state block of shares of the QAJ is the Road Committee under the MoT.

23. In accordance with the QAJ's Charter, the principal activities of QAJ are: (i) to implement budget investment projects for the development of the network of public motorways of international and national significance on the basis of the state assignment; (ii) to implement design, construction, reconstruction, repair and maintenance of public roads of international and national significance within the framework of the state assignment; (iii) control over the progress and quality of construction, reconstruction, repair and maintenance of public roads of international and national significance within the framework of organization of execution of

the state task; (iv) trust management of toll roads; (v) elimination of faults preventing uninterrupted and safe passage of vehicles along the toll motorway; and (vi) collection of tolls for travelling on toll roads.

24. QAJs revenue is mainly from (i) budget allocation for expenses from providing service in implementing the construction, reconstruction, repair and maintenance of public roads within the framework of the state task, (ii) budget allocation for the maintenance and repair works on the toll-free road, and (iii) collection of toll revenue on the toll roads.

25. In general, all national roads are owned by SPPC MoF on behalf of the GoK. Whenever, there is a need to reconstruct or rehabilitate the road, the QAJ enters into Trust Management Agreement (TMA) with SPPC MoF and RC which governs the (i) transfer of road asset among SPPC, QAJ and Contractor in different stages of works and (ii) reimbursement of expenses related to the provision of these activities above. Under the TMA, QAJ acts as an Agent with the RC as a Principal.

26. Following internal procedures to move forward with development of the road project under a sovereign guarantee, the QAJ will submit a budget request to MoF via MoT. Once it is approved, the TMA is signed between three parties. Under the TMA, QAJ signs a monthly compensation act with the RC, which allows for reimbursement of all expenses. Following this, QAJ uses the reimbursed funds to pay civil works and services and repay the debt service on the bank loans.

Historical Performance.

27. *Asset.* According to the audited financial statements of QAJ, the Company's total asset increased to USD2.9 billion as of December 31, 2023, compared to USD2.5 billion a year earlier. A significant portion of QAJ's assets (84 percent) are classified as non-current. Notably, around 64 percent of these non-current assets consist of non-current trade and other receivables. These are long term receivables related to reimbursement for the repayment of state-guaranteed loans under the TMA.

28. The QAJ primarily serves as a government agency between the SPPC MoF and EPC contractor(s), with limited direct ownership of national roads. This is evidenced by the minimal value of property, plant, and equipment, recorded at just USD2.6 million. The small amount of tangible assets underscores QAJ's role as an agent rather than an owner of road assets.

29. *Liabilities.* As of December 31, 2023, total liabilities increased by 11 percent to USD2.9 billion on the back of higher loans. Financial debt[2] forms a substantial portion of QAJ's liabilities, amounting to approximately USD2.1 billion. These loans are long-term, with most maturing in 2038-2039, reflecting a long-term debt strategy. About 77 percent of QAJ's financial debt is owed to the Export-Import Bank of China (Exim Bank), making it the Company's largest creditor. The remaining debt is sourced from EBRD and ADB. All these financial loans are backed by the state guarantees. Two WB loans in the past occurred before QAJ establishment, and so are on the book of RC and directly funded by MoF. Thereafter, the government changed its approach to put foreign loans on the book of QAJ to make it as a guarantee obligation of the government. However, the ultimate debtor is still the government.

[2] Excluding financial leases.

30. QAJ acts as a nominal borrower on behalf of the government with sovereign guarantee, but the ultimate credit risk/responsibility is still with the government backed by the TMA, and QAJ does not earn any profit from the transaction.

31. *Equity.* As of December 31, 2023, shareholder equity had considerably improved from a negative USD140 million to negative USD40 million thanks to positive net income recorded in that year and accession of KazhService LLP (increase in equity by USD56 million), formerly named as Kazakhavtodor LLP, which was owned by SPPC MoF.

32. *Profitability.* QAJ generated a USD46 million net profit that was largely driven by an accounting gain from revaluation of QAJ's financial debt and advanced paid. As most of these long-term loan obligations are denominated in USD, the strengthening of the KZT in 2023 reduced the value of these obligations when converted to the local currency. This revaluation gain was significant enough to contribute to a positive net profit for the year.

33. As of June 30, 2024, 17 toll road sections are operational in the country, covering a total length of 3,221 km. This includes 11 sections of the 1st technical category spanning 2,161 km, and six sections of the second and third technical categories covering 1,060 km[3]. In 2023, QAJ collected USD68.9 million (2022: USD53.5 million) in revenue from toll roads[4]. A significant development occurred on October 1, 2023, when QAJ implemented a 20 percent toll tariff adjustment—the first increase since the toll road system began operating in 2013. This adjustment is crucial, as it partially addresses the accumulated inflation of approximately 142 percent since 2013. Additionally, the new tariff is now linked to the Monthly Calculation Index, ensuring that future toll rates will be automatically adjusted for inflation, providing a more sustainable revenue model for QAJ that will be directed towards maintenance of national roads.

34. Conclusion: QAJ is acting as an extended arm of the RC under MoT to implement its mandate, and with full financing support from the state government.

[3] https://ru.qaj.kz/tollroads/

[4] Table 6 below shows the revenue generated by QAJ only, without third party. The main reason for such recognition is that all toll generated revenue by third party is re-routed to the maintenance of that specific toll road, it is therefore netted out in the P&L

Table 6 High-level Summary of QAJ's Financials

QAJ Consolidated Financials	2023 (audited) (1 USD =456.31 KZT)		2022 (audited) (1 USD =460.48 KZT)		2021 (audited) (1 USD =426.44 KZT)	
Currency (in millions)	USD	KZT	USD	KZT	USD	KZT
Income Statement						
Total Revenue	**969**	**442,139**	**520**	**239,642**	**597**	**254,568**
Reimbursement for construction and maintenance	921	420,127	486	223,676	582	248,307
Reimbursement for tolling road	48	22,006	35	15,966	15	6,261
Other	0	6	-	-	-	-
COGS	(960)	(437,995)	(515)	(236,982)	(594)	(253,307)
Gross Profit	**9**	**4,144**	**6**	**2,660**	**3**	**1,262**
Admin expenses	(6)	(2,769)	(5)	(2,281)	(4)	(1,813)
Other expenses	2	858	2	977	(4)	(1,771)
Other income	(9)	(4,082)	(10)	(4,469)	3	1,357
Net Finance expenses	2	1,018	(2)	(1,126)	(3)	(1,241)
FX gain / (Loss)	45	20,519	(23)	(10,444)	5	2,206
Profit/(Loss) Before Tax	**43**	**19,688**	**(32)**	**(14,683)**	**(0)**	**(0)**
Income Tax	3	1,270	(7)	(3,197)	0	127
Profit for the year	**46**	**20,958**	**(39)**	**(17,880)**	**0**	**127**
Cash flow Statement						
Cash flow from Operating activities	52.5	23,973	88.0	40,541	(44.3)	(18,905)
Cash flow from Investing activities	9.3	4,234	1.9	890	1.6	692
Cash flow from Financing activities	(68.0)	(31,051)	(21.1)	(9,736)	48.2	20,546
Effect of foreign exchange rate changes on cash	(0.2)	(69)	(0.1)	(32)	(0.1)	(41)
Net increase (decrease) in cash and cash eq.	(6.4)	(2,912)	68.8	31,662	5.4	2,292
Cash and cash eq. at 31 December	**86.4**	**39,256**	**91.1**	**42,169**	**24.2**	**10,507**

QAJ Consolidated Financials	2023 (audited) (1 USD =454.56 KZT)		2022 (audited) (1 USD =462.65 KZT)		2021 (audited) (1 USD =434.78 KZT)	
Currency (in millions)	USD	KZT	USD	KZT	USD	KZT
Balance Sheet						
Total Current Assets	461	209,431	435	201,285	358	155,668
Total Non Current Assets	2,392	1,087,294	2,039	943,158	1,892	822,811
Total Assets	**2,853**	**1,296,725**	**2,474**	**1,144,443**	**2,251**	**978,479**
Total Current Liabilities	486	220,811	404	186,935	265	115,291
Total Non-current Liabilities	2,407	1,094,283	2,210	1,022,256	2,093	910,056
Total Liabilities	**2,893**	**1,315,094**	**2,614**	**1,209,191**	**2,358**	**1,025,348**
Total Equity	**(40)**	**(18,369)**	**(140)**	**(64,748)**	**(108)**	**(46,868)**

Annex 4: Detailed Project Description

This Annex is to provide additional information in details, primarily on Component 1 of the Project.

1. Subcomponent 1.1 Corridor Connectivity will finance the improvement of selected sections (around 498 km) of the Jezkazgan - Karagandy road corridor to up-to-date standards in climate-resilience and road safety. It will introduce the use of integrated design, build, and maintenance contracts to optimize value for money and foster private sector participation. **The entire Project corridor will be rehabilitated, and the s**elected sections of the corridor will be designed and upgraded to first category highways with four-lane carriageways, staggered arrangement and a phased approach would be considered as appropriate together with the market response to the first tenders during implementation.

2. The civil works for highway upgrading will pilot Output and Performance-Based Road Contracts (OPBRC) based on standard World Bank bidding documents, the first use of such a contract in Kazakhstan. These contracts will address the Borrower's concerns about cost fluctuations and quality by combining design and construction with an extended seven-year maintenance period during which the same contractor will be responsible for emergency, routine, and winter maintenance. This arrangement creates a single point of responsibility for construction and maintenance and transfers risk to the private sector, where it can be better managed. It also provides the QAJ with a robust framework for sustainable, performance-based maintenance practices, ensuring long-term infrastructure resilience and offering a model suitable for broader future applications.

3. The Project will assist the Borrower in amending bidding documents for the civil works to require selected firms to develop and submit a Gender Action Plan to improve female representation within their workforces. Each plan will explain how the firms plan to recruit local women in mid and high skilled technical roles both as interns and as employees and list concrete actions that it will put in place to build a more inclusive workplace that supports greater gender equality, including creating adequate working conditions, safe infrastructure, hygienic facilities, and confidential reporting mechanism to provide the interns and the employees with means to share their grievances free of retaliation in case of need.

4. The civil works under Component 1 including total seven lots have been divided into two procurement packages as below. It would be subject to the further refined and determined together with the MoT, Road Committee and QAJ during the tender documents preparation stage.

Table 1. Indicative Works Packages

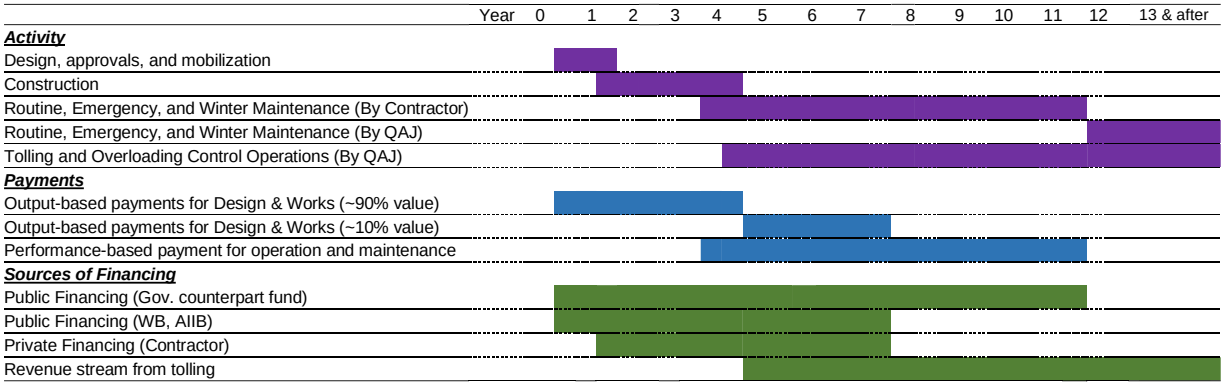
Package	Lot No.	Lot ID	Length km	Cost estimate, incl. VAT KZT million	Cost estimate, incl. VAT USD million
CW1	1	683-733 km	50	67,500	150.00
	2	733-783 km	50	67,500	150.00
	3	783-833 km	50	67,500	150.00
	4	833-883 km	50	135,000	150.00
	5	883-946 km	63	85,050	187.00

Package	Lot No.	Lot ID	Length km	Cost estimate, incl. VAT KZT million	Cost estimate, incl. VAT USD million
CW2	6	448-583 km	135	182,250	406.00
	7	583-683 km	100	135,000	300.00
TOTAL			**498**	**672,300**	**1,493.00**

5. The WB specifically developed OPBRC for road projects, incorporating design-build elements and an extended maintenance phase to mitigate delays, cost overruns, and construction quality deficiencies. This Project aims to demonstrate improved road investment and maintenance efficiency through the OPBRC approach for the Jezkazgan - Karagandy highway. This model transfers detailed design, construction, operations, and maintenance risks to the contractor, with payments based on achieving specified milestones and service levels. This incentivizes contractors to manage risks effectively and ensures appropriate construction and maintenance quality. All works will include several years of maintenance for which payments are fixed lump sum amounts contingent upon meeting the specified service levels. These service levels will address pavement quality indicators, such as road roughness, rutting, skid resistance, drainage clearance, and vegetation control. Additional performance indicators include the consistent presence and visibility of road signs and markings, timely defect rectification, and keeping roads passable in winter. The challenges would come from limited capacity and experience and possible inaccurate understanding of the OPBRC contract by both the PIU and the contractors. The key would be to ensure the tender documents are well prepared with suitable conceptual design, financial models and parameters. WB has engaged an international consultant to support QAJ in tender document preparation. PT is closely monitoring progress. If needed, PT will consider to mobilizing available resources to support tender document preparation and implementation of procurement.

6. The maintenance stage under the OPBRC is expected to be seven years. During these period, the private contractors will provide maintenance services for the road sections they constructed. QAJ will monitor service quality against key performance indicators (KPIs) specified in the OPBRC. Upon satisfactory KPI achievement, QAJ will make regular, expected to be quarterly, payments to the private contractors to (a) repay the private co-financing share of the initial construction cost and (b) cover the maintenance costs incurred. Failure to meet the KPIs will result in penalty deductions from regular payments. It is planned that the maintenance period may extend for more years after the contract closure, and will be funded by the toll revenue collected by QAJ. The indicative timing and financing of OPBRC related activities and revenue streams are shown in Figure 1 below.

Figure 1. Indicative Timing and financing of OPBRC activities



7. ***Subcomponent 1.2 Last Mile Connectivity*** will finance short-distance access roads to rural settlements and agricultural producers along the Project corridor. It will reconstruct approximately 40 km of local roads and bridges, primarily unpaved roads, that interconnect at least thirteen communities within the Jezkazgan - Karagandy corridor, including improving links to railway stations. Additionally, the subcomponent promotes non-motorized transport by constructing over 35 km of cycle tracks and footpaths. The roads to be rehabilitated have been selected using criteria including (i) demand from the local akimats and populations, (ii) the number of road users (size of the village populationand settlement services), (iv) road safety benefits (particularly at junctions), (v) existing road condition and, (vi) benefits attainable from facilitating non-motorized green transportation (cycling and pedestrian mobility). Provisional lists of roads, bicycle lanes, and pedestrian access are as follows.

Table 2. Selected local roads to be improved

No.	Location	km	Type of works	Length
1	Terekti, Population 380 people	500+621	Construction of a road to Terekti village and railway station. The existing road does not have asphalt concrete pavement.	2 km
2	Tuyemoinak, Population 164 people	548	Construction of a road to Tuyemoinak village railway station. At present, it is a dirt track.	1 km
3	Kyzylzhar, Population 2,000 people	591+650	Construction of a road to the village. Flooding has washed out the existing road, and there is no bridge. The road is paved but in poor condition. Provides a link to an existing railway station.	3.5 km
4	Zhomart	640	Construction of a road. Flooding has washed out the existing road, and there is no bridge. Provides a link to an existing railway station.	2 km
5	Mynadyr, population 700 people	673	Construction of a road. Flooding has washed out the existing road, and no bridge exists.	4 km
6	Zhanaarka, Population 17,559 people	748 to 754	The upgraded highway will bypass the village, so the existing road Jezkazgan - Karagandy will be repaired where it passes through the village, and a new bridge will be constructed at km 749+870.	5 km

No.	Location	km	Type of works	Length
7	Karamola, population 300 people	768	Construction of a road to the village from highway.	1 km
8	Karamuryn Population 300 people	871	Construction of an access road to Karamuryn Railway station.	1.5 km
9	Krasnaya Polyana, repair Population 1,300 people	872	Construction of a paved road to Krasnaya Polyana. The existing road is unpaved.	4.6 km
10	Yalta, Population 20 people	900	Access to a road user service and recreation area.	1 km
11	Dubovka, Population 4,111 people	933	Reconstruction of Saburkhan Street connecting the village to the highway.	2.5 km
12	Local road connecting Karabas-Abai-Topar-Novyi Karagan		Provision of a local road between settlements and grade separated junction with the highway.	10 km
Total				**39.1 km**

Figure 2. Examples of Existing Conditions on "Last Mile" connections

1. Terekti

4. Zhomart

5. Mynadyr

Table 3. Selected Bicycle Lanes to be improved

No.	Location	km	Type of works	Length
1	Baidaly bi (Atasu)	729+200	Construction of bicycle lane adjacent to the existing road.	1 km.
2	Zhanaarka	748 to 754	Construction of bicycle lanes.	5 km
3	Karamola	768	Construction of bicycle lanes.	1 km
4	Yuzhnyi Population 1,935 people	884	Construction of bicycle lanes.	2.5 km
5	Novyi Karagan Population 1,290 people	917	Construction of bicycle lanes adjacent to the existing road.	4.5 km
6	Dubovka Population 4,111 people	933	Construction of bicycle lanes on Saburkhan Street.	2.5 km
7	Dubovka Population 4,111 people	933	Construction of bicycle lanes on a back road.	2.2 km
Total				**18.7 km**

Table 4. Selected Pedestrian Access to be Improved

No.	Location	km	Type of works	Length
1	Kyzylzhar	591+650	Construction of pedestrian sidewalks connecting the bus station and existing railway.	3.5 km
2	Aktubek	709	Construction of pedestrian sidewalks connecting the bus station.	1 km

No.	Location	km	Type of works	Length
3	Baidaly bi (Atasu)	729+200	Construction of pedestrian sidewalks connecting the settlement and bus station.	1 km
4	Zhanaarka	748 to 754	Construction of pedestrian sidewalks connecting along the existing road.	5 km
5	Aktailak	759+150	Construction of pedestrian sidewalks connecting to the bus station.	1 km
6	Karamola	768	Construction of pedestrian sidewalks connecting to the bus station.	1 km
7	Kulaigyr	890	Construction of pedestrian sidewalks in the recreation park and bus stops.	1 km
8	Karabas	911	Construction of pedestrian sidewalks connecting along an existing road.	2 km
9	Dubovka	933	Construction of pedestrian sidewalks and street lighting along an existing road in the settlement.	2.2 km
Total				**17.7 km**

Figure 3. Examples of Locations for the construction of access for non-motorized traffic.

1. Kyzylzhar

3. Baidaly bi

7. Kulaigyr

B. Road Sustainability

8. ***Subcomponent 1.3 Road Sustainability*** will support enhancing road sustainability and asset management of the road by introducing modern tolling facilities, an axle load management system and electric charging stations along the **Jezkazgan - Karagandy road corridor**.

9. Toll System Implementation. The Republic of Kazakhstan has 17 toll sections totaling 3,221 km, including 11 sections of motorway-standard road with a length of 2,161 km.[5] This toll system ensures drivers are charged only for the road sections they use, thereby promoting fairness and precision in toll collection. The fee is either collected at a toll plaza at the end of the toll road segment or paid online. If the vehicle exits the highway before the toll gate, the vehicle license plate will be captured by the traffic control gantries with advanced cameras. The toll fee will be charged directly from the driver's prepaid account, or can be collected the next time the vehicle passes a toll plaza or paid via the Internet. Toll rates vary depending on the distance traveled, the route, and the type of vehicle, ranging from about 130 KZT (USD0.27) per 100 km for passenger cars on specific routes to 3,200 (USD6.8) tenge per km for the

[5] KazAvtoZhol. November 2023 data. Website available at: https://ru.qaj.kz/tollroads/#

largest trucks.[6] In 2023, tolling fees on Category I roads amounted to about 32 billion KZT (USD64 million).[7]

10. The Project will implement the hybrid toll system[8] along the Jezkazgan - Karagandy corridor to enhance revenue generation and traffic management efficiency as part of a broader strategy to modernize Kazakhstan's transportation infrastructure. Along the corridor, 11 traffic control gantries will be installed, equipped with advanced cameras to capture and recognize vehicle license plates. The gantries will transmit data to KazToll's existing information system, which will process the data, allowing for effective monitoring and categorization of all vehicles. The KazToll information system then manages toll collection, ensuring real-time processing of payments, whether at the toll gate or online. KazToll is part of QAJ.

11. The hybrid toll system is projected to generate significant revenue, which will be reinvested into road maintenance and continuous infrastructure improvement. This self-sustaining model ensures the long-term sustainability of the country's road network and corridor, contributing to continuous infrastructure improvement.

12. Dynamic Weight Control Systems. Three traffic control gantries used for tolling will incorporate weigh-in-motion (WIM) systems to monitor vehicle weight compliance. These systems will enhance road safety by ensuring vehicles do not exceed load regulations, thereby reducing road damage. The WIM systems will measure the weight of vehicles in motion, capturing detailed data such as vehicle class, speed, and total weight. Vehicle weight is measured by utilizing strain gauges embedded in the road surface. Data collected from these weight control arches will be transmitted to the "Transport Database and Monitoring of Transportation Safety Dynamics." This database is managed by the Committee for Roads and Transport Control within the MoT of the Republic of Kazakhstan.

13. EV Charging Infrastructure. To support the expansion of EV use, charging stations will be installed at three rest areas along the route. These rest areas are strategically located to ensure access from both traffic directions at 543 km (near Tuyemoinak station), 764.4 km (bypassing Zhanaarka village), and 819.2 km (near Batyk village). Each rest area will provide two charging stations, each with a capacity of 120 kW/h and equipped with two connectors. Additionally, charging stations will be installed at Qazaq Oil gas stations located at 591 km and 764.4 km.

[6] KazToll. https://kaztoll.kz
[7] Official Information Service of the Prime Minister of the Republic of Kazakhstan. November 2023.
[8] Hybrid Toll system means the toll roads are not fully access controlled. The toll is collected through the installed control gantries equipped with advanced cameras to capture and recognize license plates of vehicle using the road.

Annex 5: Paris Agreement Alignment and Climate Finance

1. The Bank committed to align all its new financing operations with the Paris Agreements (PA)'s goals by July 1, 2023. To achieve that target, in July 2023, the Bank launched its Methodology for Assessing the Alignment of AIIB Investment Operations with the PA99. The document elaborates application of joint multilateral development bank (MDB) methodological framework to aligning AIIB investment operations with the PA (specifically, the mitigation dimension or BB1 and the adaptation aspects or BB2). The AIIB Methodology has been followed to assess the alignment of the project with the PA.

2. **BB1: Alignment with the Mitigation Goals of the Paris Agreement.** The use of proceeds will finance three components, the main one being reconstruction and upgrade of 498km of roads. These roads will have a capacity increase from a 2-lane carriageway to a 4-lane carriageway in selected sections and thus cannot be considered Universally Aligned and will be subject to Specific Criteria (SC) assessment during the appraisal stage to determine alignment with the mitigation goals of the Paris Agreement (BB1). Given their research and policy nature, the other two sub-components (Component 2: Transport Systems Development and Components 3: Project Management)can be classified as aligned both for adaptation and mitigation due to their neutral impact on climate mitigation and the immateriality risk from a climate resilience perspective.

3. **SC1 and SC2: Nationally Determined Contributions (NDC) and (Long-term Low-GHG Emissions Development Strategy) LTS Alignment:** The NDC of Kazakhstan[9] presents an unconditional target for reducing GHG emissions by 15 percent by end-2030 relative to the 1990 base year and a conditional target for reducing GHG emissions by 25 percent by end-2030 relative to the 1990 base year, subject to significant additional international investments and significant grant assistance; access to an international technology transfer mechanism; co-financing and participation in international research projects, development of promising Low-Carbon technologies and initiatives to build local expertise.

4. The sector coverage in accordance with the IPCC Guidelines for National Greenhouse Gas Inventories are energy, industrial processes and product use, agriculture, forestry and other land use, waste thus, transport is excluded, and we can conclude that the project is not incompatible with the NDC of the Country.

5. Some Long Term Strategies of the Country, namely the National Development Plan of the Republic of Kazakhstan until 2025 and the Action Plan for the implementation of the Concept for the Transition of the Republic of Kazakhstan to a "green economy" for 2021-2030, call for the necessary measures to reduce greenhouse gas emissions in the energy sector, energy efficiency and energy conservation, development of sustainable transport, infrastructure for electric and gas vehicles, smart traffic management systems, sustainable municipal waste management, transition to sustainable land use methods and organic agriculture, afforestation and the formation of an ecological culture.

[9] 12updated NDC KAZ_Gov Decree313_19042023_en_cover page.pdf (unfccc.int)

6. Under Component 2, the Project will finance a consultancy to help bring a systematic approach to the process of motorization management in the development of policies and measures. This aims at managing vehicle stocks in a proactive, phased, and systematic manner to make them safer, cleaner, and more fuel efficient. Kazakhstan's vehicle fleet typically has an aged pre-Euro I emission standards ICE, with about half of passenger cars older than 20 years. As such, the Project will support preparing a strategy to shape the profile, quality, quantity, and intensity of motor vehicle stock use and identify opportunities to enhance multimodality. The MoT will be supported by (i) facilitating a transparent, deliberate, and coordinated policy-making process to establish motorization management goals and priorities, (ii) gathering and assessing data with continuous analytics to validate progress in motorization management, (iii) drafting and helping to promulgate vehicle and fuel standards prospectively towards shifting to cleaner vehicles, (iv) helping ensure systems are put in place to manage motor vehicle stock, including the adoption of electric and hydrogen powered vehicles, and (v) assessing the applicability of e-tolling commercial vehicles based on their CO2 emissions. This activity aims to supporta shift from the existing aged, non-efficient ICE fleet to cleaner ones (e.g., electric and hydrogen powered fleets, a fleet with Euro VI emission standards motors), leading to a potential substantial reduction in relative GHG emissions in alignment with the country's NDC and the Country Climate and Development Reports (CCDR) and Long-Term Strategies (LTS).

7. Under sub-component B, the project will also finance a TA to investigate opportunities to improve the multimodality of the Middle Corridor within Kazakhstan to enhance the corridor's efficiency, functionality and commercial attractiveness, and reduce the carbon footprint. The activity will identify barriers and formulate solutions to enhance multimodality, prioritizing lower carbon modes of transport. This approach will contribute to the decarbonization of freight transportation and help mitigate the impacts of potentially higher future motorization through studies of the transport sector. The TA will identify pathways to increase multimodality supporting railways and road systems to manage freight transport and improve productivity, efficiency, and overall attractiveness of the corridor. The railway line is complementary to the road corridor and is important considering the country's low levels of access and connectivity; however, it does not substitute the road corridor.

8. The Project will also finance a study to develop a roadmap for a multimodal transport hub in the Jezkazgan - Satpayev industrial agglomeration to support decarbonization of the transport sector through the use multimodal logistics facilities, including a container terminal linked to the region's road and railway corridors.

9. Therefore, the project adheres to the SC1 and SC2 criterion.

10. **SC3: Low Carbon Pathway (LCP) Test:** according to the WB analysis, several factors contribute to the high reliance on carbon-intensive transport, including subsidized fossil fuels, the country's large size and sparse population, the availability of cheap and customs-exempt second-hand cars from nearby countries, and the increase in private vehicle use with rapidly increasing incomes. Electric cars are expected to be cost-competitive with combustion engine vehicles within the decade and—aided by government policy to level the playing field with combustion engines—could dominate the car market from the 2030s. Motorization is expected to continue to rise into the 2040s due to increasing population and incomes, making electrification an important strategy for decarbonization.

11. WB has helped the government of Kazakhstan to prepare low carbon pathways to serve as a guide to decarbonize key sectors of the economy, including the road sector: these pathways are described in the Kazakhstan Country Climate and Development Report[10].

12. These strategies envisage that road transport decarbonizes in 2055 as passengers fully shift to EVs, following a consistent switch to EVs starting in 2030. Decarbonization of aviation and shipping occurs in 2060, so that net zero is achieved for the entire energy sector. Under the NZE trajectory, energy consumption reduces by 0.9 percent a year with increasing energy efficiency and significant electrification. The transport sector recommendations (Low-Carbon pathways) can be divided into short term and long term as follows:

13. Short term (zero to five years) i) Develop and implement early-stage EV recharging infrastructure and prepare a longer-term strategy for the infrastructure needed to facilitate the rapid uptake of low-cost EVs expected from 2025; ii) Consider fiscal incentives, such as removal of customs duties on second-hand EVs, adjustment of vehicle taxes to be more aligned with emissions, and purchase subsidies for EVs; iii) Undertake public procurement of low-emissions vehicles for public purposes and offer incentives for cleaner vehicles to decrease emissions from the public transport and government fleets; iv) Adopt higher-quality fuel standards, fuel efficiency standards, and fuel efficiency labeling for vehicles; v) Develop a planning scheme for new peri-urban developments that incorporates compactness and mixed-use developments, local access to services and public transport, and high-quality, dedicated, physically protected, connected networks for active transport; vi) Expand public transport networks, including more dedicated bus lanes to improve the speed and efficiency of trips. Continue to plan the introduction of more low-emissions buses and the expansion of Almaty metro, when feasible; vii) Develop a plan for continued electrification and logistical improvements to the rail network that can help reduce emissions from the freight and logistics sector and maximize the efficient use of local construction capabilities.

14. Longer term i) Rationalize and electrify the rail network; ii) Develop infrastructure to support uptake of low-emission heavy vehicles; depending on which technology becomes more commercial, this could be hydrogen refueling or electric charging; iii) Expand urban planning reform to integrate transport-oriented development principles.

15. The Project is not inconsistent with any of the low carbon pathway measures established by the WB for a smooth transition to net-zero transportation and benefits of some climate mitigation elements that match some of the recommendations (EV charging infrastructure, NMT lanes, railway connection and tolling system offering lower pricing for low emission vehicles like EVs, among others). Please see a full list under the climate mitigation section.

16. Therefore, the project adheres to the SC3 criterion.

17. **SC4a Alternatives Test.** An existing more efficient transport infrastructure cannot serve current and forecasted passenger and/or freight demand, with a similar level of service (LOS).

[10] Kazakhstan Country Climate and Development Report (worldbank.org)

This part of the assessment considers whether the project demand can or cannot be served by an existing less carbon intensive transport infrastructure with a similar LOS. If there is no comparable alternative to the proposed investment, then the SC4a test is passed. The following steps should be followed:

18. Step 1: Identify what potential lower-carbon transport alternatives exist that provide access to the main origins and destinations (ODs) within the proposed road's influence area (RIA).

19. The Project is part of the Trans-Caspian International Transport Route (the "Middle Corridor") as a multimodal regional and intercontinental trade route linking Kazakhstan to China, Azerbaijan, Georgia, Türkiye, and Europe. Two parallel branches of the Middle Corridor run east-west through Kazakhstan: a southern branch via Almaty and a more northerly branch across central regions from Dostyk (near the China border) through Balkhash, Jezkazgan, and Shalkar, reaching the Caspian Sea port of Aktau. The project will enhance the Jezkazgan to Karagandy road (south branch of the 'middle corridor') which forms a substantial portion of this route and runs parallel to the Middle Corridor railway line (Dostyk - Aktau). In addition to enhancing east-west connectivity, the Jezkazgan-Karagandy section serves as a critical north-south route, significantly contributing to national transport resilience.

20. The Road's Influence Area would be the north and north-east part of Kazakhstan (Karagandy oblast and the surroundings of Astana) and the south and the south-west of the Country (Ulytau oblast). The ODs would be Jezkazgan and Karagandy respectively.

21. The main lower-carbon alternative connecting the main ODs would be the existing railway line running along the corridor parallel to the Middle Corridor (Dostyk - Aktau).

22. Step 2: Assess whether the alternatives identified in the previous step are comparable to the proposed project by comparing them to the project in terms of LOS.

23. There is an existing railway line in the same corridor connecting Jezkazgan to Karagandy, with the total length of 539 km. It was a signal track diesel-powered railway line built in 1940s. There are 4 passenger trains running between the cities of Jezkazgan and Karaganda which takes approximately 12 hours to travel between the two. There are 19 villages along the corridor, only a few of them have the passenger train stop stations nearby. Key large-volume cargoes in the Karagandy and Ulytau regions - the major copper producing regions in Kazakhstan – rely on railway traffic with direct links to the production zones. These "last miles" rail connections belong to the monopoly copper producer, Kazakhmys. Kazakhmys has priority in using the Karagandy – Jezkazgan railway links, while for other shippers this link lacks capacities because of this priority heavy load with copper ores and non-ferrous metals. Hence, industries use the road mostly for the transport of construction and repair equipment, supplies, and personnel.

24. The financed road provides higher LOS compared to the existing railway line as it i) allows for the transport of different goods and personnel whereas the railway link is prioritized for the transport of copper ores and other metals ii) offers more flexibility when it comes to door-to-door transportation, consignment size, and distance, which means that the rail line

complements rather than replaces the highway and iii) provides a strategic missing link to the south of the country (whereas the railway runs East-West only), connecting communities at some distance from the railway, and provides direct services for vital industries in the region.

25. Step 3: Analyze and document whether the project demand can or cannot be served by the lower-carbon alternative(s) identified with a similar LOS.

26. We conclude that the project demand cannot be served by the lower-carbon alternative identified with a similar LOS given its constraints in terms of variety of goods transported, lower transport flexibility, and lack of north-south connections, not fully covering of the main ODs.

27. Therefore, the Project adheres to the SC4a criterion.

28. **SC4b: Lock-in test.** As a common carrier agnostic to types of motorized vehicles, roads are typically not subject to technological lock-in of a particular type of fleet. The Project can be considered as future-proof, as it will be able to accommodate the infrastructure required to enable the deployment of future lower-carbon fleets, once available. The Project will be designed to allow the future deployment of a more energy-efficient public transport fleet, vehicle types, or road operations, as well as other Paris-aligned activities. These activities including:

i) *LED lighting and other Low-Carbon technologies*: The Project will support a transition to lower-carbon intensive technologies, as the proposed small-scale road-side service center facilities will use energy efficiency lighting, low-energy consumption equipment, and information and communications technology.
ii) *Intelligent Transport System (ITS).* The Jezkazgan - Karagandy section of the Middle Corridor will be a toll road, with differentiated tolling by vehicle emission standards, providing lower pricing for low emission vehicles like EVs to contribute to managing motorization by improving the attractiveness of environmentally cleaner vehicles and public transport.
iii) *NMT and EV chargers*: This Project will also invest in pedestrian pathways, sidewalks, and road crossings, and finance re-charging points for low-emission vehicles for both the upgraded existing two-lane carriageway and the new two-lane carriageway.
iv) *Landscape*: The Jezkazgan - Karagandy section of the Middle Corridor will implement tree and grass planting for roadway reserve protection, which will contribute to some extent in carbon capture and sequestration.

Therefore, the Project adheres to the SC4b criterion.

29. **SC5: Economic Evaluation.** The Project is still economically viable when considering the carbon emissions due to the operation stage, valued using the shadow carbon price recommended by AIIB's Economic department. Please refer to Annex 3– Economic and Financial Analysis for further information. According to the emission outputs, the Project will increase emissions by 1,599,939 tons CO_2eq over the reference period (20 years), equivalent to 79,997 tons per year. Carbon emissions during construction are difficult to estimate but are expected to be small, and hence not estimated.

30. *Therefore, the project adheres to the SC5 criterion.*

BB1 conclusion: Based on the analysis performed for SC1-5, the project can be considered to be aligned with the PA's climate mitigations goals (BB1).

31. **BB2: Alignment with the Adaptation Goals of the Paris Agreement.** The Project is likely to be materially affected by climate hazards and thus, has been subject to a Climate Resilience Assessment (CRA) following the AIIB's methodology to determine its alignment with the adaptation goals of the Paris Agreement (BB2). The methodology has 3 steps: i) a climate risk and vulnerability assessment (CRVA); ii) the identification of measures addressing the climate risk found on the previous step and; iii) the compatibility of the Project against the NDC and other climate adaptation national strategies.

32. **Climate Risk and Vulnerability Assessment (CRVA):** Due to geographic and climatic conditions, Kazakhstan's exposure to climate change is significant. Ranking 36th out of 181 countries in the 2021 ND-GAIN Index,[11] Kazakhstan's climatic context is characterized by its vast and varied landscape, including steppes, semi-deserts, deserts, forested areas, and mountain ranges. The country experiences a continental climate, with increasingly colder winters and hotter summers every year due to climate change and relatively low precipitation, which increases the risk of desertification, land degradation, and water scarcity. The occurrence and intensity of extreme weather events in Kazakhstan are exacerbated by climate change, and the country's temperatures are projected to rise more rapidly than in other Asian nations. This is accompanied by changes in precipitation patterns, which have led to the melting of glaciers, more intense and frequent droughts, and the jeopardy of food security and the livelihoods of rural communities. Furthermore, there is an increased risk of cascading flash floods, especially during the spring thaw when snow melts rapidly. Climate change affects the natural ecosystems and the economy, particularly trade potential and employment opportunities in the agricultural sector.

33. The WB Climate and Disaster Risk Screening[12] rated the exposure to climate and geophysical hazards as high, considering elevated exposure to geohazards, such as increasing temperatures, changes in precipitation patterns, stronger and more frequent storms. Changes in meteorological behavior result in increasing risk of droughts, a concentration of heavy localized rains in short periods, and rapid melting of snow in the springtime, which cause high water discharge and run-off and, thus, increase the risk of flash floods.

34. The transportation sector shows signs of vulnerability to projected future temperatures. The Representative Concentration Pathways (RCP) 4.5 scenario projects a 2.2°C increase in annual mean temperature for the mid-range future period of 2040 to 2059 compared to a 1986 to 2005 baseline.[13] This will affect all modes of transportation across the country through deterioration of road surfaces, expansion of bridge joints and pavement, and buckling of railroad tracks. In mountainous regions, rising temperatures will also accelerate the rate of glacial melt, increasing the risk of slope failure and triggering landslides and, in the longer term, reducing the flow of rivers, which can increase water scarcity in the country.

[11] University of Notre Dame. Notre Dame Global Adaptation Initiative. 2021. https://gain.nd.edu/our-work/country-index/rankings
[12] World Bank Climate and Disaster Risk Screening | The World Bank Climate and Disaster Risk Screening Tools
[13] Representative Concentration Pathways (RCP) are climate change scenarios to project future greenhouse gas concentrations. RCP 4.5 is considered as an intermediate scenario with emissions peaking around 2040, then declining.

35. Similarly, annual precipitation frequency and intensity will increase nine percent under RCP 4.5 from 2040 to 2059, affecting the structural integrity of roads, bridges, and tunnels.[14] Excessive rainfall runoff combined with flash floods from melted snow damages Kazakhstan's transportation infrastructure by (i) increasing seepage and infiltration into the pavement and subgrade which reduces the structural stability of roads and pavements, (ii) washing away roads and bridges, (iii) damaging tunnels and railroad tracks, (iv) triggering landslides and mudslides which disrupt road and rail transportation, and (v) overloading roadside drainage, thus creating water buildups alongside roads and tunnels. For instance, severe floods and flash floods spread throughout the oblasts transversed by Kazakhstan's northern, western, and central regions in spring 2024 due to altered precipitation levels, temperature rise, and consequential snow melting. These events persisted throughout April and May and were still ongoing during the preparation of this document. The impacts of the flooding have been severe, resulting in the deaths of seven people and the displacement of over 118,000 individuals. Many communities have been cut off, with 180 sections of road damaged and over 6,000 houses flooded.[15]

36. **Climate adaptation measures:** The project incorporates measures tackling the climate hazards found (on the CRVA) as likely to materially affect the project such as increasing temperatures, changes in precipitation patterns, and stronger and more frequent storms. The whole list of measures is as follows:

Climate Hazard	Measure and justification
Increased precipitation and flash floods	The project will incorporate a "Green Roads for Water" approach, focused on flood risk mitigation and water management solutions.[16] This approach involves waterproofing roadways, improving drainage and groundwater recharge, protecting the communities adjacent to the proposed roads, and making available much needed water resources. Adaption recommendations proposed for the roads include: (i) adopting a systematic approach to water courses passing under or near the road to ensure the water has a clear flow path and that obstructions are of sufficient capacity to cope with extremes without causing flooding; (ii) protection of the base from accumulated water on the roadside by the addition of widening berms; (iii) tree and grass planting in the roadway reserve to protect the road and its drainage system from erosion; and (iv) use of climate-resilient materials for the paved roads (e.g., consideration of the use of polymer modified binder within asphalt layers to provide thermal resistance to the cyclical extremes or the use of concrete pavement with closely located temperature joints) as the unusual phenomenon of the extreme temperature differentials (volatilities) is being observed not just seasonally, but at much higher frequencies (sometimes within a day).
Increased precipitation and flash floods	The existing 220 culverts along the Jezkazgan – Karagandy section cannot accommodate the seasonal flooding and will be further challenged by exacerbated hazards driven by climate change. Thus, the Project plans to finance their replacement with larger diameter pipes as well as further finance the construction of another 240 culverts (for a total of 460), all with improved

[14] Ministry of Energy of the Republic of Kazakhstan, United Nations Development Programme in Kazakhstan Global Environment Facility. Third Biennial Report. (2017). Seventh National Communication and Third Biennial Report of the Republic of Kazakhstan. Available at: https://unfccc.int/documents/28937

[15] ReliefWeb. Kazakhstan: Floods. Data as of 23 April 2024. Available at: https://reliefweb.int/disaster/fl-2024-000039-kaz

[16] Van Steenbergen,Frank W. M.; Arroyo Arroyo,Fatima; Rao,Kulwinder Singh; Hulluka,Taye Alemayehu; Woldemariam,Kifle Woldearegay; Deligianni, Anastasia. Green Roads for Water: Guidelines for Road Infrastructure in Support of Water Management and Climate Resilience (English). International Development in Focus Washington, D.C.: World Bank Group. Available at URL.

Climate Hazard	Measure and justification
	flow capacity to provide resilience to emerging climate change impacts. The cross-drainage (culverts) and side drains will allow run-off from sudden snowmelt and extreme rainfalls to pass under the road, and therefore is driven by climate resilience objectives, and not designed to support future business-as-usual maintenance efforts.
Increased precipitation and flash floods	In this area bridges are mostly needed for the passage of water (not transport overpasses). Bridges allow run-off from sudden snowmelt and extreme rainfalls to pass under the road, and therefore help to provide resilient connectivity. The existing 20 bridges are not capable of accommodating the current and forecasted flow volumes. Thus, the Project plans to finance their replacement with bridges with increased volumetric flow capacity as well as further finance the construction of an additional 42 bridges (for a total of 62 bridges), also with enhanced flow capacity to provide resilience to the impacts of climate change.
Increased precipitation and flash floods	The project area being characterized with steppes and a flat terrain exacerbates the vulnerability of the system to floods. As there was no need for the old road to have high embankment when the existing road was built, half of it is currently less than 1 meter in height. The Project will finance the elevation of the embankment to an additional 2-3 meters for the sole reason of addressing the impacts of climate change in order to ensure that the flooding water stays below the road and does not damage it.
Snowfall	The snowy period of the year lasts for six months, from mid-October to mid-April, with a sliding 31-day snowfall of at least 1.0 inches, especially in the Jezkazgan – Karagandy section of the Middle Corridor. Recently snowstorms have increased in frequency and intensity in the Karagandy region, with greater average snowfall of 3.3 inches due to climate change as climate models suggest. [17] Similarly, shorter snow cover durations are due to rising temperatures following snowstorms. While the national construction standards do not require the use of snow fences, the project will also finance snow fencing along the Jezkazgan - Karagandy section of the Middle Corridor to prevent snow drift and road closure due to increasing intensity and frequency of snowfall; therefore, helping to provide resilience to the road network. This investment is entirely driven by climate change impacts in this region.
All climate hazards	The Project will also finance strategically located road-side service centers and maintenance depots to provide i) refuge for drivers during extreme events, ii) a location for early-warning information on hazardous road conditions (including road conditions caused by extreme weather events), and iii) facilities and equipment from which to support routine, winter, and emergency maintenance operations. Eight service centers will be built to include i) improved monitoring and enable timely maintenance of damage due to extreme temperatures and flooding, ii) buildings designed to accommodate local temperature conditions, and iii) installation of culverts to accommodate more rainwater discharge around these centers.
All climate hazards	The Project is designed to address climate change impacts across the entire project cycle, including design, construction, and maintenance. Maintenance in Kazakhstan is severely underfinanced and done on a force account and input-based Soviet time approach that disregards the additional maintenance needs imposed by climate change. With climate change, temperature fluctuations are increasing, both seasonally and within the same season. For example, in recent winters, sudden thaws follow extreme cold much more frequently, causing

[17] https://weatherspark.com/y/107797/Average-Weather-in-Karagandy-Kazakhstan-Year-Round

Climate Hazard	Measure and justification
	significantly more spring and winter maintenance requirements and increased potential for water ingress into pavements and subgrades, necessitating more rigorous maintenance measures. The large increases in the number of culverts and bridges, elevated embankments, separation of carriageways and other climate adaptation measures in the financed roads will require significantly more maintenance. The use of long-term OPBRC format contracting to include a performance-based maintenance phase introduced under the Project is essential to improving and maintaining the resilience of road connectivity as it will ensure full financing and protection of assets. Maintenance of pavement, culverts, road-side drainage, bridges, snow fences, erosion control devices, and roadside service centers is all critical to addressing climate change.
All climate hazards	This subcomponent will finance technical assistance (TA) to enable the development of new resilience-focused road design standards through the adaptation of the current framework of state standards and construction rules and regulations, as the Current practices are based on outdated standards inherited from the former Soviet Union era. As such, this activity will update obsolete methodologies not aligned with the design practices needed to cope with climate change in the road sector. Recommendations for modernization will be provided based on this review and feedback from stakeholder consultations and will also introduce the concept of sustainable management of vulnerable road sections through appropriate tree and grass planting forest belts) in the roadway reserve. Updated resilience and safety focused road design standards will be developed based on the feedback and utilizing the current regulatory framework.

37. The Project does not pose risk for maladaptation.

38. **Non-incompatibility with the NDC and other Adaptation Strategies.** The project is not incompatible against the NDC or any other national climate adaptation strategy.

BB2 Conclusion: The project incorporates measures to tackle the climate hazards that might materially affect it and it is not incompatible with the NDC and other national adaptation strategies, thus it is considered aligned with the adaptation goals of the PA (BB2).

39. **Climate Mitigation Finance.** Some elements of the project qualify as Climate mitigation finance following the JMDB common principles. The AIIB's amount of climate mitigation finance has been estimated as USD73.2 million or approximately 11.27 percent.

Climate mitigation Activity	Justification	CAPEX (USD)
The Jezkazgan - Karagandy section of the Middle Corridor will implement tree and grass planting for roadway reserve protection, which will result to some extent in carbon capture and sequestration.	Listed on the JMDB common principles under Category of '9.3. Measures that reduce net energy consumption, resource consumption or CO2e emissions, or increase plant-based carbon sinks in public areas or installations'	*61,700,000 (Shared between all these three interventions)
The Project will provide enhanced road-railways connections to create a modal shift for long distances from private vehicles to rail and promote public buses by investing in bus stops along the highway.	Listed on the JMDB common principles under the Category of '8.1. Urban and rural public transport projects'.	*61,700,000 (Shared between all these three interventions)
This Project will also invest in pedestrian pathways, sidewalks, and road crossings, and finance re-charging points for low-emission vehicles for both the upgraded existing two-lane carriageway and the new two-lane carriageway of the Jezkazgan - Karagandy section of the Middle Corridor.	Listed on the JMDB common principles under the Category of '8.6. Land-based, airborne, or waterborne vehicles transporting passengers or freight with zero or low direct emissions, or associated infrastructure' and under Category 8.2. Non-motorised transport (NMT) or electric personal mobility	*61,700,000 (Shared between all these three interventions)
Additionally, the Project will support a transition to lower-carbon intensive technologies, as the proposed small-scale road-side service center facilities will use energy efficiency lighting, low-energy consumption equipment, and information and communications technology.	Listed on the JMDB common principles under Category of 8.8 'Transport demand management policy or associated intelligent transport systems (ITS)' and under Category '9.3 Measures that reduce net energy consumption, resource consumption, or CO2e emissions, or increase plant-based carbon sinks in public areas or installations.'	3,000,000
In addition to the mitigation measures described in subcomponent 1.1, provision will be made for NMT (i.e., pedestrians and cyclists), particularly between communities and to bus stops on the highway making these modes of transport accessible and practical. Overall, travel times will be reduced and private vehicles will be used less as access will be provided for the use of public transit.	Listed on the JMDB common principles under Category of '9.3. Measures that reduce net energy consumption, resource consumption or CO2e emissions, or increase plant-based carbon sinks in public areas or installations'	5,090,000

Climate mitigation Activity	Justification	CAPEX (USD)
The Jezkazgan - Karagandy section of the Middle Corridor will be a toll road, with differentiated tolling by vehicle emission standards, providing lower pricing for low emission vehicles like EVs to contribute to managing motorization by improving the attractiveness of environmentally cleaner vehicles and public transport. The resources collected by the toll will be used for the sustainability of the road network, keeping the road in good condition with both climate mitigation and adaptation benefits. The project will support the design and implementation of modern electronic tolling facilities and axle load management systems to expand the country's toll road network, using advanced automatic number plate recognition technology to enable accurate and automated toll collection. The latter will utilize weigh-in-motion technology along the project road to increase efficiency through reduced pavement damage and improved safety. This sub-component will enable the establishment of more stringent enforcement of efficiency standards to ultimately reduce GHG vehicle emissions. For instance, given the fleet age of the country, a GHG emission reduction ranging between 18 to 53 percent could be achieved by incentivizing the replacement of older trucks to be scrapped with modern lower emission internal combustion engine (ICE) vehicles[10]. The reduction will reach 100 percent if the transition is made to an EV after scrapping older ones.	Listed on the JMDB common principles under Category of 8.8 'Transport demand management policy or associated intelligent transport systems (ITS)'	2,300,000
This subcomponent will also finance a TA to support bringing a systematic approach to the process of motorization management in the development of policies and measures aimed at managing vehicle stocks in a proactive, phased, and systematic manner to make them safer, cleaner, and more fuel efficient. Kazakhstan's vehicle fleet typically has an aged pre-Euro I emission standards ICE, with about half of passenger cars older than 20 years. As such, the Project will support preparing a strategy to shape the profile, quality, quantity, and intensity of the motor vehicle stock use and identify opportunities to enhance multimodality. MoT will be supported by (i) facilitating a transparent, deliberate, and coordinated policy-making process to establish	Listed on the JMDB common principles under Category of '12.6. National, subnational or territorial cross-sectoral policy actions that aim to lead to climate change mitigation actions or technical support for such actions '	745,000

[10] World Bank (2024). Implementation and Completion Report for BF-Transport Sector Modernization and Corridor Trade Facilitation Project (P156892).

motorization management goals and priorities, (ii) gathering and assessing data with continuous analytics to validate progress in motorization management, (iii) drafting and helping to promulgate vehicle and fuel standards prospectively towards shifting to cleaner vehicles, (iv) helping ensure systems are put in place to manage the motor vehicle stock including the adoption of electric and hydrogen powered vehicles, and (v) assessing the applicability of e-tolling commercial vehicles based on their CO2 emissions. The activity aims to support the shift from the existing aged, non-efficient ICE fleet to cleaner ones (e.g., electric and hydrogen powered fleets, a fleet with Euro VI emission standards motors), leading to a potential substantial reduction in relative GHG emissions in alignment with the country's NDC and the CCDR.		
This subcomponent will finance a TA to investigate opportunities to improve the multimodality of the Middle Corridor within Kazakhstan to enhance the corridor's efficiency, functionality and commercial attractiveness, and reduce the carbon footprint. The activity will identify barriers and formulate solutions to enhance multimodality, prioritizing lower carbon modes of transport. This approach will contribute to the decarbonization of freight transportation and help mitigate the impacts of potentially higher future motorization through studies supporting the transport sector. The TA will identify pathways to increase multimodality supporting railways and road systems to manage freight transport and improve productivity, efficiency, and overall attractiveness of the corridor.	Listed on the JMDB common principles under Category of '12.15. Articulation of entity-level climate action or decarbonization plans'	330,000
The Project will also finance a study to develop a roadmap for a multimodal transport hub in the Jezkazgan - Satpayev industrial agglomeration to support decarbonization of the transport sector through the use multimodal logistics facilities, including a container terminal linked to the region's road and railway corridors.	Listed on the JMDB common principles under Category of '12.15. Articulation of entity-level climate action or decarbonization plans'	100,000
AIIB's Total mitigation Finance		73,235,000
AIIB's share amount		11.27%

40. **Climate Adaptation Finance:** The project has some elements that qualify as climate adaptation finance. To quantify the amount, the Project Team has followed the 3-criteria methodology set forth on the JMDB methodology for tracking climate adaptation finance.

41. **Criterion 1, The climate risk context of the activity or project is clearly set out**: The Interventions to be financed by the project were guided by the Climate Resilience and Risk Assessment for Roads Infrastructure report in Kazakhstan, based on their potential to enhance the resilience of transport infrastructure to the impacts of climate change and geohazards (i.e., flash floods, extreme heat, snowstorms).[111] As such, the proposed project is fully informed by climate risks and supports adaptation beyond its immediate scope by enhancing physical assets using innovative technologies for the proposed investments to cope with experienced and anticipated impacts of climate change. Adaptation is the primary objective of the investment as it seeks to provide resilience to the entire road network (wider system) through the proposed project activities.

42. Despite repeated efforts to retrofit the road infrastructure, Jezkazgan-Karagandy area has experienced an increase in the frequency and intensity of floods over time, resulting in the deterioration and destruction of road infrastructure and disruptions from overflowing. The road base of the Jezkazgan-Karagandy section is approximately 50 years old. In the early 2000s, a major resurfacing, the upgrade of the embankment to its current elevation, and the construction of 220 culverts were undertaken to address damage to the asphalt and the constant overtopping due to flooding. The early 2000s upgrade proved effective in the short term. However, floods continued to deteriorate the road as snowstorms increased, temperatures changed more abruptly, and changing rain patterns and snow melting in the spring resulted in increasing destructive and disruptive floods. The most recent rehabilitation of the road varies between three and ten years ago depending on the area, and roads are inspected twice a year for regular maintenance. The existing culverts are damaged and appear to lack sufficient capacity to accommodate the flow demands of early spring snowmelt. Additionally, water accumulates on the roadside in numerous locations, resulting in infiltration into the embankment and foundations, which ultimately compromises the structural integrity of the road and causes deformations that lead to pavement deterioration. Consequently, the necessity for upgrading and rehabilitating this road section as well as adding redundancy through the construction of a new parallel two-lane road is wholly attributable to the effects of climate change. It is unlikely this investment would be necessary if it were not for the impact of climate change-induced events.

43. **Criterion 2, A statement is explicitly made for the project to reduce the climate vulnerability and/or to enhance the climate resilience:** As such, the Project finances upgrading the Jezkazgan - Karagandy section of the Middle Corridor to climate-resilient standards and the addition of a new two-lane carriageway built in parallel at an offset of 70 to 130 meters. These activities would not happen in the absence of climate change and are designed to achieve the core objective of improving the climate resilience of the road network while providing measures that reduce the underlying causes of vulnerability to climate change at the systemic level. This road section was selected for financing due to its climate vulnerability and the need to provide all-year connectivity of a strategic link in the country's road network and for the local population and other road users. A parallel green field road is

[11] Oleg Li. Climate Resilience and Risk Assessment of Road Infrastructure, Final Report, 2023.

also being financed with the sole objective of introducing redundancy in the face of climate change and not any other objective as the traffic on the existing road is quite low. Disruptions resulting from climate events will be significantly reduced with the introduction of this parallel two-lane road as the rehabilitated and new sections will be capable of handling two-way traffic following a climate-induced closing of either one of the carriageways. Hence, the addition of this new two-lane carriageway is entirely driven by climate change to build redundancy into an essential strategic link.

44. **Criterion 3, There must be a logic and direct link between an activity or project and the climate risk context established within the project:** The project investments are not for business-as-usual rehabilitation and instead are focused on upgrading the existing roads to climate-resilient standards and on building a second parallel, two-lane carriageway in selected sections to introduce redundancy in the road network. These investments in upgrading and introducing redundancy for continued operations after climate events would not be needed if it were not for the impact of climate change-induced events to the road infrastructure.

45. Given that the Project belongs to climate adaptation type 2 (Enable adaptation) as with climate resilience as one of its main project objectives (PO), having one output level indicator (Climate resilience measures incorporated in the Project roads), and the measures taken on it (structural and non-structural) listed on the BB2 section above, using the AIIB's proportional approach based on the JMDB methodology for tracking climate adaptation finance, we can allocate to the project a 25 percent climate adaptation finance on the CAPEX components of the project (sub-component 1.1, 1.2 and 1.3, totaling USD 645.33 million) , equivalent to USD 161.33 million or 24.82 percent of AIIB's finance.

46. The total climate finance of the project (summing adaptation and mitigation) would be USD 234.5 million, equivalent to 36.1 percent of AIIB's finance.

47. **GHG Assessment:** The GHG accounting assessment performed by the World Bank estimates that there will be an increase in carbon dioxide (CO2) emissions on the Project Road with the Project. The baseline CO2 emissions for the Project (without Project emissions) are 10,382,198 tons, and the Project gross CO2 emissions (with Project emissions) are 11,982,137 tons. The total net and annual net CO2 emissions for the Project roads are 1,599,939 tons (79,997 tons per year). The increase in CO2 emissions is attributed to the rise in fuel consumption with the Project due to the increase in vehicle speeds and the generated traffic on the Project Road with the Project.

Annex 6: Member Context

1. **Country and Macroeconomic Overview.** Kazakhstan is a resource-rich, upper-middle-income (UMIC) country, with a population of 20 million and a Gross Domestic Product (GDP) per capita of USD14,800 as of 2024. Kazakhstan's is the largest economy in central Asia, accounting for more than 60 percent of the region's GDP. Kazakhstan relies heavily on hydrocarbons and the state has a large footprint in the economy. The economy is expected to grow around 3.5 percent in 2024, and then by up to 5.7 percent in 2025, thanks to the expansion of oil production from a new field. The impact of geopolitical tensions on Kazakhstan remains limited.

2. **Infrastructure**. As the world's largest landlocked country, Kazakhstan relies heavily on robust road infrastructure to support its economy. With a geostrategic location, Kazakhstan has the potential to become a key logistical hub on the increasingly significant Middle Corridor trade route. Progress has been made in upgrading transport infrastructure, including enhancing East-West connectivity and diversifying export routes by addressing key bottlenecks.

3. **Poverty and employment**. It is estimated that 14.3 percent of the population lives below the international poverty line for UMIC countries.[2] However, poverty in rural areas (18.9 percent) is much higher than in in urban areas (10.9 percent). The labor market has shown strong performance, with the level of unemployment dropping to a historic low of 4.7 percent in 2023.

4. **Recent policy measures**: In 2023, the government adopted a new climate policy strategy and intends to invest in joint ventures to foster the advancement of renewable energies and water-saving technologies. In May this year the President also signed a decree on measures to liberalize the economy focusing on increasing competition and reducing the role of the state in the economy. Finally, to reinforce debt sustainability, the government has recently introduced a set of fiscal rules, including a debt ceiling of 60 percent of GDP.

5. **Debt Sustainability.** Kazakhstan's public debt is low and sustainable. Government and government-guaranteed debt is projected to reach 24.2 percent of GDP in 2024 and increase to 26.5 percent in 2025. Most of the debt is domestic and issued at rates below the key policy rate, which helps moderate FX rate risks and rising debt servicing costs. Rollover risks for public external debt are largely mitigated by the sizable assets of the National Fund of the Republic of Kazakhstan.

6. **Credit rating:** Kazakhstan is an investment grade country. Fitch (BBB) and S&P (BBB-) Moody's (Baa2). Fitch and S&P have kept the outlook at 'stable', while Moody's changed the outlook from 'stable' to 'positive' citing progress in reducing reliance on hydrocarbons which will support economic resilience.

[2] World Bank Document, 2024