



**ASIAN INFRASTRUCTURE
INVESTMENT BANK**

Sovereign-backed Financing

Approval Project Document

P000309 Republic of Tajikistan: Obigarm-Nurobod Road Project – Long Bridge and Approaches

Currency Equivalents
(As of November 13, 2023)

Currency Unit – TJS
TJS1.00 = USD0.091 = RMB 0.663
USD1.00 = TJS10.96 = RMB 7.291

Borrower's Fiscal year
January 1 – December 31

Abbreviations

ADB	Asian Development Bank
ADT	Average Daily Traffic
AiIB	Asian Infrastructure Investment Bank
BB	Building Block
CAREC	Central Asia Regional Economic Cooperation
CEP	Committee for Environmental Protection
CRA	Climate Risk and Adaptation Assessment
CSC	Construction Supervision Consultancy
CWC	Civil Works Contract
DB	Design-Build
EBRD	European Bank for Reconstruction and Development
E&S	Environmental and Social
EIRR	Economic Internal Rate of Return
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESP	Environmental and Social Policy
FM	Financial Management
GDP	Gross Domestic Product
GoT	Government of Tajikistan
GRM	Grievance Redress Mechanism
HPP	hydroelectric Power Plant
IFI	International Financial Institution
IMF	International Monetary Fund
IRI	International Roughness Index
IUFR	Interim Unaudited Financial Report
JICA	Japan International Cooperation Agency
MDB	Multilateral Development Bank
MOF	Ministry of Finance
MOT	Ministry of Transport
NCBP	Non-Concessional Borrowing Policy
NPV	Net Present Value
OFID	OPEC Fund for International Development
OHS	Occupational Health and Safety
OPEC	Organization of Petroleum Exporting Countries

O&M	Operation and Maintenance
PD	Project Document
PIU	Project Implementation Unit
PIURR	Project Implementation Unit for Roads Rehabilitation
PMT	Project Management Team
POM	Project Operation Manual
PP	Procurement Plan
PPM	Project-affected People's Mechanism
PPSF	Project Preparation Special Fund
PSC	Pre-Stressed Concrete
RMB	Chinese Renminbi
RMF	Results Monitoring Framework
VOC	Vehicle Operating Costs

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1. Summary Sheet

Project No.	P000309
Project Name	Obigarm-Nurobod Road Project – Long Bridge and Approaches
AIIB Member	Tajikistan
Borrower	Republic of Tajikistan
Project Implementation Entity	Project Implementation Unit for Rehabilitation of Roads under the Ministry of Transport (PIURR)
Sector Subsector	Transport Roads
Alignment with AIIB's thematic priorities	Connectivity and Regional Cooperation
Project Objective	To improve connectivity along the Obigarm–Nurobod section of M41 Highway by constructing a long bridge and its approaches.
Project Description	<p>The proposed Project will construct a 920-meter bridge and its approaches (the Long Bridge) on Obigarm–Nurobod section of M41 Highway to replace the existing segment that will be submerged by the Rogun dam reservoir.</p> <p>The alignment replacement will ensure continued connectivity along a vital transport corridor in Tajikistan that connects central part of the country with northeast and border to the Kyrgyz Republic.</p> <p>The Obigarm–Nurobod section of M41 Highway (75km) is referred to as the Overall Project, which has been divided into three sections:</p> <p>(i) The Obigarm–Tagikamar section is about 30-km long financed by ADB and OFID; it is hereinafter referred to as Section 1;</p> <p>(ii) The Tagikamar–Nurobod section is about 44km long financed by the EBRD; it is hereinafter referred to as Section 2; and</p> <p>(iii) The 920-meter-long bridge and its approaches will be financed by AIIB; it is hereinafter referred to as Section 3 or the Overall Project.</p>
Implementation Period	Bridge construction start date: September 2024 Bridge construction end date: August 2028 Maintenance period: 2 years after completion
Expected Loan Closing Date	December 2030
Proposed Amount of AIIB Financing	RMB 536,400,000 (approximately USD75.50 million equivalent)
Financing Plan	Total Project Cost: USD80.58 million

	AIIB will provide a standalone loan of RMB 536,400,000 (approximately USD75.50 million equivalent). Contribution of the Government of Tajikistan (GoT): USD5.08 million
ES Category	A
ES Category Comments	Given the Project's activities, location, and potential risks, the Project is rated as Category A project.
Risk (Low/Medium/High)	High
Conditions of Effectiveness	(i) Establishment of an operational Project Management Team (PMT) that hires key staff/consultants required by the Bank. The TORs and recruitment evaluation reports shall be cleared by the Bank before any contract obligations are raised; and (ii) Adoption of a Project Operation Manual prepared by PIURR to guide the project implementation.
Key Covenants	(i) Furnish to AIIB, every six months, a semi-annual Project Progress Report and Project Environmental and Social Monitoring Report. (ii) The Borrower through MOT and PIURR shall ensure civil works for the construction of the long bridge are carried out only in dry land environment and no water reaches the location of piers during construction, otherwise the ESIA shall be revised, in the form and substance satisfactory to the Bank. (iii) complete the automation of project accounting either through existing accounting software (1C) or separately procured accounting software for the Project in a manner acceptable to the Bank not later than three (3) months after the Effectiveness Date. (iv) A sustainable funding mechanism of project maintenance shall be agreed with AIIB no later than 6 calendar months before the Project bridge and approach roads are open to traffic.
Conditions for Disbursement	N/A
Retroactive Financing (Loan % and dates)	Up to 20 percent of the loan amount, for expenditures incurred and paid for no earlier than 12 months prior to the expected signing date.
Policy Waivers Requested	No
Policy Assurance	The Vice President, Policy and Strategy, confirms an overall assurance that the proposed Bank Financing complies with the applicable Bank operational policies.

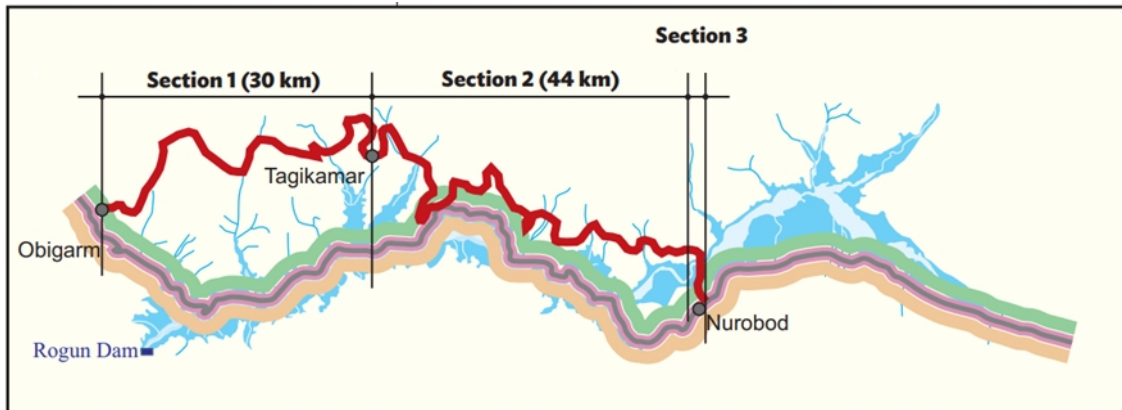
Economic Capital Consumption (USDm) (ECap)	ECap amount: USD30.53 million ECap ratio: 51.23%
President	Liqun Jin
Vice President	Konstantin Limitovskiy
Acting Director General	Gregory Liu
Team Leader	Runze Yu, Investment Operations Specialist – Transport
Back-up Team Leader	Komron Rajabiyon, Investment Associate
Team Members	Gulru Azamova, Senior Social Development Specialist Yunlong Liu, Senior Procurement Specialist Shodi Nazarov, Financial Management Specialist David Rollinson, Senior Environmental Specialist Liu Yang, Counsel Yanyang Shi, Admin Assistant

2. Project Description

A. Project Overview

1. **Project Objective.** To improve connectivity along the Obigarm–Nurobod section of M41 Highway by constructing a long bridge and its approaches.
2. **Project Description.** The M41 Highway, commonly known as the Pamir Highway, holds profound significance for Tajikistan as a critical cross border route connecting various Central Asian countries. Spanning approximately 1,200 kilometers through the rugged landscapes of Tajikistan, the M41 traverses the Pamir Mountains, linking the capital city of Dushanbe to the eastern town of Murghab and further extending to the border with Kyrgyz Republic. As part of Central Asia Regional Economic Cooperation (CAREC) Corridors 2, 3, and 5, the road is strategically important for enhancing economic cooperation, promoting tourism, and strengthening ties across the Central Asian region.
3. It is expected that the 75km section between Obigarm and Nurobod of M41 Highway located in central part of Tajikistan will be inundated by the reservoir of the Rogun Hydropower Project (Rogun HPP). The proposed bridge and its approaches (the Project) are part of alternative alignment to be constructed to replace the submerging 75 km section between Obigarm and Nurobod of the M41 Highway (the Overall Project).
4. The Overall Project is divided into three sections:
 - a) *Section 1: Obigarm to Tagikamar.* It is approximately 30km long and includes six bridges, two tunnels and 30km of local access roads. Section 1 is funded by the Asian Development Bank (ADB), through a USD110 million grant and by the OPEC Fund for International Development (OFID) through a USD40 million loan. Section 1 construction is in progress.
 - b) *Section 2: Tagikamar to Nurobod.* It is approximately 44km long and includes seven bridges, one tunnel, 40km local access roads, and a temporary bridge over the Surkhob River. It is funded by the European Bank for Reconstruction and Development (EBRD), through a USD150 million loan. Section 2 construction is in progress.
 - c) *Section 3: Bridge over Rogun Reservoir and its approaches (the Project).* It includes the construction of the 920-metre-long permanent bridge over the Rogun Reservoir at Darband town over the Surkhob River, as well as approximately 600 meters of bridge approaches connecting the northeast and central parts of Tajikistan. The Project is located within Section 2 site. The Asian Infrastructure Investment Bank (AIIB) will finance the Project through a loan in amount of RMB 536,400,00 (approximately USD75.5 million). Figure 1 illustrates the schematic sectioning of the Overall Project.

Figure 1. Schematic Illustration of Sectioning of the Overall Project



5. The bridge will connect two banks of the reservoir when the Rogun HPP is filled to the Nominal Maximum Operating Level of 1290 meters above mean sea level (masl). Consequently, the construction of the bridge passage will be elevated to more than 100 meters from the Surkhob riverbed, currently situated at 1,186 masl. The bridge will be the longest bridge at such elevation in the Republic of Tajikistan.

6. The bridge site, located in a remote mountainous area, faces challenges such as complex geological and tectonic structures, high seismic activity (up to grade 7 on the Richter scale), massive land erosions, natural material movements, and intense rock falls. These natural phenomena pose significant technical challenges and cost implications for planning and designing the Long Bridge.

7. Due to the technical complexity and novelty of the Project, the Ministry of Finance (MOF) of the Republic of Tajikistan requested AIIB in June 2019 to allocate a grant from the Project Preparation Special Fund (PPSF) for project preparation. The Grant Agreement between AIIB and the Republic of Tajikistan came into force in July 2020, marking the start of project preparatory activities. The grant supports feasibility studies, preliminary design, preparation of tender documents for the main civil works, addendum to environmental and social impact studies, individual consultants for technical support, and capacity building. Implementation of the PPSF Grant is on track and set to conclude in 2024. The Grant has proven to be effective in facilitating a comprehensive examination of project delivery strategy and empowering informed decisions regarding the bridge option.

8. **Expected Results.** The Project's results are expected to be achieved by the completion of the Overall Project. Therefore, the outcome level results will be measured by the following indicators:

- 1) Number of beneficiaries of improved transport connectivity (Annual Average Daily Traffic);
- 2) Improved connectivity (travel time saving along the road); and
- 3) Improved safety (reduction of road death and injuries per 100 million vehicle-km of travel on the overall project road).

9. The detailed Results Monitoring Framework (RMF) is included in Annex 1. Progress against indicators of the RMF will be monitored by AIIB during implementation to confirm that the Project is progressing towards the Project Objective.

10. **Expected Beneficiaries.** The M41 Highway holds strategic significance for Tajikistan, serving as the only gateway to the northeastern region of the country. The new road and the bridge are poised to directly benefit about 350,000 residents across five districts of the Region of Republican Subordination, establishing a crucial link between this mountainous area and the central part of Tajikistan.

11. The Overall Project extends its benefits also to the local population residing along the road. Key advantages for these communities encompass reduced travel times, lower transportation costs, access to an upgraded highway that replaces the inundated road near the Rogun Dam Reservoir, improved connectivity to social infrastructure and economic hubs, and the establishment of enhanced climate-resilient infrastructure.

12. The Overall Project will provide improved access to educational facilities for students living in remote areas, leading to increased enrollment and improved educational outcomes. Improved transportation links can facilitate better access to healthcare facilities, allowing residents in remote areas to reach hospitals or clinics more easily in cases of medical emergencies or for routine healthcare needs.

13. The Overall Project extends its benefits to the tourism sector, benefiting local businesses, hospitality services, and tour operators by attracting visitors to explore the scenic beauty of the future reservoir, the bridge's surroundings, and the cultural heritage of the northeastern region. Additionally, the agricultural sector will gain from increased market access for its products.

14. Recognizing the disproportionate impact on women due to limited access to healthcare, education, and economic facilities, the Overall Project aims to empower women as key beneficiaries. This will be achieved through the implementation of an entrepreneurship program tailored to address the identified skill needs.

15. Lastly, the Overall Project is designed to provide substantial benefits to public and private sector stakeholders within the road transport industry. Capacity building initiatives and sector support activities are integral components of the Project, ensuring positive outcomes for both public and private entities involved in the road transport sector.

B. Rationale

16. **Strategic Fit for AIIB.** The proposed Project is aligned with the AIIB Thematic Priority of *Connectivity and Regional Cooperation*. The Project plays a significant role in sustaining the connection throughout the M41 Highway. It contributes to linking Tajikistan with the Kyrgyz Republic and forms the shortest corridor to China, establishing an important regional cross-border artery and ensuring continued connectivity along a vital East-West transport corridor. The Project is aligned with Green Infrastructure Thematic Priority as it entails adaptation finance elements.

17. The proposed Project also closely aligned with the Bank's *Transport Sector Strategy* as it neatly matches the key priorities for transport sector investments on bolstering trunk linkages, cross-border connectivity and infrastructure upgrade. In line with the *Strategy*, the Project's components contribute to the enhanced and universal access to the improved infrastructure financed by AIIB. The Project is an example of

AIIB's strategic cooperation with other development partners in early needs identification in CAREC zone and adding value along the project cycle as set out in para 3.7. of the *Transport Sector Strategy*.

18. AIIB's early involvement in project preparation aligns with *AIIB's Mission 2030 Pillar 3: Adding value along the project cycle*. AIIB has proactively involved and added value in every stage of the project cycle. It has started with early-stage engagement on project identification together with other financiers, provided technical and financial support in project preparation and will provide financing to the project implementation and 2-year maintenance of the bridge.

19. **Paris Alignment.** The Project is aligned with the goals of the Paris Agreement Alignment. Based on the "Joint MDB Assessment Framework for Paris Alignment for Direct Investment Operations" and the AIIB Paris Alignment methodology, the mitigation dimension of projects (labeled as Building Block 1 or BB1) and the adaptation dimension of projects (labeled as BB2) need to be considered to determine whether the Project is "Paris-aligned." As the Project builds the new road and the bridge to substitute the inundated highway and will upgrade the existing alignment, maintaining the same category road with 2 lanes, thereby not adding new capacity to the current route. The Project is universally aligned with BB1. In addition, climate adaptation and resilience measures to address the climate risks were identified to be included in the bridge design; hence, the project is aligned with BB2. The PT also confirms consistency of the Project with the national policies for climate resilience of Tajikistan. Further details of the Paris Agreement Alignment analysis are presented in Annex 6.

20. **Value Addition by AIIB.** The Project brings significant value to the country by providing the only road connection for around 350,000 people in the northeastern region to the remaining part of Tajikistan.

21. The proposed Loan represents a logical continuation of AIIB's upstream involvement in this technically complex Project, which the Bank initiated and developed since 2019. The Bank has demonstrated responsiveness to the Government, actively contributing to each step of informed decision-making for this significant undertaking. AIIB has played a vital role in building capacity and providing necessary technical expertise to the Client through the AIIB PPSF Grant for the comprehensive preparation of this major infrastructure.

22. The activities under the grant supported the preparation of feasibility studies, bridge options study, and preliminary designs, with the objective of applying internationally recognized procurement procedures to mitigate risks associated with civil works, environmental and social aspects. Through the studies, the Bank has added value by bringing the Project to its high level of preparedness.

23. The grant served as a valuable resource to facilitate strategizing the project implementation. Initially, the bridge was planned to be delivered through the traditional Design-Bid-Build approach, requiring the development of a detailed design as the foundation for a tender process. This approach would have placed all design risks on the employer. In March 2021, the Ministry of Transport requested AIIB to transition to a Design-Build (DB) approach which would transfer a significant portion of detailed design risks to the contractors. Since the new approach was offering a balanced distribution of

risks and ensuring efficient implementation, the Bank has supported the Client's request despite the fact that it has led to relaunch of the ongoing design consultant's procurement process, which was already at an advanced stage.

24. The grant also empowered the Client to make informed decisions regarding the bridge option. Being the first bridge of its kind in the country, the Government exercised caution in evaluating various bridge options with due consideration to different factors, including construction cost, aesthetics, resilience to climate and seismic impacts, and maintenance expenses. As the design works progressed, the grant supported two study tours to bridge sites and prepared 3D physical models of each type of the bridge.

25. **Value Addition to AIIB.** Through the Project, AIIB will gain experience in the design and construction of a bridge located in a mountainous and hazardous area, which is in a high seismic zone. The Project will also strengthen partnership with OFID, EBRD and ADB through parallel financing.

26. The Project marks a significant milestone as it will be the first bridge financed by AIIB through the utilization of the Design-Build Contract (2017 FIDIC Yellow Book, 2nd Edition). Collaborating with the Client, the Project Team has learned that Design-Build practices vary significantly between developed and emerging economies. This pioneering experience deepens AIIB team's understanding of applying Design-Build modalities across other developing countries in the region: preliminary designs need to be in good depth due to rigorous requirements for design approval by state expertise institutes and budget constraints for public spending, aiming to minimize the premium for shifting design risks.

27. **Lessons Learnt.** The proposed Project represents AIIB's second intervention in the road sector of Tajikistan with the same implementing agency. Notably, the previous Dushanbe-Uzbek Border Road Improvement Project (P000002) stands as the second-ever approved project by AIIB. Valuable lessons learnt from this co-financed with EBRD operation underscored the importance of considerate management and full adherence to Occupational Health and Safety (OHS) requirements. Additionally, implementing advanced disbursement methods to maintain positive cash flow for the contractor proved crucial. Both lessons have been duly considered and will be incorporated into the project implementation arrangement.

28. The Project has incorporated lessons gleaned from the challenges encountered in Section 1 and Section 2 of the same project, which experienced multiple scope and cost variations during the implementation stage. To mitigate such risks as well risks associated with detailed design, the Design-Build approach will be implemented. This approach offers a single point of responsibility, integrating detailed design and construction under one entity, streamlining communication and decision-making. This method often results in faster project delivery, as the design and construction phases overlap, and fosters cost savings through early collaboration and value engineering. Moreover, the Design-Build approach bolsters risk management by allocating greater accountability to the contractor for the project performance, fostering enhanced communication and collaboration right from the Project's inception.

C. Components

29. The following components are proposed to be included in the Project.

30. **Component 1: Construction of the Long Bridge and Its Approaches.** This is the major component of the Project, which includes the following sub-components:

Sub-component 1a: Civil works for construction of long bridge and its road approaches, and maintenance of the long bridge. According to the *Bridge Options and Feasibility Study and the State Expertise Conclusion*, the price estimation for the direct construction cost for this sub-component is USD69.74 million¹. This sub-component includes detailed design development, the works for foundation, sub-structures, super-structures, auxiliary and landscape construction in the adjacent area to the bridge, as well as provisions for independent design review checker, insurance coverage during the construction; and contingencies for inflation and unforeseeable circumstances;

Sub-component 1b: Construction supervision consultancy (CSC) for the works contract. This sub-component will finance the role of Engineer according to the FIDIC Yellow Book 2017 (2nd Edition) to supervise and administer the civil works contract (CWC), as well as monitor the contract's compliance to environmental, social, health and safety requirements.

31. **Component 2: Project Implementation Capacity Strengthening.** This component aims to enhance the capacity of the Project Implementation Unit for Roads Rehabilitation (PIURR) by furnishing it with necessary resources to timely deliver this complex Project in quality. Under this component, the following activities are proposed to be included:

Sub-component 2a: Project implementation support, which will be achieved through hiring experienced individual consultants with expertise in procurement & contract management, bridge engineering, project management, financial management (FM), and environmental and social (E&S).

Sub-component 2b: PMT incremental operational expenses². This sub-component is to cover the operational expenses related to project implementation.

32. **Component 3: Economic Empowerment for Women.** This component will (i) conduct the scoping study and skills needs assessment to identify potential business and livelihood opportunities for women living in the project-affected area of Section 3; (ii) develop women's entrepreneurship program, based on the skills needs assessment, and provide a possible list of participants and selection criteria; (iii) work together with ADB and with the National Committee of Women and Family Affairs, and local authorities to help them to assess potential sources of grants financing women

¹ The prices are shown in USD following the findings of the Feasibility Study. Here and further in the document, the project costs figures should read in RMB equivalent of the provided USD numbers.

² Incremental Operating Expenses means operating expenditures incurred by the PIURR including taxes related to consultants' fees, stationary costs, local travel per diem and allowances, communication costs, advertising, translation and interpretation costs, bank charges and other costs of similar nature.

entrepreneurs. The component will complement the ADB and EBRD gender-focused investments by covering larger group of female beneficiaries and expanding gender activities in the remaining target villages in the road corridor.

Table 1. Project Cost Components³

	Cost, USD m	%	AIB share, USD m	%	GoT share ⁴ , USD m	%
Component 1: Construction of the Long Bridge and Its Approaches	78.27	100%	73.69	94%	4.58	6%
Sub-Component 1a: Civil works for construction of long bridge and its road approaches, and maintenance of the long bridge ⁵	73.67	100%	69.69	93%	3.98	7% ⁶
Sub-component 1b: Construction supervision consultancy for the works contract	4.60	100%	4.00	85%	0.60	15%
Component 2: Project Implementation Capacity Strengthening	2.10	100%	1.60	76%	0.50	24%
Sub-component 2a: Project implementation support	1.55	100%	1.55	100%	0.00	0%
Sub-component 2b: PMT incremental operational expenses	0.55	100%	0.05	9%	0.50	91%
Component 3: Economic Empowerment for Women	0.21	100%	0.21	100%	0.00	0%
TOTAL:	80.58	100%	75.50	92%	5.08	8%

D. Implementation Arrangements

33. **Implementation Period.** The project implementation period is estimated at 4 years for construction works with a subsequent maintenance period of 2 years. The bridge will be constructed in dry conditions, according to the reservoir's water filling schedule.

34. **Implementation Preparedness.** By overseeing the grant implementation, AIIB played a pivotal role in assisting the Client to bring the Project to high quality implementation readiness for financing. With the completion of the *Bridge Options and Feasibility Study Report*, the Design Consultant is now preparing the preliminary design, other technical documents of the selected bridge option, and the tendering package. The prequalification stage of the tender process has been issued. The tender processes for both civil works contractor and CSC are planned to be completed by the time of the loan agreement signing. Moreover, additional ground investigation works will be completed by mid-February 2024 and its findings will be part of the Tender Documents

³ Prices are shown in USD following the findings of the Feasibility Study. The figures should read in RMB equivalent of the provided USD numbers.

⁴ GoT share includes tax exemption and incremental operational expenses of PIURR.

⁵ Sub-component 1a includes: detailed design and civil works contract (CWC) for the bridge and road approaches for USD56,463,478; two year bridge maintenance; provisions for independent design review checker (0.5% of CWC); insurance coverage during the construction (2% of CWC); and contingencies for inflation and unforeseeable circumstances (20% of CWC).

⁶ Taxation of 7% of construction works.

for civil works. Environmental and Social Impact Assessment (ESIA) Addendum was publicly disclosed on December 18, 2023.

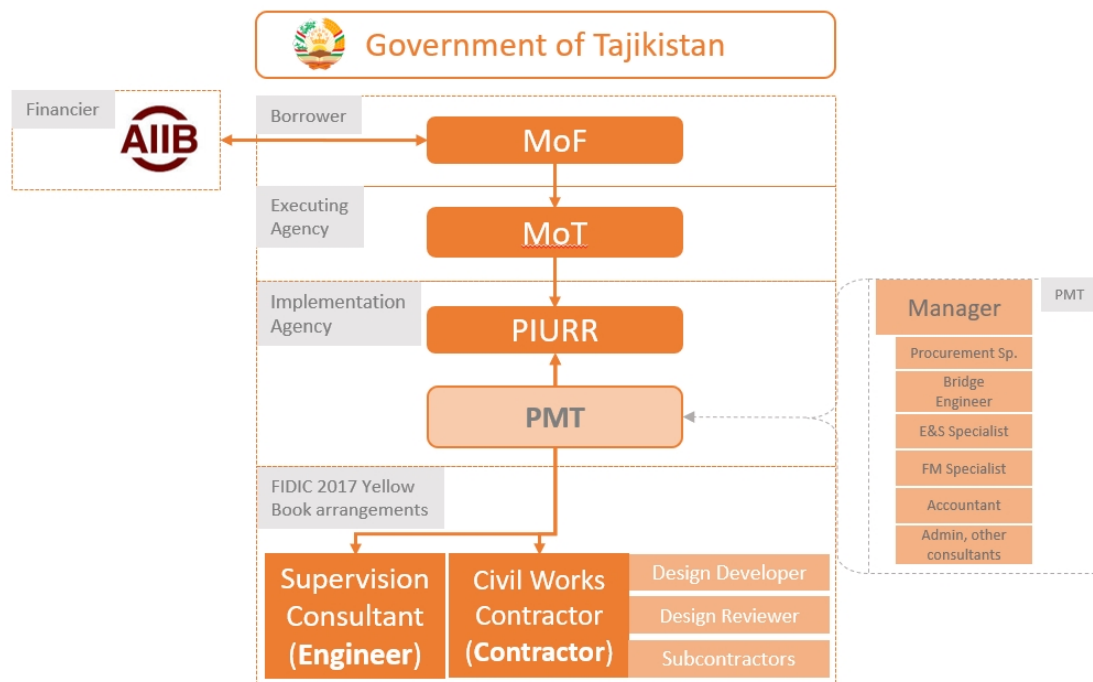
35. **Implementation Arrangements.** The Ministry of Transport will be the Executing Agency and its Project Implementation Unit for Roads Rehabilitation (PIURR) will be the Project Implementing Entity. PIURR will manage the project implementation from its inception to completion. PIURR will be responsible for communication between AIIB, Government, and other relevant parties. PIURR will also be responsible for coordinating the day-to-day project implementation activities through the dedicated Project Management Team (PMT), supported by individual consultants.

36. PIURR has extensive experience in managing and delivering internationally financed projects. This includes projects funded by the ADB and EBRD, as well as successful implementation of AIIB co-financed project P000002: Dushanbe-Uzbekistan Border Road Improvement and S000609 PPSF Obigarm-Nurobod Road Grant Project. PIURR maintains a separate Procurement Department, with experience in the procurement and contracting of major internationally financed works and services contracts.

37. To expedite the implementation of this technically complex bridge project and enhance work quality, a dedicated full-time Project Management Team (PMT) will be hired. This PMT will comprise a mix of international high-caliber experts and skilled national professionals, fully engaged and reporting directly to the Executive Director of PIURR. Figure 2 illustrates the implementation structure for the Project, and Annex 7 provides the matrix of Project Management Roles and Responsibilities.

38. Currently, a dedicated team is actively engaged in project preparation. The approved PPSF Grant has savings that can support early implementation activities. For this Project, these activities encompass the period before both contractors and the supervision consultant are in place, working in tandem with all monitoring functions established. Specifically, this involves, but is not limited to, drafting tender documents, administering the tendering process, evaluating tenders, and managing contracts in the early stages. The Bank team and the Client have concurred to utilize the remaining grant on individual consultant contracts, recognizing their crucial role in successfully conducting preparatory activities during the early stages of project implementation.

Figure 2. Project Implementation Structure



39. **Project Operation Manual (POM).** PIURR should prepare the Project Operation Manual by the loan effectiveness, but not later than three months from the Loan Agreement signing. This document summarizes key aspects of the Project and determines the responsibilities as well as the tools to be applied during the project implementation. The POM is intended to ensure consistency, transparency, and accountability in the application of the project management procedures and will apply during the entire project implementation period.

40. **Financial Management.** PIURR will be responsible for the overall project financial management and disbursement work. The cash basis accounting system will be followed for project accounting. PIURR will maintain project accounts and have custody of supporting documents. The Project’s financial progress will be reported quarterly through Interim Unaudited Financial Reports (IUFRs) to be submitted within 45 days of each quarter’s end. The PIURR will present the Project’s audited financial statements for each year of project implementation within six months following the fiscal year-end.

41. **Procurement Arrangements.** The procurement of goods, works, non-consulting services, and consulting services contracts funded partially or in whole by AIIB under the Project shall be conducted in accordance with the AIIB’s *Procurement Policy* revised on November 22, 2022, as well as its *Interim Operational Directive on Procurement Instructions for Recipients* dated June 2, 2016. As an existing and experienced public entity of the Government of Tajikistan, PIURR will be responsible for the procurement and contract management of the Project with the support of both externally and locally hired technical experts and construction supervision consulting firms.

42. For the implementation of the Project, PIURR has prepared Project Delivery Strategy together with a Procurement Plan (PP) for AIIB's review and comments. Specific procurement arrangements, including contract packaging, cost estimates, procurement methods, procurement timelines and prior review requirements, etc. have been detailed in the draft PP. PP will be further updated regularly or as needed for AIIB's review and no objection during project implementation. PIURR will carry out project procurement in accordance with the specific procurement arrangements of the PP.

43. It was originally envisaged that the bridge would be designed and constructed using a traditional way as Design-Bid-Build, with a detailed design developed by the Client as the basis for tendering of civil works under the FIDIC Conditions of Contract for Construction Red Book. However, due to the specialized technical nature of the Project and to better manage the design risks, the Client has requested to change the course to Design-Build approach, under the FIDIC Conditions of Contract for Design-Build (the Yellow Book, 2017).

44. The procurement of CWC will be carried out by applying a single stage two envelope procedure with Prequalification, modelled on the World Bank's Single-Stage Request for Proposals, after Initial Selection (revised in January 2021), which incorporates the FIDIC Conditions of Contract for Design-Build (2017). The prequalification document has been completed, reviewed, and approved by the Bank team for use. The Prequalification process was launched, while finalization of the Preliminary Design and Tender Documents is ongoing. PIURR is now in the process of preparing the tender document for works based on the sample tender document for Design-Build contract which has been modified by AIIB Project Team on the basis of the World Bank's Standard Bidding Document for Design-Build contract.

45. The Procurement of Construction Supervision Consulting Service Contract will be conducted via International Open Competitive Selection and Quality Cost Based Selection method, using the AIIB Standard Procurement Document for Consulting Services. PIURR has completed the Terms of Reference (TOR), staffing plan and cost estimate of the consultancy services which have been reviewed and accepted by AIIB Project Team. The procurement process will be conducted in due course to cater for the need of the DB contract.

46. Advance procurement may commence before the planned loan agreement signing date.

47. The Bank will carry out regular procurement supervisions of the Project as per the procurement performance as well as conduct procurement prior reviews and post reviews of the procurements as per the PP as updated and concurred by the Bank.

48. **Monitoring and Evaluation.** The PIURR will establish, assisted by the PMT, a project performance monitoring system according to the RMF. Disaggregated data for project objective indicators and intermediate results indicators will be updated and reported annually through the PIURR's annual progress reports. Data for project objective indicators and intermediate results indicators will be collected and analyzed during the project implementation period while data for end targets will be collected and analyzed after one year after the project completion.

49. **AIB's Implementation Support.** To supervise the Project in accordance with AIB's applicable policies and procedure, the Project Team will conduct two supervision missions per year and will hire a high-caliber bridge technical expert to support the implementation oversight.

3. Project Assessment

A. Technical

50. The current M41 section between Obigarm and Nurobod is slated for closure due to the expected increase in reservoir water level. Section 3 is required to be fully completed and open to traffic by latest 2032 when the reservoir water level is projected to rise above the temporary bridge's deck. The temporary bridge, which will be installed as part of Section 2, will serve its purpose until the completion of Section 3, at which point it will be dismantled. The bridge cannot operate without Section 2 finalized.

51. **Bridge Option Study.** The Design Consultant hired under the PPSF Grant has examined three types of the bridges: Box Girder type, Extra-dosed and Cable-stayed bridges. The bridge options were analyzed with due consideration of the findings from the geotechnical, topographic, seismic, wind, hydrological investigations as well as climate resilience analyses, specifically related to the climate and hydrological impact in the greater area of the Project location. Multi-criteria decision making of Analytic Hierarchy Process (AHP) has been used to help making the rational decision on a design plan to proceed with the preliminary design.

52. To address seismic risks, PIURR recruited Tajikistan Institute of Geology, Seismological Construction and Seismology (the Institute) to provide technical support. The Institute conducted seismic deterministic and probabilistic analysis for the return periods of 475, 1000, 2500 and 5000 years, calculated parameters of the seismic actions such as peak ground acceleration and uniform hazard response spectrums. The Design Consultant complemented the seismic studies by eigenvalue analysis assessing the dynamic behavior and the estimation of relative seismic efficiency of the structure. Results of the studies have been duly considered while reviewing the bridge options.

53. The Government has taken a comprehensive and inclusive approach to ensure an informed decision making which included extensive deliberations with all stakeholders involved. As a result of series of wide technical and economical discussions, the State Working Group recommended a Box Girder bridge as the optimal option of choice, considering the lower cost, simplicity of construction, availability, and use of domestic materials during the construction of the bridge. Another important aspect considered by the MOT was relative efficiency in operation and maintenance (O&M).

54. **Project Design.** Following the selection of type of the bridge, PIURR requested an additional detailed geotechnical investigation to define the geological composition of terrain, activity of contemporary geological processes, hydro-geological conditions of terrain and physical-mechanical properties of the soils composing the site of the project bridge and approaches required for Preliminary Design and tendering for the Design, Build and Maintain Works Contract for a safe and sustainable preferred bridge option.

55. The bridge length, initially estimated at 760m during the Concept stage, was extended to 920m based on safety considerations for the embankment on the left side of the river and the abutment, as determined by the results of the Feasibility Study and geotechnical investigations.

56. Subsequently in the Preliminary Design, the Bridge construction works include construction of the 920m long permanent bridge over the Rogun HPP Reservoir at Darband town over the Surkhob River from Km 72+811 to Km 74+292. Total length of Section 3 is about 1,481 meters.

57. The scope of work of the bridge construction includes foundation, sub-structures, super-structures, road, environment, and ancillary works. According to the preliminary design findings, the bridge will have a width of 15.5m with two-lanes road of 3.75m each (2-lane for both directions), 2.0m shoulder, and 1.5m of sidewalks on each side. The bridge will consist of a two side spans of 85m and 5 main spans of 150m each. The bridge will have six main piles, with the tallest one of about 120m height, and two supporting piles at the beginning and the end. The design speed is 60km/h on the bridge section.

58. Certain measures are recommended to be included by the Climate Risk and Adaptation Assessment (CRA) in the preliminary design budget. These measures will be considered in the detailed design by the contractor under the Design-Build approach. Specific climate resilience requirements will be incorporated into the Tender Documentation for civil works.

59. The bridge structure design adheres to the American Association of State Highway and Transportation Officials (AASHTO) code, considering adverse climatic, geological, and site conditions in the project area. Designed for a 100-year lifespan, transient loads will be recalculated for a 100-year service life from 75 years, including considerations for earthquake, wind, fatigue, durability, and the impact of the future reservoir.

B. Economic and Financial Analysis

60. **Economic Analysis.** The proposed Project involves multiple financing agencies to construct a new 75km bypass road. Economic benefits are interdependent across the sections, and the analysis considers the entire 75km road, including the bridge section, as full benefits are expected upon the completion of both the bypass and the bridge.

61. The economic analysis for the Project takes into account the economic analysis conducted by ADB for all three sections of the project in 2019. The economic analysis reflects the up-to-date information, including update of traffic data, recalculation of the Project's costs and benefits and other input data. Full benefits are expected to be realized once the bypass and the bridge are complete.

62. The Project also has components on the enhancement of institutional capacity on project implementation and supports a number of measures to improve women's access to economic opportunities complementing to the ongoing efforts of other development partners in the Overall Project. While these components will have positive

economic and financial impacts, their costs and benefits were not quantified for inclusion in the economic analysis.

63. **Traffic Survey and Forecast.** To identify the current traffic volume and prepare the baseline data for the future traffic estimate, the traffic volume survey was carried out by the survey team in October 2022. The base-year (2022) Average Daily Traffic (ADT) for the Project sections was estimated as 2,713 vehicles as presented in Table 2.

Table 2: Results of the Base Year Traffic, based on the conducted traffic survey in October 2022

Year		Small Passenger Vehicles	Light-Medium Goods	Heavy Goods	Truck-Trailers	Bus	Total, veh/day
ADT	Base-year (2022) traffic	1,754	498	301	134	26	2,713

64. The traffic growth assumptions considered general economic growth in the country as well as the intensified trade activities with neighboring countries, historical trend, avoided suppression and return of the diverted traffic from longer routes. They are summarized in Table 3.

Table 3: Annual Growth Rate for Traffic Forecasting

Year	Small Passenger Vehicles	Light-Medium Goods	Heavy Goods	Truck-Trailers	Bus
Up to 2026	4.9%	4.9%	7.1%	7.1%	7.2%
From 2027	3.4%	3.4%	4.9%	4.9%	5.0%

65. **Results.** Based on the traffic projections, a detailed economic analysis was carried out from 2024 to 2057, with four years for construction and 30 years for operation. The economic analysis was conducted based on a standard methodology for appraisal of road investments. The project costs comprise of capital and O&M costs. The economic benefits quantified are reduction in vehicle operating costs (VOC), travel time saving for passengers and freight carriers, reduction in carbon emissions and reduction in road accidents due to improved road conditions.

66. The results show that the construction of the Overall Project (Section 1 - Section 3) adopting Pre-Stressed Concrete (PSC) Box Girder bridge type is economically viable. The economic internal rate of return (EIRR) for the recommended scenario is 12.7 percent and net present value (NPV) is USD164.9 million at 9% discount rate. The EIRR was also tested by a sensitivity analysis against the worst-case scenario of 20% of cost increase and 20% of benefits reduction. The model has confirmed the robustness of the net economic benefits. Results of the cost-benefit and sensitivity analyses are illustrated in Tables 4 and 4.1.

Table 4. Summary of Economic Analysis Results

Discounted rate	Criteria	Value
9%	BCR	1.53
	NPV, USD mln	164.9
	EIRR, %	12.7%

Table 4.1. Summary of sensitivity analysis

Cost variation	Discounted rate	Criteria	BENEFIT		
			+20%	0%	-20%
+20%	9%	BCR	1.53	1.27	1.02
		NPV, USD mln	197.9	102.4	6.9
		EIRR, %	12.7%	11.0%	9.1%

67. **Financial Analysis and Operational Sustainability.** As the project road will not be tolled and will be wholly financed by the public sector during construction and O&M, a financial analysis was not conducted. The project road will be maintained under the government's road assets program. Therefore, aspects of financial sustainability have been assessed from the viewpoint of the government's ability to ensure the upkeep of the assets created and improved under the Project.

68. The annual maintenance cost of the bridge is estimated at around USD200,000-230,000. For the period of 30 years of operation assumed in the economic analysis, the total maintenance cost is estimated at around USD6.5 million.

69. To ensure the operational sustainability of the Project considering the country's limited institutional capacity, the civil works contract (CWC) for the bridge construction will include a 2-year maintenance period. Following this, the Ministry of Transport (MOT) or its specialized maintenance entity is expected to take over the maintenance responsibilities, with funding allocated from the state budget.

70. The overall state budget for the road sector is being contributed from numerous sources. The primary source of government expenditures on road asset maintenance is derived from the transport tax. A fuel excise tax is collected for petrol and reached about USD14 million in 2015. A vehicle tax is collected by local governments at the time of technical inspection and reached about USD20 million in 2018⁷. Other charges collected from road users include overloading fees and fines and customs duties on imported vehicles. The total amount collected from road users' tax is estimated at USD42 million in 2018⁸.

71. Total road subsector funding has been increasing, almost doubling in Tajik somoni terms during 2015–2019 (Table 5).

Table 5. Road Subsector Funding by Source of Funding (TJS million)

Source of funding	2015	2016	2017	2018	2019
MOT budget	188.0	125.4	235.1	159.1	455.9
Development partners	711.6	727.9	754.4	1,022.1	941.6
Local government	73.9	69.9	76.6	89.8	317.6
Other	13.5	25.1	8.8	29.2	36.4
Total	987.0	948.3	1,074.9	1,300.2	1,751.5

⁷ Technical Assistance Consultant's Report: Road Asset Management Road Map. ADB, Manila, 2019. [Link](#).

⁸ Same source as above.

Total, USD	160.2	121.0	125.7	142.1	183.8
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72. From 2010 to 2019, the MOT's annual budget for road maintenance doubled from TJS34 million (USD 3 million) to TJS68 million (USD 6.8 million). However, the maintenance budget, though increased, continues to face constraints, and improvements in road planning and design are progressing gradually.

73. The road assets O&M budget is financed from different sources, including revenues that MOT enterprises receive for services provided to other entities and the private sector. Funding is dependent on the general budget and outlays by local governments. Road maintenance funding made up 26% of total road government subsector funding in 2015. As of 2019 numbers, the road maintenance budget equals to 0.09% of the Gross Domestic Product (GDP), which is equivalent to an annual allocation of USD7.7 million⁹.

74. The Government of Tajikistan is putting efforts to optimize budget allocations within the road sector. As part of this strategy, the government is contemplating the establishment of a distinct entity under the MOT dedicated to the maintenance of bridges and tunnels, supported by separate funding from the state budget. The approved Roads Assets Management System (RAMS) Action Program¹⁰ stipulates that a new road maintenance fund is to be established by 2024 to secure road maintenance budgets at a required level. Potential funding sources would be tolling revenues from the other tolled sections of the national road network and other road user charges.

75. Several development institutions are actively participating in efforts to enhance road asset management. The ADB, for instance, is supporting the government in improving the MOT's RAMS and aiding in the development of comprehensive data inventories for the country's arterial highway networks. Japan International Cooperation Agency (JICA) is in the process of implementing a USD3.94 million grant for a technical assistance project aimed at capacity development in bridge management in Tajikistan. This initiative seeks to strengthen bridge management organizations by sharing technical expertise and conducting specialized training for personnel in this field.

C. Fiduciary and Governance

76. **Procurement.** PIURR possesses extensive experience in managing and delivering internationally financed projects, having successfully implemented projects funded by ADB and EBRD in recent years. The organization is committed to efficiently executing projects financed by major development banks and has a dedicated Procurement Department with significant expertise in procuring and contracting major internationally financed works.

77. PIURR has established a dedicated PMT with the assistance by the Grant, including a highly competent Project Manager with over 14 years of experience in civil engineering, economics, and project management. The team has also recruited technical and procurement staff, with plans to hire additional procurement professionals

⁹ Source: Tajikistan Transport Sector Assessment. December 2021. ADB. [Link](#); Technical Assistance Consultant's Report: Road Asset Management Road Map. ADB, Manila, 2019. [Link](#).

¹⁰ Government of Tajikistan, Decree No. 706. Road Asset Management System Program for 2021–2024. Dushanbe, 2020.

to strengthen PIURR's capacity. International technical experts, contract management specialists, and construction supervision firms are being employed to support project implementation. Preparatory work, including feasibility studies and preliminary design, has been completed by an international consultant, and PIURR is responsible for preparing procurement documents, including tender and prequalification documents.

78. Based on the above procurement assessment, it can be concluded that PIURR has sufficient institutional and procurement capacity and is experienced to ensure the successful implementation of the project procurement. Therefore, the project procurement capacity and risk assessments are rated as Medium. Major potential procurement risks have been identified and mitigation measures have been proposed in the below Table 6: Summary of Risks and Mitigating Measures.

79. **Financial Management.** The FM assessment was conducted during the Appraisal stage, and the review covered the system of accounting, budgeting, the flow of funds, financial reporting, auditing, and internal controls at PIURR. Based on the results of the FM assessment, the residual FM risk is Medium, and the following measures have been agreed: (i) A separate FM chapter will be developed within the POM, (ii) Automation of project accounting either through existing accounting software (1C) or separately procured accounting software to be regulated under the POM, and (iii) A dedicated FM Consultant will be assigned or hired for the PMT.

80. **Budgeting.** Under the Project, the FM Consultant will prepare the annual project budgets based on the PP, the legal agreement, and the annual forecast of operating expenses. The budgets will have quarterly figures and be classified by components and major activities. Annual project budgets and detailed estimates of operating expenses should be agreed with the Bank before PIURR and the MOT approve them and forward to the MOF for further consolidation into the state budget.

81. **Accounting System.** The Project will be accounted for and reported using the cash basis of accounting. PIURR has accounting software which tracks other projects except for the ongoing AIB's Grant Project. Nevertheless, the finance team cannot produce periodic financial reports like IUFRRs or Summary of Expenditures. Therefore, the PIURR maintains an Excel database parallel to the 1C accounting software. As for the proposed Project, all transactions should be recorded and maintained in the project accounting software either through updating the existing accounting software (1C) or separately procured accounting software. The automation of Project accounting should be completed within three months after the loan effectiveness. The project profile chart of accounts will be based on MOF's Chart of Accounts but modified to allow for tracking of project transactions by the project components and activities.

82. **Staffing.** The Finance Department of PIURR is headed by a Chief Accountant, who oversees all projects implemented by the PIURR and is supported by three Senior Finance Specialists, two Finance Specialists and a Cashier. The overall FM responsibility of the Project will be handled by the PIURR Finance Department, which is experienced in managing the FM aspects of MDB-financed projects. Almost all FM aspects of the AIB's Grant Project were handled by the Consultant hired to support the Project Manager till September 30, 2023. Since October 2023, the Finance Specialist was recruited under the Grant Project. Considering the increased scope of finance-related work under the proposed Project, PIURR should keep the Finance Specialist or

hire an FM Consultant within three months after the loan effectiveness who will report to the Project Manager and support the existing PIURR's finance team in implementing FM aspects of the Project.

83. **Internal Control and Internal Audit.** PIURR appears to have some internal controls, especially regarding the review and approval of transactions. These procedures are not formally documented in the Operational Manual of PIURR. Instead, the finance unit utilizes governmental instructions and the latest ADB project's Project Administration Manual. Therefore, the project-specific POM will be prepared, and a separate FM Chapter should be developed within the POM to specify the FM process and procedures. Currently, there is no internal audit function covering the operations of PIURR.

84. **Financial Reporting.** Under the Grant Project, PIURR submits semi-annual IUFRRs which are found satisfactory to the Bank. To monitor the Project's progress and financial performance, the FM Consultant will prepare IUFRRs each calendar quarter under the proposed Project, and PIURR's finance staff should verify it before it is signed and submitted to the Bank. The format of IUFRRs would be agreed on with the Bank. IUFRRs should be submitted to the Bank within 45 days of the end of each calendar quarter.

85. **External Audit.** The audit of the Project should be conducted (i) annually, covering the entire period of the Project; (ii) by independent auditors based on terms of reference acceptable to the Bank; and (iii) according to the International Standards on Auditing. The audited project financial statements will be provided to the Bank within six months after the end of each fiscal year and the closing date of the Project.

86. **Disbursements.** The primary disbursement modalities under the ongoing Grant Project are direct payment and advance methods. The Grant Project opened a segregated Designated Account (DA) denominated in USD and a segregated operating account denominated in Tajikistan Somoni (TJS) in Amonatbank. All payment orders are approved by the Executive Director of PIURR or his designate and the Chief Accountant of PIURR or his designate after being verified by the Finance Specialist. Advances are provided to the DA based on a six-month forecast and subsequently replenished based on the submitted Summary of Expenditures. Similar arrangements will be applied under the proposed Project. PIURR will open a separate DA in USD and an operating account in TJS for the proposed Project. The minimum application threshold for direct payments and supporting documentation will be outlined in the Project's Disbursement Letter. The proposed threshold for direct payments under civil work contracts will be equivalent to one million USD, and consultancy and non-consultancy contracts will be equivalent to one hundred thousand USD. Payments below these thresholds should be processed through the advance procedure.

87. **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 risks, including Money Laundering and Financing of Terrorism risks, sanction risk, and risk deriving from integrity unsoundness when dealing with its Counterparties and Connected Parties in the financing. No critical findings were found.

88. **Governance and Anti-corruption.** AIIB is committed to preventing fraud and corruption in the projects it finances and places the highest priority on ensuring that financed projects are implemented in compliance with its Policy on Prohibited Practices (2016). The Bank's Policy on Prohibited Practices applies to the Project. Implementation will be monitored regularly by AIIB staff. AIIB reserves the right to investigate, directly or indirectly through its agents, any alleged Prohibited Practice relating to the Project will require the borrower to take necessary measures to mitigate the risk of such practices and promptly address any issues, as appropriate. AIIB will monitor the work related to tender document preparation and tender/proposal evaluation under AIIB financing.

D. Environmental and Social

89. **Categorization.** The applicable environmental and social safeguards for Section 1 and Section 2 will be those of ADB and EBRD, respectively. Their environmental and social standards are in line with those of AIIB. Section 3, the Project, is a long bridge within the road alignment of EBRD's Section 2. AIIB will parallel finance Section 3 and its Environmental and Social Policy (ESP) and Environmental and Social Exclusion List will apply. The Project's environmental and social impact assessments have determined that ESS 1 (Environmental and Social Assessment and Management) and ESS 2 (Involuntary Resettlement and Land acquisition) are applicable to this Project. Given the Project's activities, location, and potential risks, the Project is rated as Category A project.

90. The Project will construct a bridge over the Rogun HPP reservoir. The HPP and its reservoir does not fit the definition of 'associated facility' under the ESP. The sections financed by ADB and EBRD do not fall under the definition of 'associated facilities' either, as these sections have been described as a single Overall Project in project documents by ADB and EBRD. These facilities are being constructed, even without Section 3 existence. Package 2 includes the temporary bridge construction for the road corridor to be viable. Section 3 will be constructed at a higher altitude to secure the road corridor viability after the reservoir inundation. An Environmental and Social Impact Assessment covering the ADB and EBRD sections has been prepared and disclosed by the EBRD. A Supplemental ESIA has been carried out by a MOT Consultant, financed through the Bank's PPSF Grant, for the bridge and approach roads as an addendum to the ESIA already prepared. The Supplemental ESIA includes an Environmental and Social Management Plan (ESMP), which integrates the actions and measures set out in both the Client's existing ESIA and the supplementary ESIA.

91. In terms of domestic ESIA approval, the MOT shared EBRD's ESIA, and this was approved by the Committee for Environmental Protection (CEP) in July 2023. Whilst the CEP considers that the bridge component lies within the ESIA already shared, the MOT will share the Supplemental ESIA, specifically for the bridge section, with the CEP in parallel to disclosure on the AIIB website.

92. **Environment.** As a large infrastructure project, the Project will invariably give rise to environmental impacts, that will require robust mitigation measures and regular monitoring throughout the implementation stage as set out in the ESMP.

93. The main environmental impacts will occur during the construction phase. The bridge alignment is situated far from any noise or air sensitive receivers and is not within

proximity to any protected areas or habitat of ecological value. Dust, vibration, and noise will be among the typical environmental impacts associated with the Project which will be mitigated to acceptable levels as per the findings in the ESIA.

94. A key assertion in the ESIA is that the foundations of the bridge will be constructed in dry season when there is no water present within the river the bridge traverses. As such, significant adverse water quality impacts are not anticipated. However, it should be made clear in the tender documents that this provision is included within the Contractors construction sequence and schedule. Should extensive construction work associated with the bridge foundations take place when the river is flowing, this will constitute as a material change to the ESIA and a non-compliance. Further assessment on water quality impacts and mitigation measures such as, but not limited to, silt curtains would be required.

95. Key issues in the operational stage will arise from maintenance activities and usage of the bridge. Oil and other debris from surface run off may enter the waterbody below the bridge should the drainage system and oil interceptors not be regularly maintained. These impacts will be addressed in ESMP prepared for the Project.

96. **Occupational Health and Safety (OHS).** There will be OHS and road safety risks during construction and operation phases of the Project. Typical with any infrastructure project, construction risks such as working at height, hazards from falling debris, working over water as well as numerous other typical risks will be present, whilst in the operational phase key risks will be present for maintenance staff working at height and working in the vicinity of roads. As part of the ESIA, the ESMP contains templates to guide the contractor in forming an OHS Management Plan and Traffic Management Plan. These managements plans will form a key part of the Contractor Environmental Management and Monitoring Action Plan (CEMMAP) which will detail the actions that the Contractor will follow to comply with OHS international standard requirements.

97. The Project will likely have numerous sub-contractors, under the main contractor, working on many different elements of the Project (i.e., groundwork, viaduct, steelwork etc.). OHS requirements will be cascaded down into the Contractor and sub-contractors' scope of work through inclusion into tender documentation, contracts and their policy and procedures during construction and operation. The content of the CEMMAP and the respective OHS management plans will be checked by the Bank for quality assurance. The Construction Supervision Consultant (CSC) will be engaged to supervise the E&S performance of the Contractor and subcontractors and to ensure emergency response measures are in place to prevent potential hazards and respond to incidents and natural disasters. The PIURR will arrange for regular monitoring, reporting and site inspections during the implementation phase, as detailed in the ESMP to ensure that OHS practices and emergency response measures are properly followed and are in place, and any non-compliances are swiftly dealt with.

98. Impacts and risks associated with labour influx have also been assessed. The ESMP includes guidance to prepare a Workers' Accommodation Management Plan and to address Gender-Based Violence risks. The provisions will be incorporated into the tender documents. A separate worker grievance mechanism will be established under the Project to accommodate all project worker concerns and address them appropriately.

99. **Climate Change.** An initial physical climate risk screening was carried out by the MOT using “AWARE” climate software. The results of the screening indicated a high climate risk rating.

100. As such, to further analyze the climate risks and identify adaptation measures, a detailed Climate Risk and Adaptation Assessment (CRA) as per the AIIB’s Paris Alignment methodology has been carried out by a third-party Consultant and submitted to the Bank for review.

101. The assessment for BB2 contains scientific data to support the qualitative narrative presented in the detailed CRA report. The report details the methodology and data used in assessing physical climate risks. The CRA also provides more details on the alignment with national strategies and plans for adaptation. It also presents more details on extreme precipitation risk and hydrological assessments and identified adaptation measures to address these risks and enhance water-related resilience.

102. Climate adaptation measures that should be integrated in the project design have been identified to address climate risks and enhance climate resilience. The Project also has been assessed within a national context for climate resilience. Based on the CRA, with suggested adaptation measures, aligning with national policies, it is concluded that the Project is in full compliance with the AIIB Paris Agreement Alignment on climate adaptation and resilience goals (BB2). The detailed CRA report will be appended to the ESIA. A summary of key findings can be found in Annex 6.

103. **Social Aspects.** The Project has the potential to result in socio-economic benefits for 17 villages and their residents living along the route, as the bridge will link them to markets and services. The Project is not anticipated to induce any physical or economic resettlement, which was verified during field visits. Temporary land acquisition impacts are associated with workers accommodation and construction facilities. These impacts will be avoided and minimized by acquiring the state-owned and not used by communities’ lands, if needed an abbreviated land acquisition plan will be prepared and implemented. If any costs associated with land acquisition are incurred, the Government counterpart funds will be used to cover those costs. Other social impacts are likely to comprise mainly construction-induced nuisances such as noise, dust emissions, access restriction, and risks to community health and safety for adjacent residents. These impacts will be addressed in the ESMP prepared for the Project.

104. **Gender Aspects.** The gender gap analysis was completed as part of the ESIA. Recognizing the disproportionate impact on women due to limited access to healthcare, education, and economic facilities, the Project aims to empower women as key beneficiaries. This will be achieved through the implementation of an entrepreneurship program tailored under Component 3 to address the identified skills needs. The main gender-related risks associated with the Project activities, apart from issues of road safety, will be the subsequent sexual exploitation and abuse risks related to influx of construction workers during the construction phase. The management of this risk has been addressed in the ESMP.

105. **Stakeholder Engagement and Information Disclosure.** A Stakeholder Engagement Plan (SEP) has been developed for this Project to ensure effective communication of the investment plans, potential impacts, and mitigation measures

during project implementation. The SEP has provisions of overall management and coordination, disclosure and meaningful consultations, and effective and clear reporting of SEP implementation. A Non-technical Summary (NTS) was also prepared and will be translated into the local language. The E&S documents disclosure follows the current requirement for Category A Project. Hard copies of the ES instruments will be available in the targeted rural jamoats in a form and language(s) understandable to the local Project-affected people and other stakeholders, so that they may provide meaningful inputs into the design and implementation of the Project, if needed. All the E&S instruments are disclosed at the AIIB website along with respective links to MOT disclosures.

106. **Project-level Grievance Redress Mechanism.** A two-tier project-specific Grievance Redress Mechanism (GRM) has been established and functional for Section 3. Tier One is based on the established practice of filing complaints in rural area; while Tier Two is with the MOT/PIURR at the national level. The Borrower will prepare and widely disseminate a GRM-related leaflet in the local language at the project site, including disclosure at the MOT website.

107. **Independent Accountability Mechanism.** AIIB's Project-affected People's Mechanism (PPM)¹¹ 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. Information on the PPM has been included in the SEP and NTS to be disclosed.

108. **Supervision Arrangements.** The MOT's Project Implementation Unit for Roads Rehabilitation (PIURR) will be responsible for managing the day-to-day project implementation activities, including ensuring the E&S compliance of the Project. PIURR has extensive experience in managing and delivering MDB-financed projects (including ADB and EBRD). It is currently implementing the AIIB-financed Obigarm-Nurobod Road Grant Project allocated for project preparation. PIURR is concurrently managing several projects with its existing human resources, which is leading to efficiency limitations during project implementation. To support the implementation of this technically complex bridge project and secure quality work, a dedicated full-time Project Management Team (PTM) will be recruited by the PIURR. PMT will be represented by individual consultants with experience in contract management, technical supervision, procurement, financial management and E&S safeguards of the MDB-financed infrastructure projects. Construction Supervision Consultant will be engaged to supervise and review the contractor's design and construction works, including E&S compliance monitoring and reporting. The PIURR will prepare and submit semi-annual reports to AIIB for review in accordance with the agreed format. The Bank's E&S Specialists will carry out field-based E&S supervision missions to monitor the E&S instruments' implementation and the Borrower's E&S performance. AIIB plans to conduct supervision missions twice a year.

¹¹ Link to PPM: <https://www.aiib.org/en/policies-strategies/operational-policies/policy-on-the-project-affected-mechanism.html>

E. Risks and Mitigation Measures

Table 6: Summary of Risks and Mitigating Measures

#	Risk Description	Assessment (H/M/L)	Mitigation Measures
1	<p>Detailed design risks The engineering design is not technically sound, particularly in ensuring that the bridge will be robust against the seismic and climate change risks in this particular site.</p>	L	<p>The seismic risks have been extensively considered during the project preparation stage. Clear requirements are set out in the preliminary design. PIURR is equipped with the following information to mitigate the design risks: preliminary, geotechnical investigations, and climate adaptation measures, to minimize risks during project design finalization. Construction Supervision Consultant will be engaged to supervise and review the contractor's design and construction works based on a fit for purpose basis. Notably, the detailed design will be reviewed and approved by the Independent Design Check using different approach of program/calculation and State Expertise to ensure the soundness and appropriateness of the design calculations.</p>
2	<p>Limited DB contract management experience Administering the DB contract, including to evaluate and monitor the contractor's performance, to review and approve payments, and to avoid and/or negotiate disputes/claims with the contractor.</p>	H	<p>PIURR/PMT shall be continuously supported by experienced individual consultants on managing the DB contract throughout the project implementation. These consultants will be continuously financed by the forthcoming loan or other grant resources.</p>
3	<p>Limited interest from the market Very limited DB experiences have existed in Tajikistan. There are risks if there is very limited interest from the contracting market.</p>	M	<p>PIURR prepared a market analysis reviewing the most recent tendering for Section 2 (the EBRD section). The analysis shows that there may be enough competition as many tenders were with extensive experience in both the construction of major bridge structures and in the</p>

			implementation of Design & Build projects.
4	Potentially long evaluation period Potentially long evaluation period for both the civil works contractor and supervision consultant tendering. Design & Build approach is new to the country which may impose this challenge.	H	Evaluation criteria will be thoroughly discussed among the PMT, AIIB, and the individual consultants to PMT. The PIU procurement specialist and PMT will closely engage with AIIB, Ministry of Transport and other related government agencies to address tender evaluation issues timely.
5	Potential cost increase With the currently ongoing impounding process of the Rogun Dam reservoir, potential cost may increase due to the construction delay.	M	Risks caused by external price changes shall be fairly distributed under the contract by adopting appropriate price adjustment formula. Contingencies for civil works contract will be sufficiently set up to absorb potentially additional works and price fluctuations. Preliminary design layout optimizes pile locations to reduce this risk. The contractor will be required to prioritize construction of foundations adjacent to the channel. Coordination of the timeline for overall Rogun HPP is ensured by Project Coordination Committee.
6	Stress from heavy vehicles The repeated stress from heavy vehicles due to the transportation of goods and materials.	M	Component 1 will include purchase of maintenance equipment that would be transferred to the GUSAD (local road maintenance agency) under the MOT after the handing over of works. It will also support installation of Weigh-in-Motion devices to monitor and regulate the passing of heavy trucks.
7	Maintenance risks Insufficient allocation of funds to maintain the project roads and facilities.	M	The government has agreed to develop and implement a 5-year road map, with support from the donors' community, with the view to improving road maintenance and asset management across the road network. Additional information is provided in paragraphs 70-77.
8	FM reporting risks The absence of specific Project FM procedures, a	M	These risks are manageable, and detailed mitigation measures have

	dedicated Finance specialist, and manual accounting may lead to deficiencies in project accounting and financial reporting.		been agreed upon and described in the FM section's paragraph.
9	<p>Environmental and social risks</p> <p>Given the technically complex project activities, its location in remote and mountainous area not far from Rogun HPP, and potential E&S risks, the Project is rated as Category A project. As a large infrastructure project, the Project will invariably give rise to environmental and social risks and impacts, that will require robust mitigation measures and regular monitoring.</p>	H	<p>Relevant E&S instruments have been prepared under the AIIB-financed project preparation grant to address the high E&S risks and impacts anticipated by the Project. The mitigation measures incorporated in the E&S instruments will be implemented, supervised, monitored, and reported by the PIURR supported by PMT, CSC and contractors on regular basis.</p> <p>AIIB will work closely with the Borrower to ensure E&S compliance. It will carry out field-based E&S supervision missions to monitor the E&S instruments implementation and the Borrower's E&S performance.</p>

4. Next Steps

Milestones	Actual or Expected Completion Dates
Screening	May 2019
Concept Review	September 2019
Special Fund Approval	September 2019
Special Fund Effectiveness	January 2020
Project Appraisal	December 2023
Negotiation	January 2024
AIIB Approval	March 2024
Loan Signing	May 2024
Effectiveness	June 2024
First Disbursement	July 2024

Annex 1: Results Monitoring Framework




Project Objective:		To improve connectivity along the Obigarm–Nurobod section of M41 Highway by constructing a long bridge and its approaches.									
Indicator Name	Unit of measure	Baseline (2022)	Cumulative Target Values						End Target	Frequency	Responsibility
			2024	2025	2026	2027	2028	2029	2029		
Project Objective Indicators¹²:											
1. Number of beneficiaries of improved transport connectivity	Passenger Car Unit (PCU)	3,461	-	-	-	-	6,461	6,708	6,708	Annually	PIURR/MOT
2. Improved connectivity: Travel time	Minutes	80	-	-	-	-	70	70	70	Annually	PIURR/MOT
3. Improved safety: Reduction of road death and injuries per 100 million vehicle-km of travel on the project road	Number of road death and injuries	3.6	-	-	-	-	2.7	2.7	2.7	Annually	PIURR/MOT
Intermediate Results Indicators:											
1. Women's entrepreneurship program developed and implemented, based on the skills needs assessment and participant selection criteria	Annual implementation report	0	0	1	2	3	4	5	5	Annually	PIURR/MOT
2. Number of women gained and reported knowledge and skills on business development	Persons	0	-	25	-	50	-	75	75	Annually	PIURR/MOT

¹² Outcome are measured for all three sections.

Annex 2: Detailed Project Description

1. The bridge site is located in a remote mountainous area with complex geological and tectonic structure positioned in a highly seismic active zone. According to the seismic zoning, the bridge construction area belongs to the zone prone to high intensity earthquakes up to grade 7 on the Richter Scale. The bridge location is characterized by massive land erosions and movements of natural materials, intensive rock falls in multiple locations along the road alignments and its surroundings. These natural phenomena represented serious technical and cost implications to planning and designing of the planned major long bridge.
2. On a global scale, the construction area of the Long Bridge is influenced by a tectonic collision of the Indo-Asian plates. The Indian Plate movement from south to north puts a high stress on contact zones of major geo-structures, such as the Pamirs, eastern Tajik Depression and southern Tien-Shan. The bridge construction site is located in the Indo-Asian collision and induced deformation within Eurasia.
3. On a local scale, the construction area is located on the boundary of two large geo-structures – Tajik Depression (eastern part) and Hissar-Alai (southern spurs of the Tien-Shan Mountain system), sharply differing by pre-modern and modern history, tectonic development, specific manifestations of movements and the character of modern structure. As a result, the site is characterized by a complex geological and tectonic structure and high seismic activity.
4. The Design Consultant hired under the PPSF Grant has conducted the Feasibility and Bridge Options Studies, which has examined three alternative types of the bridges with due consideration of the existing terrain: Box Girder type, Extra-dosed and Cable-stayed bridges. The bridge options were analyzed following the findings from the geotechnical, topographic, seismic, wind, hydrological investigations as well as climate resilience analyses, specifically related to the climate and hydrological impact in the greater area of the Project location. Multi-criteria decision making of Analytic Hierarchy Process (AHP) has been used to help making the rational decisions in deciding on a design plan to proceed with the preliminary design. Key items of each option are compared in Table 2-1.
5. Design Consultant recommended Option 3, a cable-stayed bridge as the optimal type of bridge for the Project. The other alternatives were both assessed feasible, with Option 1 being assessed as a better choice than Option 2, due to the lower cost and simplicity of both construction and visual form.
6. However, the State Working Committee recommended a Box Girder bridge as the optimal option of choice, considering the lower cost, simplicity of construction, availability and use of domestic materials during construction of the bridge. Another important aspect considered by the MOT was relative efficiency in operation and maintenance.

Table 2-1. Comparison of the Bridge Options for the Project

ITEM	Alt-1 (PSC Box Girder Br.)	Alt-2 (Extra-dosed Br.)	Alt-3 (Cable Stayed Br.)
Layout			
Project Cost	56.93 Million USD	65.00 Million USD	77.19 Million USD
Construction Period	49 months	54 months	48 months
Construction Difficulty	Easy	Moderate	Difficult
Maintenance	Good	Moderate	poor
Impact on Environment	Moderate	Moderate	Excellent
Aesthetics	Moderate	Good	Excellent
Safety (Seismic)	High seismic forces need adapted design	Higher seismic forces than Alt-1	Good (light superstructure)

7. Tajikistan Institute of Geology, Seismological Construction and Seismology (the Institute) was recruited by the Client to provide technical support to the PIURR during project preparation as well as the oversight of the work of Design Consultant. Seismic Institute has provided deterministic and probabilistic analysis for the return periods 475, 1000, 2500 and 5000 years. The Institute also provided the calculated parameters of the seismic actions such as peak ground acceleration, uniform hazard response spectrums, set of the 3-components synthetic accelerograms for needed return periods. The seismic analysis verified the relative effect of equivalent earthquake force. Eigenvalue analysis was also conducted to assess the structure's dynamic behavior, unique vibration characteristic and the estimation of relative seismic efficiency. Results of the studies have been duly considered while reviewing the bridge options.

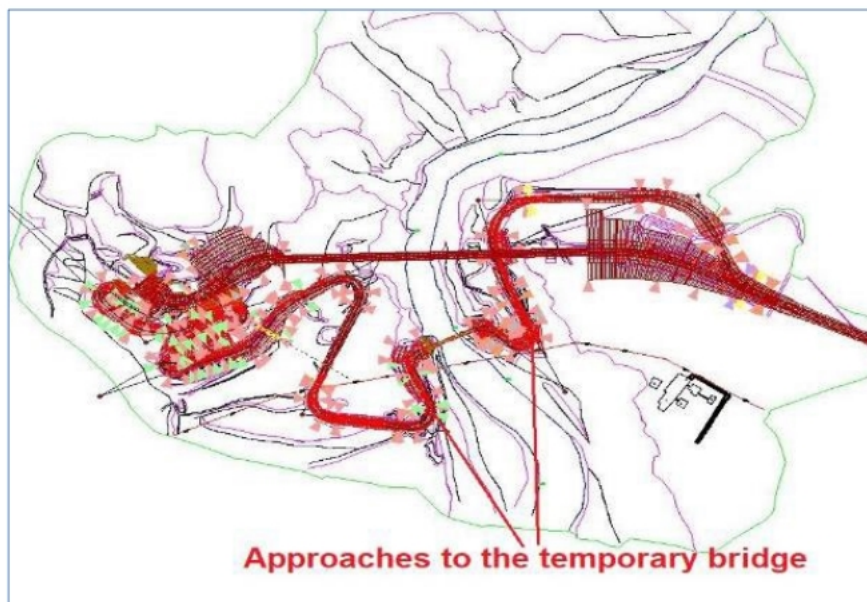
8. Following the selection of type of the bridge, additional detailed geotechnical investigations are being carried out to define the geological composition of terrain, activity of contemporary geological processes, hydro-geological conditions of terrain and physical-mechanical properties of the soils composing the site for the Project bridge and its approaches, considering the areas with major cutting and embankments. Conducting the detailed geotechnical investigation is one of the recommendations by the State Working Committee, who advised that additional geotechnical surveys must be carried out to determine the depth of the ground strength layer and geotechnical properties.

9. Originally, at the Concept stage, the bridge was estimated to have a length of 760m. However, based on the results of Feasibility Study and geotechnical investigations, it was decided to extend the bridge length to 920m.

10. The fundamental reason for changing the original extension from 760m to 920m lies in the safety of the embankment on the left side of the river and the safety of the abutment. In other words, with the original extension of 760m, there would be a significant amount of embankment involved, and it would be submerged within the reservoir, making it constantly susceptible to the effects of water. Additionally, placing an abutment on the high-leveled embankment would result in reduced structural stability over time due to long-term settlement and lateral active pressure of the soil. Therefore, to ensure safety, the decision was made to relocate the bridge to a position beyond the influence of these factors, resulting in an extended length of 920m.

11. According to the Preliminary Design, Bridge construction works include construction of the 920m long permanent bridge over the Rogun HPP Reservoir at Darband town over the Surkhob River from Km 72+811 to Km 74+292. The Long Bridge will be located from Km 73+183 and Km 74+103, within Section 2 site. Total length of Package 3 is about 1,481.10 meters. The temporary bridge will be installed over the reservoir as part of Section 2 and will be dismantled when Section 3 is open to traffic. To ensure coordinated implementation of the Overall Project, the Government has established a Project Coordinating Committee, comprising representatives from AIIB, ADB, EBRD, OFID, and the Rogun HPP working group. This committee convenes regularly to synchronize construction timelines, ensuring continuity amidst the Rogun HPP construction schedule.

Figure 2-1. Location of the Bridge and Approaches and Temporary Bridge



12. The scope of work of the bridge construction includes foundation, sub-structures, super-structures, road, environment, and ancillary works. According to the preliminary design findings, the bridge will have a width of 15.5m with two-lanes road of 3.75m each (2-lane for both directions),

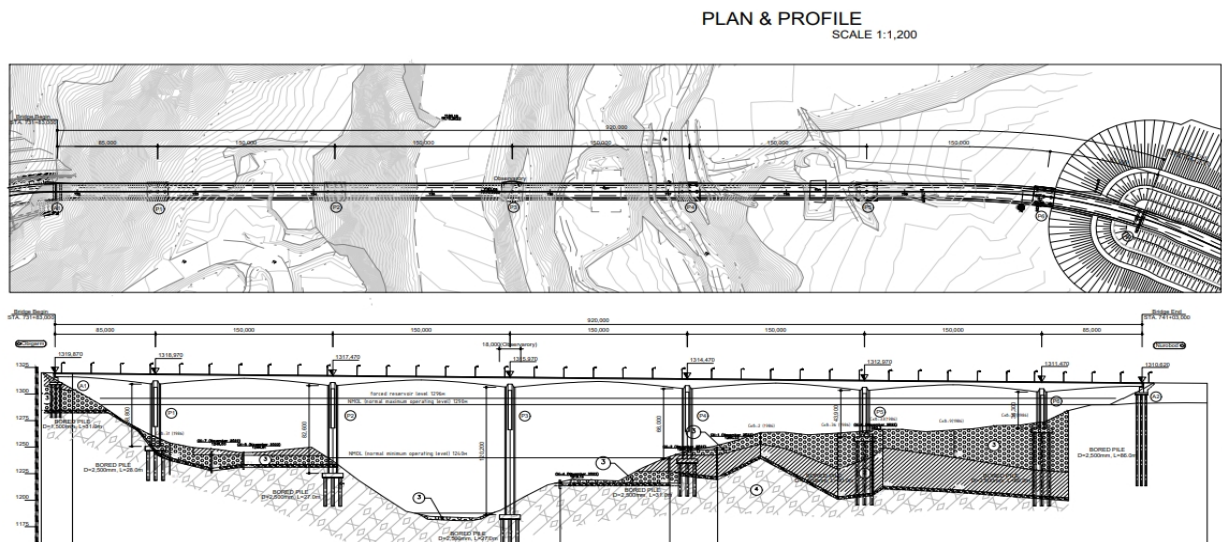
2.0m shoulder, and 1.5m of sidewalks on each side. The design speed is 60km/h on the bridge section.

Table 2-2. Key Technical Parameters of the Bridge

Bridge Type	PSC (Pre-Stressed Concrete) Box Girder
Method of Construction	FCM (Free Cantilever Method)
Pile Cap	Foundation bored piles
Span Length	85.0 m + 5x150.0 m + 85.0 m = 920.0 m
Width	15.5m (2 Lanes)

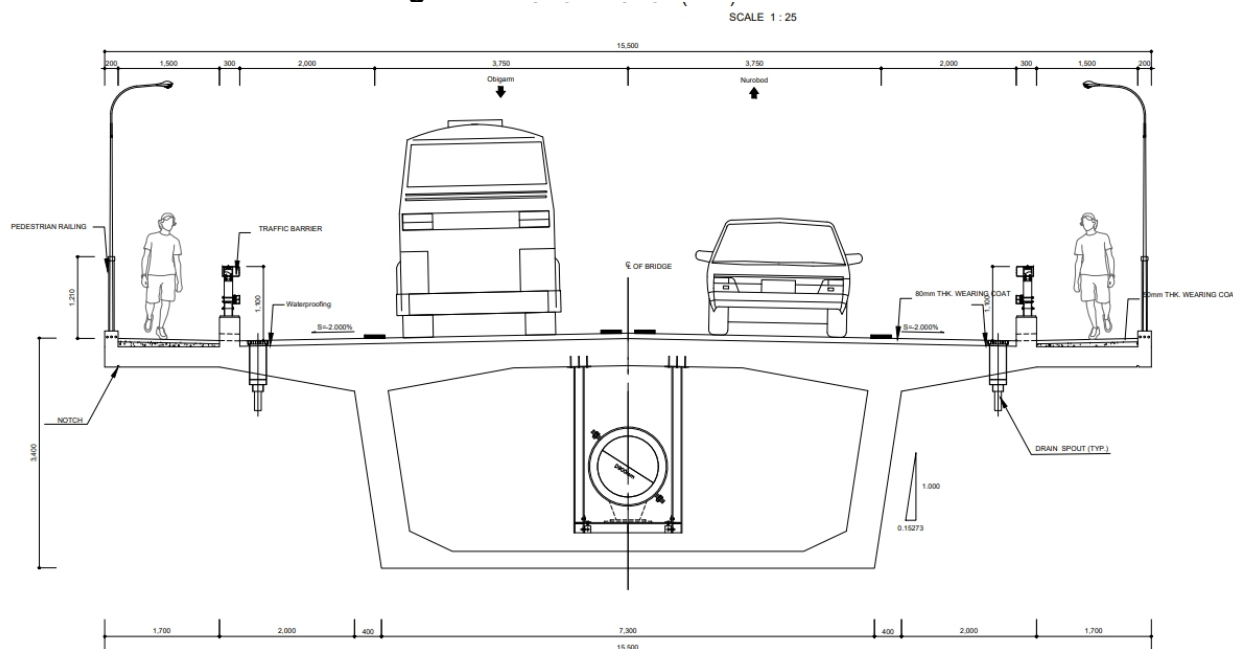
13. The bridge consists of a side span of 85m and 5 main spans of 150m each (Figure 2-2). The bridge will have six main piles, with the tallest one of about 120m height, and two supporting piles at the beginning and the end. It is a pre-stressed concrete Box Girder whose cross-section changes from 3.5m in the general section to 9.5m in the pier section with a curve. It is inclined at 1%, from north down to the south. The curved section of R-1500 begins at the point past Pillar 5, so Pillar 6 and Abutment 2 are skewed. Considering the ground conditions, all foundations are supported by bored piles.

Figure 2-2. Bridge Layout



14. The girder of the long bridge was designed as a 1-cell box girder with an open-type web and a 1:0.153 slope, as shown in Figure 2-3. The lateral slope of the normal part is 2% from the center to both ends, and the lateral slope of the curved part is 4%. The round trip with a sidewalk also has 2 lanes, the roadway is 3.75m wide, and the sidewalk/shoulder is 2.0m wide. There is a pedestrian railing at the end of the cantilever; a closed drainage system is proposed. A steel traffic barrier between the sidewalk and the roadway is proposed. The thickness of the pavement was designed to be 80mm.

Figure 2-3. General Girder Section



15. The cross section of the pier is a polygonal design with a constant width of 8.5m in the vertical direction. The upper 40m of the pier is made of twin shafts to ensure ductility against earthquakes, and the lower part of the pier is designed a solid section. To increase consistency between the twin shafts and the lower part of the pier, the pier cross section was designed in the form of a tuning fork. This pier design is scenic and structurally safe.

16. Deep foundation of the piles is necessary due to the risk of landslide along the river. In addition, a foundation type that can handle the large load of a long-span bridge and has a large resistance to seismic pulling force will be required.

17. It was originally envisaged that the bridge would be designed and constructed using a traditional way as Design-Bid-Build, with a detailed design developed by the Client as the basis for tendering of Civil Works under the FIDIC Conditions of Contract for Construction Red Book. However, due to the specialized technical nature of the Project, the Client has requested to change the course to Design-Build approach, under the FIDIC Conditions of Contract for Design-Build (the Yellow Book).

18. Construction of the substructures could be done on dry conditions until October 2027.

19. The bridge structure design has been prepared in accordance with the AASHTO code and design specifications and taken into account of the adverse climatic, geological and site condition that exist in the project area. The impact to the structure due to future reservoir was also considered. The current level of the preliminary design provided more information than what is usually needed for a Design-Build process in order to make compatible public procurement procedures. This would enable the Client with more information for tender selection and future contract management.

20. As it is anticipated that the reservoir will become a local tourist destination and will carry considerable number of visitors to observe the view of the longest bridge and biggest reservoir in the country, it is proposed to include a tourist service area at the adjacent territory to the bridge. The facilities will include a mini-hotel, observation deck, toilets, vehicles service point and parking, security desk, bicycle parks, landscaping and gardening elements.

Figure 2-4. Master Plan of the Landscape Development Area



Annex 3: Economic Analysis

1. **Economic Analysis.** Development of road infrastructure is a top priority for the Government of Tajikistan, providing greater mobility and accessibility to road users in the villages, and supporting agriculture, which in turn is an important foundation for the sustainable economic development of the country.
2. The proposed Project is a coordinated initiative involving multiple financing agencies to construct a whole new 75km bypass road along a new alignment between Obigarm and Nurobod. Since the economic benefits that accrue from the completion of these sections are contingent on each other, this economic analysis considers the 75km road in its totality, including the bridge section.
3. The economic analysis for the Project takes into account the economic analysis conducted by ADB for all three sections of the project in 2019. The economic analysis reflects the up-to-date project costs and benefits and other input data. Full benefits are expected to be realized once the bypass and the bridge are complete.
4. The Project also enhances the Ministry of Transport's institutional capacity on project implementation and supports a suite of measures to improve women's access to economic opportunities complementing to the ongoing efforts of other development partners. While these components will have positive economic and financial impacts, their costs and benefits were not quantified for inclusion in the economic analysis.
5. **Traffic Survey.** To identify the current traffic volume and prepare baseline data for the future traffic estimate, the traffic volume survey was carried out in October 2022. A field survey was carried out to identify current socio-economic characteristics and traffic volume of passengers and freight in the administrative divisions along the Project section. These survey's target areas lie along the M41 corridor and include five districts of republican subordination such as Nurobod, Sangvor, Lakhsh, Rasht and Tojikobod.
6. At the border of the Lakhsh district and Kyrgyz Republic in the project area, the international traffic route from/to east and west is connected by the Vahdat - Nurobod - Rasht - Lakhsh - Kyrgyz Republic border road which is one of the most important arteries in the region. The route carries out imports and exports across the border of Tajikistan, Kyrgyz Republic, and China with the rest of the CIS countries, and the border point is Karamyk (Lakhsh, Tajikistan).
7. The base-year (2022) Average Daily Traffic (ADT) for the Project sections was estimated as 2,713 vehicles as presented in Table 3-1.

Table 3-1. Results of the Traffic Survey and the Base Year Traffic

Year		Small Passenger Vehicles	Light-Medium Goods	Heavy Goods	Truck-Trailers	Bus	Total, veh/day
ADT	Base-year (2022) traffic	1,754	498	301	134	26	2,713

8. **Traffic Forecast.** The traffic growth assumptions considered general economic growth in the country as well as the intensified trade activities with neighboring countries, historical trend, avoided suppression and return of the diverted traffic from longer routes. Analysis for optimistic (+10%) and pessimistic (-10%) traffic growth scenarios were considered. From 2027 onwards, more conservative growth projections are applied despite the expectation that after completion of the construction the traffic will grow. Traffic growth rate assumptions and traffic forecasts are summarized in Tables 3-2 and 3-3.

Table 3-2. Annual Growth Rate for Traffic Forecasting

Year	Small Passenger Vehicles	Light-Medium Goods	Heavy Goods	Truck-Trailers	Bus
Up to 2026	4.9%	4.9%	7.1%	7.1%	7.2%
From 2027	3.4%	3.4%	4.9%	4.9%	5.0%

Table 3-3. Traffic Forecast on the Project Road

Year	Small Passenger Vehicles	Light-Medium Goods	Heavy Goods	Truck-Trailers	Bus	Total, veh/day
2022	2,456	698	421	188	36	3,799
2028	3,177	900	604	270	49	5,000
2033	3,756	1,061	764	340	59	5,980
2038	4,440	1,253	969	430	73	7,165
2043	5,249	1,479	1,228	545	90	8,591
2048	6,206	1,746	1,558	689	112	10,311
2052	7,096	1,994	1,883	832	134	11,939

9. **Economic Costs.** The project costs comprise of capital and O&M (Operation and Maintenance) costs. According to feasibility study, capital cost estimates for construction of the bridge is USD56.9 million, including: bridge construction – USD52 million, road approaches – USD2.8 million. O&M costs are estimated at USD0.2 million per year, 10 years of maintenance is included in the capital costs. The costs of other sections are provided in Summary Sheet.

10. **Benefits.** Based on the traffic projections, a detailed economic analysis was carried out covering 33 years from 2024 to 2057, with four years for construction and 30 years for operation. The economic analysis was conducted based on a standard methodology for appraisal of road investments. The economic benefits quantified are reduction in vehicle operating costs (VOC) and Value of Time (VOT) saving for passengers and freight carriers due to improved road conditions, reduction in road accidents and reduction in carbon emissions. Estimated average International Roughness Index (IRI) measurement is used for calculating the benefits from the improved road conditions. For the current roads, IRI of 6.0 applied while for with-project scenario rate of 4.5 is applied.

11. **Vehicle Operating Cost and Time Savings.** Using Highways Development and Maintenance Model Version 4 (HDM-4), the VOC and time savings have been monetized. Vehicle

operating costs (VOC) and Value of Time (VOT) savings across the entire fleet type and over the evaluation period are summarized in the Table 3-4.

Table 3-4. Vehicle Operating Cost and Journey Time Savings

	Scenario	Small Passenger Vehicles	Light-Medium Goods	Heavy Goods	Truck-Trailers	Bus
		(\$/vehicle-km)				
VOC	without (IRI=6.0)	0.364	0.737	1.343	1.903	0.931
	with (IRI=4.5)	0.174	0.477	0.778	1.133	0.501
	savings	0.190	0.260	0.565	0.770	0.430
VOT	without (IRI=6.0)	0.251	0.061	0.038	0.044	2.648
	with (IRI=4.5)	0.105	0.019	0.012	0.012	1.020
	saving	0.146	0.042	0.026	0.032	1.628

Table 3-5. Summary of the Vehicle Operating Cost and Journey Time Savings

Item	Without-Project (IRI=6.0)	With-Project (IRI=4.5)	Savings
Vehicle operating cost, \$/vkm	0.59	0.34	0.25
Travel time values, \$/vkm	0.17	0.08	0.09

12. Changes in pavement quality affect vehicles' engine performance, which, in turn, affects tailpipe greenhouse gas emissions. Avoiding incremental without-project emissions is considered as a project benefit, and HDM-4 was used to calculate changes in emissions from fuel consumption. Emission quantification assumptions were made based on the AIIB Guidance Note on Cost-Benefit Analysis of Projects (July 2023) and sectoral knowledge of the Design Consultant.

13. **Road Safety Savings.** Road accident cost savings from enhancement of road safety was also calculated as project benefits. It includes avoided medical expenses; avoided damage to vehicles, properties, and road structure; avoided income loss due to injuries; and avoided deaths. These was estimated using data on accidents related medical expenses, replacement cost of assets, and income loss per accident, as well as estimates of the statistical value of life. For road safety benefits, GDP per capita has been assumed to calculate fatality cost and serious injury cost in HDM-4.

14. **Results.** The incremental benefits of reductions in VOCs, travel times, and emissions were compared with the initial investment costs and changes in O&M costs over a 34-year appraisal period (including 4 years construction, and 30 years operation). 9% discount rate is used. Streams of Costs and Benefits are provided in Table 3-8.

15. The results show that the construction of the entire road section (Section 1 - Section 3) adopting PSC Box Girder bridge type is economically viable. The economic internal rate of return (EIRR) for the recommended scenario is 12.7 percent and net present value (NPV) is USD164.9 million at 9% discount rate as shown in Table 3-6. Details of the economic analysis are available upon request.

Table 3-6. Summary of Economic Analysis Results

Discounted rate	Criteria	Value
9%	Benefit/Cost Ratio	1.53
	NPV, USD mln	164.9
	EIRR, %	12.7%

16. **Sensitivity Analysis.** The EIRR was tested by a sensitivity analysis against the worst-case scenario of 20% of cost increase and 20% of benefits reduction. The model has confirmed the robustness of the net economic benefits. Results of the cost-benefit and sensitivity analyses are illustrated in Table 3-7.

Table 3-7. Summary of Economic Analysis Results by Scenario

Cost variation	Discounted rate	Criteria	BENEFIT		
			+20%	0%	-20%
+20%	9%	Benefit/Cost Ratio	1.53	1.27	1.02
		NPV, USD mln	197.9	102.4	6.9
		EIRR, %	12.7%	11.0%	9.1%

Table 3-8. Streams of Costs and Benefits, USD million

Year	COST (\$/year)				BENEFIT (\$/year)						
	Construction Cost	O&M Cost	Total Cost (A)	Discounted Total Cost, 9%	VOC	VOT	Emission	Road Safety	Total Benefit (B)	Discounted Total Benefit, 9%	(B)- (A)
2023											
2024	96.7	0.0	96.7	88.7	0.0	0.0	0.0	0.0	0.0	0.0	(96.7)
2025	96.7	0.0	96.7	81.4	0.0	0.0	0.0	0.0	0.0	0.0	(96.7)
2026	96.7	0.0	96.7	74.6	0.0	0.0	0.0	0.0	0.0	0.0	(96.7)
2027	96.7	0.0	96.7	68.5	0.0	0.0	0.0	0.0	0.0	0.0	(96.7)
2028	0.0	0.4	0.4	0.3	28.9	12.8	0.2	1.1	42.9	27.9	42.5
2029	0.0	0.2	0.2	0.1	30.5	13.4	0.2	1.2	45.3	27.0	45.0
2030	0.0	0.4	0.4	0.2	32.2	14.1	0.2	1.2	47.7	26.1	47.3
2031	0.0	0.4	0.4	0.2	34.0	14.8	0.2	1.3	50.3	25.3	49.9
2032	0.0	0.4	0.4	0.2	36.0	15.6	0.2	1.4	53.1	24.5	52.7
2033	0.0	0.4	0.4	0.2	37.4	16.1	0.2	1.4	55.2	23.3	54.7
2034	0.0	0.4	0.4	0.2	38.8	16.7	0.2	1.5	57.3	22.2	56.9
2035	0.0	0.4	0.4	0.2	40.4	17.3	0.3	1.5	59.5	21.1	59.0
2036	0.0	0.4	0.4	0.1	42.0	17.9	0.3	1.6	61.7	20.1	61.3
2037	0.0	0.4	0.4	0.1	43.6	18.5	0.3	1.6	64.1	19.2	63.7
2038	0.0	0.4	0.4	0.1	45.4	19.2	0.3	1.7	66.6	18.3	66.1
2039	0.0	0.3	0.3	0.1	47.1	19.8	0.4	1.8	69.1	17.4	68.8
2040	0.0	0.4	0.4	0.1	49.0	20.5	0.4	1.8	71.8	16.6	71.3
2041	0.0	0.3	0.3	0.1	51.0	21.3	0.4	1.9	74.6	15.8	74.2
2042	0.0	0.4	0.4	0.1	53.0	22.1	0.4	2.0	77.5	15.1	77.1
2043	0.0	0.2	0.2	0.0	55.2	22.9	0.5	2.0	80.5	14.4	80.3
2044	0.0	0.4	0.4	0.1	57.4	23.7	0.5	2.1	83.7	13.7	83.3
2045	0.0	0.2	0.2	0.0	59.7	24.5	0.5	2.2	86.9	13.1	86.7
2046	0.0	0.4	0.4	0.1	62.1	25.4	0.6	2.3	90.3	12.4	89.9
2047	0.0	0.4	0.4	0.1	64.6	26.3	0.6	2.4	93.9	11.9	93.4
2048	0.0	0.4	0.4	0.0	67.2	27.2	0.7	2.4	97.6	11.3	97.1
2049	0.0	0.4	0.4	0.0	69.9	28.2	0.7	2.5	101.4	10.8	101.0
2050	0.0	0.4	0.4	0.0	72.8	29.3	0.8	2.6	105.4	10.3	105.0
2051	0.0	0.4	0.4	0.0	75.7	30.3	0.8	2.7	109.6	9.8	109.1
2052	0.0	0.3	0.3	0.0	78.8	31.4	0.9	2.8	113.9	9.4	113.6
2053	0.0	0.4	0.4	0.0	82.0	32.6	0.9	2.9	118.4	8.9	118.0
2054	0.0	0.4	0.4	0.0	85.3	33.8	1.0	3.0	123.1	8.5	122.7
2055	0.0	0.4	0.4	0.0	88.8	35.0	1.1	3.2	128.0	8.1	127.6
2056	0.0	0.4	0.4	0.0	92.4	36.2	1.2	3.3	133.1	7.7	132.7
2057	(64.0)	0.4	(63.6)	(3.4)	96.2	37.6	1.2	3.4	138.4	7.4	202.0
Total	322.6	11.9	334.6	312.6	1,717.2	704.5	16.2	63.1	2,501.0	477.5	2,166.4
	IRR:	12.7%			NPV:	164.9			B/C:	1.53	

Annex 4: Member and Sector Context

1. **Country's Transport Sector Strategy.** The Government of Tajikistan puts highest priority towards ending the “communications deadlock” at the national and regional level to improve access to markets and increase its competitiveness as a transit country through reduction in transport costs. The development of the transport sector in Tajikistan is guided by the 2030 National Development Strategy¹³ and implemented through the State Program on Transport Sector Development.

2. The National Development Strategy sets the goal of overcoming the communication impasse and turning Tajikistan into a transit country by developing and integrating cross-border corridors with national transport system. The State Program on Transport Development includes a list of short-, medium-, and long-term investments that is regularly reviewed and updated, and aims to (i) minimize total transport costs, (ii) develop specific transport modes and enhance their efficiency, (iii) maximize the country's transit potential and develop tourism, and (iv) increase competitiveness of transport services.

3. **Transport Sector Overview.** The MOT is the lead policy-making and regulatory agency in charge of land transportation in Tajikistan, planning for investment and operations of road and railway transportation. The MOT is headed by a minister and three deputy ministers and divided into six departments. The MOT's subordinate organizations include six state enterprises for transport management and 64 state enterprises for highway maintenance. The country's transport network comprises approximately 27,000km of roads, 680km of railway tracks, and four international airports.

4. Four CAREC corridors (2, 3, 5, and 6) cross the territory of Tajikistan, which highlights the importance of road network connectivity and regional integration. The road network was largely constructed before the 1970s, and the rapid increase in traffic on some arterial roads is intensifying pressure on aging transport infrastructure. Tajikistan has limited links to neighboring countries, especially Afghanistan and China. The World Bank's 2016 Logistics Performance Index placed Tajikistan near the bottom of the global ranking (134th out of 160). Tajikistan ranked 127th for quality of transport infrastructure, and 104th in timeliness of shipments delivery¹⁴. Logistics costs are very high, accounting for about 20% of exported value and 17% of imported value.

5. **Roads Network.** Tajikistan has a large road network inherited from the former Soviet Union. The road network under the MOT's jurisdiction (14,220km) comprises 3,348km of international roads (23%), 2,129km of national roads (15%), and 8,743km of local roads (62%). Paved roads account for 73% of the MOT's Road network (by length), including 32% with asphalt concrete and 41% with aggregate and bitumen. The remaining roads are gravel (19%) and earthen roads (8%). Road density is 187km per 1,000 square km, which is comparable to that of the Kyrgyz Republic (176km per 1,000 square km). The backbone of Tajikistan's road network,

¹³ Government of Tajikistan. 2017. National Development Strategy of the Republic of Tajikistan for the Period up to 2030. Dushanbe.

¹⁴ World Bank. 2018. International Logistics Performance Index Global Ranking. Washington, DC.

comprising four CAREC corridors and three Asian Highways, has been largely improved with assistance from development partners.

6. Demand for road transport is outpacing demand for other transport modes, with approximately 93% of cargo (73,900 million tons in 2018) and 90% of passenger traffic carried by road. About 7% of cargo is carried by rail and less than 1% by air. Domestic freight transport uses roads in preference to airlines and railways because the average freight haul distance is relatively short at 22km. During 2014–2018, freight carriage by road increased from 67,600 million tons to 73,900 million tons. Vehicle ownership is relatively low (48 vehicles per 1,000 people) compared with in the neighboring Kyrgyz Republic (58 vehicles per 1,000 people).

7. **Investments in Road Sector.** The country's investments in transport infrastructure have mostly been financed by international development partners from various sources. Since 1992, approximately 2,830km of new roads was constructed, of which over 85% was financed by IFIs¹⁵. Approximately USD1.6 billion has been provided by development partners to finance investments on road rehabilitation projects, with technical assistance mainly focusing on capacity development and institutional support, including through AIIB-funded Dushanbe-Uzbekistan Border Road Improvement Project.

8. IFIs funded activities have made contributions to the country's connectivity with Uzbekistan to the east (Dushanbe – Tursunzoda); with Kyrgyz Republic to the north (Guliston and Madaniyat; Khujand – Chanok); with Afghanistan to the south (Dangara – Qurghonteppa); and with China to the east (Murgab – Kulma Pass).

9. **Road Funding.** The budgetary process for road funding is centralized at the MOF, which allocates funds to the MOT for both road maintenance and construction. Recognizing the need to further expand its revenue base, the government has sought assistance from development partners to gradually (i) set up a road asset management unit within the MOT, (ii) establish a dedicated road maintenance fund, and (iii) introduce tolling on selected highway sections.

10. **Road Maintenance.** While aggregated road condition data are not yet available, the MOT's 2016 road condition surveys revealed that about 85% of international roads (3,348km) and 52% of secondary roads (2,129km) were in good or fair condition. During 2010–2019, the annual budget for winter and routine maintenance doubled, from TJS34.0 million to TJS68.0 million. The compounded growth rate for winter and routine maintenance budget was 7.2%, with an average annual inflation rate of 6.7%. The annual average incremental maintenance costs associated with the Project are estimated to be in line with the current expenditure on international highways (about \$2,000 per km). However, current budget allocation is insufficient to meet the overall network maintenance needs, especially in relation to periodic maintenance. The Road repair and maintenance is carried out by MOT's local repair and maintenance units.

11. **Road Safety.** The road safety record in Tajikistan is dismal, despite the low level of vehicle ownership. In 2016, 427 road traffic fatalities were reported. The World Health Organization

¹⁵ Source: World Bank. Fourth Phase of the Central Asia Regional Links Program (P166820).

estimated that there were 1,577 fatalities in 2016, which corresponds to about 18.1 fatalities per 100,000 people, compared with 15.4 fatalities per 100,000 people in the Kyrgyz Republic. In 2014, the causes of fatalities were the high speed of vehicles (54%), driving on the wrong side of the road (21%), illegal maneuvering (5%), driving under the influence of alcohol (2%), and other causes (18%)¹⁶. With development partner's assistance, the MOT is currently developing a road safety strategy and action plan that will provide stakeholders with a reference framework to implement future road safety programs.

¹⁶ World Health Organization. 2018. Global Status Report on Road Safety 2018. Geneva.

Annex 5: Country Credit Fact Sheet

1. **Background.** Tajikistan is a landlocked lower-middle-income country in Central Asia with a population of around 10 million. Over the past two decades, following the recovery from a civil war, Tajikistan has experienced significant economic progress, growing at 7.3 percent per year on average. However, this growth has been to a much extent driven by income from Tajik migrant workers in Russia—these remittances are equivalent to some 30-40 percent of GDP, one of the highest ratios in the world, and reflect limited domestic employment opportunities. Tajikistan remains one of the poorest countries in Asia, with per capita income of only USD 1,100 (around USD 5,000 in purchasing power parity terms).

2. The economy is vulnerable to external shocks due its small size (total GDP of around USD10 billion), and a relative lack of diversification. Apart from remittances, the main earners of external income are commodities, notably gold, aluminum, and cotton. In the medium and long run, the country faces a challenge to undertake far-reaching structural reforms to foster stronger and more inclusive growth, improve competitiveness, and promote economic diversification. Essential reforms include improving performance of SOEs (which account for almost a quarter of employment and a fifth of GDP), enabling private sector development, enhancing social protection, and improving governance.

3. One strategic element of Tajikistan's development strategy is the Rogun hydropower plant. Once completed and fully operational, with over 3.6 GW of planned capacity, it would be the biggest hydropower plant in Central Asia (and among 30 biggest in the world). It would eliminate domestic power shortages, provide significant export revenues and help Tajikistan to become a leader in green energy. Construction restarted in 2007, and accelerated in 2016, with around USD 3.5 billion spent on the project so far – equivalent to around 50 percent of GDP - mostly from the country's own resources, as official external development financing was not available due to insufficient regard to commercial viability and macroeconomic sustainability risks. In 2020, the authorities agreed to proceed at a pace consistent with debt sustainability, and in 2021 completed a rigorous financing study to that effect, which has allowed development partners to finally engage and consider support for the project. The remaining completion cost is estimated at USD 4.5-5.0 billion (another 50 percent of GDP).

Selected Macroeconomic Indicators	2020	2021	2022	2023*	2024*	2025*
GDP growth 1/	4.4	9.4	8.0	6.5	5.0	4.5
CPI Inflation (end-of-period) 1/	9.4	8.0	4.2	5.0	6.5	6.5
General government overall balance	-4.3	-0.7	-0.2	-2.5	-2.5	-2.5
Public debt	51.8	42.1	32.6	33.5	32.9	32.1
Gross public financing needs	..	1.8	3.2	4.3	4.0	5.1
Current account balance	4.3	8.2	15.6	-3.7	-2.4	-2.1
External debt (public)	44.2	37.5	30.6	29.1	28.5	28.3
Gross external financing needs	..	10.4	-7.1	12.8	8.6	7.5
Gross official reserves (USD billion)	2.2	2.5	3.8	4.4	4.8	5.2
Exchange rate (TJS/USD) 2/	11.3	11.3	10.2	11.0

Source: IMF Report 23/125, in percent of GDP unless indicated otherwise; ** = projections

Notes: 1/ percent change y/y; 2/ data from central bank, end-of-period, for 2023: as of Nov 24

4. **Recent Developments.** Over the past years, Tajikistan has managed to withstand severe shocks, including the Covid pandemic and the impact of geopolitical tensions. The pandemic-related growth slowdown, to 4.4 percent, was much less than feared, and a strong broad-based recovery followed in 2021, with growth reaching 9.4 percent, also thanks to high global prices of gold and other export commodities. Furthermore, record-high remittances in 2022 supported consumption and economic activity across sectors. GDP growth in 2022 came to 8.0 percent.

5. Helped by favorable external, macroeconomic management has improved significantly in the past years. As recently as early 2020, IMF assessed Tajikistan's debt as unsustainable, due to high debt, high fiscal deficits and public investment plans inconsistent with macroeconomic stability. However, since then, the authorities have committed to more prudent policies, such as adhering to the indicative fiscal deficit ceiling of 2.5 percent of GDP, avoiding non-concessional financing and keeping capital spending consistent with debt sustainability. The fiscal deficit has been reduced and the monetary policy kept relatively tight. Despite high global prices, inflation (at 4.4 percent year-on-year as of October 2023) has been contained, thanks to some currency appreciation, government interventions and strong domestic agricultural output. Good performance has been enabled by large current account surpluses (partly thanks to high remittances). As a result, foreign reserves increased to around USD4 billion, or around eight months' import coverage—adequate by IMF standards. In addition, banking sector soundness indicators have been improving, particularly after the resolution of two insolvent banks, which helped clean up legacy bad loans in the system.

6. **Outlook and Risks.** The economic outlook is subject to uncertainty, as it is not clear whether Tajikistan would continue to be resilient to more prolonged economic weaknesses in Russia. Growth in 2023 is projected at 6.5 percent, as remittances and export prices normalize.

7. In the medium term, growth should return to a potential, estimated at around 4.5 percent, which is lower than the historical average. Growth-enhancing reforms and the completion of the Rogun power plant could significantly add to the potential.

8. Fiscal deficits are expected to be contained below the indicative limit. Tajikistan has an indicative medium-term deficit target of 2.5 percent of GDP. Inflation should remain within the central bank's target of 6 percent (+/- 2 percentage points). The current account is expected to return to deficits, albeit manageable.

9. According to the IMF, Tajikistan's public debt is sustainable, but with a high risk of debt distress, due to the country's vulnerability to external shocks, and contingent liabilities from SOEs. After a spike to over 50 percent of GDP in 2020, due to the pandemic, public debt has declined to around 33 percent of GDP in 2022, thanks to good economic performance. Assuming the government's adherence to fiscal prudence, debt is expected to further decrease in the medium term. The high share of concessional debt makes debt service relatively affordable. Going forward, the financing of the Rogun dam needs to be consistent with macroeconomic stability.

10. Tajikistan's sovereign credit is rated at B- stable and B3 stable, by S&P and Moody's respectively. The most recent action was a change of outlook from negative to stable by Moody's

in October 2023. This was attributed to the economy's resilience and the strengthening of its external buffers against a series of shocks globally.

Annex 6: Paris Agreement Alignment

A. BB1: Alignment with mitigation goals

1. The Project will upgrade the existing highway, maintaining the same category road with 2 lanes, thereby not adding new capacity to the current route. The road's current capacity (on the supply side) is up to 6,000 passenger car units (PCUs), with an estimated traffic volume (on the demand side) of 2,713 vehicles per day in 2022. Hence it is included in the 'universally aligned list' of BB1 in the AIIB Paris Agreement methodology.

B. BB2: Alignment with adaptation and resilience goals

1. The transport infrastructure in Tajikistan is directly vulnerable to the impacts of climate change. Climate change is expected to manifest itself in Tajikistan in increased temperatures as well as increased precipitation intensities and extreme weather events, especially in spring and summer.
2. An initial physical climate risk screening was carried out for the project using the "AWARE" web-based tool. The results of the screening indicated a high climate risk rating. As such, a detailed Climate Risk and Adaptation Assessment (CRA) for the project as per AIIB's Paris Alignment methodology was conducted. The full report will be attached to the ESIA. Some key findings are below.
3. In the CRA, a vulnerability assessment by assessing the sensitivity and exposure of the project to detected climate hazards was conducted. A probability analysis and an impact analysis of the high vulnerable climate hazards were followed to determine the risks. Below are the identified climate risks for the project.
 - a. **Extreme Precipitation and Floods.** Expected increase in extreme precipitation events is the most serious threat. This may not only lead to higher extreme discharges (i.e., flash floods) but can also lead to more frequent and powerful mudflows, landslides, and avalanches. These may pose additional risk for bridge foundations and drainage systems by discharge levels and solid loads exceeding the systems' design capacity. Similarly, an increase in extreme snowfall events may lead to an increase in the frequency of avalanches. Increases in precipitation extremes is also likely to increase the frequency of landslides and rockfall, upstream of the bridge location.
 - b. **High Temperature and Heatwaves.** The substantial projected increase in air temperatures as well as annual number of days where daily maximum temperature exceeds 30°C, indicates that heat waves are more likely to occur and may last longer. This poses potential increased risks related to asphalt pavement integrity and thermal expansion of bridge expansion joints and paved surfaces. The current hazard level for wildfire in the project area is medium to high, but since the bridge is located in an area which has sparsely distributed vegetation the risk to the bridge

is relatively minor. The risk of mudflows may also increase as their occurrence can be linked to deforestation by wildfire and increasing precipitation extremes.

4. Considering the risks to the project components, resilience and adaptation measures to mitigate the impact were identified. These measures were categorized as Prioritized and Advisable measures.
 - a. **Prioritized Adaptation Measures:** (i) Use of waterproof membrane for bridge deck, (ii) Increased reinforcement in bridge piers, (iii) Providing more stiffness to the bridge girders, (iv) Increasing of Riprap installation at bridge piers, (v) Regular inspection and maintenance of the pier, (vi) Increased drainage system capacity for bridge pavement, (vii) Slope stabilization measures, river bank protection works, bio-engineering works along the slopes, and (viii) Sub-surface drainage in abutments.
 - b. **Advisable Adaptation Measure:** Use of more expansion Joints in bridge pavement.

5. Climate adaptation finance was estimated with consideration of information available in the project documents including the project feasibility study, preliminary engineering design, and Environment Impact Assessment reports. An incremental approach was applied to estimate the cost of the identified adaptation measures. As a result, the cost was estimated to be in the range of USD 3.3 to 3.5 million. Details can be found in the table below. It should be noted that the recommended measures are included in the preliminary design budget. These measures will be considered in the detailed design by the contractor under the Design-Build approach. Specific climate resilience requirements will be incorporated into the Tender Documentation for civil works.

Table 6-1. Cost Estimates for Adaptation Measures for the Project

Climate Variable	Prioritised Adaptation Measures	Advisable Adaptation Measure	Incremental cost of adaptation (USD)	Remarks
Temperature Rise	-	Use of more expansion Joints in bridge pavement	29,250	Estimated from Preliminary design
Increase in extreme rainfall events	Use of waterproof membrane for bridge deck	-	78,246 – 294,354	\$1.05 to \$3.95 per square foot x 74520 square foot
	Increased reinforcement in bridge piers	-	314,000	Estimated from Preliminary design
	Providing more stiffness to the bridge girders	-	120,000	Estimated from Preliminary design

	Increasing of Riprap installation at bridge piers	-	82,740	Estimated from Preliminary design
	Regular inspection and maintenance of the pier (for plaster damage, reinforcement damage, foundation damage etc.)	-	750,000	Assumed USD 10000 per year for 75 years
	Increased drainage system capacity for bridge pavement	-	131,000	Estimated from Preliminary design. The design team to confirm that spacing.
	Slope stabilization measures, riverbank protection works, bio-engineering works - vegetation along the slopes Sub-surface drainage in abutments	-	1,769,119	Estimated from Feasibility Study
Total			3,270,415- 3,486,523	

6. Potential inconsistency of the project with key national policies and strategies of Tajikistan was assessed. These policies include Tajikistan's (a) Intended Nationally Determined Contribution (NDC) 2021, (b) National Action Plan for Climate Change Mitigation (c) National Strategy for Adaptation to Climate Change, and (d) National Disaster Risk Reduction Strategy. It is concluded that the project was aligned with Tajikistan's national climate adaptation and resilience policies and strategies. Details are below.

- a. **Intended Nationally Determined Contribution (NDC) 2021:** Tajikistan's revised NDC commits in 2021 to achieve a 40-50% reduction in emissions by 2030 compared to 1990 levels, conditional on international support. The country also set an unconditional emissions reduction target of 30-40% by 2030 compared to 1990 levels. The revised NDC expands adaptation in the energy, water, agriculture, forestry, and transportation sectors. Adaptation measures in the transport sector include improving the protection and long-term maintenance of transport infrastructure, updating national building codes for the construction of bridges, providing support to improve infrastructure and access roads in hazardous and vulnerable areas, adapting rail, road, air, and all modes of transport to international standards, and promoting incentives and regulations for fuel-efficient vehicles. The project is not inconsistent with Tajikistan's intended NDC as project design will consider measures for climate resilient infrastructure design of bridge and thus supports climate adaption in transport sector.

- b. **National Action Plan for Climate Change Mitigation:** Tajikistan's National Action Plan for Climate Change Mitigation outlines steps to reduce greenhouse gas emissions and increase resilience to climate change. The country aims to achieve a balance between economic development and environmental protection by promoting the use of renewable energy, increasing energy efficiency, and implementing carbon pricing mechanisms. Tajikistan also plans to conserve and restore ecosystems and enhance climate change adaptation measures, particularly in vulnerable communities. The project is aligned with Tajikistan's National Action Plan for Climate Change Mitigation as enhance connectivity will lead in expanding public transportation networks, and promoting the use of clean energy vehicles, such as electric or hybrid cars and motorcycles.
- c. **National Strategy for Adaptation to Climate Change:** This presents a long-term outline of priority adaptation measures to prepare the country for projected climate change impacts until 2030. The National Strategy for Adaptation to Climate Change identifies key sectors sensitive to climate change. These sectors include energy, water resources, transport, agriculture, and various intersecting areas. The project is aligned with Tajikistan's National Strategy for Adaptation to Climate Change as it will enhance the resilience of transport infrastructure to withstand climate change impacts. The bridge design will consider future climate extremes. The bridge is designed to withstand future climate for the year 2100.
- d. **National Disaster Risk Reduction Strategy:** The National Disaster Risk Reduction Strategy of the Republic of Tajikistan is a comprehensive plan that aims to reduce the impact of disasters on the country's people and infrastructure. This strategy was formulated by the interdepartmental Working Group within the National Disaster Risk Reduction Platform. The DRR Strategy follows recommendations set forth in the Sendai Framework and takes into account the Agenda 2030, the National Development Strategy of Tajikistan until 2030, as well as the commitments under UNFCCC. It outlines risk mapping and hazard assessment, prevention and preparedness measures, and response and recovery plans. The key priorities of the DRR Strategy are as follows: (a) strengthen institutional capacities to integrate climate resilience in national development and investment planning; (b) improve the accuracy and timeliness of hydrometeorological services for early warning, weather forecasting and climate change; (c) make key water management and hydropower infrastructure more climate resilient; and (d) support land management measures to enhance rural livelihoods through greater resilience to climate-related shocks. The strategy is implemented at the national and local levels, with support from international communities. The Tajik government regularly reviews and updates the strategy to ensure its effectiveness in addressing emerging risks and improving disaster resilience. The project is aligned with this Strategy as it will implement measures to ensure the continuity of transport services during emergencies.

7. Based on the assessment in the report, it can be concluded that the project is in full compliance with climate adaptation and resilience goals (BB2 assessment) of Paris Agreement Alignment of AIIB criteria, provided that the suggested adaptation measures for climate resilience are included in the project design.

Annex 7: Project Management Roles and Responsibilities

Project Implementation Organizations	Roles and Responsibilities
Borrower: Ministry of Finance	<ul style="list-style-type: none"> • Sign and oversee the implementation of the loan agreement, including its amendments, if any; • Provide documents and other requirement for loan effectiveness; • Timely allocate and release counterpart funds; • Monitor the project implementation and provide appropriate coordination support; • Provide AIIB with details of the authorized staff with specimen signatures for withdrawal applications processing; • Open and maintain designated accounts for deposit of loan funds; • Putting into place the VAT and Tax exemptions based on the released decree of GoT; • Process and submit to AIIB any request, when required.
Executing agency: Ministry of Transport	<ul style="list-style-type: none"> • Provide overall project oversight; • Ensure compliance with all covenants of the loan agreement and AIIB's policies, procedures, and guidelines; • Coordinate with all ministries and agencies involved in the Project as appropriate; • Ensure time provision of counterpart funds for project activities; • Ensure that the PIURR is adequately staffed and functional during the entire period of project implementation; • Recruit and supervise consultants and contractors, including approval of contract variations, suspension, and termination of contracts; • Bid evaluation and contract signing; • Establish adequate financial management system and submit timely withdrawal applications to AIIB; • Conduct timely financial audits as per agreed timeframe and take recommended actions; • Collect and retain all supporting and reporting documents, including annual audit reports and financial statements; • Involve beneficiaries and civil society representatives in all stages of project design and implementation as appropriate; • Regularly post on MOT website the updated project information documents for public disclosure, including safeguards documents, in consultation with AIIB;
Implementation agency: Project Implementation Unit for Roads Rehabilitation/Project Management Team	<ul style="list-style-type: none"> • Coordinate the day-to-day project implementation activities; • Finalize bidding documents, manage recruitment of consultants and procurement of contractors, and finalize contract awards; • Ensure that the day-to-day project implementation activities comply with E&S safeguards requirements set for the Project, including the preparation of E&S performance reports identifying issues and action plans;

	<ul style="list-style-type: none">• Monitor and evaluate project activities and outputs, including periodic review and preparation of review reports identifying issues and action plans;• Prepare regular periodic progress reports, and the project completion report, and ensure their timely submission to AIIB;• Assist AIIB project review missions; and• Provide necessary office space, equipment, and facilities for PMT.
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