ASIAN INFRASTRUCTURE INVESTMENT BANK

August 25, 2025

Sovereign-backed Financings

Approval Project Document

P000871 Uzbekistan: Karakalpakstan and Khorezm Local Roads Network Reconstruction Project

Currency Equivalents

May 31, 2025

Currency Unit – Uzbekistani Som (UZS)
USD1.00 = UZS12813.9

Fiscal year

January 1 – December 31

Abbreviations

AADT	Annual Average Daily Traffic
AIIB	Asian Infrastructure Investment Bank
AYA	Avtoyulinvest Agency
CBA	Cost-Benefits Analysis
CRRN	Core Rural Road Network
CRVA	Climate Risk and Vulnerability Assessment
CS&PMC	Construction Supervision and Project Management Consultant
DA	Designated Account
ES	Environmental and Social
EIRR	Economic Internal Rate of Return
ENPV	Economic Net Present Value
ESMP	Environmental and Social Management Plan
ESMPF	Environmental and Social Management Planning Framework
ESP	Environmental and Social Policy
ESS	Environmental and Social Standard
GIS	Geographic Information System
FM	Financial Management
GAP	Gender Action Plan
GDI	Gender Development Index
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GII	Gender Inequality Index
GOU	Government of Uzbekistan
GRM	Grievance Redress Mechanism
iRAP	International Road Assessment Programme
IRI	International Roughness Index
IUFR	Interim Unaudited Financial Report
JMDB	Joint Multilateral Development Bank
km	kilometer
MDB	Multilateral Development Bank
MOT	Ministry of Transport
NDC	Nationally Determined Contributions
O&M	Operation and Maintenance
OHS	Occupational Health and Safety

PA	Paris Agreement
PDS	Project Delivery Strategy
PIU	Project Implementation Unit
PMO	Project Management Office
POM	Project Operations Manual
PP	Procurement Plan
RC	Committee for Roads
RPF	Resettlement Planning Framework
RSA	Road Safety Audit
TOR	Terms of Reference
VOC	Vehicle Operating Costs
VOT	Value of Time

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1. Executive Summary

1.1 The **Karakalpakstan and Khorezm Local Roads Network Reconstruction Project** (the Project) is a major infrastructure initiative by the Government of Uzbekistan (GOU) to improve local connectivity, road safety, and climate resilience across two underserved regions in Western Uzbekistan. Covering a total of approximately **516.1 kilometers of local roads** across **23 districts**, the Project targets enhanced access to essential services, inclusive development, and regional equity in the Republic of Karakalpakstan and Khorezm Region.

1.2 A total Asian Infrastructure Investment Bank (AIIB or the Bank) financing envelope of **USD173.475 million** is proposed under a **Multi-tranches financing modality**, to be implemented in **two phases**. The first loan tranche, **USD71.163 million**, will finance about **188 kilometers** of priority rural roads in **Khorezm Region**. The second loan tranche will finance **328.1 kilometers** of roads in **Karakalpakstan**, subject to readiness conditions.

1.3 The Project aligns with Uzbekistan's national strategies for transport modernization, gender inclusion, and digital public service delivery. It integrates **climate-adaptive engineering**, a **Geographic Information System (GIS)-based road project management and asset management platform**, and **community-driven programs for women and youth empowerment**, directly contributing to SDG 9 (Infrastructure), SDG 5 (Gender Equality), and SDG 13 (Climate Action).

1.4 Key implementation challenges include capacity gaps in decentralized road agencies, limited environmental and social (ES) supervision capacity in remote regions, and ensuring environmental, social, and safety during and post-construction. To address these, the Project includes dedicated ES consultants, capacity-building plans, and a two-tier Grievance Redress Mechanism. Civil works will only commence once safeguard staffing is confirmed.

1.5 AIIB adds value through tailored, staged financing, long-term support for regional development, and technical enhancements including climate risk screening, digital monitoring, and ES oversight. The Project represents a strategic investment in Uzbekistan's sustainable, inclusive, and resilient rural infrastructure, with strong government ownership and phased delivery to ensure operational success.

<table>
<tr><td>Project No. and Name</td><td colspan="3">P000871 Karakalpakstan and Khorezm Local Roads Network Reconstruction Project</td></tr>
<tr><td>AIIB Member</td><td colspan="3">Uzbekistan</td></tr>
<tr><td>Borrower</td><td colspan="3">Republic of Uzbekistan</td></tr>
<tr><td>Guarantor</td><td colspan="3">Not applicable</td></tr>
<tr><td>Project Implementation Entity</td><td colspan="3">Committee for Roads under the Ministry of Transport of the Republic of Uzbekistan (RC)</td></tr>
<tr><td rowspan="2">Proposed Amount of AIIB Financing (USDm)</td><td rowspan="2">USD173.475 million
Tranche 1:
USD71.163 million</td><td>Instrument type (Instrument subtype)</td><td>Loan (Direct Sovereign)</td></tr>
<tr><td>Currency of financing requested</td><td>US Dollar</td></tr>
</table>

	Tranche 2 (tentatively): USD102.312 million		
Sector (Subsector)	Transport (Roads)		
Environmental and Social Category and Comments	B The Project has been proposed Category "B" in accordance with AIIB's Environmental and Social Policy due to the limited number of potentially adverse ES impacts, which will be limited to the Project area and can be managed using conventional ES risk management.		
Project Objective	To enhance climate resilient and inclusive road transport connectivity to markets and services in the Republic of Karakalpakstan and the Khorezm Region of Uzbekistan.		
Project Description	The *Karakalpakstan and Khorezm Local Roads Network Reconstruction Project* (the Project) aims to rehabilitate and reconstruct up to **516.1 kilometers (km)** of local roads across **23 districts** in the Republic of Karakalpakstan and the Khorezm Region of Uzbekistan. These roads serve as critical links between rural communities and key socioeconomic services such as markets, schools, hospitals, and administrative centers. The Project will finance the following activities: (i) civil works for the rehabilitation of up to 516.1 km of rural roads using climate-resilient pavement structures and improved safety features; (ii) consultancy services for construction supervision and quality control; (iii) development of a digital geospatial platform to support construction monitoring, grievance management, and climate vulnerability mapping; and (iv) institutional strengthening and capacity building, including targeted programs to promote women and youth empowerment. Project implementation will be carried out over 5 years through two phases, 1 and 2. The financing for the Project is proposed to be committed via two separate loan tranches, each with its own Loan agreement, in line with the Project's implementation readiness and allowing for operational viability and efficient resource allocation. • **Phase 1**: Reconstruction of up to **188 km** of local roads across **9 districts** in **Khorezm Region**, together with **Institutional Strengthening and Capacity Building** as well as **Development of Digital Geospatial Platform and Women and Youth Empowerment Program** with a proposed AIIB financing amount of **USD71.163 million**.		

<table>
<tr><td></td><td colspan="3">Phase 2: Reconstruction of up to 328.1 km of local roads across 14 districts in the Republic of Karakalpakstan, with an expected AIIB financing amount of USD102.312 million. This Phase will be prepared and submitted for AIIB management’s verification once agreed conditions for Tranche 2 readiness are met. The Project is aligned with the Government of Uzbekistan’s ongoing shift in road sector strategy—from improving international corridors to upgrading regional and local road infrastructure. Local roads in Uzbekistan, many built in the 1950s–60s, have suffered from decades of underinvestment, resulting in widespread deterioration and limited accessibility. Improving these roads is critical to unlocking the industrial and agricultural potential of underserved areas, particularly in Western Uzbekistan, including the environmentally fragile Aral Sea region. Reconstruction works will include full pavement rehabilitation, bridge repairs and new small-scale structures, enhanced drainage, safety signage, and bus stops. Where needed, sidewalks will be added to improve pedestrian safety, especially near schools and community centers. All civil works are planned within the existing rights-of-way, minimizing the need for land acquisition or resettlement. Environmental impacts are expected to be minor and localized to construction activities. The Project also includes a dedicated inclusion component, designed to enhance economic participation and resilience in project-affected communities. This includes vocational training for women, road safety and climate awareness campaigns for youth, and targeted support for women’s entrepreneurship initiatives. These activities will be integrated with the development of the digital geospatial platform to facilitate inclusive monitoring, evidence-based planning, and transparent grievance redress. </td></tr>
<tr><td>Co-financing type</td><td>Standalone</td><td>Following other financier’s E&S Policy?</td><td>No</td></tr>
<tr><td>Lead financier</td><td>N/A</td><td>Following other financier’s Procurement Policy?</td><td>No</td></tr>
<tr><td>Implementation Period</td><td>01/01/25
12/31/29</td><td>Expected Loan Closing Date</td><td>6/30/30</td></tr>
<tr><td>Financing Plan</td><td colspan="3">Project Cost: USD197.91 million
AIIB Loan: USD173.47 million (86%)
GOU: USD24.44 million (14%)</td></tr>
<tr><td>Risk (Low/Medium/High)</td><td colspan="3">Medium</td></tr>
</table>

Retroactive Financing (Loan % and dates)	Up to 20% of the loan amount, for expenditures incurred and paid for no earlier than 12 months prior to expected signing date.
Policy Waivers Requested	None
Policy Assurance	The Vice President, Policy and Strategy, confirms an overall assurance that the proposed Bank Financing complies with the applicable Bank operational policies.

Risk	
Key risks	**Mitigation Measures**
i. Outdated technical designs may not align with international road safety and climate resilience standards. ii. Complex implementation due to project scope spanning two remote regions. iii. Procurement delays, including approval bottlenecks and contractor performance issues. iv. Delay in auditor recruitment and submission of financial reports. v. Limited capacity to implement Environmental and Social Management Plan (ESMP) in remote areas.	i. Include Road Safety Audits in the terms of reference (TOR) and apply updated climate resilience guidelines in the tender design documents. ii. Establish local Project Management Office (PMO) teams with ES specialists in both regions and engage international/local supervision consultants. iii. Hire a Procurement Specialist, engage approval authorities early, and appoint a Construction Supervision and Project Management Consultant (CS&PMC) firm for implementation support. iv. Finalize audit TOR and reporting formats at project launch; retain qualified finance staff. v. Assign qualified ES staff within both the supervision consultants and the contractors and provide regular field support through AIIB and localized PMO's ES staff.
Economic Capital (ECap) Consumption	17.97 (10.36%)

Strategic Alignment				
Alignment with AIIB's thematic priorities	Green infrastructure; Connectivity and Regional Cooperation; Technology-Enabled Infrastructure			
Alignment with AIIB's strategies	Transport Sector Strategy			
Key Outcomes	**Indicator**	**Unit of measure**	**Baseline (2025)**	**Target (2031)**
Green infrastructure	Kilometers of rural roads upgraded with safety measures and climate resilient	Number	0	188

	features in Khorezm region			
Connectivity and Regional Cooperation	Increased annual average daily traffic (AADT) on Project roads	AADT	3,935	4,806
Technology-Enabled Infrastructure	Digital Geospatial Platform developed and operational	Yes/No	No	Yes

Other Key Financing Requirements	
Conditions of Effectiveness	• The Borrower, through the RC, has prepared and adopted the Project Operations Manual, in form and substance satisfactory to the Bank as confirmed by the Bank; and • The Borrower has updated the Environmental and Social Management Planning Framework (ESMPF) including the Resettlement Planning Framework (RPF) and the Stakeholder Engagement Plan (SEP) to reflect the shift from design-built-maintain to design-bid-build procurement modality, in form and substance satisfactory to the Bank; and • The PMO has been established and with adequate staffing in accordance with the ESMPF requirements and in form and substance satisfactory to the Bank.
Key Covenants	• No civil works may commence until all required PMO ES staff and consultants are fully onboarded and confirmed by the Bank. • PMO should prepare an ES capacity building plan for both PMO staff and the supervision consultant team within 90 days of loan effectiveness.
Key Conditions for 1st Disbursement	None

President	Liqun Jin
Chief Investment Officer	Konstantin Limitovskiy
Director General	Xiaohong Yang
Manager	Evren Dilekli
Team Leader	Runze Yu, Senior Investment Officer
Team Members	Muzaffar Ahmad, Senior Environment Specialist Alberto Alcubilla Arribas, Senior Investment Solutions Specialist Jingyu Gao, Economist Nahom Ghebrihiwet, Economist Mengmeng He, Finance Officer Yogesh Malla, Senior Financial Management Specialist Ercan Ozbulut, Social Development Specialist Guoquan Jesse Ong, Finance Associate Liu Yang, Project Counsel

	Chitambala John Sikazwe, Senior Procurement Specialist Tim Bassanets, Investment Analyst Umid Khudoyberdiev, Consultant Elle Yanyang Shi, Project Assistant

2. Context

2.1 **Country and Macroeconomic Overview:** Road transport connectivity in rural areas is vital for Uzbekistan's economic development. As a double-landlocked country with a population of 36 million in 2023, Uzbekistan faces significant socioeconomic challenges, particularly in its rural areas, where 49% of its population resides. Agriculture plays a central role in rural livelihoods, employing 25.7% of workforce and contributing 24.6% of Gross Domestic Product (GDP), as of 2019. Despite agriculture accounting for nearly 20% of country's exports, its contribution to GDP has steadily declined from 34.4% in 2000 to 25.1% in 2022. Furthermore, nearly 17% of the population remains below national poverty line, with most of these individuals living in rural regions.

2.2 Socioeconomic disparities across Uzbekistan are most pronounced in regions with low industrial development, particularly in the remote areas of Western Uzbekistan. These lagging regions are plagued by environmental degradation due to industrial pollution, poor agricultural practices, and hazardous waste sites. Agriculture remains the main source of income in these areas; however, due to considerable resource scarcity, limited job opportunities, and high population growth, it fails to provide sufficient income to all workers. Addressing these issues requires comprehensive strategies that promote infrastructure development, industrialization, and urbanization, ensuring that economic progress benefits all regions, not only the more developed ones.

2.3 Two regions, in particular, face acute socioeconomic challenges: the Republic of Karakalpakstan and the Khorezm region. Karakalpakstan, covering 166,590 square kilometers and home to 1.97 million people, has a population density of only 11.9 people per square kilometer. It suffers from environmental degradation, high poverty rates, and limited access to essential services such as healthcare and education. Similarly, Khorezm, with a much smaller territory of 6,050 square kilometers and a population of 1.96 million, has a much higher population density of 323.7 people per square kilometer. Despite its heavy reliance on agriculture, Khorezm faces issues like water scarcity and soil salinity, which hinder agricultural productivity and exacerbate poverty. Both regions exhibit per capita GDP figures significantly below national average, with Karakalpakstan at approximately USD1,310 and Khorezm at USD1,480, compared with national average of USD2,275. These disparities highlight economic challenges faced by these regions in comparison to other more prosperous parts of Uzbekistan.

2.4 To address these issues, targeted interventions are needed to enhance infrastructure, improve transportation links, and foster sustainable development in Karakalpakstan and Khorezm. By focusing on these areas, Uzbekistan can create a more equitable and inclusive economic landscape, benefiting communities in its most underserved regions.

2.5 **Sector Overview:** Uzbekistan's road network is categorized into public roads, streets in cities and settlements, and inter-farm rural roads. Public roads are further classified into international, state, and local roads, while streets and inter-farm roads form part of the internal road system. The scope of the current Project focuses solely on local roads.

2.6 The public road network in Uzbekistan covers approximately 184,562 kilometers (km), which includes international, state, and **local roads**. Local roads, vital for rural connectivity, span about 24,589 km and are managed by the Committee for Roads (RC) under the Ministry

of Transport (MOT). Local roads play a crucial role in connecting rural areas to healthcare, education, and employment, but many remain in poor condition, limiting access and development in rural communities.

2.7 Public roads in Uzbekistan are classified into five categories based on technical standards and traffic capacity. Category I includes expressways and highways with four or more lanes, while Category II includes two-lane international and local roads. Local roads, which primarily serve rural areas with traffic volumes below 2,000 passenger car units (PCU), make up a significant portion of the network. Of these, 93% are paved, with the remaining 7% having a gravel surface. The majority of local roads (57%) fall under Category IV, 16% are Category III or higher, and 28% are classified as the lowest Category V. Despite this extensive network, 31% of local roads require capital repairs to maintain functionality.

2.8 **Addressing Key Development Challenges:** The low levels of socioeconomic development in Karakalpakstan and Khorezm are compounded by the **lack of safe, reliable, and all-season local roads**, which hinder access to essential services and broader economic opportunities. Existing rural roads in both regions need major rehabilitation to facilitate economic growth and improve access for rural populations.

2.9 More than 30% of rural roads in Karakalpakstan and Khorezm require major repairs to ensure safety for residents. In Khorezm, the Asian Infrastructure Investment Bank (AIIB or the Bank) observed that road conditions are so low that vehicles struggle to travel faster than 20 km/h. Approximately 140,000 people in Karakalpakstan and 191,091 people in Khorezm rely on these roads to access essential services. Vulnerable groups, including women and children, are disproportionately affected, often relying on unsafe alternative travel options such as motorcycles.

2.10 Recent development plans[1] for Karakalpakstan and Khorezm aim to diversify local economy by promoting tourism. However, poor condition of local roads, which limits travel speed to around 20 km/h, undermines the region's appeal to tourists. Rehabilitating rural roads is crucial to improving tourist accessibility and supporting other infrastructure improvements, such as potable water and electricity.

2.11 Without major rehabilitation and sustainable maintenance, rising climate risks will further degrade rural roads in Karakalpakstan and Khorezm. These risks include heat waves, seasonal flooding, and freeze-thaw cycles, which will worsen existing road conditions. Extreme weather events, such as flash floods, have the potential to destroy rural roads entirely. A comprehensive rehabilitation plan must address both the current road conditions and long-term climate resilience using advanced technologies and materials.

2.12 **Project Contributions:** The proposed Project focuses on rehabilitating local roads in Karakalpakstan and Khorezm, improving access to primary services and economic opportunities. The rehabilitation will use climate-resilient materials and technologies to ensure long-term durability in face of increasing climate risks. Additionally, the Project will enhance the technical and operational capacity of local Project Implementation Unit (PIUs) in road management, incorporating Geographic Information System (GIS)-based solutions and

[1] The Decree of the Cabinet of Ministers of the Republic of Uzbekistan on Additional Measures for Comprehensive Development of Tourism Potential of Karakalpakstan and Khorezm in 2022-2026.

aligning with international standards. This will bring positive benefits for future road projects in Uzbekistan.

2.13 The proposed Project aligns with Uzbekistan's *National Development Strategy for 2022-2026*, which prioritizes transportation as a driver of economic development. It also reflects Uzbekistan's commitment to addressing climate change by enhancing the resilience of critical infrastructure, including transport networks.

3. Rationale

3.1 **Project Objectives.** To enhance climate resilient and inclusive road transport connectivity to markets and services in the Republic of Karakalpakstan and the Khorezm Region of Uzbekistan.

3.2 **Expected Beneficiaries.** The Project will benefit approximately 3.8 million people in Khorezm and Karakalpakstan. Around 600,000 individuals living along the targeted local roads will directly experience improved access. These rehabilitated roads will connect 180 settlements, 138 schools, 65 hospitals, 56 markets, 48 cultural sites, and 7 tourist facilities, thereby contributing to regional development.

3.3 **Farmers** will benefit from better road connectivity and enhanced access to regional, national, and international markets. Improved logistics will facilitate transport of agricultural products, creating new economic opportunities and expanding trade in the region. **Women and youth**, who are disproportionately affected by poor infrastructure, will gain improved access to healthcare, education, and economic opportunities. Enhanced road connectivity will empower these groups to participate more fully in social and economic activities. Both **public and private sector stakeholders** in the road transport sector will benefit from capacity building activities[2]. These efforts will strengthen their skills and resources, contributing to the efficiency, effectiveness, and sustainability of road operations.

3.4 **Expected Results.** The Project will enhance the local road network in Karakalpakstan and Khorezm, improving connectivity, safety, sustainability, and climate resilience, while integrating new technologies.

3.5 Progress toward the Project's objectives will be tracked using the following indicators:

- Annual Average Daily Traffic (AADT) on Project roads.
- Travel time saved on Project roads.
- Number of Project beneficiaries with improved climate resilient road access to markets, schools and health facilities.
- Number of women completed vocational training.
- Number of youths trained on climate change and road safety.
- Percentage of adult women and youths surveyed among communities satisfied with the improvement of Project roads.
- Improved safety standard, assessed by higher star rating of the International Road Assessment Programme (iRAP)[3].

Project Intermediate Results Indicators:

- Number of the local roads reconstructed in Khorezm region.
- Kilometers of rural roads upgraded with safety measures and climate resilient features in Khorezm region.

[2] Capacity buildings activities include training on road safety, study tours for rural roads projects which are successfully operated and maintained.

[3] The International Road Assessment Programme (iRAP) is a tool that assesses the safety standard of a road against safe system principles. The star ratings are based on road inspection data and provide a simple and objective measure of the level of safety which is 'built-in' to the road. The higher the star rating, the safer the road. The iRAP star rating model used today is the result of 20 years of development work, which began with EuroRAP (https://irap.org/european-regional-support/) in 1999.

- Digital Geospatial Platform developed and operational.

3.6 **Strategic Fit for AIIB.** The proposed Project is well-aligned with AIIB's thematic priorities and strategies as follows:

1) ***Green Infrastructure*.** The Project aligns with AIIB's emphasis on green infrastructure by **incorporating climate-resilient road designs and materials** that address specific vulnerabilities of the Republic of Karakalpakstan and Khorezm Regions. These regions, located in the Aral Sea basin, are highly susceptible to climate impacts such as rising temperatures, increased drought frequency, and accelerated glacier melting, which exacerbate water scarcity and seasonal flooding. By focusing on improving drainage systems, the Project reduces risks of road damage from flooding and poor water management. Additionally, durable road materials capable of withstanding high temperatures and extreme weather conditions, such as heat waves and freeze-thaw cycles, are being used to ensure long-term infrastructure stability.

   The Project's climate resilience measures not only prevent disturbances to the transportation network but also enhance the **all-weather connectivity** of rural roads, ensuring continuous access to essential services like healthcare, education, and markets, even under adverse weather conditions. These resilience features contribute to mitigating the broader risks of climate change by minimizing disruptions to rural connectivity, thus fostering economic stability and growth.

2) ***Connectivity and Regional Cooperation*.** While the Project focuses on rehabilitating local roads, it significantly enhances internal connectivity in the underserved regions of Karakalpakstan and Khorezm. Improved access to healthcare, education, and markets is expected to stimulate local economic activity with potential spillover effects on broader regional development. Although the targeted roads are local, they can indirectly strengthen regional mobility. Given the proximity of Karakalpakstan and Khorezm to key border crossings with Kazakhstan and Turkmenistan, enhanced local networks may also improve integration with national corridors and facilitate more efficient cross-border movement over time.

3) ***Technology-Enabled Infrastructure*.** The development of the **Digital Geospatial Platform** is a key feature of this Project that aligns with AIIB's priority to incorporate technology into infrastructure development. This platform will allow for real-time monitoring of project progress, assess socioeconomic benefits, and streamline operations, thereby improving transparency, governance, and operational efficiency. The use of this technology supports AIIB's vision of promoting modern, data-driven infrastructure solutions, enhancing both the sustainability and effectiveness of the Project. While such technology is not new worldwide, its application is novel in the region and context.

4) ***Transport Sector Strategy*.** The Project is in line with AIIB's *Transport Sector Strategy*, which includes supporting financing rural roads and envisages supporting basic infrastructure with significant social value in response to clients' demand and willingness to borrow. The Project is specifically aligned with the trunk linkages and upgrading of existing infrastructure sector investment priorities.

3.7 **Paris Agreement Alignment (PAA) and Climate Finance.** In line with AIIB methodology for assessing the alignment with the mitigation and adaptation goals of the Paris Climate Agreement, the Project is assessed as universally aligned for BB1 and no new road capacity is planned for. Details on the assessment for both BB1 (mitigation) and BB2 (adaptation) are provided in Annex 4. In line with the joint multilateral development bank (MDB) methodology for tracking adaptation finance, it is estimated that USD37.4 million of the Project cost contributes to support adaptation. Details on these estimates are provided in Annex 4.

3.8 The Project is not inconsistent with the sectoral or national priorities for climate resilience and climate mitigation outlined in the country's Nationally Determined Contributions (NDC)[4].

3.9 **Value Addition by AIIB.** Beyond the provision of financing, AIIB's participation will strengthen the Project in several key areas.

1) **Technical Expertise**: AIIB adds value to the Project by offering technical advice to the RC and the design institute on the formulation of design parameters, preparation of technical documentation, cost estimation, road safety and climate resilience measures. AIIB draws on its extensive knowledge and experience gained from designing and implementing similar infrastructure projects in Uzbekistan and across the region. In addition, the Bank is contributing to the Project's formulation by financing parts of the project preparation activities from the AIIB Loan L0313A Bukhara Road Network Improvement Project (Phase 1) (BRNIP-1), which forms part of a phased approach and ensures AIIB's continuous and comprehensive engagement in Uzbekistan's road sector.

2) **Digital Platform for Project Management**: AIIB is further enhancing its value to the Project by introducing a digital platform that strengthens project management capabilities of RC. This platform will facilitate real-time monitoring of construction progress, maintenance activities, and resource allocation. By enabling greater transparency and informed decision-making, the platform promotes efficiency and accountability among all stakeholders, helping to ensure that the project implementation remains on track and meets its objectives.

3) **Environmental and Social (ES) Standards**: Beyond financing, AIIB is committed to addressing the Project's environmental and social impacts through implementing international best practices for environmental and social management. This approach not only improves the quality and sustainability of the project outcomes but also strengthens the capacity of the RC to manage complex projects. AIIB's involvement ensures that environmental and social risks are minimized, while the Project remains in line with international standards.

4) **Climate Resilience and Social Impact**: The Project places a strong emphasis on climate resilience, integrating climate adaptation principles into the design and implementation of infrastructure assets. This is expected to significantly extend infrastructure's economic lifespan while also increasing its resilience in regions most vulnerable to climate impacts. Furthermore, the inclusion of **Women and**

[4] Updated Nationally Determined Contribution, 2021. https://unfccc.int/sites/default/files/NDC/2022-06/Uzbekistan_Updated%20NDC_2021_RU.pdf

Youth Empowerment sub-component amplifies Project's impact by addressing the needs of vulnerable communities. Through targeted initiatives on road safety and climate awareness, the Project supports Uzbekistan's broader climate adaptation strategies and fosters inclusive, sustainable development, particularly in the environmentally sensitive region of the Aral Sea.

3.10 **Value Addition to AIIB.** This Project offers AIIB a strategic opportunity to expand its expertise in several key areas.

1) **Enhancing AIIB's Expertise in Climate Resilience and Technological Integration**: The Project will deepen AIIB's understanding of climate resilience measures for local roads, especially in regions highly vulnerable to climate change. Managing a road project in remote areas with challenging environmental conditions will provide valuable experience in complex project management. Furthermore, the Project will highlight the advantages of utilizing technology to streamline supervision processes, enhancing AIIB's project management capabilities.

2) **Enhanced Visibility and Impact**: The Project's direct benefits to rural communities will significantly raise AIIB's visibility in Uzbekistan, complementing its ongoing efforts in water and railway infrastructure development in the country's western regions. By improving local road infrastructure, AIIB reinforces its commitment to grassroots-level development, essential for promoting inclusive economic growth. This initiative aligns with AIIB's broader mission of supporting sustainable infrastructure projects that drive long-term socioeconomic progress.

3) **Strengthened Capacity and Partnerships**: The Project will also bolster AIIB's capacity to operate in the roads sector, particularly in low-income regions, thereby expanding its reach and impact. Building on its ongoing collaboration with the RC and the success of Project P000313 BRNIP-1, AIIB will further solidify its partnership with Uzbekistan. This cooperation not only strengthens AIIB's foothold in the country but also paves the way for future investments, contributing to long-term sustainable development and infrastructure growth in the region.

3.11 **Lessons Learned.** Lessons learned from past AIIB-financed projects[5] in the same regions of Uzbekistan emphasize the need for ample time in procurement, especially for consultancy services, due to extended evaluation processes and domestic clearance requirements. Prolonged project preparation timelines may lead to the need for updating the engineering designs and cost estimates at the implementation stage, necessitating further rounds of approval. Mitigation measures during project preparation include thorough discussion with clients and agreement on terms of reference (TOR) and evaluation criteria pre-tendering, engagement of experienced project management advisors, and advocating for the Design and Build procurement method to shift design risks to contractors.

[5] In particular the approved P000313 Bukhara Road Network Improvement Project (Tranche 1), the approved P000341 Bukhara-Miskin-Urgench-Khiva Railway Electrification Project, and the P000350 Karakalpakstan and Khorezm Water Supply and Sanitation Project under preparation.

3.12 The Bank also accumulated experience from similar local road projects in rural areas in other AIIB members[6], which highlights the importance of capacity building for implementing entities and post-project maintenance for asset sustainability. Promoting gender equality and social inclusion in project design is also crucial. Several mitigation and enhancement measures that have been incorporated during the project preparation involve financing PIU capacity building and assigning dedicated Project Management Office (PMO) staff to both Karakalpakstan and Khorezm, including at least two-year Defect Liability Period (DLP) in civil works contracts, and dedicating Project components to women's empowerment and youth education.

3.13 Leveraging lessons from other MDBs' rural roads projects[7]. **Prioritization criteria** are crucial to optimizing public fund utilization, while the decentralized nature of rural road projects necessitates effective construction management. Integrating these lessons includes developing a detailed screening tool for road section prioritization and establishing a **digital geospatial platform** to monitor project implementation progress in real-time and to support construction supervision.

[6] Including the approved P000020 Republic of India Madhya Pradesh Rural Connectivity Project, P000025 Republic of India Gujarat Rural Roads (MMGSY) Project, P000063 Republic of India Andhra Pradesh Rural Roads Project, P000736 Republic of Côte d'Ivoire: Inclusive Connectivity and Rural Infrastructure Project.
[7] World Bank's Regional Roads Development Project (2015) and ADB's Rural Roads Resilience Sector Project (2023)

4. Project Description

4.1 **Overview.** The Project will rehabilitate and reconstruct up to 516.1 km of local roads in the Republic of Karakalpakstan and the Khorezm Region. This encompasses 23 road sections spanning up to 328 km across 14 districts in Karakalpakstan and 16 road sections covering up to 188 km across 9 districts in Khorezm. Additionally, the Project includes institutional strengthening and capacity building activities for the PIU and the development of a digital geospatial platform and Women and Youth Empowerment Program.

4.2 **Components.**

4.2.1 **Component 1. Reconstruction of the Local Roads in the Republic of Karakalpakstan and Khorezm Region.** This component focuses on the reconstruction of local roads in the Republic of Karakalpakstan and the Khorezm region. The reconstruction works include pavement reconstruction, bridge repair and construction, drainage improvements, and the installation of road safety measures such as signs, barriers, pedestrian crossings, and bus stops. Where necessary, sidewalks will be added to improve pedestrian safety. The works include a two-year Defect Liability Period.

Climate resilience measures, such as the use of durable pavement materials and enhanced drainage systems to cope with higher temperatures and seasonal flooding, will be integrated. **No capacity expansion is planned**, and road rehabilitation will remain within the existing corridors.

Additionally, the component will fund the hiring of a Construction Supervision Consultant to oversee the entire construction process, including the review of climate-resilient measures to ensure proper adaptation and mitigation efforts are in place, as well as the Road Safety Audit (RSA) in overseeing compliance with contractual obligations and ensuring quality and safety standards.

There are three sub-components:

- ***Sub-component 1.1.*** Reconstruction Works of the Local Road Network in the Republic of Karakalpakstan
- ***Sub-component 1.2.*** Reconstruction Works of the Local Road Network in Khorezm Region
- ***Sub-component 1.3.*** Construction Supervision Consultancy for Sub-component 1.1. and 1.2.

4.2.2 **Component 2. Institutional Strengthening and Capacity Building.** This component will support:

- PMO operational costs.
- Financial audit and compliance functions.
- Training programs to strengthen procurement, contract management, safeguards, and financial reporting.
- Deployment including road engineers and ES and gender consultants.

4.2.3 **Component 3. Development of Digital Geospatial Platform and Women and Youth Empowerment Program.** There are two sub-components:

- ***Sub-component 3.1.*** Development of Digital Geospatial Platform

The objective of this sub-component is to create a sophisticated, web-based GIS platform that serves multiple purposes:

1) Provide an interactive, online tool for construction supervision, enabling real-time monitoring of project implementation, and generating progress and financial reports with visualizations.
2) Support the evaluation of social and economic benefits derived from improved connectivity, including enhanced access to healthcare, education, and tourism facilities, and the increase in public facilities accessible to the community.
3) Visualize climate vulnerability and risks affecting each road section to be rehabilitated, while tracking the implementation of climate resilience measures.
4) Streamline grievance registration and monitoring, allowing PMO, supervision consultants, and RC to manage incoming complaints, generate alerts, and track responses in real-time.

- ***Sub-component 3.2.*** Women and Youth Empowerment Program

This sub-component focuses on fostering social and economic inclusion, particularly for women and youth, by leveraging the Project's interventions. Key activities to be implemented by the PMO include:

1) Conducting a scoping study and skills needs assessment to identify potential business and livelihood opportunities for women in the surrounding areas.
2) Developing a women's entrepreneurship program based on the needs assessment, along with participant selection criteria and a list of potential participants.
3) Identifying potential sources of grant financing for women entrepreneurs.
4) Upgrading an existing community center to provide a dedicated and functional space for delivering training, mentorship, and business development support.
5) Providing in-kind support to selected women entrepreneurs, such as essential equipment or materials to help operationalize their business plans.
6) Providing training on climate resilience and road maintenance, targeting residents in Project-affected areas, with a special focus on women and youth.
7) Organizing engaging road safety awareness programs for young people, incorporating educational materials and campaigns on traffic rules and pedestrian safety.

4.3 **Cost and Financing Plan.** The table below provides indicative costs of these components and financing plan:

Table 1. Project Cost and Financing Plan			
Item	**Project Cost (USD m)**	**Financing (USD m and %)**	
		AIIB	**GOU**
Component 1. Reconstruction of the Local Roads in Karakalpakstan and Khorezm			
1.1. Reconstruction Works of the Local Road Network in the Republic of Karakalpakstan (incl. 5% contingency)	115.90	102.31	13.60
	100%	88%	12%
1.2. Reconstruction Works of the Local Road Network in Khorezm Region (incl. 5% contingency)	73.60	64.10	9.50
	100%	87%	13%
1.3. Construction Supervision Consultancy	5.08	4.28	0.80
	100%	84%	16%
(A) Sub-total Component 1	**194.59**	**170.69**	**23.90**
	100%	88%	12%
Component 2. Institutional Strengthening and Capacity Building			
2.1. PMO Operating Costs and Capacity Building Activities to Strengthen the PMO Capacity (incl. financial audit)	2.45	2.01	0.44
	100%	82%	18%
(B) Sub-total Component 2	**2.45**	**2.01**	**0.44**
	100%	82%	18%
Component 3. Development of Digital Geospatial Platform and Women and Youth Empowerment Program			
3.1. Development of Digital Geospatial Platform	0.53	0.47	0.06
	100%	89%	11%
3.2. Women and Youth Empowerment Program	0.34	0.30	0.04
	100%	88%	12%
(C) Sub-total Component 3	**0.87**	**0.77**	**0.1**
	100%	89%	11%
Grand Total (A+B+C)	**197.91**	**173.47**	**24.44**
	100%	86%	14%

Note: There are some differences due to rounding up.

4.4 **The Multi-Loan Tranche Financing.** The Government of Uzbekistan (GOU) has requested for the Bank to provide financing of USD173,475,000 from AIIB to finance the Karakalpakstan and Khorezm Local Roads Network Reconstruction Project adopting the multi-tranche loan financing approach. The financing is proposed to be committed in phases through two loan tranches, via two separate loan agreements. Subject to the approval of the financing, the first loan tranche for the amount of USD71,163.000, will be committed for the Project following the Board approval. This first loan tranche of the Project's financing will finance Phase 1 of the Project, which support the activities described in Sub-component 1.2

and 1.3, Component 2 and 3. The second loan tranche of the financing, for the amount of USD102,312,000 million, will be committed within the Project's implementation period, approximately between 2026 and 2030, following Management's verification of the conditions set forth below in Section 4.5 of the Project Document. The second loan tranche will support Phase 2 of the Project, which supports activities described in Sub-component 1.1.

4.5 **Conditions for the Commitment of the Second Loan Tranche.** The second loan tranche is conditional upon Management's verification of the fulfillment of the conditions below:

- **Construction Supervision Consultant Shortlisted and Environmental and Social Management Planning Framework (ESMPF)-Compliant TOR Finalized:**
  AIIB must confirm that the shortlist of supervision consultants for Phase 1 has been finalized and that the finalized TOR for the Construction Supervision Consultant (CSC) fully integrate the environmental, social, and occupational health and safety (ES/OHS) staffing requirements outlined in the approved ESMPF. This ensures that the institutional arrangements for project oversight are in place and capable of supporting compliance during Phase 2.
- **Disclosure and Implementation of Updated Safeguard Instruments and Staffing Review:**
  The ESMPF, Stakeholder Engagement Plan (SEP), and Resettlement Planning Framework (RPF) must be updated to reflect the revised centralized staffing model and be publicly disclosed in accordance with AIIB's Environmental and Social Framework. In parallel, AIIB will conduct a review of the effectiveness of the current Phase 1 ES supervision arrangements. The Bank's consideration of Tranche 2 will be contingent upon this review confirming that all core ES personnel have been onboarded, perform satisfactorily, and that any identified gaps—particularly regarding field-level implementation in Khorezm—have been addressed, including through potential recruitment of a regional ES Consultant.

4.6 The Government's proposal to adopt a multi-loan tranche financing approach is well-justified on both technical and readiness grounds. The Project involves two geographically distinct regions—Khorezm and Karakalpakstan—with varying levels of implementation preparedness. By advancing with the Phase 1 in Khorezm, where detailed designs are already available and readiness is high, the Government can initiate procurement and civil works promptly while allowing additional time to finalize technical and institutional preparations for Phase 2 in Karakalpakstan. This phased approach ensures operational viability and efficient resource allocation, aligns with the Government's evolving budget planning and absorption capacity, and allows AIIB to provide tailored support over time while maintaining strategic continuity. It also enables the application of lessons learned from Phase 1 to improve the design and implementation of Phase 2, in line with the Project's objective to support long-term, scalable infrastructure development.

4.7 The Loan for Phase 1 will tentatively have a term of **25 years**, including a **5-year grace period**, and will follow AIIB's standard terms and conditions for sovereign-backed financings, as outlined in the draft Loan Agreement.

4.8 AIIB financing will cover eligible expenditures for civil works, consulting services, and incremental administrative costs associated with the reconstruction of local roads, institutional capacity building, development of a digital geospatial platform, and the women and youth

empowerment program. The Government of Uzbekistan will finance applicable taxes, duties, and financial charges during implementation and provide counterpart funds to cover any unforeseen costs. In addition to the AIIB Loan, the Government will ensure that adequate resources are made available in a timely manner to support the full implementation of the Program.

4.9 Any required **land acquisition and resettlement** will be undertaken in accordance with the **Law of the Republic of Uzbekistan No. 781, dated June 29, 2022**, and RPF which has been prepared in line with AIIB Environmental and Social Standard 2.

4.10 **Implementation Arrangements and Readiness**

4.10.1 **Implementation arrangements.**

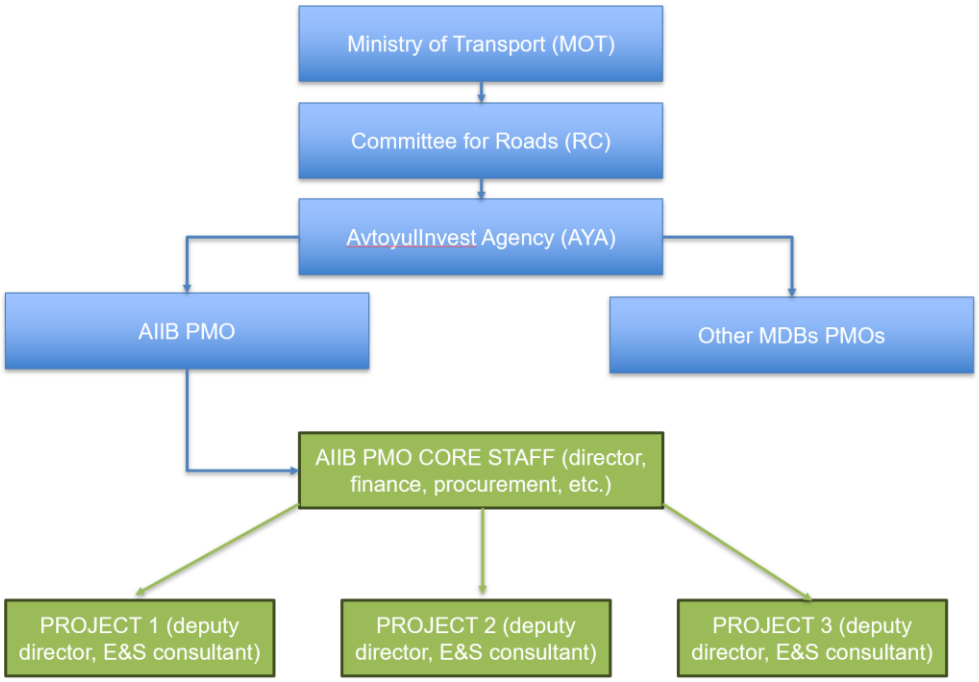
(i) Project Management Office

a. **Implementation Management.** RC under the MOT is the Project Implementing Agency. Within RC, the Avtoyulinvest Agency (AYA) will oversee overall implementation and management of the Project, including procurement, contract management, and progress monitoring.

b. **Reform on Managing MDB Projects.** In line with Order No. 92 dated September 30, 2024, RC has restructured its approach to managing MDB-financed projects. Instead of maintaining separate PIUs for each project, all MDB-financed operations are now managed through centralized, MDB-specific PMOs under AYA. For AIIB-financed projects, this reform has led to the establishment of the *Group for the Implementation of Projects of the Asian Infrastructure Investment Bank* (AIIB PMO), which consolidates project oversight and strengthens institutional capacity.

c. The AIIB PMO operates with a dedicated, full-time team across key technical, fiduciary, and safeguards functions. For this Project, one Deputy Director will be appointed to manage day-to-day implementation, ensuring strong leadership and inter-agency coordination. While the PMO currently includes one full-time environmental and social specialist, additional specialists as consultants to PMO in accordance with the published ESMPF will be recruited specifically for both Phase 1 and Phase 2 implementation to enhance safeguard monitoring and ensure full compliance with AIIB's Environmental and Social Policy. This is illustrated in the figure below.

Figure 1. Institutional Structure



d. The AIIB PMO currently consists of a multidisciplinary team of technical and operational specialists, including one Monitoring and Evaluation Expert, one Procurement Specialist, one Contract Specialist, one Financial Management Specialist, one Accountant, a Bridge Engineer, a Road Engineer, one Environmental and Social Specialist, a Legal Specialist, one Interpreter, and one Office Manager. This staffing structure ensures that the PMO has the necessary capacity across key functions, including procurement, contract management, engineering, legal affairs, and environmental and social compliance, to support the effective implementation of AIIB-financed projects.

e. The PMO has the following responsibilities and functions including:

- Jointly with RC, coordinate with all required entities in preparation of the Project.
- Facilitate the project implementation and timeliness at all stages of implementation.
- Ensure monitoring and control over project implementation, fulfillment of signed contracts, effective and targeted use of financial and other resources.
- Interact with AIIB in the implementation and supervision.
- Participate as an integral body of Procurement Committee during procurement procedures.

f. **Financing the PMO.** Under this new centralized structure, the PMO manages multiple AIIB-financed projects simultaneously. To support this

setup, **AIIB is open to continuing loan-based financing of the PMO's staffing and operational costs, as well as training and capacity programs.**

(ii) Financial Management (FM), Procurement, and ES arrangements:

a. **FM.** PMO shall be responsible for the overall project financial management of AIIB financed projects. It has been staffed with the pooled finance and accounts staff responsible for managing acceptable project financial management of AIIB financed projects including this project. For each project, PMO shall prepare an annual Project budget and share with Bank for its review and comments in September each year.

b. PMO shall prepare a Project Operations Manual (POM), which shall include detailed project financial management arrangements. The Project shall follow cash basis of accounting. PMO shall maintain separate project account and supporting documents for each AIIB-financed project including this Project. The financial progress of the Project shall be reported on a quarterly basis through Interim Unaudited Financial Reports (IUFRs) to be submitted within 45 days of the end of each quarter. The Project audited financial statement for each year of project implementation shall be submitted within six months from the financial year-end.

c. **Procurement**: RC under the MOT, AYA and AIIB PMO are public entities and therefore specific procurement provisions outlined in the "Section 2 Procurement by Public Entities" of the Directive on Procurement Instructions for Recipients (PIR) (July 26, 2024) shall apply to the Project's procurement processes. The PMO will be responsible for the procurement process and contract management under the Project. The PMO will maintain the Project Delivery Strategy (PDS), including a Procurement Plan (PP) updated outlining procurement arrangements, contract packaging, amounts, procurement methods, and timelines, which will serve as the foundation for the Project procurement activities. Any updates to the PDS and PP will be submitted to the Bank for review and no objection

d. **ES Monitoring and Supervision Arrangements:** The centralized PMO, led by a dedicated Deputy Director, will be responsible for the day-to-day implementation of the Project, including oversight of ES compliance in accordance with AIIB's Environmental and Social Policy. While the PMO currently includes one full-time ES Specialist, additional consultants—specifically one Environmental and Social and Safety Consultant and one Gender Consultant—will be recruited for Phase 1 in line with the institutional setup described in the ESMPF. AIIB may require the recruitment of an additional regional ES Consultant for

Phase 2 (Karakalpakstan), subject to review of performance under Phase 1.

e. To further strengthen field-level oversight, the construction supervision consultant will deploy four specialists in each region (Khorezm and Karakalpakstan): an Environmental Specialist, a Social Safeguards Specialist, a Road Safety Specialist, and an OHS Specialist. The contractors will also assign dedicated ES and OHS personnel to monitor implementation and ensure compliance. AIIB must review and confirm all ES and OHS personnel prior to mobilization.

f. No civil works will be permitted to begin until all required ES and OHS staff are fully onboarded and approved by AIIB. The PMO will be required to submit quarterly ES progress reports to the Bank, in accordance with the agreed format. AIIB's ES specialists will also conduct regular field supervision missions to monitor implementation of the ES instruments and assess Borrower performance.

(iii) **Project Implementation Plans and POM:** To streamline project implementation and coordination, especially given the decentralized nature of the local roads involved, the Client is considering engaging international contractors for seven civil works packages. Civil works are anticipated to commence in Q2 2026. To maintain consistency across concurrent project implementations, the PMO will compile a comprehensive POM following loan effectiveness. This manual will serve as a reference guide, ensuring uniformity and adherence to established procedures throughout the project implementation.

4.10.2 **Implementation period.** Phase 1 of the Project is slated for a three-year construction period, spanning from 2026 to 2028, followed by a two-year Defect Liability Period.

4.10.3 **Implementation readiness.** Tendering for civil works under Phase 1 is currently underway, with construction expected to begin in early 2026.

4.10.4 **Monitoring and Evaluation.** The Project's monitoring framework is designed to be comprehensive, operating at three distinct levels. At the RC level, the AYA will be responsible for overseeing Project results. At the Project level, the PMO will track Project progress and performance, relying on the result indicators outlined in the Results Monitoring Framework. At the component level, the appointed Engineer, under the FIDIC contract for Component 1, will conduct on-site supervision to ensure compliance and quality control.

4.10.5 **AIIB's Implementation Support.** The Bank plans to conduct regular field visits twice per year to monitor progress and may conduct additional field visits as and when required during the initial years. In addition, the Bank will engage international consultants for technical and climate aspects to carry out more frequent supervision of design, construction, and climate resilience activities on

the ground in the early stages of project implementation. The Bank plans to provide guidance to the client regarding the technical specifications of the pavement types to be used on the road reconstruction, as well as developing the Digital Geospatial Platform. The Bank will carry out a mid-term review between 30 to 36 months following the implementation start date.

5. Project Assessment

A. Technical

5.1 **Project Design.** The proposed Project involves the reconstruction of approximately 328.1 km of local roads in Karakalpakstan and 188 km in Khorezm, covering 23 in Karakalpakstan and 16 road sections in Khorezm. These road upgrades aim to improve connectivity between rural communities and the broader international and state road networks, providing better access to markets, schools, healthcare, and other essential services for local residents. The enhanced transportation network will significantly contribute to the socio-economic development of both regions, which have been historically underserved.

Table 2. Summary of the Project Scope

	Total no. of roads sections	No. of districts	Roads sections length				Road category	Traffic	
			Total	Avg	Max	Min		Total AADT	Avg AADT
Measure	#	#	*km*	*km*	*km*	*km*	*Category*	*AADT*	*AADT*
Karakalpakstan	23	14	328.1	14	33	5	III-V[8]	94,679	4,397
Khorezm	16	9	188	12	25	6	III-IV	45,980	3,715
TOTAL:	**39**	**23**	**516.1**						

Source: Committee for Roads. The Bank obtained raw AADT data of Khorezm for 2018 and Karakalpakstan for 2024. Both are adjusted to 2025 baseline using growth assumptions described in Annex 3. Estimates are in with Uzbekistan's PCU for road categories of III-V, where the Project roads are classified.

5.2 Eligible roads were selected using **a screening tool jointly developed by AIIB and RC**, focusing on critical factors such as pavement condition, traffic volume, population size in the served areas, and connectivity to socioeconomic facilities. The roads targeted for reconstruction typically feature asphalt pavement widths of 5 to 9 meters and unpaved shoulders of 1 to 2 meters. Many of these roads are in low to very low condition, exhibiting problems like potholes, alligator cracking, and surface depressions. In addition, essential road safety features such as sidewalks, guardrails, and drainage are often either insufficient or completely absent.

5.3 The Project will rehabilitate unpaved or worn-out rural roads, transforming them into **climate-resilient, all-season, and safer roads with asphalt concrete pavement**. The design will generally consist of 10-meter-wide roads, including unpaved shoulders of 1.5 meters, paved shoulders of 0.5 meters, and traffic lanes of 3.0 to 3.5 meters on each side. Reconstruction works will involve the removal of damaged pavement, replacement of asphalt and base layers, bridge repair and construction, enhancement of drainage systems, installation of road safety measures (such as additional signs, barriers, and pedestrian crossings), and the provision of bus stops. Where necessary, sidewalks will be added, especially near schools, to enhance pedestrian safety. All rehabilitation activities will take place within the existing right-of-way, thereby eliminating the need for land acquisition or resettlement. The detailed design for this local road rehabilitation Project is currently in

[8] Four road sections include segments which classify under Category V.

finalization stage, and it is expected that no significant disruptions will occur during the construction phase.

5.4 The AIIB Project Team conducted site visits and reviewed the technical documentation, including the draft detailed designs for all road sections and two exemplary Category IV roads, 4K52 and 4K921, prepared by Yo'l-Loyiha Byurosi LLC, a design institute specializing in road infrastructure. The designs adhere to national standards and have incorporated recommendations from AIIB, particularly regarding climate resilience and road safety measures. The Project Team has engaged in thorough technical due diligence, ensuring that the designs are safe, cost-effective, and in line with both national and international standards. This due diligence process includes a detailed review of technical aspects such as applied standards, typical cross-sections, road layouts, interchange designs, traffic sign placement, and the vertical and horizontal profiles of the road network. The aim is to ensure that all technical elements meet the necessary criteria for a successful project execution.

Road Safety

5.5 **Baseline Road Safety Conditions**. No accident data specific to local roads in the Karakalpakstan and Khorezm regions are available. However, nationally in Uzbekistan, 9,364 accidents were recorded in 2024, resulting in 8,901 injuries and 2,203 fatalities. Alarmingly, approximately 50 percent of all road crash victims are pedestrians, with 8–10 percent being children under the age of 16. The national fatality rate is over 45 percent higher than the EU average, imposing significant economic burdens estimated at 2.6 to 3.8 percent of GDP. These statistics place road traffic injuries among the top five causes of death in the country. Site visits conducted along the Project roads revealed several hazardous conditions, including lack of sidewalks and crossings, unmarked intersections, and absence of speed calming measures near schools and market areas.

5.6 **Road Safety Hazards and Risks**. Rural and peri-urban sections of the Project corridor show clear evidence of road safety risks. In many populated areas, the national speed limit of 60 km/h is enforced without localized adjustments near sensitive zones such as schools and marketplaces. Although a Presidential Decree (February 2022) endorsed reducing school-zone speed limits to 30 km/h, implementation remains inconsistent. These high speeds, combined with the lack of sidewalks, signage, and pedestrian infrastructure, heighten risks for vulnerable road users, particularly children, women, and the elderly.

5.7 **Expected Improvements and Outcomes**. The Project targets a measurable improvement in road safety, particularly for pedestrians. Key outcomes include the provision of dedicated pedestrian facilities and traffic calming measures that will reduce crash risks at critical points. A formal RSA will be carried out by the construction supervision engineer to validate design-stage interventions, while an iRAP evaluation will ensure a minimum 3-star safety rating for all users before handover.

5.8 **Proposed Safety Interventions**. The Project will adopt a package of engineering measures to address known safety gaps. These include:

- Construction of sidewalks and pedestrian paths in settled areas;
- Marked pedestrian crossings at schools and market areas;

- Speed limits and traffic calming (e.g., rumble strips, raised crossings) at sensitive locations;
- Improved road signage and lane marking;
- Installation of guardrails and street lighting where necessary.

5.9 Safety audits and iRAP protocols will be used to verify implementation. While enforcement and education are not part of this Project's scope, awareness campaigns may be considered during implementation in collaboration with local authorities.

5.10 **Implementation Approach and Financing**. Road safety is fully integrated into the Project's design and implementation framework. The engineering design complies with national safety standards, and technical specifications require the contractor to adjust working drawings based on RSA findings. The budget for road safety measures—including signage, sidewalks, and traffic calming—is included within the civil works bill of quantities (BOQ), specifically under Program Line Bill 100. Compliance with international safety practices will be verified by the final iRAP assessment prior to completion and handover.

Climate Resilience

5.11 **Climate Risk Assessment and Identified Hazards**. The ESMPF Consultant conducted a Climate Hazards and Sensitivity Analysis for the Project, identifying seven major climate risks: extreme temperatures, heavy precipitation, flooding, extreme winds, droughts, dust storms, winter storms, and freeze-thaw cycles. These hazards pose critical risks to road pavement durability, bridge and culvert stability, drainage infrastructure, road signs, and safety features. To mitigate these impacts, the Project integrates climate-resilient design elements that address both current and projected climate vulnerabilities.

5.12 **Resilient Pavement Design**. Pavement materials will be finalized by the Engineer during mix-design review, taking into account site-specific climate risks and using standards such as GOST 9128-2013 and KR 06.03-23. The Climate Risk Assessment recommends the use of asphalt mixtures that can withstand heat extremes and freeze-thaw cycles.

5.13 Polymer modified bitumen (PMB), a material that enhances pavement durability and flexibility, is being piloted in Uzbekistan on select urban roads. It is not yet widely adopted in national practice for rural road infrastructure, primarily due to cost and supply considerations. PMB is not available domestically and would need to be imported from regional markets. While the Road Committee has not committed to using PMB under this Project, the phased nature of the program allows for continued technical engagement. The Bank will continue working with the Government to explore opportunities for piloting climate-resilient pavement materials, including PMB, under Phase 2 (Karakalpakstan).

5.14 **Drainage System Improvements**. To address flood risks, hydrological and hydraulic calculations were completed in accordance with SHNK 2.05.02-07, using a 100-year return period for bridges and 50-year return for culverts. Enhanced drainage features—such as deeper side ditches, reinforced culverts, and improved water outflows—will be validated during implementation based on site-specific Environmental and Social Management Plans (ESMPs) and climate risk findings.

5.15 **Erosion and Dust Storm Protection**. The Project includes green protective belts (tree planting) along roads near settlements and sensitive receptors to reduce dust impacts and prevent erosion. Costs for these measures are included in the civil works contract. The final locations and planting details will be determined in the site-specific ESMPs. Maintenance responsibilities will rest with the State-Owned Enterprise under the Committee of Roads as part of their routine operations.

5.16 **Implementation and Institutional Strengthening**. Climate-resilient features are embedded in project design and technical specifications. The Bank will continue supporting knowledge transfer and capacity-building related to climate adaptation measures, particularly in materials technology and drainage management. The phased structure of the program allows for incorporating lessons from Phase 1 into future works under Phase 2.

5.17 By focusing on both road safety and climate resilience, the Project aims to ensure that the rehabilitated road network will not only provide safer transportation but also withstand the growing climate risks faced by the region. This holistic approach to infrastructure development will deliver long-term benefits to the communities of Karakalpakstan and Khorezm while aligning with AIIB's goals of promoting sustainable, climate-resilient infrastructure.

5.18 **Operational Sustainability.** The operational sustainability of the Project was evaluated by examining government budget allocations, as illustrated in Table 3. Historical spending by RC and local administrations (khokimiyats) on the routine maintenance of local roads revealed an annual increase of over 11% between 2018 and 2022 in nominal terms. These trends closely aligned with Uzbekistan's nominal GDP growth during the same period, indicating a consistent commitment to funding road maintenance. However, despite these positive trends for routine maintenance, the average allocation for major repairs or rehabilitation of local roads amounted to USD32.9 million annually between 2018 and 2022. This funding level falls short considering the extensive network of 24,600 km under the RC's jurisdiction. Consequently, insufficient funds allocated for sustainable maintenance have led to a decline in the overall condition of the network, with approximately one-third of the local road network managed by RC deemed to be in poor condition.

5.19 The estimated total annual routine maintenance budget, for the 516.1 km slated for reconstruction under the Project is assumed around USD3,500 per km per year from Year 2030 (as the civil works contract will include two-year maintenance for 2028 and 2029), or USD1.15 million for Karakalpakstan and USD0.66 million for Khorezm, or USD1.75 million for both regions yearly. This represents 4.2% of total allocations for maintenance of all local roads in Uzbekistan in 2030, in the year of anticipated project completion, assuming an 8% annual increase from 2022. Given this comparatively marginal annual maintenance costs requirements for the Project Road sections and based on the past few years of GOU's increase in budget allocation for road maintenance, it is expected that sufficient maintenance funding to sustain the investment will be ensured after the project completion. It would also be crucial to monitor the progress of the GOU to implement its Rural Roads Strategy 2035, which outlines a roadmap to secure adequate funding for road maintenance and rehabilitation.

Table 3. Maintenance and Rehabilitation Expenditures by RC for Local Roads, Historical Data

	Historical Data				
Year	**2018**	**2019**	**2020**	**2021**	**2022**
Reconstruction/ Rehabilitation, USDm	24.3	23.9	38.2	47.1	30.8
Summer Routine Maintenance, USDm	13.6	11.3	16.1	16.8	19.8
Winter Routine Maintenance, USDm	1.2	12.7	1.7	2.1	2.8
Total, USDm	**39.1**	**47.9**	**56.0**	**66.0**	**53.4**
Expenditure per km, USD	**1,591**	**1,947**	**2,272**	**2,684**	**2,167**

Source: Committee for Roads

B. Economic and Financial Analysis

5.20 **Economic Analysis** or Cost-Benefits Analysis (CBA) assesses the economic viability of the Project using the 25-year Project cycle and comparing with/without Project scenarios. The scope of CBA considers all the 39 AIIB-financed rural road sections in Khorezm and Karakalpakstan. The starting year is 2025, based on the latest project implementation plan. The analysis includes a standardized demand analysis (see Annex 3 for details) to forecast AADT demand and calculation of the economic internal rate of return (EIRR) and economic net present value (ENPV). The demand analysis of AADT is based on the estimated growth of AADT count of each section from base year, by major types of vehicles including trucks, cars, bus and motorcycles. Since the Project is rehabilitating existing road sections without adding new roads, the demand analysis assumes there is no incremental traffic exclusively attributable to the Project. All economic benefits come from non-incremental traffic demand.

5.21 **Traffic Demand Forecast.** The RC collected raw data for the AADT for all the sections in Khorezm (2018) and Karakalpakstan (2024), for major types of vehicles including cars, buses, trucks and motors. The Bank adopted the raw AADT count from the RC, then forecasted average AADT for AIIB financed sections (see Table 4 below) using different growth assumptions for different types of vehicles (Annex 3 shows details). The forecasted AADT in Khorezm and Karakalpakstan is consistent with the Bank mission's field observations in certain sections, and in line with a published assessment by CAREC.[9] Overall, the Bank's forecast is more on the conservative side by adopting IMF macro growth assumptions and careful comparison with other similar assessment report. This is because all the Project roads are in rural areas, with higher uncertainties of future demand. The forecasted traffic demand AADT is used to form CBA.

Table 4. 2025 Baseline AADT Estimates

	Length (km)	Total	Trucks	Cars	Buses	Motors	Others
Khorezm	188	3715	343	2600	26	421	325
Karakalpakstan	328	4397	636	3144	35	477	104

Notes: Khorezm average AADT was forecasted to 2025 based on 2018 data, while Karakalpakstan was forecasted to 2025 based on 2024 data.

[9] Transport-and-Trade-Logistics-Uzbekistan.pdf (carecprogram.org)

Table 5. AADT Growth Assumptions

	Trucks	Cars	Buses/Motors/Others
Periods	GDP total %	GDP per capita %	Population %
2025-2029	5.5%	3.4%	2.0%
2030-2034	5.5%	3.4%	2.0%
2035-2039	5.5%	3.4%	2.0%
2040-2044	3.5%	2.4%	1.0%
2045-2049	3.5%	2.4%	1.0%

5.22 Main economic benefits include savings from vehicle operating costs (VOC), value of time (VOT), and greenhouse gas (GHG). These savings are largely due to better road quality after rehabilitation, leading to faster speed and smoother road surface. The passengers and vehicles thus benefit from shorter travel time, less costs on fuels/tires, which also translate into fewer carbon emissions. Note that there are other economic benefits not included in this analysis, such as reduced traffic accident and modal shift to cheaper public transport options. Regarding economic costs, the analysis is based on capex and maintenance costs adjusted by AIIB, excluding cost items such as tax, financial cost per MDB CBA practices.

Table 6. Total Economic Benefits Over the Project Cycle (25 Years)

Economic Benefits	Million USD
VOC Savings	1649.07
VOT Savings	358.82
GHG Savings	31.33
Total	2039.22

Table 7. Economic Costs Over the Project Cycle (25 Years)

Economic Costs	Million USD
Capex	174.06
Khorezm	67.79
Karakalpakstan	106.27
Operational and maintenance cost	54.17

Notes: Capex excluded government taxes, duties, and financial costs.

5.23 The Project is economically viable. EIRR and ENPV appear to be resilient and remain above the accepted threshold in the sensitivity analysis. Overall baseline EIRR is 29.4%, with 24.1% for Khorezm and 32.5% Karakalpakstan respectively. ENPV is about USD280.65 million. Both EIRR and ENPV remain resilient under most extreme scenarios where traffic projections drop by 30% and cost overrun increases by 30%.

5.24 To assess the Project's economic robustness under less favorable maintenance conditions, a sensitivity analysis was conducted assuming no major periodic maintenance is undertaken. In this scenario, the road's International Roughness Index (IRI) in the "with Project" case is assumed to deteriorate linearly from 2 to 8 over the evaluation period, resulting in an average IRI of 5 m/km annually. Under these conditions, the overall EIRR decreases to 22.3%, with Khorezm and Karakalpakstan yielding EIRRs of 18.2% and 24.8%, respectively. The ENPV declines to USD150.91 million. Despite these reductions, the results still demonstrate

the Project's strong economic viability. Importantly, such deterioration can be mitigated through timely and adequate routine maintenance during the operation phase.

5.25 As the Project will not be tolled and will be wholly financed by the public sector during construction and operation and maintenance (O&M), a financial analysis has not been conducted. Nevertheless, a fiscal analysis on the sustainability of maintaining the road sector infrastructure in Uzbekistan was carried out. Routine maintenance requirements are well within RC's budget allocations. A detailed analysis is presented in the technical section of this Chapter on Operational Sustainability. This allocation is in line with what would be adequate to maintain the road network in Uzbekistan, based on the consultations with PMO estimates.

C. Fiduciary and Governance

5.26 **Procurement:** AIIB's *Procurement Policy* (June 26, 2024) and its associated PIR (July 26, 2024) apply to the Project. AIIB's Standard Bidding Documents or other suitable MDB procurement documents will be used under the Project. A PDS has been developed by PMO and will be revised as needed. It is anticipated that there will be up to 7 packages for civil works. Civil works contracts estimated to cost above the National Competitive Tendering threshold will be awarded following International Open Competitive Tendering method without pre-qualification. It is planned to have two CSC contracts, one for each region. It is also planned to engage a consultant to develop a Digital Geospatial Platform. These three consultant services will be awarded following International Open Competitive Selection method. All contracts will be subject to prior review by the Bank. The Project is utilizing Advance Procurement and has already engaged the firm to prepare the ESMPF.

5.27 **Financial Management:** The Executing Agency has prior experience in managing AIIB funded project. Based on the assessment, FM risk is considered "Medium" and FM capacity acceptable provided proposed mitigation measures are addressed. The AIIB PMO shall be responsible for overall project financial management.

5.28 **Staffing.** In the existing project implemented by the Executing Agency, there has been frequent transfer of finance staff. In finance staff hiring, there are issues noted in quality and experience. The PMO needs to ensure that they hire qualified finance and accounting staff based on competitive market rates and retain them for some period of time. In the PMO, the Financial Management Specialist and the Accountant are on-board and functional.

5.29 **Planning and Budgeting.** PMO shall prepare an annual project operational budget as per PP/financing agreement and have it approved on a timely basis. PMO shall share the proposed annual budget with the Bank for its review and comments in September of each year until loan closure.

5.30 **Funds Flow.** The prior review contracts shall be directly disbursed by the Bank. For any retroactive period expenditures, the GOU may prefinance and get reimbursed once the Loan is effective. For other operating or local costs, it shall be paid through the Designated Advance bank account.

5.31 **Accounting, Financial Reporting and Internal Controls.** A cash basis accounting system shall be followed. PMO shall be responsible for maintaining separate Project accounts. The Project's financial progress shall be reported quarterly through IUFRs to be submitted 45

days from the end of each quarter. The format and the content of IUFRs shall be agreed during the start of the project implementation. All the required ledgers related to disbursement including Loan Register, Designated Account ledger etc. shall be maintained at the PMO.

5.32 PMO shall establish an internal control system designed to provide reliable and adequate oversight of funds and transaction flows. As the PMO is fully operational and finance and accounting staff are hired, the government's internal control mechanisms will become effective. These controls will be further enhanced through the procurement of accounting software and the approval of POM.

5.33 **External Audit.** The Project financial statements including Statement of Expenditures shall be audited by an independent Chartered Accountant firm annually**.** The external audit report for each year of the project implementation that includes audit opinion and management letter shall be submitted to Bank within six months from the end of each fiscal year. TOR has been shared with PMO and this needs to be finalized and agreed with Bank before starting the hiring process. In the existing project, there has been a delay in hiring the project auditor and it is suggested to initiate the hiring process at the earliest.

5.34 **Supervision Plan.** The financial management of the Project shall be closely monitored by PMO and Bank staff. Key FM fiduciary work includes: (i) implementation support to the Project including participation in supervision missions and informing the task team on FM issues and required improvements; and (ii) review of financial/audit reports and preparing summaries of such reports for further action if required.

5.35 **Disbursements:** The disbursement of Loan proceeds shall be made using the reimbursement, direct payment and advance methods. The direct payments shall be used against payment of contracts under prior review threshold. For any retroactive expenditures to be financed through this Project, the Bank shall discuss and agree with the Government on category/nature of eligible expenditures, total amount and retroactive period. The eligible retroactive expenditures shall be prefinanced by GOU and reimbursed by the Bank after loan effectiveness.

5.36 The Government counterpart shall cover payments of taxes such as social tax and exemption of VAT and customs duties. PMO shall open a Designated Account (DA) in USD in a financial institution acceptable to Bank. PMO shall also open a sub-account in Uzbek Soms where Loan proceeds from DA shall be transferred to pay for eligible operating expenditures. The Disbursement Letter shall detail the authorized signatories, ceiling of DA, process of submitting claims and other terms and conditions of disbursements.

5.37 **Financial Crime and Integrity (FCI) and Counterparty Due Diligence/Know Your Counterparty (CDD/KYC):** Following AIIB's applicable policies and guidelines, KYC/FCIDD has been conducted to assess Financial Crime (FC) risks, including Money Laundering and Financing of Terrorism (ML/FT) risks, sanction risk, and risk deriving from integrity unsoundness when dealing with its Counterparties and Connected Parties in the financing. Integrity screenings have been performed. No critical findings were found. The above-mentioned representatives are identified by World-Check One as politically exposed persons (PEPs) due to their public status.

5.38 **Governance and Anti-corruption:** AIIB is committed to preventing fraud and corruption in the projects it finances and will ensure strict compliance with AIIB's Policy on Prohibited Practices (2016). The Bank reserves the right to investigate, directly or indirectly through its agents, any alleged corrupt, fraudulent, collusive, coercive, or obstructive practices, and misuse of resources and theft or coercive practices relating to the Project and to take necessary measures to prevent and redress any issues in a timely manner, as appropriate.

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

D. Environmental and Social

5.40 **Environmental and Social Policy and Categorization:** AIIB's Environmental and Social Policy (ESP), including the Environmental and Social Standards (ESSs), and Environmental and Social Exclusion List, is applicable to the Project. ES due diligence has determined that ESS 1 (ES Assessment and Management) applies to the assessment of ES impacts of Project activities. ESS 2 (Involuntary Resettlement) also applies, as road rehabilitation will require temporary and permanent land acquisition. ESS 3 (Indigenous Peoples) is not applicable as no Indigenous Peoples are identified in the Republic of Karakalpakstan and Khorezm Region. The Project has been assigned Category "B" in accordance with AIIB's ESP due to the limited number of potentially adverse environmental and social impacts which will be limited to the Project area and can be managed using conventional ES risk management strategies.

5.41 **Environmental and Social Instruments:** The Project will follow framework approach as construction drawings for each road section will be finalized during project implementation. The exact location of activities and Project works may also be updated upon request from RC; therefore, the adopted framework approach offers flexibility to accommodate these anticipated changes. The ESMPF has been prepared for the Project. The ESMPF includes a generic ESMP and an RPF. The draft ES instruments has been disclosed by both the Client and the Bank on May 15, 2025. The ESMPF elaborates the regulatory frameworks under which the Project will be implemented, establish baseline in Project regions, identify potential Project activities, assess generic environmental and social risks and impacts of the activities, and define the screening process of activities. The RPF sets out policies and procedures to address likely impacts due to land acquisition and loss of livelihood. The ESMPF provides guidance for the development of ES documents for Project activities, i.e., ESMP, Resettlement Plan (RP). The Borrower will ensure that the ESMPF for Project activities are incorporated into the contractual agreement with the contractors and prepared to site specific ESMPs. The ESMPF will be updated to change the procurement methodology from Design-Build-Maintenance (DBM) to Design-Bid-Build (DBB) to clearly define the roles, responsibilities, and coordination arrangements among the Central PMO, the supervision consultant, and the Contractor to ensure effective implementation across all levels.

5.42 **Site-Specific ESMP Preparation and Institutional Oversight:** Although the procurement approach has shifted from DBM to DBB, the nature of this Project—covering numerous dispersed and diverse rural roads across two regions—requires a flexible and localized approach to ES management. Each road section faces distinct environmental and social sensitivities and stakeholder contexts, and the selection of specific road sections may continue to be refined as implementation progresses. Therefore, even with the availability of

detailed designs, it remains appropriate and necessary for site-specific ESMPs to be prepared by the contractors, who will have the best access to up-to-date site conditions and engagement with affected stakeholders during mobilization.

5.43 For both Phase 1 (Khorezm) and Phase 2 (Karakalpakstan), site-specific ESMPs will be prepared by contractors during mobilization, based on finalized designs and in line with the ESMPF. These ESMPs will be reviewed by the Supervision Consultant (CSC) and cleared by the PMO prior to submission to AIIB for no objection, and finalized prior to the commencement of civil works. All site-specific ESMPs will be disclosed through the RC and AIIB websites in accordance with AIIB's Environmental and Social Framework and Uzbekistan's regulations.

5.44 The ESMPF will be updated to reflect the shift to DBB procurement and to clarify the respective roles, responsibilities, and coordination arrangements among the PMO, the Supervision Consultant, the contractors, and relevant government authorities. This is particularly important as site-specific ESMPs will be prepared by contractors, while the ESMPF remains the overarching governing instrument for the Project. The updated ESMPF will explicitly set out the obligations of government authorities in supporting ES management and ensuring effective coordination where government action is required.

5.45 The centralized PMO, based in Tashkent, will oversee the implementation and monitoring of ESMPs to ensure compliance with AIIB safeguard requirements and applicable national regulations. The PMO's staffing includes a dedicated ES Specialist who will conduct regular regional visits, a Gender Consultant (based in Tashkent with regional responsibilities), and an OHS Consultant based in Khorezm. The Supervision Consultant and Contractors will each mobilize dedicated Environmental, Social, Road Safety, and OHS Specialists in each region to ensure robust site-level safeguard oversight and compliance.

5.46 **Environment Aspects:** The Project is expected to generate positive benefits in Karakalpakstan and Khorezm by improving the condition of roads to make them efficient and safe to use. The road rehabilitation will be limited to existing corridors only and the existing width of the roads will be maintained. New road construction and road widening is not anticipated as part of this Project. However, the works will include removal, retrofitting and construction of new bridges (albeit small scale) over small drainage canals and safety improvements that will not impact road capacity. The works will be carried out on previously disturbed land with minimal impact on the local flora and fauna of the region.

5.47 The temporary negative environmental impacts which will occur during the construction of the road rehabilitation subprojects will include (i) air pollution, (ii) noise pollution, (iii) water contamination, (iv) traffic disruptions, (v) restricted community access, and (vi) disturbances due to the influx of workers. Additionally, there is a risk of improper waste management, including hazardous materials such as asbestos, engine oils, and other contaminants, which could lead to soil and water pollution. Construction activities could also cause ecosystem disruption, particularly through impacts on local flora and fauna. Moreover, if not properly managed, the Project poses a risk to cultural heritage in the Khorezm region, as well as cumulative impacts on air quality and noise levels due to concurrent construction activities in the area.

5.48 The negative impacts during the operation of the Project will include increased vehicle speeds due to improved road conditions, which can lead to increased frequency, likelihood

and severity of accidents which has a potential for loss of property and life. Additionally, increased traffic volumes, particularly from heavy trucks, will cause increased air pollution along the roads, affecting nearby sensitive receptors such as schools, hospitals, and residential areas. Noise and vibrations from vehicular traffic, especially along populated sections, will impact on the quality of life and potentially damage nearby structures.

5.49 The ESMPF has assessed the risks and suggested the generic mitigation measures to be included in the detailed design and relevant construction contracts to minimize the environmental impacts. These includes dust suppression near sensitive areas like schools and residential zones, routine maintenance of construction equipment to reduce emissions and setting maximum allowable noise limits near sensitive receptors. Workers will be provided with personal protective equipment and trained in safe work practices to mitigate health and safety risks. Proper storage of construction materials, waste segregation, and hazardous waste management will be enforced to prevent soil and water contamination. Tree cutting and trimming will be monitored to comply with both local regulations and ESMPF requirements.

5.50 During the operation phase, traffic safety will be enhanced with road safety features such as properly designed pedestrian crossings, street lighting, speed breakers, speed limits, especially near schools, hospitals, and populated areas. Noise barriers and buffers will be installed (if required) to protect nearby communities from increased noise and vibration from vehicular traffic.

5.51 **Social Aspects:** The potentially negative social impacts will include temporary impacts on habitations, noise, dust emissions, disruptions in commercial activities / livelihood, risks to community health and safety for adjacent residents, disturbance to local traffic and public utilities, access restrictions due to construction activities, and possible land acquisition. A generic ESMP has been prepared within the ESMPF in order to address these impacts and listed detailed requirements for the subprojects. Also, the archaeological “chance finds” procedures has been defined in the ESMPF and will be reflected in all site specific ESMPs for all road sections during the construction activities.

5.52 The road rehabilitation will be executed within the designated road corridors following the existing alignment. It is likely that some temporary and permanent land acquisition will be required for construction activities and road facilities such as bus stops. The exact location of these facilities is not yet determined. Therefore, the RPF has been prepared in line with the AIIB ESS2 for possible temporary and permanent land acquisition. The RPF includes clear procedures for the implementation of displacement and compensation activities for both formal and informal owners/users, as well as for managing the impact of temporary land occupation. The RPF includes an Entitlement Matrix based on the relevant provisions in the national legislation of the GOU and the provisions of AIIB’s ESP as well as the budgetary responsibilities of relevant parties for acquiring the land and supporting livelihood restoration for both formal and informal settlers (if any). The RPF has guidelines for preparing Resettlement Action Plans for the road sections.

5.53 **Occupational Health and Safety, Labor and Employment Conditions:** During construction and rehabilitation of roads, the primary OHS risks include exposure to high levels of noise, dust and vibration, and hazards associated with the handling of chemicals, heavy machinery and hot asphalt. The Project will primarily utilize mechanized and automated

methods, significantly reducing the need for manual labor. The generic ESMP contains templates to guide the contractor in forming an Occupational Health and Safety Management Plan (OHSMP) and Traffic Management Plan as well as provisions to manage the labor and working conditions (LWC) and HS of maintenance workers as well as the review of the contractor's systems and practices to manage LWC and HS issues.

5.54 The generic ESMP and Gender Action Plan (GAP) include provisions related to OHS and guidance to address gender-based violence. The Project will aim to reduce the risk of labor influx by encouraging contractors to hire local workers to rehabilitate road infrastructure. Additionally, a separate grievance mechanism will be proposed specifically for project workers to handle their concerns appropriately. The ESMPF has provisions in order to mitigate any negative impacts from labor influx. Moreover, a Code of Conduct for workers will be included in the bidding documents and in the contracts signed with the contractors.

5.55 The contractor will be required to develop its own OHS Management Plans, covering risk assessments, safety procedures, training, monitoring, incident investigation, and reporting. Implementation of OHS plans will be contractually mandated for the contractors and reviewed by supervision consultant and AIIB Project Team for compliance during implementation review missions.

5.56 **Stakeholder Engagement, Consultation and Information Disclosure:** Stakeholder mapping and consultations are being conducted by the ES Consultant during the preparation of the ESMPF. The English version of the ESMPF and the executive summaries of the local language(s) has been disclosed in Client's website and will be available in hard copy in the Project area. The ESMPF sets out procedures and requirements on stakeholder engagement, public consultation and information disclosure for Project activities during the implementation of this Project. The documents has also been disclosed on the Bank's website.

5.57 **Project Grievance Redress Mechanism (GRM):** A two-tier GRM will be established at two levels, one at each regional level, and another at the PMO level with the requirements of the Bank's ESP and it will be indicated in the ESMPF and established for the proposed Project prior to its implementation. A separate workers' GRM will also be developed. The Digital Geospatial Platform will streamline grievance registration and monitoring for both construction and maintenance stages in accordance with the principle of confidentiality. Information of established project-level GRM including Project-affected People's Mechanism (PPM) of AIIB in local languages will be timely disclosed to project-affected people in an appropriate manner.

5.58 **Bank's Project-Affected People's Mechanism:** The Project-affected People's Mechanism (PPM) has been established by the Bank to provide an opportunity for an independent and impartial review of submissions from Project-affected people who believe they have been or are likely to be adversely affected by AIIB's failure to implement its ESP in situations when their concerns cannot be addressed satisfactorily through the Project-level GRM or the processes of the Bank's Management. For information on AIIB's PPM, please visit: https://www.aiib.org/en/about-aiib/who-we-are/project-affected-peoples-mechanism/how-we-assist-you/index.html.

5.59 **Monitoring and Supervision Arrangements:** The PMO and supervision consultant will oversee the day-to-day management of project implementation activities, including the

assurance of the Project's ES compliance. Currently, the PMO has one ES Specialist located in Tashkent. Also, The PMO will hire an Khorezm-based ES and Safety Consultant as a priority with a strong profile in OHS, labor safety, and community-level risk management and a Gender Specialist who will be located in Tashkent. Additionally, the supervision consultant will engage at least one Environmental Specialist, one Social Specialist, one Road Safety Specialist and one OHS Specialist, who will be responsible for overseeing and reviewing the contractor's design and construction activities, including monitoring and reporting on ES and OHS compliance. Also the Contractors will have ES Specialists and OHS Specialists. The PMO will prepare and submit quarterly reports to AIIB in the agreed format for review. The Bank's ES Specialists will conduct regular field-based ES supervision missions to monitor the implementation of the ES instruments and assess the Borrower's ES performance.

E. Climate Change

5.60 **Climate Change:** The Project comprises the rehabilitation and reconstruction of 516.1 km of local roads in the Republic of Karakalpakstan (encompassing 23 road sections spanning 328 km across 11 districts) and in the Khorezm Region (16 road sections covering 188 km across 9 districts). It falls under the list of "universally aligned activities (UC1)" under the category of road upgrading, rehabilitation, reconstruction, and maintenance without capacity expansion and thus we can conclude that it is aligned with the mitigation goals of the Paris Agreement (BB1).

5.61 The initial assessment performed by the Team revealed that the Project is likely to be materially affected by extreme temperature/heatwaves and heavy precipitations/floodings. The Client's consultant performed a thorough climate risk and vulnerability assessment that confirmed it. A set of measures have been proposed to address the impact of those climate hazards (please see full list on Annex 4). These measures have been discussed with the Client and its incorporation on the Project will be enforced through its inclusion in the tender documents and on the TOR of the Supervision Consultant. Given that the Project incorporates measures that tackle the climate hazard 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 Paris Agreement (BB2).

5.62 Climate adaptation measures (that can be considered substantial contributors) have been incorporated into the different Project components. Given that the Project belongs to the climate adaptation type 1 (adapted project) and the measures taken on it (structural and non-structural) listed under Annex 4, using the AIIB's proportional approach based on the joint multilateral development bank (JMDB) methodology for tracking climate adaptation finance, we can allocate a 20% climate adaptation finance to the EPC elements on Component 1 financed by AIIB (20% of USD187 million as the sum of sub-components 1.1 and 1.2) equivalent to USD37.4 million or 18.7% of AIIB's finance. As the Project does not have elements qualifying as climate mitigation finance, the final climate finance is equivalent to the climate adaptation finance allocated (37.4 million or 18.7% of AIIB's finance).

F. Gender Aspects

5.63 **Gender Aspects:** The Project will enhance the ease and safety of travel for women and vulnerable or disadvantaged individuals, thereby improving their access to markets, employment, education, and health services. By repairing and rehabilitating transport routes

and enhancing ease of travel, the Project will have a disproportionate benefit for women's mobility, improving their access to markets, employment, education, and health services.

5.64 A framework GAP has been prepared in order to promote gender-inclusive design and implementation of the Project. Along with providing visibility and enhancing accountability for gender mainstreaming, it will include activities, targets, and design features to enhance the gender dimensions of the Project sustainably. The GAP will cover gender-based violence (GBV), Gender inclusion, institutional capacity building, and gender-sensitive GRM-related measures. The Project GRM will be gender sensitive and shall include female members in the Grievance Redress Committee. It will also collect gender-disaggregated data on complaints received and resolved. ES and GAP training will be provided to PMO, as well as construction supervision consultants and contractors. Annex 6: Gender Equality summarizes the key approaches of this Project for gender mainstreaming.

5.65 With sub-component 3.2, the Project will also support the economic development of rural women by providing vocational training to help them improve their knowledge and skills on viable livelihood activities. The Project is exploring to engage one national gender specialist who will support the PMO in the overall implementation of the GAP and sub-component 3.2, monitoring, preparation, and submission of the semi-annual GAP progress reports and completion report. To support the economic development of rural women by providing vocational training to help them improve their knowledge and skills, the Project will engage an NGO or a consulting firm with work experience in working with local government (Mahalla committees) to coordinate the conduct of skills training for women on viable livelihood activities.

G. Risks and Mitigants

Table 8: Summary of Risks and Mitigating Measures

Risk Description	Assessment (H/M/L)	Mitigation Measures
Project Preparation Risks		
Technical designs		
▪ Designs of the road structure and the associated structures related to roads crossings using old standards may not be reflecting international design standards, especially on road safety and climate resilience.	M	▪ TOR for construction supervision consultant will incorporate RSA. ▪ Tender Documents for civil works will reflect guidelines on climate resilience design based on the preliminary Climate Hazards and Sensitivity Analysis. ▪ The construction supervision consultant will be responsible for verifying the contractor's compliance with these climate resilience measures before final approval is granted by the state expertise.
Project Implementation Risks		
Implementation capacity		

Risk Description	Assessment (H/M/L)	Mitigation Measures
▪ Implementation of the Project with such widely spread scope of works across two remote regions would require enhanced implementation supervision.	H	▪ While the overall Project will be managed from central office of AYA, the PMO will have a local presence including ES specialists in both Karakalpakstan and Khorezm for effective implementation monitoring. ▪ The Digital Geospatial Platform will be developed as a monitoring and supervision tool for PMO. ▪ Construction Supervision Consultant equipped by international and local consultants will assist the PIU and PMO in project implementation
Land acquisition and resettlement		
▪ Potential social, economic, and environmental disruptions to affected communities due to involuntary displacement, loss of livelihoods, and cultural heritage impacts resulting from project implementation.	L	▪ The road rehabilitation will occur within the existing right-of-way without capacity expansion, eliminating the necessity for land acquisition and resettlement.
Financial management		
▪ Delay in hiring of the Project auditor. ▪ Delay in submission of Financial Reports. ▪ Frequent turnover of Project finance/accounts staff.	M	▪ Finalize audit TOR and initiate hiring at the earliest. ▪ Finalize financial reporting format by the start of the project implementation. ▪ PMO shall use existing finance and accounts staff.
Procurement		
▪ Delays in preparation of acceptable procurement documents. ▪ Delays in obtaining internal approvals. ▪ Insufficient PMO resources to evaluate a large number of tenders. ▪ Contract implementation challenges by contractors.	M	▪ Engaging qualified Procurement Specialist and providing targeted support. ▪ Early engagement by PMO of various approval authorities. ▪ Early engagement of Construction Supervision and Project Management Consultant (CS&PMC) firm to support PMO. ▪ Ensure adequate Evaluation and Qualification criteria are specified and screening of tenderers to ensure only qualified and

Risk Description	Assessment (H/M/L)	Mitigation Measures
		experienced contractors are hired and that qualified CS&PMC firm is hired with adequate contract management oversight from PMO.
Time and cost overrun		
▪ The Feasibility Study and cost estimates are done in 2020 which imposes the risk of cost overrun.	M	▪ The Project Team reviewed the Project cost estimates to cover the price escalation during the last 4 years. The cost estimates include 5% of contingency to mitigate the future price fluctuations.
ES risks and impacts during construction and operation		
▪ Insufficient capacity for implementation of ESMP in the remote areas of the region.	M	▪ The PMO will include ES experts supported by the Supervision Consultant. Qualified ES staff will be deployed by the PMO to address ES issues. ▪ ES experts will be allocated in both regions in addition to the PMO staff based in Tashkent. ▪ AIIB ES specialists will undertake regular field-based review to support implementation of measures to address ES issues.

Annex 1: Results Monitoring Framework

Project Objective (PO):	**To enhance climate resilient and inclusive road transport connectivity to markets and services in the Republic of Karakalpakstan and the Khorezm Region of Uzbekistan.**									
Indicator Name	**Unit of measure**	**Base-line Data 2025**	**Cumulative Target Values**					**End Target 2031**	**Data source / Methodology**	**Responsibility**
			2026	**2027**	**2028**	**2029**	**2030**			
Project Objective Indicators:										
1. Increased annual average daily traffic (AADT) on Project roads	AADT	3,925	4,056	4,195	4,340	4,490	4,645	4,806	RC / Annual	RC
2. Reduced travel time on Project roads	%	0	0	0	0	33%	33%	33%	RC / Annual	RC
3. Number of Project beneficiaries with improved climate resilient road access to markets, schools and health facilities in selected districts in Project-financed areas (gender disaggregated)	Number (% of which are women)	0	60,000	300,000	500,000	600,000	600,000	600,000	RC / Annual	RC
4. Number of women participated in vocational trainings	Number	0	0	30	60	100	100	100	RC / Annual	RC
5. Number of youths trained on climate change and road safety, disaggregated by gender	Number	0	0	100	200	300	300	300	RC / Annual	RC
6. Percentage of women and youth surveyed among communities are satisfied with	%	0	-	-	-	80	80	80	RC / Annual	RC

Project Objective (PO):	**To enhance climate resilient and inclusive road transport connectivity to markets and services in the Republic of Karakalpakstan and the Khorezm Region of Uzbekistan.**									
Indicator Name	**Unit of measure**	**Base-line Data 2025**	**Cumulative Target Values**					**End Target 2031**	**Data source / Methodology**	**Responsibility**
			2026	**2027**	**2028**	**2029**	**2030**			
the improvement of Project roads										
7. Improved road safety resulting in improved safety standard, assessed by higher star rating of the International Road Assessment Programme (iRAP)	Number	1	-	-	2	3	-	3	RC / Annual	RC
Intermediate Results Indicators:										
1. Number of the local roads reconstructed in Khorezm region	Number	0	7	14	16	16	16	16	RC / Annual	RC
2. Kilometers of rural roads upgraded with safety measures and climate resilient features in Khorezm region	km	0	82	164	188	188	188	188	RC / Annual	RC
3. Digital Geospatial Platform developed and operational	Yes/No	No	No	Yes	Yes	Yes	Yes	Yes	RC / Annual	RC

Annex 2: Detailed Project Description

1. Uzbekistan has a relatively dense road network, with 42,785 km public roads classified as international (3,993 km), state (14,203 km), and local (24,589 km). Local roads are defined as roads connecting the administrative centers of districts with towns, villages and hamlets, as well as with international and state roads, based on the classification system of roads in Uzbekistan.

Table A2-1. Summary of the Local Roads' Classification in Uzbekistan

	No. of Roads	Length, km	Technical Category, km				
International Roads	11	3,993	I	II	III	IV	V
State Roads	231	14,203					
Local Roads	2,913	24,589	125	612	3,114	13,948	6,790

2. Local roads suffer from backlogs in maintenance and rehabilitation, with many roads in poor condition. Much of the road deterioration is caused by aging infrastructure, which requires structural and safety upgrades. The poor condition of roads significantly impacts travel times, fuel consumption, vehicle damage, and overall transport costs.

3. Ensuring connectivity between rural communities, markets, and services through safe, reliable, and climate-resilient local roads is crucial for achieving inclusive and sustainable economic development in Uzbekistan. With approximately 18 million people, constituting 49% of the population, residing in rural areas as of January 1, 2024, these communities depend heavily on local roads for their livelihoods, underscoring the critical importance of improving and maintaining rural infrastructure to support their economic activities and overall well-being.

4. The GOU has underscored economic development as a top priority in its Development Strategy for 2022-2026, recognizing transportation as a fundamental component in bolstering economic growth. In line with this strategy, the 18 May 2022 Presidential Decree of the Republic of Uzbekistan, No. 249, titled "On measures to expand the network of roads with cement concrete pavement", specifically highlights the reconstruction of local roads as a targeted priority within the country. This decree not only emphasizes the importance of enhancing local roads infrastructure in rural areas but also facilitates the involvement of additional funds from international financial institutions to support the construction and improvement of these vital transportation networks.

5. The proposed Project aims to enhance approximately 328 km of existing local roads in Karakalpakstan and 188 km in the Khorezm region, which currently suffer from poor to very poor conditions characterized by degraded bituminous pavements, extensive cracking, potholes, and depressions. The existing carriageway width ranges from 5.0 to 9.0 meters, with unpaved shoulder widths varying between 1.0 to 2.0 meters. Selection of roads for rehabilitation is based on several criteria, including the current condition of the road, its connectivity to the national road network, the population size served by each road, access to essential services such as schools and hospitals, as well as access to marketplaces and tourist destinations, ensuring that the Project targets roads critical for socioeconomic development and community connectivity in both regions.

6. The proposed scope of the Project, focusing on selected road sections, will lead to the repair of 36% of the local roads in need of repair in the Republic of Karakalpakstan and 32% in the Khorezm Region, as indicated in Table A2-2. The Project roads have been selected based on existing pavement condition, traffic volume, settlement population served, and connectivity to socioeconomic facilities and services around two socio-economical centers of Western Uzbekistan.

7. This initiative is estimated to benefit approximately 307,231 rural inhabitants across 101 rural communities in the Khorezm region and 283,122 rural inhabitants in 79 rural communities in Karakalpakstan, enhancing their access to improved road conditions and facilitating greater connectivity to essential services, markets, and opportunities for socioeconomic development.

Table A2-2. Scale of Impact of the Project by Region

Region	Indicator	# of local roads	Total length, km	Needing repair, km
Karakalpakstan	Overall local roads network, km	246	2,604	901
	Roads to be repaired under the Project's scope, km	23	328	328
	Percentage of roads included in the Project's scope	9%	13%	**36%**
Khorezm	Overall local roads network, km	172	1391	575
	Roads to be repaired under the Project's scope, km	16	188	188
	Percentage of roads included in the Project's scope	9%	14%	**33%**

8. The proposed reconstruction efforts include pavement removal and replacement of asphalt and base layers, bridge repair and construction, drainage improvements, and the installation of road safety features such as additional signs, barriers, pedestrian crossings, and bus stops. Sidewalks will be added where needed to enhance pedestrian safety. The goal is to create a safer, climate-resilient, and cost-effective local road network in Karakalpakstan and Khorezm, providing year-round access to markets, schools, medical services, and district centers. **The Project includes two years of DLP**.

Table A2-3. List of Roads in the Republic of Karakalpakstan

No.	Road Code & Section Name	Length (km)

	Amu Darya District	
1	4K21A “4R160 AUTOYULIDAN-MANGIT SHAKHRI-JUMURTOV PRISTANIGA ROAD 0-15 KM 0-15”	15.0
2	4N62 “DUSTLIK DFH-SHIYIK KALA-UYCHI OVULI KM2-10”	8.0
	Beruni District	
3	4K51“A” “4K51 AVTOYULIDAN-KIRKIZOBOD DFHGA” KM 0-16	16.0
4	4K28 “BERUNI SH.-NAVOI DFH-MAKHTUMKULI DFH KM0-17”	17.0
5	4N115 “4R182 AVTOYULI (40KM)-SARIBIY OVULI KM0-20”	20.0
6	4K27 “BERUNI SH.-OKSHAKOL BURDOKICHILIK BAZASI KM0-15” ROAD	15.0
7	4K32G “A-380 AVTOYULI (589 KM)-SHURAKHON OIL BASE KM0-5”	5.0
	Kegeylinsky District	
8	4K7 “4R175 AVTOYULI-KS-1-MAIZHAP DFH” MOTOR ROAD ON THE 0-10KM SECTION	10.0
9	4K34“B” 4R176 AVTOYULI ROAD (31KM)-KUVONISH-ZHARMA DFH KM0-12”	12.0
10	4H85 KOZONKETGKAN OVULI-KS-1-SHAHAMAN OVULI KM30-40	10.0
	Nuku District	
11	4K42 “4R171”D” AVTOYULI (4KM)-KHUZHAILI SH.-OKHUNGBOBOEV DFH-SHOMURATOV DFH” KM 0-10	10.0
12	4K18 “KATTAGAR DFH-KREITUZAK SUV TAKSIMLAŞ INŠOOTI” KM 2-16”	16.0
	Takhtakupir District	
13	4K3 “B” “4R176 AVTOYULI (89KM)-”KORAUZAK” DFH CA KM 0-10”	10.0
	Daukhara Dfh-Borshetov	
14	4N42 DAUHARA DFH-BORSHETOV DFH KM0-15 MOTOR ROAD	15.0
	Karauzyaksky District	
15	4N121 “4R179 AVTOYULI (4KM)- 4H19 AVTOYULI KM 0-10”	10.0
	Shumanay District	
16	4N20”Zh” “4R177 AV-TOYULI (28KM)-A.MUSAYEV DFS AT 0-10	10.0
	Konlikul District	
17	4H87 “4KONLIKUL-JAYKHUN DFH-AJINIYAZ DFH KM 0-24”	24.0
18	4N88 “4R173 AVTOYULI (61KM)-OLTINKUL DFH-BEKEP PUMP ST.-KORABAYLI TEMIR YUL STANTSIYASI KM 0-33”	33.0
	Kungirat District	
19	4N105 “D” “A-380 AVTOYULI-RAUSHAN OVULIGA KM 0-22”	22.0
20	4H79 “KUNGIROT SHAHRI-RAUSHAN DFH-SAKSOVULSOY-AMUDARE KURIKHONASI ROAD KM 45.5-57”	11.1
21	4N105 “V” “A-380 AVTOYULI (961KM)-BARSAKERMES BOOK KM0-12”	12.0

	Muynak District	
22	4N109 “MUYNAK SHAKHRI-UCHSOY OVULI KM 0-15”	15.0
23	4K2 “4R173 AVTOYULI (26KM) KIZILZHAR OVULIGA KM0-12” ROAD	12.0
	TOTAL THE REPUBLIC OFKARAKALPAKSTAN	**328.1**

Table A2-4. List of Roads in the Khorezm Region

No.	Road Code & Section Name	Length (Km)
	Bogatsky District	
1	4K957, SABIRZAN K. - OLAZHA K.- KULONKORABOG K.-URGENCH-KHAZARASP HIGHWAY	14
	Gurlan District	
2	4K921, HIGHWAY “SHAVAT - GURLAN “ - FROM ABINCHI K	6
3	4K985, GURLAN -VAZIR TOWN - DEKHKONOBOD TOWN	13
	Kushkupir District	
4	4K986, KHIVA-GAZAVAT CITY - ARVUK . K. - MONOK K	25
5	4K986A, AUTOYULIDAN - KUSHKUPIR KISHLOGIGA	10
	Urgench District	
6	4K931, URGENCH- CHATKUPIR K.-G. SHAVAT	17.5
7	4K941, URGENCH - CHANDIRKIYOT K . - URGENCH - KHONKA HIGHWAY	8
8	4K944, “URGENCH-KHIVA” AUTOYULI - KORAMON K.- KUSHKUPIR K.	16
	Khiva District	
9	4K949, PIRNAKHOS K.- SHOMAHULUM K.- CHANASHIK K.- KHUZHAOVUL K	12
10	4K951, KHIVA - OKYOP K . - RAVOT K. - KORAKUM K. - “KHIVA-GAZAVAT” AUTOYULI	9
	Khazorasp District	
11	4K968, BAGAT CITY - TOMA K . - DEKHKONBOZOR K. - KIZILRAVAT K. - KHAZARASP HIGHWAY	8
12	4K974, KHAZARASP - MUTPURI K.- TOSHSOKA KANALI	6
	Shavat District	
13	4K931, URGENCH- CHOTKUPIR K.-G. SHAVAT	13.5
	Yangiarik District	
14	4K956, YANGIARYK BIG BYPASS ROAD	11
15	4K983, CHIKIRCHI K.- LAKE SHURKUL	8
	Yangibazar District	
16	4H1925, KHAYVAT K.- KALANDURMAN K .	11
	TOTAL KHOREZM REGION	**188**

9. Climate resilience measures, including the provision of durable pavement materials and enhanced drainage systems to mitigate the impacts of increased temperatures and seasonal flooding, are incorporated where necessary in the Project. No capacity expansion is planned, and road rehabilitation will be carried out within the designated road corridors, maintaining the existing alignment. This approach ensures that the Project focuses on improving the resilience of the local road network in rural areas to climate-related challenges while optimizing existing infrastructure to better serve local communities.

10. Some **Adaptation Measures** are recommended to minimize the impacts of climate-related hazards on the roads and bridges in the Republic of Karakalpakstan and Khorezm Region of Uzbekistan. These measures aim to increase the resilience of the infrastructure to projected climate risks such as extreme heat, heavy rainfall, droughts, dust storms, and freezing conditions. Here are the key adaptation measures for various climate hazards:

1) **Heat-Resistant Pavements:**
- **Problem**: Rising temperatures and prolonged heatwaves can soften asphalt, leading to rutting and degradation of road surfaces.
- **Solution**: The document suggests the use of **high-temperature-resistant materials** such as modified asphalt or cement-concrete pavements that are less prone to deformation under heat stress. These materials are designed to withstand higher temperatures, thus prolonging the lifespan of the road infrastructure.

2) **Drainage Systems Enhancement:**
- **Problem**: Heavy precipitation and flooding are key climate hazards that can lead to erosion, waterlogging, and washouts on roads and bridges.
- **Solution**: **Improved drainage systems** are critical. This includes designing deeper side ditches, constructing culverts, and installing reinforced drainage structures to handle larger volumes of water. These systems are intended to quickly direct water away from the road surfaces, reducing damage from excessive rainfall.

3) **Protection Against Erosion and Dust Storms:**
- **Problem**: Dust storms and wind erosion can degrade road surfaces and create hazardous driving conditions.
- **Solution**: Establishing **green protective belts** along the sides of roads can serve as natural windbreaks to reduce the accumulation of dust on roads. These belts may also help to prevent erosion of the road surfaces by stabilizing the surrounding soil.

4) **Freeze-Thaw Cycle Resilience:**
- **Problem**: Freeze-thaw cycles can cause road materials to crack, expand, and degrade more rapidly, especially in areas subject to significant temperature fluctuations.
- **Solution**: **Cold-resistant construction materials** and **improved road surfacing techniques** that reduce water penetration are essential. This could include using water-repellent coatings or installing insulation layers beneath the road surface to reduce frost penetration and subsequent damage during thawing periods.

5) **Road Safety and Traffic Management:**
- **Problem**: Climate hazards such as heavy precipitation, fog, and dust storms reduce visibility and make driving more dangerous.
- **Solution**: Implementing **early warning systems**, **weather information systems**, and installing **climate-resilient road signs** and lighting that can withstand extreme

weather conditions. These measures improve the safety and operability of roads by giving drivers real-time weather updates and increasing visibility in adverse conditions.

6) **Bridges and River Crossings:**

- **Problem**: Increased risks of flooding and more frequent extreme weather events can undermine the structural integrity of bridges and river crossings.
- **Solution**: **Strengthening the foundations of bridges** by using materials that are more resistant to water erosion and ensuring that river crossings have sufficient capacity to handle increased water flow. Reinforced concrete structures, elevated roadways, and flexible bridge joints can help accommodate thermal expansion and water pressure changes.

7) **Maintenance and Monitoring Systems:**

- **Problem**: Infrastructure degradation due to climate impacts can occur gradually and go unnoticed until severe damage has occurred.
- **Solution**: Establishing **regular monitoring systems** and **early maintenance schedules** for roads and bridges to detect and repair climate-related damage promptly. This involves integrating climate resilience into ongoing road maintenance programs, ensuring that small issues are addressed before they become major structural problems.

8) **Flood-Resilient Design:**

- **Problem**: Areas prone to seasonal flooding can suffer road washouts, making roads impassable during critical times.
- **Solution**: **Raising road levels** above potential flood levels and installing protective embankments along vulnerable road sections. This prevents floodwaters from damaging road surfaces and ensures that the roads remain usable during floods.

9) **Sustainable Vegetation Management:**

- **Problem**: Deforestation and poor land management contribute to soil erosion, exacerbating climate risks.
- **Solution**: Encouraging **sustainable vegetation management** practices, such as planting climate-resistant trees and shrubs alongside roads. These green buffers help stabilize the soil, reduce erosion, and provide additional shade to lower road surface temperatures.

11. These adaptation measures collectively aim to ensure the long-term functionality, safety, and resilience of roads and bridges in Karakalpakstan and Khorezm. By integrating these strategies into the design, construction, and maintenance phases of the Project, the infrastructure will be better equipped to handle the growing risks posed by climate change, ensuring sustainable and continuous connectivity for rural communities.

Annex 3: Economic Analysis

A. Approach and Methodology

1. **General.** Economic Analysis or CBA is to identify and quantify key economic benefits and costs associated with the Project. CBA for the Projects identified benefits and costs of the main Component 1 - reconstructing the existing 647 km of Category III and Category IV local roads in the Republic of Karakalpakstan and in the Khorezm Region. The proposed rehabilitation will improve the local road quality, therefore generate savings in VOT, VOC and GHG, along with other benefits such as reduced traffic accidents. These benefits all come from forecast of non-incremental traffic demand of the involved local roads in both regions. The Project is not expected to generate incremental demand as it will not build additional roads.

2. The CBA was carried out by using the discounted cash flow (DCF) to obtain the EIRR and ENPV for the proposed investments linked with the Project. This is followed by a standard sensitivity analysis that tests the viability of EIRR and ENPC under optimistic/pessimistic scenarios of traffic, cost projections.

3. **Analytical Framework.** The CBA calculations are based on the net benefits and costs, by comparing with and without project scenarios described below.

- **Without the Project:** This scenario simply means the financed local roads will remain the status quo without major rehabilitation in the future. Traffic demand in terms of AADT will grow along with income level, population and GDP total. However, due to poor road surface conditions, all types of vehicles currently traveling on these local roads suffer from much slower driving speed, higher operating costs and carbon emissions. According to technical consultant, the existing IRI is around 8m/km.
- **With the Project:** The rehabilitation will significantly improve the local road conditions by resurfacing, widening and strengthening the climate resilience. AADT as non-incremental demand will stay the same as without the Project scenario for both regions, but the vehicles will travel faster while they have lower operating costs. The average IRI after the Project will aim to reach 2m/km, given the design and materials used.

4. **Benefits Calculation.** The Project will bring several key positive net economic benefits, including VOT, VOC and GHG savings. At the end, EIRR and ENPV are the results of adding all these positive/negative items together.

5. **Approach.** Approaches to identify and quantify benefits are based on consultations with the feasibility study team (FST), literature of similar airport projects done by other MDBs and various databases providing essential parameters to the estimates. The quantified benefits include the following items.

Table A3-1. Identified Economic Benefits

Benefits: Non-incremental demand
VOT savings: Average driving speed will increase from 40 to 60 km/h after the Project due to smoother road surface and safer road design.

VOC savings: IRI of the Project roads will improve from 8 to 2 after the Project, assessed by the technical consultants. Accordingly, unit VOC will be reduced per vehicle based on HDM-4 model calculations.
GHG savings: Gasoline consumption will be reduced due to better road conditions. This will translate into carbon savings.

6. **AADT Traffic Demand and Key Assumptions.** The CBA assumed 3 years of construction (2025-2027) and afterwards 22 years of operations (2028-2049). To better align with actual implementation timelines, the capex is reallocated across the first three years of construction, followed by two years of Defects Liability Period (DLP), thereby providing a more realistic distribution of investment costs over the five-year implementation period. Below are the key assumptions used in the analysis:

i. **AADT Traffic Demand Forecast.** Based on the baseline data input AADT in 2025, AADT is forecasted assuming trucks will grow at GDP total growth. Cars are assumed to grow along with GDP per capita, while buses/motors/others are at population growth. Growth assumptions are drawn from IMF World Economic Outlook April 2024, with downward adjustments in later years assuming all growth will converge at slower pace. Below shows the forecasted average AADT for the Project. Overall, for both regions, cars account for the biggest share of 70% of traffic, trucks rank the second between 11-17%.

Table A3-2. AADT Forecast (Number of Vehicles)

	Khorezm					Karakalpakstan				
Year	Trucks	Cars	Buses	Motors	Others	Trucks	Cars	Buses	Motors	Others
2025	343	2600	26	421	325	636	3144	35	477	104
2026	362	2689	26	429	331	671	3252	36	486	106
2027	382	2782	27	438	338	708	3364	37	496	108
2028	403	2877	27	447	345	747	3479	37	506	110
2029	425	2976	28	456	352	788	3599	38	516	112
2030	449	3078	28	465	359	832	3722	39	527	114
2031	473	3184	29	474	366	878	3850	40	537	117
2032	499	3293	29	484	373	926	3982	40	548	119
2033	527	3406	30	493	381	977	4119	41	559	121
2034	556	3523	31	503	388	1031	4260	42	570	124
2035	587	3644	31	513	396	1087	4406	43	581	126
2036	619	3769	32	524	404	1147	4558	44	593	129
2037	653	3898	32	534	412	1210	4714	45	605	131
2038	689	4032	33	545	420	1277	4876	46	617	134
2039	727	4170	34	556	429	1347	5043	46	629	137
2040	752	4272	34	561	433	1394	5166	47	636	138
2041	778	4376	34	567	437	1443	5292	47	642	140
2042	806	4482	35	572	442	1493	5420	48	648	141
2043	834	4591	35	578	446	1546	5552	48	655	142
2044	863	4703	36	584	451	1600	5687	49	662	144
2045	893	4817	36	590	455	1656	5826	49	668	145
2046	925	4934	36	596	460	1714	5967	50	675	147

2047	957	5054	37	602	464	1774	6112	50	682	148
2048	990	5177	37	608	469	1836	6261	51	688	150
2049	1025	5303	37	614	474	1900	6413	51	695	151

ii. **VOC Assumptions.** VOC savings are estimated using the World Bank's simplified HDM-4 model, by inputting key parameters specific to the Project. These include: IRI for all roads will change from 8 to 2. Other road and vehicles specific to Uzbekistan as below, collected based on desktop research on various price items in 2024. This input resulted in unit VOC savings (see Table 3-4).

Table A3-3. HDM-4 VOC Input

	Economic or Financial Unit Costs ($)					Basic Vehicle Fleet Characteristics					
	New Purchase	New Tire	Fuel	Lubricants	O&M Labor	Annual km Driven	Annual Working Hours	Service Years	Private Use	No. of Pax	Gross Weight
	($/vehicle)	($/tire)	($/liter)	($/liter)	($/hour)	(km)	(hours)	(years)	(%)	(#)	(t)
Motors	4900	236	0.976	24.61	1	6400	2080	10	100	1	0.2
Cars	23000	260	0.976	24.61	2.6	22131	2080	10	100	2	1.2
Trucks	91710	370	0.937	74.65	2.6	40000	2080	10	0	1	12
Buses	35000	103	0.937	74.65	2.6	67200	2080	9	0	25	6
Others	23000	260	0.976	24.61	2.6	22131	2080	10	100	2	1.2

Table A3-4. Unit VOC Savings (USD/vehicle-km)

Trucks	0.192
Cars	0.036
Buses	0.070
Motors	0.026
Others	0.057

iii. **VOT Assumptions.** The Project is assumed to increase the average speed from 40 km per hour to 60 km per hour for all types of vehicles. This leads to 0.008-hour savings per km by vehicles. Current average speed on the Project roads is all around 40 km per hour based on the Feasibility Study Report (FSR). In fact, the Bank mission observed in some rural roads, particularly in Khorezm, that the speed can be much lower around 20-30 km per hour due to unsafe road conditions. Hence, the VOT savings are likely to be higher than the estimates. Other VOT assumptions include hourly wage workers (USD1.29 per hour) based on GDP per worker USD current (USD2597).

Table A3-5. VOT Assumptions

GDP per worker, USD Current	2597
Total working hours, Hrs	2008
Per hour wage (working), USD	1.29
Per hour wage (non-working), USD	0.39
Labor participation rate, %	0.56
Weighted hour wage, USD	0.90

iv. **GHG.** Improved road conditions can save gasoline consumptions compared to without project scenario, leading to savings of carbon dioxide emissions per vehicle-km (see below. These will translate into GHG savings in terms of USD values using the AIIB CBA carbon price forecast.

Table A3-6. kg CO2 Savings Per Vehicle-km

	Without	With	Savings
Trucks	0.53	0.49	0.04
Cars	0.32	0.31	0.01
Buses	0.51	0.48	0.03
Motors	0.07	0.07	0.00
Others	0.30	0.30	0.01

B. Economic Analysis Summary

7. Overall economic benefits and costs per year are summarized in Table 3-7 below. EIRR is 29.4% and ENPV is USD280.65 million (social discount rate = 12%). Both are well above SBF investment threshold. VOC savings is the dominating factor (81%) contributing to the Project's economic benefits, while VOT savings accounting for 18% and GHG savings for 2%.

Table A3-7. Economic Benefits and Costs (USD Million)

	VOC	VOT	GHG	**Total Benefits**	Capex	O&M	**Total Costs**	Net Benefits
2025	-	-	-	-	58.02	-	58.02	**-58.02**
2026	-	-	-	-	58.02	-	58.02	**-58.02**
2027	-	-	-	-	58.02	-	58.02	**-58.02**
2028	48.61	11.58	.69	60.87	-	2.46	2.46	**58.41**
2029	50.67	11.97	.73	63.36	-	2.46	2.46	**60.90**
2030	52.82	12.37	.78	65.97	-	2.46	2.46	**63.51**
2031	55.07	12.79	.84	68.70	-	2.46	2.46	**66.24**
2032	57.42	13.23	.89	71.54	-	2.46	2.46	**69.07**
2033	59.89	13.68	.95	74.51	-	2.46	2.46	**72.05**
2034	62.46	14.14	1.02	77.63	-	2.46	2.46	**75.16**
2035	65.16	14.63	1.09	80.88	-	2.46	2.46	**78.42**
2036	67.98	15.13	1.17	84.28	-	2.46	2.46	**81.82**
2037	70.94	15.64	1.25	87.83	-	2.46	2.46	**85.37**
2038	74.03	16.18	1.34	91.55	-	2.46	2.46	**89.09**
2039	77.27	16.74	1.43	95.44	-	2.46	2.46	**92.98**
2040	79.49	17.13	1.51	98.13	-	2.46	2.46	**95.66**
2041	81.78	17.54	1.58	100.90	-	2.46	2.46	**98.43**
2042	84.14	17.95	1.66	103.75	-	2.46	2.46	**101.29**
2043	86.57	18.37	1.75	106.69	-	2.46	2.46	**104.23**
2044	89.07	18.81	1.84	109.72	-	2.46	2.46	**107.26**
2045	91.65	19.25	1.95	112.86	-	2.46	2.46	**110.39**
2046	94.31	19.71	2.05	116.07	-	2.46	2.46	**113.61**
2047	97.06	20.18	2.15	119.39	-	2.46	2.46	**116.92**

2048	99.89	20.66	2.27	122.82	-	2.46	2.46	**120.36**
2049	102.80	21.15	2.39	126.34	-	2.46	2.46	**123.88**
Total	1649.07	344.05	31.33	2039.22	174.06	54.17	228.24	**1810.99**

8. **Sensitivity Analysis.** EIRR and ENPV remain robust under extreme scenarios where costs overrun by 30% and AADT forecast is reduced by 30% (Table A3-8). Additionally, Table A3-9 presents another scenario where IRI in with the Project scenario is 5m/km, assuming the IRI deteriorates from initial 2m/km to 8m/km at the end year if there is no major maintenance. It shows that even in the most extreme negative case (if costs overrun by 30% and AADT down by 30%), the overall EIRR remains robust above 9% benchmark.

Table A3-8. Sensitivity Analysis

Overall EIRR		AADT					Overall ENPV		AADT				
	29.4%	-30%	-15%	0%	15%	30%		280.65	-30%	-15%	0%	15%	30%
Cost	-30%	29.4%	33.9%	38.1%	42.0%	45.8%	Cost	-30%	196.45	261.46	326.47	391.49	456.50
	-15%	25.3%	29.4%	33.1%	36.6%	40.0%		-15%	173.54	238.55	303.56	368.57	433.58
	0%	22.3%	26.0%	29.4%	32.6%	35.6%		0%	150.63	215.64	280.65	345.66	410.67
	15%	19.9%	23.3%	26.4%	29.4%	32.2%		15%	127.71	192.72	257.73	322.75	387.76
	30%	17.9%	21.1%	24.0%	26.8%	29.4%		30%	104.80	169.81	234.82	299.83	364.84
Kho. EIRR		AADT					Kho. ENPV		AADT				
	24.1%	-30%	-15%	0%	15%	30%		69.86	-30%	-15%	0%	15%	30%
Cost	-30%	24.1%	28.0%	31.6%	35.0%	38.2%	Cost	-30%	48.90	68.26	87.61	106.96	126.32
	-15%	20.6%	24.1%	27.3%	30.3%	33.2%		-15%	40.03	59.38	78.74	98.09	117.44
	0%	17.9%	21.1%	24.1%	26.8%	29.4%		0%	31.16	50.51	69.86	89.22	108.57
	15%	15.8%	18.8%	21.5%	24.1%	26.5%		15%	22.28	41.64	60.99	80.34	99.70
	30%	14.1%	16.9%	19.4%	21.8%	24.1%		30%	13.41	32.76	52.12	71.47	90.82
Kara. EIRR		AADT					Kara. ENPV		AADT				
	32.5%	-30%	-15%	0%	15%	30%		210.78	-30%	-15%	0%	15%	30%
Cost	-30%	32.5%	37.3%	41.9%	46.1%	50.1%	Cost	-30%	147.55	193.21	238.86	284.52	330.18
	-15%	28.1%	32.5%	36.5%	40.3%	43.9%		-15%	133.51	179.17	224.82	270.48	316.14
	0%	24.8%	28.8%	32.5%	35.9%	39.2%		0%	119.47	165.13	210.78	256.44	302.10
	15%	22.2%	25.9%	29.3%	32.5%	35.5%		15%	105.43	151.09	196.74	242.40	288.06
	30%	20.1%	23.5%	26.7%	29.6%	32.5%		30%	91.39	137.05	182.70	228.36	274.02

Table A3-9. Sensitivity Analysis

Assuming IRI = 5 in with the Project Scenario

Overall EIRR		AADT					Overall ENPV		AADT				
	22.3%	-30%	-15%	0%	15%	30%		150.91	-30%	-15%	0%	15%	30%
Cost	-30%	22.3%	26.0%	29.5%	32.7%	35.7%	Cost	-30%	105.63	151.18	196.73	242.28	287.83
	-15%	19.0%	22.3%	25.4%	28.3%	31.0%		-15%	82.72	128.27	173.82	219.37	264.92
	0%	16.5%	19.5%	22.3%	25.0%	27.4%		0%	59.81	105.36	150.91	196.45	242.00
	15%	14.5%	17.3%	19.9%	22.3%	24.6%		15%	36.89	82.44	127.99	173.54	219.09
	30%	12.9%	15.5%	18.0%	20.2%	22.3%		30%	13.98	59.53	105.08	150.63	196.18
Kho. EIRR		AADT					Kho. ENPV		AADT				
	18.2%	-30%	-15%	0%	15%	30%		32.39	-30%	-15%	0%	15%	30%
Cost	-30%	18.2%	21.4%	24.4%	27.2%	29.8%	Cost	-30%	22.67	36.41	50.14	63.87	77.60
	-15%	15.3%	18.2%	20.8%	23.3%	25.7%		-15%	13.80	27.53	41.27	55.00	68.73
	0%	13.0%	15.7%	18.2%	20.5%	22.6%		0%	4.93	18.66	32.39	46.12	59.86
	15%	11.3%	13.8%	16.0%	18.2%	20.2%		15%	-3.95	9.79	23.52	37.25	50.98
	30%	9.8%	12.2%	14.3%	16.3%	18.2%		30%	-12.82	0.91	14.64	28.38	42.11
Kara. EIRR		AADT					Kara. ENPV		AADT				
	24.8%	-30%	-15%	0%	15%	30%		118.51	-30%	-15%	0%	15%	30%
Cost	-30%	24.8%	28.7%	32.4%	35.9%	39.2%	Cost	-30%	82.96	114.78	146.59	178.41	210.23
	-15%	21.2%	24.8%	28.1%	31.2%	34.1%		-15%	68.92	100.74	132.55	164.37	196.19
	0%	18.5%	21.8%	24.8%	27.6%	30.2%		0%	54.88	86.70	118.51	150.33	182.15
	15%	16.4%	19.4%	22.2%	24.8%	27.2%		15%	40.84	72.66	104.47	136.29	168.11
	30%	14.6%	17.5%	20.1%	22.5%	24.8%		30%	26.80	58.62	90.43	122.25	154.07

Annex 4: Paris Agreement Alignment and Climate Finance

1. The Bank has committed to align all its new financing operations with the Paris Agreement's (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 PA[10]. The document elaborates the application of the JMDB methodological framework to aligning AIIB investment operations with the PA (specifically, the mitigation dimension or Building Block 1 - BB1 and the adaptation aspects or BB2. The AIIB Methodology has been followed to assess the alignment of the Project with the PA.

BB1: Climate Mitigation goals

2. The Project comprises the rehabilitation and reconstruction of 647 km of local roads in the Republic of Karakalpakstan (encompassing 23 road sections spanning 328 km across 11 districts) and in the Khorezm Region (16 road sections covering 188 km across 9 districts). It falls under the list of "universally aligned activities (UC1)" under the category of road upgrading, rehabilitation, reconstruction, and maintenance without capacity expansion.

BB1 conclusion: As it falls into the list of universally aligned activities, we can conclude that the Project is aligned with the mitigation goals of the Paris Agreement (BB1).

BB2: Climate Adaptation goals

3. The Project is likely to be materially affected by climate hazards and thus, has been subject to a Climate Resilience Assessment (CRA) following AIIB's methodology to determine its alignment with the adaptation goals of the Paris Agreement (BB2). The methodology has 3 steps: 1) a climate risk and vulnerability assessment (CRVA); 2) the identification of measures addressing the climate risk found on the previous step; and 3) the compatibility of the Project against the NDC of the Country and other climate adaptation national strategies.

Step 1, Climate Risk and Vulnerability Assessment (CRVA):

4. The Project Team conducted an initial analysis using a mix of external databases (World Bank Climate Change Knowledge Portal and Swiss-Re CatNet) and in-house developed tools. The initial CRVA was performed on different sections of the road (initial point, middle point and end point) and it showed that the Project poses high risk of being affected by extreme temperature and precipitations and floodings under the SSP5-RCP8.5 scenario.

5. An external consultant performed in parallel an independent analysis during appraisal stage. The level of exposure of the Project facilities was analyzed based on the review of the climate baseline data[11] and climate change trends[12] and qualitatively evaluated using expert judgment. A *Think Hazard!* tool[13] was applied for verification of the experts' grades for exposure to the key climate hazards identified above. The analysis found material risk on the same climate hazards (increased temperature/heatwaves and increased precipitation/floods).

[10] AIIB; "*Methodology for Assessing the Alignment of AIIB Investment Operations with the Paris Agreement*"; July 2023; (link).
[11] Including data provided by the World Bank's Climate Change Knowledge Portal – Current Climate / Uzbekistan (https://climateknowledgeportal.worldbank.org/country/uzbekistan/climate-data-historical)
[12] World Bank's Climate Change Knowledge Portal – Climate Projections / Uzbekistan (https://climateknowledgeportal.worldbank.org/country/uzbekistan/climate-data-projections)
[13] https://thinkhazard.org/en/report/261-uzbekistan/EH

1) **Increased temperature / extreme heat (heat waves):**

i Both Project regions are characterized by rather high mean and summer temperatures. For Uzbekistan as a whole, the average annual temperature increased by 0.13°C for the decade between 1901 and 2018, with a significantly higher increase of about 0.51°C for the decade from 1983 to 2018.

ii In recent years, an increase in the number of significant positive temperature anomalies (relative to the norm for the period 1961-1990) has been observed throughout the territory of Uzbekistan, and the highest increase in the number of "heat waves" days was observed in the Project regions[14]. Further increase in average annual temperatures are expected for the coming 25 and 50 years: 1.8 to 3.3°C by 2050 and 2.0 to 5.4°C by 2085.

iii The sensitivity analysis revealed that the Project components affected by this climate hazard are as follows:

- Road structure / sections (paved surface and sub-surface): High temperatures can cause softening of asphalt concrete pavement resulting in rutting and shoving. If high temperatures are accompanied by drought, asphalt concrete pavement can crack becoming more vulnerable to raining water. Sensitivity of the pavement depends on asphalt binder threshold to temperatures; the binder may exhibit sensitivity if above 42°C especially combined with high truck traffic.
- Bridges across the rivers and road: The same sensitivities as of road pavement; increasing health risks for the workers providing maintenance.
- Operation and maintenance: High temperatures increase health and safety risk and engine and equipment heat stress for road maintenance and vehicles operation (OFSM, 2002). The risk and stress begin from around 30°C and become more critical at 40-43°C.

2) **Heavy precipitation, and resulting inland flooding driven by precipitation (applicable for specific locations):**

i The territory of both Project regions is quite arid, with an average annual rainfall of 60 to 150 mm, which falls mainly in winter and spring with very limited precipitation between July and September.

ii Although have been some spatial differences in precipitation trends in Uzbekistan, annual precipitation is expected to moderately increase in the Project regions. The most prominent increase is assumed to be the spring and winter months, while precipitation in dry and hot summer months will not change or will slightly decrease. Overall, both the frequency of heavy rains and intensity of rainfall events is expected for the country, i.e. by 2085 rainfall intensity will increase by 7-23%, and frequency of heavy rains by 12-74%. Therefore, one may expect an increase in the frequency of inland flooding events, especially in areas close to rivers in cold months.

- Road structure / sections (paved surface and sub-surface): Heavy rain and flooding can erode paved road surface, including worsening already existing damages. Rainwater can leak in under the pavement and damage the

[14] Third National Communication of the Republic of Uzbekistan to the UN Framework Convention on Climate Change. Tashkent. 2016. Figure 4.9. https://unfccc.int/sites/default/files/resource/TNC_Uzbekistan_under_UNFCCC_rus.pdf

subgrade. Some of the damages from moisture are pavement deformations and cracking. The sensitivity of pavement depends on the pavement structure (thickness of bituminous layer). Cumulative effect appears if damages from high temperatures and heavy traffic loads are accelerated by heavy precipitation. Also, there might be possible impacts derived from debris accumulation and sedimentation that might cause structural damage.

- Bridges across the rivers and road: Heavy precipitation can increase the flow velocity and flow depth of a stream or river resulting in bridge local erosion (scour).
- Operation and maintenance: Safety risk increases due to impairing visibility and the likelihood of sliding.

Step 2, Climate adaptation measures:

6. The Project incorporates measures (structural and operational) tackling the climate hazards found (on the CRVA) as likely to materially affect the Project such as temperature increase/heatwaves, higher precipitation and flooding. These measures have been discussed with the Client and its incorporation on the Project will be enforced through its inclusion in the tender documents and on the TOR of the Supervision Consultant. The whole list of measures is as follows:

Climate Hazard	**Measures**
Increased temperature and extreme heat (heat waves)	Structural: • Using high-grade heat/water resistant asphalt to avoid excessive softening and cracking. • Developing green protective belts along the roads to reduce road heating (by shading and reduced evaporation). • Constructing stops, equipping the stops with shading and cooling devices (at least, in the settlements). Operational: • Restricting heavy trucks traffic during days with temperatures excessing asphalt binder thresholds. • Providing meteorological announcements to drivers via the Internet and communication means. • Restricting the road maintenance and traffic on the days with very high temperatures. • Installing information signs and boards along the roads with recommendations on how to operate at high temperatures.

Heavy precipitation, and inland flooding driven by precipitation	Structural: • Designing and constructing systems of drainage ditches and culverts with a capacity sufficient to sustain the expected heavy rainfalls and flooding, maintaining the road drainage systems in good condition. • Designing bridge structures, system of culverts and flood defenses with a capacity sufficient to sustain the expected flooding. • Restoring/creating the vegetated areas around bridges to increase water accumulation and storage. • Constructing stops at locations protected from flooding. Operational: • Providing meteorological announcements to drivers via the Internet and communication means. • Restricting road maintenance and traffic on the days with very high rainfall. • Installing information signs and boards along the roads with recommendations on how to operate in case of heavy rainfall flooding.

Step 3, Non-incompatibility with the NDC and other Adaptation Strategies.

7. The Project is not incompatible with the NDC or any other national climate adaptation strategies.

BB2 Conclusion: The Project incorporates measures that tackle the climate hazard 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).

Climate Adaptation Finance

8. The JMDB methodology specifies three criteria that need to be met simultaneously for a project or activity to be considered as adaptation finance. These criteria and the justification for this Project is explained below:

Criteria 1, the climate risk context of the activity or project is clearly set out: Please refer to the CRVA on the BB2 section above.

Criteria 2, a statement is explicitly made for the project to reduce the climate vulnerability and/or to enhance the climate resilience: The Project construction related costs will include climate resilience measures, identified through a thorough climate risk and vulnerability assessment. It is therefore the explicit intent of those activities to reconstruct and rehabilitate road sections that are resilient to the impacts of climate change. The Project has allocated appropriate climate change measures as part of climate adaptation solutions, which are listed in the BB2 section above.

Criteria 3, there must be a logic and direct link between an activity or project and the climate risk context established within the project: As mentioned on the adaptation section above, Climate adaptation measures (that can be considered substantial contributors) have been incorporated into the different Project components.

9. Given that the Project belongs to the climate adaptation type 1 (adapted project) and the measures taken on it (structural and non-structural) listed above, using the AIIB's proportional approach based on the JMDB methodology for tracking climate adaptation finance, we can allocate a 20% climate adaptation finance to the EPC elements on Component 1 financed by AIIB (20% of USD187 million as the sum of sub-components 1.1 and 1.2) equivalent to USD37.4 million or 18.7% of AIIB's finance.

10. As the Project does not have elements qualifying for climate mitigation finance, the total climate finance of the Project would be equivalent to the climate adaptation finance allocated to it (USD37.4 million or 18.7% of AIIB's finance).

Annex 5: Member and Sector Context

Country Context

1. **Country and Macroeconomic Overview.** Uzbekistan is a lower-middle-income country with a population of 36 million which makes it the most populous country in Central Asia. Uzbekistan is landlocked and borders all other countries in Central Asia allowing it to hold a strategic position between Asia and Europe. Uzbekistan's efforts to expand its role in developing international transport corridors and partnering on infrastructure projects with foreign stakeholders have gained fresh momentum. The country has a remarkably high investment rate, around 40% of GDP. Furthermore, the economic impact of the pandemic and the negative spillovers from geopolitical tensions has been less than feared, with positive growth in 2020, a strong rebound 2021, and robust growth (around 6%) in 2022 and 2023, thanks to better domestic and external economic environment, strong fiscal support and strong remittances.

2. **Green Agenda.** Between 2016 and 2021, Uzbekistan made significant strides in advancing its green agenda, focusing on improving vehicle emission standards, setting more ambitious environmental goals, and developing a new pollution control system and a national green taxonomy. The high levels of CO2 emissions relative to economic output highlight the need for significant improvements in energy efficiency. Electricity and heat generation in Uzbekistan are still heavily reliant on natural gas, with renewable energy use remaining minimal. However, the government has intensified its efforts to develop alternative energy sources. Preliminary data indicate a substantial increase in electricity generated by solar plants (from 49 million kwh in 2021 to 445.7 million kwh in 2022). The Government also unveiled ambitious renewable energy investment plans for 2022 and beyond and adopted a Long-term Carbon Plan (LCP) for the power sector.

3. **Economic Reform Program.** Uzbekistan has undertaken extensive reforms in recent years, liberalizing various sectors of the economy and enhancing opportunities for private sector development. Since 2016, the private sector's presence in the Uzbek economy has grown, evidenced by the tripling of private sector credit as a share of GDP. However, large state-owned enterprises (SOEs) and state-owned banks (SOBs) still account for over 50% of GDP. Important reforms in the energy sector have also been introduced such as higher electricity and gas tariffs for businesses in 2023 and these have been expanded to households in May 2024. They aim to almost reach cost recovery by 2027.

4. **Poverty and Employment.** The population in Uzbekistan is young with almost 90% at or below working age and the labor force is growing at about 1.2% annually. Hence, continued reform and skill development efforts are needed to support job creation. Furthermore, the unemployment rate fell to 8.1% in 2023, down from 8.9% in 2022. Average real wages increased by 7.8% in 2023, driven by both rising demand and skills shortages in the labor market. However, this wage growth was more pronounced among skilled (and wealthier) workers than among the poor, leading to increased income inequality.[15] At the same time, robust real wage growth has helped reduce poverty from 5.0% in 2022 to 4.5% in 2023.[16]

[15] https://openknowledge.worldbank.org/entities/publication/59eecf1d-3f8b-4eb8-b065-dc4acc624dd2
[16] Measured at the lower-middle-income poverty line (USD3.65/day, 2017 PPP).

Sector Context

5. The Government of Uzbekistan had developed the Rural Road Strategy 2035 which prioritizes the response to the lack of all-season rural roads in the country. Uzbekistan considers that addressing the conditions of the rural roads is the key to addressing rural poverty and inequalities in the country. The Strategy aims to improve people's access to health services, education, employment opportunities, markets, and other facilities limited by the existing condition of rural roads by improving the conditions of the existing road network.

6. A core rural road network (CRRN) will be identified for each region and district to establish the minimum rural road network required to connect rural settlements to international and state roads. The estimated CRRN required to connect all rural settlements is approximately 36,000 km in total length, 12,000 km of this are inter-farm rural CRRN. With the CRRN, rural settlements will have better access to services and facilities in nearby town and cities. Uzbekistan targets that by 2035, 85% of all rural settlements in each region will have access and connectivity to maintainable all-season road.

7. **Rural Road Network.** The Cabinet of Ministers holds the overall responsibility for the road network, including registration of public roads. The public road network is managed by the RC, a specialized authorized body under the MOT. Meanwhile, local authorities oversee the management of inter-farm rural roads. There is a total length of 24,000 km for local roads, 93% are paved surface, 72% are categorized as category IV or higher. Inter-rural roads make up a larger network with a total of 116,000 and a total length of 140,000 km, 67% of which are unpaved with the lowest technical classification of category V for the entire network. The inter-farm rural roads condition requires 42% of the total rehabilitation. The average length of these roads is 1.2 km. The access level of rural settlements varies from one region to another, where the Republic of Karakalpakstan, Kashkadarya, Khorezm and Surkhandarya have less than 40% connectivity through inter-farm rural roads. A large portion of the unpaved roads require rehabilitation and lacks winter maintenance that severely limits the access to settlements in the region resulting in physical isolation during some parts of the year when the roads are unpassable.

8. **Standardization and Maintenance.** The Rural Road Strategy 2035 aims to provide usable road access all-season, requiring upgrading of surface materials from basic earth or gravel road to an improved paved standard. Under the Strategy, the roads will be designed to be climate resilient and consider various climate vulnerabilities including flood risk, erosion risk, rainfall, drought, extreme temperature, etc. Appropriate designs will be applied to find balance between construction cost, maintenance, and repairability. All CRRN roads will have a system of regular maintenance and repair including comprehensive repairs that will be carried out after 5 years of performance-based maintenance. All CRRN roads are constructed to a minimum category V road, which is a single lane, 4.5 meter width road.

9. **Rural Road Financing.** The State provides 82% of the required budget for financing of rural roads, 12% of the required funding comes from regional and district level allocation. Total rural road financing over the past 5 years averaged UZS2,195 billion per year, most of the financing are dedicated to repairs (83%) and 16% is dedicated for upgrading, the remaining allocation (1%) is dedicated to maintenance.[17] The financing priority is targeted

[17] ADB 2022 Republic of Uzbekistan Rural Road Strategy 2035

towards CRRN roads with the goal of connecting rural settlements and their population by all-season roads at the shortest timeframe possible and allocating funding towards maintenance to ensure all-season standards of roads.

Annex 6: Gender Equality

1. The Bank intends to improve the quality and impact of its investments by incorporating gender considerations into projects. It is thus important to capture the potential ways the Project may address gender inequalities within its scope. This analysis is conducted in accordance with the Bank's Guideline on the Gender Equality Annex (GEA) for Transport Projects:

A. Gender Assessment (GA):

2. Uzbekistan's performance on global gender indices provides an important context for understanding the existing gender disparities. According to the Gender Development Index (GDI), the country's progress towards closing gender gaps has been slow, with disparities in education, health, and income. The Gender Inequality Index (GII) reflects similar trends, showing gaps in labor market participation, reproductive health, and empowerment. Women in Uzbekistan, especially in rural regions, continue to face barriers to accessing education, employment, and healthcare, which hinders their overall development. According to the UNDP, Uzbekistan has a GII score of 0.287 and ranks 64th out of 191 countries[18]. This relatively low GII score reflects notable progress in areas such as reproductive health and educational attainment. However, significant gender disparities remain in political representation and labor force participation. Uzbekistan's GDI value is 0.937, which measures gender disparities in human development across dimensions such as health, education, and income[19]. This score suggests that although Uzbekistan is making progress, women still face inequalities in income and labor market participation, especially in rural areas. According to the 2022 Global Gender Gap Report by the World Economic Forum, Uzbekistan ranks 123rd out of 146 countries, with a GII score of 0.659[20]. While Uzbekistan has made strides in educational attainment, it continues to lag in economic participation and political empowerment.

3. Uzbekistan has made substantial progress in recent years through various reforms aimed at promoting gender equality, ensuring women's rights, and increasing their representation in political and economic spheres. One significant milestone is the Gender Equality Strategy 2022-2030[21], which sets the foundation for increasing women's participation across all sectors of society. Key legislative reforms include:

i The President's Decree (March 2022) introduced a national program to increase the role of women in the economy and social life between 2022-2026[22]. This program includes measures to ensure that women from socially vulnerable groups receive access to education and employment opportunities, such as allocating a 4% quota for women from low-income families to study at higher educational institutions[23].

[18] https://hdr.undp.org/data-center/thematic-composite-indices/gender-inequality-index#/indicies/GII
[19] https://hdr.undp.org/gender-development-index#/indicies/GDI
[20] https://www.weforum.org/publications/global-gender-gap-report-2022/
[21] https://saylov.uz/en/gender-equality/national-legislation_in/strategy-for-achieving-gender-equality-in-the-republic-of-uzbekistan-until-2030#:~:text=STRATEGY%20FOR%20ACHIEVING%20GENDER%20EQUALITY%20IN%20THE%20REPUBLIC%20OF%20UZBEKISTAN%20UNTIL%202030&text=The%20main%20goal%20of%20the,beliefs%2C%20personal%20and%20social%20status.
[22] https://www.worldbank.org/en/country/uzbekistan/publication/country-gender-assessment-2024
[23] https://www.eureporter.co/world/uzbekistan/2023/03/20/gender-equality-strategy-serves-stability-and-growth-in-uzbekistan/

ii In April 2023, a new law against gender-based violence was adopted. This law criminalizes domestic violence, including economic and psychological abuse, and strengthens protection for victims. It introduces harsher penalties for crimes like sexual harassment and stalking, and it allows courts to issue protection orders for up to one year[24].

iii In the realm of labor laws, restrictions preventing women from working in specific sectors were lifted, allowing greater access to jobs in areas traditionally restricted to men. Maternity leave benefits have also been extended to account for six years of service for women, thus improving job security during pregnancy[25].

4. However, challenges remain in terms of enforcement, particularly in rural areas where women still struggle to access formal employment and social benefits. Ongoing reforms aim to address these gaps by creating more inclusive systems for women's protection and economic participation.

B. Gender Action Plan (GAP):

5. The ES Consultant has prepared a framework GAP that will include a set of specific activities that will be executed to improve the Project's gender equality outcome in respect to the identified addressable gender inequalities. These activities will be organized around the three common project phases: engagement, engineering design, and construction.

i Engagement: Related activities will be proposed in the GAP to ensure that the stakeholder engagement process considers the opinions of all relevant gender groups.

ii Engineering design: The design of each sub-project will include gender-responsive and socially inclusive infrastructure design features such as solar street lightings to be installed close to villages and townships to improve safety, bus stops with CCTV, solar lights, and accessible ramps to be installed for better public transportation, traffic lights and signs, pedestrian crossing at needed locations, speed bumps and rumble strips for traffic calming.

iii Construction: Key actions will be defined for the construction in the ES Documents and GAP such as creating awareness generation campaigns with well-designed IEC (Information, Education and Communication) material for women, training the staff of the project management unit and other involved stakeholders in gender mainstreaming (GBV, sexual exploitation and abuse (SEA), etc.), organizing Women consultations, provisions Gender specific facilities in worker's camps, entitlements to be received by various categories of project affected people including women and vulnerable groups in the entitlement matrix included RPF.

6. The bidding documents will ensure that civil works contractors include: (i) comply with core labor standards, applicable laws and regulations in Uzbekistan and incorporate applicable workplace occupational safety norms; (ii) do not differentiate payment between men and women for work of equal value; (iii) mitigate potential risks associated with labor and working conditions; (iv) eliminate employment discrimination; (v) allow for freedom of

[24] https://equalitynow.org/news_and_insights/uzbekistans-strides-against-gender-based-violence-strengthened-protections-and-the-path-to-further-reforms/
[25] https://www.eureporter.co/world/uzbekistan/2023/03/20/gender-equality-strategy-serves-stability-and-growth-in-uzbekistan/

association; and (vi) to the extent possible, maximize employment of local people for project construction purposes, provided that the requirements for job and efficiency are adequately met.

C. Gender Indicators (GI):

7. The following gender-related and gender-disaggregated indicators are required to be monitored and reported as project indicators:

- Number of Project beneficiaries with improved climate-resilient road access to markets, schools and health facilities in selected districts in Project-financed areas (gender disaggregated).
- Number of women participated in vocational trainings.
- Number of youths trained on climate change and road safety, disaggregated by gender.
- Percentage of women and youth surveyed among communities are satisfied with the improvement of Project roads.

8. The purpose of this GEA is to improve the Project's design and impact on its stakeholder gender groups. It is not intended to diagnose preexisting gender inequalities within the country or sector, nor is it designed to address broader national or societal challenges.

Annex 7: Country Credit Fact Sheet

1. **Background**. Uzbekistan is a lower-middle-income country with income per capita of around USD2,600 (around USD11,000 in purchasing power parity), and population of 36 million. Since 2016, the new Government has pursued a reform agenda to transform Uzbekistan from a state-led to a market-based economy. Reforms included introduction of market mechanisms, liberalization of trade and prices, reforms to the tax system, public financial management, privatization of state banks and enterprises, as well as land and agricultural policies.

2. The modernization agenda has made Uzbekistan an attractive destination for investment, both foreign and domestic. The robust growth potential is supported by young and abundant labor supply, macroeconomic stability, and modest debt levels. Investment rates have been remarkably high, at around 40% of GDP.

3. Growth has been robust, at around 5-6%, driven by investment, industry, construction, and services. Inflation remains high, due to high growth, continued liberalization of prices and the gradual currency depreciation. However, despite high growth, incomes are still comparatively low. The state continues to have a large footprint in the economy, with state enterprises accounting for more than half of the GDP and nearly half of total revenue (43%). Furthermore, state banks control 80% of banking assets.

Key Economic Indicators	2020	2021	2022	2023	2024*	2025*	2026*	2027*
Real GDP growth 1/	2.0	7.4	5.7	6.0	5.4	5.5	5.5	5.5
Inflation (average, in percent) 1/	12.9	10.8	11.4	10.0	10.9	10.3	7.8	5.9
Fiscal balance	-3.3	-4.6	-4.1	-4.6	-3.3	-2.4	-2.5	-2.5
Public debt	37.1	35.3	33.9	36.3	35.7	35.0	33.9	32.8
Gross public financing needs	11.1	7.1	5.0	8.6	7.1	5.7	6.8	5.9
Current account balance	-5.0	-7.0	-3.5	-8.6	-7.6	-7.1	-4.6	-4.7
External debt	56.8	57.6	54.6	61.3	60.9	59.1	..	..
FX reserves (USD billion) 2/	34.9	35.1	35.8	34.6	32.2	..	..	..
Exchange rate, UZS/USD 2/	10,477	10,838	11,225	12,339	12,651	..	..	..

Source: IMF country report No. 24/210 July 2024, country authorities; in percent of GDP, unless indicated otherwise
Notes: 1/ percent change, year-on-year; 2/ data from central bank, most recent as of August 16, 2024

4. **Recent Developments.** Uzbekistan has exhibited remarkable resilience through the shock of the past few years. The economic impact of the pandemic has been less than feared, with positive growth in 2020, and a strong rebound 2021, thanks to better domestic and external economic environment, strong fiscal support and strong remittances.

5. Likewise, negative spillovers from the geopolitical tensions since 2022 have not materialized despite significant exposure to Russia—which is Uzbekistan's top export destination, the second biggest source of imports and a destination for millions of Uzbeks work migrants. The authorities focused on supporting livelihoods and safeguarding macro-economic and financial stability. In addition, the economy has been supported by favorable export prices, increase in nominal wages, further increases in remittances, and an expansionary fiscal stance. Unlike other economies, price pressures have been moderate, with inflation expected to gradually decrease, (10% in 2023), thanks to the easing of global prices and tight monetary policy. Overall, growth in 2022 and 2023 was around 6.0%.

6. **Outlook and Risks.** The negative spillovers from geopolitical tensions continues to create challenges and risks for the Uzbek economy. Other external risks include weaker growth in key trading partners (e.g., China and Russia) and potentially tighter-for-longer global financial conditions. Remittances have already normalized from the high levels.

7. Growth for 2024 is projected at 5.4%, partly driven by strong domestic demand. In the medium term, growth is expected to continue at the potential of around 5-6%. The authorities remain committed to sound macroeconomic management and the reform agenda. Moderate fiscal consolidation is expected, while monetary policy will remain relatively tight, in the face of strong consumption and credit growth, energy price liberalization, and in line with the recently adopted inflation targeting regime.

8. Uzbekistan's debt remains sustainable. Public debt has increased rapidly in the past years, to around 36% of GDP in 2023, due to externally financed investment projects and the impact of the covid pandemic. However, debt is low by peer standards and on a downward trend with growth and fiscal prudence. Total external debt has grown in parallel to 61%, but risks are mitigated by the long maturity of external debt and its concessional nature (90%). The predominantly state-owned financial system is stable, with adequate capitalization, strong liquidity, and generally low non-performing loans. The strong increase in investments also led to a rise in the current account deficit, as imports of machinery and equipment surged. This increase was mainly driven by temporary factors and the deficit is expected to gradually decrease and reach the current account norm of about 5% of GDP.

9. Key risks to the debt profile are a potential devaluation (due to high dollarization) and the volatile commodity prices. These are mitigated by a positive growth outlook, ample fiscal space, and substantial reserves (close to nine months of imports). To reinforce debt sustainability, the Government has recently introduced a set of fiscal rules, including an external borrowing limit, a debt ceiling of 60% of GDP and a budget deficit target of 3% of GDP.

10. Uzbekistan's creditworthiness has been sustained through the recent shocks. S&P and Fitch have affirmed Uzbekistan's sovereign credit rating at BB- and Moody's has recently upgraded Uzbekistan from B1 to Ba3. All three rating agencies have kept the outlook stable and appreciate the gradual progress with key structural reforms.

11. Longer-term growth requires progress on the reform agenda. However, the more complex and sensitive reforms, such as privatization or competition, are still in the early stages or yet to be implemented. A banking sector reform was initiated in October 2019, and the Law on Competition became effective in October 2023. A comprehensive privatization program is to be undertaken by 2025, with some progress already achieved. Monopolies in the energy sector are being unbundled and the creation of an independent energy regulator was recently announced. Additionally, plans for unbundling the railway sector have been revealed. Reform fatigue in the face of opposition from vested interest or potential social discontent remain key risks.

12. Ultimately, given large and growing working-age population, creating more and better jobs is the country's overarching priority. That will depend on the conducive environment for private-sector-led growth, better institutions, and improved infrastructure.