ASIAN INFRASTRUCTURE INVESTMENT BANK

December 9, 2024

Sovereign-backed Financing

Approval Project Document

P000646 Republic of Türkiye: Eastern Türkiye Middle Corridor Railway Development Project

Currency Equivalents

As of October 31, 2024

Currency Unit – Turkish Lira (TRY)
USD1.00 = TRY34.25
TRY1.00 = USD0.029

Fiscal Year

January 1 – December 31

Abbreviations

AIIB	Asian Infrastructure Investment Bank
AYGM	General Directorate of Infrastructure Investment (Altyapı Yatırımları Genel Müdürlüğü)
BMP	Biodiversity Management Plan
BTK	Baku-Tbilisi-Kars Railway
CBA	Cost-benefit Analysis
CTC	Central Traffic Control
DA	Designated Account
DAS	Distributed Acoustic Sensing
EIRR	Economic Internal Rate of Return
ENPV	Economic Net Present Value
EPRP	Emergency Preparedness and Response Plan
ES	Environmental and Social
ESF	Environmental and Social Framework
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
EU	European Union
FM	Financial Management
GHG	Greenhouse Gas
GoT	Government of Türkiye
GRC	Grievance Redressal Committee
GRM	Grievance Redress Mechanism
IAM	Independent Accountability Mechanism
IsDB	Islamic Development Bank
LMP	Labor Management Procedure
MC	Middle Corridor
MoTF	Ministry of Treasury and Finance
MoTI	Ministry of Transport and Infrastructure
NDC	Nationally Determined Contributions
OHS	Occupational Health and Safety
OHSMP	Occupational Health and Safety Management Plan
PIU	Project Implementation Unit
POM	Project Operations Manual
PP	Procurement Plan
PPM	Project-affected People's Mechanism
PPSD	Project Procurement Strategy for Development
RLIP	Railway Logistics Improvement Project
RF	Resettlement Framework
RFP	Request for Proposal
RoW	Right-of-Way

SBO	Strategy and Budget Office
SEA	Sexual Exploitation and Abuse
SEP	Stakeholder Engagement Plan
SH	Sexual Harassment
TCDD	State Railways of the Republic of Türkiye (Türkiye Cumhuriyeti Devlet Demiryolları)
TEN-T	Trans-European Transport Network
WB	World Bank

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1. Summary Sheet

Project No.	P000646
Project Name	Eastern Türkiye Middle Corridor Railway Development Project
AIIB Member	Türkiye
Borrower	Republic of Türkiye
Sector Subsector	Transport Rail transport
Alignment with AIIB's thematic priorities	Green infrastructure; Connectivity and Regional Cooperation; Technology-enabled Infrastructure
Project Objective	To improve the rail connectivity of eastern Türkiye along the Divriği-Kars-Georgia border railway section of the Trans-Caspian Middle Corridor.
Project Description	The activities under the proposed Project are: - Component 1: Rehabilitation and Modernization of the Divriği-Kars-Georgia Border Railway Line. - Component 2: Project Management.
Implementation Period	Start Date: January 2025 End Date: December 2030
Expected Loan Closing Date	December 2030
Proposed Amount of AIIB Financing (USDm)	USD250.00[1]
Financing Plan	Project cost: USD1,344.60 million Financing Plan: WB IBRD: USD660.00 million AIIB: USD250.00 million IsDB: USD250.70 million Government of Türkiye: USD183.90 million
ES Category (or AIIB equivalent, if using another MDB's ES Policy)	"Substantial" Risk as per WB's ESF, equivalent to Category B if AIIB's ESP were applicable.
Risk (Low/Medium/High)	Medium
Conditions of Effectiveness	Financing agreement between the Borrower and the WB signed. Project co-lenders agreement between AIIB and the WB signed.
Key Covenants	NA
Conditions for Disbursement	NA
Retroactive Financing (Loan % and dates)	Retroactive financing of up to 20 percent of the loan amount for eligible expenditures incurred not more than 12 months prior to the date of the loan agreement.
Policy Waivers Requested	No
Policy Assurance	The Vice President, Policy and Strategy, confirms an overall assurance that the Bank is in compliance with the policies applicable to the Project.
Economic Capital (ECap) Consumption (USDm)	USD59.55m (29.97%)
Project Approval (Board/President)	President

[1] The Loan is expected to be EUR-denominated. The costs and funding in this report will be presented in USD.

President	Liqun Jin
Vice President	Konstantin Limitovskiy
Acting Director General	Konstantin Limitovskiy
Team Leader	Natalia Sanz, Senior Investment Officer
Back-up Team Leader	Mehek Marwaha, Senior Investment Officer
Team Members	Christopher Damandl, Senior Counsel Rizal Rivai, Procurement Consultant Shodi Nazarov, Financial Management Specialist Odil Akbarov, Social Development Specialist Muzaffar Ahmad, Environment Specialist Alberto Alcubilla Arribas, Senior Investment Solutions Specialist Nurzhan Serik, Investment Officer Jiaming Yu, Project Assistant
Credit Officer	Young Bong Cho, Senior Sovereign Risk Officer

2. Context

2.1 **Country and Macroeconomic Overview.** As in other countries, the COVID-19 pandemic had a negative impact on growth in 2020. However, Türkiye was one of the few globally that did not register a GDP contraction that year, instead achieving a growth rate of 1.9 percent. This performance was largely due to the government's economic policy response to the pandemic as in rest of the world, which focused on loosening monetary policy and rapid credit expansion. Türkiye's GDP grew by 11.4 percent in 2021 and remained strong at 5.5 percent in 2022 and 5.1 percent in early 2023. Disinflation-focused policies from mid-2023 led to slower growth, with GDP rising 2.5 percent by Q2 2024, marking a shift from the post-pandemic period.

2.2 However, the policy framework that ensured a strong economic performance during and after the pandemic increased macroeconomic risks, facing high inflation and a significant depreciation of the currency. These factors have led to vulnerabilities in the corporate and banking sectors, as well as declines in reserve buffers.

2.3 Due to aforementioned developments that required rebalancing in the economy, following the May 2023 elections, the Government of Türkiye (GoT) has implemented measures to stabilize the economy and manage risks during the adjustment process, including monetary policy tightening, and fiscal revenue actions to reduce the fiscal deficit. As a result of these policies, investor confidence has notably improved, external financing has increased, the current account balance has experienced significant enhancement, growth has rebalanced, and the disinflation process has started. For the first time in over a decade, all three major rating agencies upgraded Türkiye's sovereign credit rating in 2024. Fitch and S&P raised it to BB- with a stable outlook in September and November, respectively, while Moody's issued an upgrade to B1 with a positive outlook in July, after six downgrades between 2018 and 2022. See Annex 5 for further details.

2.4 **Sector Overview.** Türkiye's strategic position at the crossroads of East and West, combined with its large domestic market and robust manufacturing base serving key markets like the EU, strengthens its role as a trading nation. In this context, efficient transportation and logistics systems are essential. Türkiye's vast territorial size means that serving its domestic market often requires the long-distance transportation of freight, making the country's logistics system inherently transport-intensive and well-suited for multimodal solutions.

2.5 Yet, Türkiye's freight transport system is unbalanced, with trucking dominating and rail participation being low. This imbalance creates avoidable transport costs, increases logistics costs for some supply chains (especially for commodities), and is inconsistent with the country's climate aspirations. In 2022, out of Türkiye's total of the 389 billion non-pipeline inland ton-km transported, 95 percent took place by truck and only 5 percent by rail.[2] This rail freight market share is significantly lower compared to other upper-middle-income countries with similar commodity structures and transport distances, such as South Africa (37 percent), China (29 percent), Mexico (25 percent), and Brazil (20 percent). Türkiye therefore has a unique opportunity among upper-middle-income countries to reduce transport costs and

[2] Turkey TR: Total Inland Freight Transport: %: Road | Economic Indicators | CEIC (ceicdata.com)

mitigate the impacts of climate change by promoting rail freight and shifting freight from trucks to rail.

2.6 **Addressing Key Development Challenges/Project Contributions.** Türkiye's railway network suffers from poor domestic and international accessibility on its eastern end, which is technically obsolete and in need of modernization. One of the most strategic lines in this region is the 660-kilometer Divriği-Kars-Georgian border line. This line serves as an international corridor, connecting Türkiye to the South Caucasus through the Baku-Tbilisi-Kars (BTK) railway line, as well as providing access to Central and East Asia via the Caspian Sea. Additionally, it is an important domestic corridor, linking four provinces in eastern Türkiye (Sivas, Erzincan, Erzurum, and Kars) to the country's major economic centers in the west.

2.7 As one of the oldest sections of the network with some parts dating back to before the founding of the Turkish Republic, it still relies on an outdated manual traffic control system, which includes line dispatchers, paper train orders, and telephone communications (known as TMI in Turkish). This outdated system reduces the line's freight capacity, makes it more susceptible to delays and safety issues, and generates avoidable costs in terms of infrastructure maintenance and service provision. Furthermore, the line is not electrified and relies solely on diesel-powered equipment. This limitation affects train speeds and station lengths, and after decades of deferred maintenance, the line is in urgent need of rehabilitation. Overall, the modernization and improvement of the Divriği-Kars-Georgian border line under this connectivity project (hereinafter, the "Project"), as well as other parts of the eastern rail network, are crucial to enhance efficiency, capacity, and safety in Türkiye's rail transportation system.

3. Rationale

3.1 **Project Objective.** The objective of the Project is to improve the rail connectivity of eastern Türkiye along the Divriği-Kars-Georgia border railway section of the Trans-Caspian Middle Corridor.

3.2 **Project Scope.** The Project consists of the installation of signaling, telecommunication and electrification systems on a 660-kilometer (km) railway section along the Divriği-Kars-Georgia border corridor; and construction/rehabilitation of sidings, bridges, station buildings, and other facilities to increase the existing railway operating capacity and improve operational safety.

3.3 The Project is located at the eastern end of the country's railway network, where an outdated manual traffic control system is currently in operation. This antiquated system relies on line dispatchers, paper-based train orders, and telephone communication known as Central Administration by Telephone. This obsolete setup hampers the corridor's passenger and freight-carrying capacity, leading to increased delays, compromised safety, and unnecessary infrastructure maintenance and service costs. Furthermore, this 660 km railway section predates the establishment of the Republic of Türkiye and remains predominantly non-electrified, constrained in terms of train speeds and station lengths, necessitating urgent rehabilitation. To address these issues, the Project aims to modernize and upgrade the railway system, fostering enhanced efficiency, safety, and connectivity for the region.

3.4 **Expected Beneficiaries.** The main beneficiaries of the Project are cargo owners, transport and logistics providers, and the local communities along the Divriği-Kars-Georgia border railway line and the Middle Corridor (MC). These communities, especially those near key economic centers such as Erzurum and Kars, will benefit from enhanced connectivity, increased economic activity, and improved access to markets. The Project will also reduce transport costs for shippers by facilitating a shift from road to rail, offering faster and more reliable freight routes. Railway companies and logistics operators will benefit from new connections and business opportunities.

3.5 The State Railways of the Republic of Türkiye (TCDD), as manager and access regulator of the national railway network, will benefit from an improved infrastructure asset that will reduce maintenance expenses and backlog. The Project will enhance TCDD's operations by providing a more resilient, better-equipped, and higher-capacity railway line, particularly in a section of the network currently hampered by obsolescence. This improvement is expected to attract both domestic and international freight, thereby increasing TCDD's revenue from track access charges and enabling better network management services.

3.6 **Expected Results.** The Project Objective Indicators will include (i) rail freight travel time between the Divriği and the Georgia border; (ii) number of people benefiting from the improved access, segregating female and young users; (iii) Greenhouse Gas (GHG) emissions per ton/km; and (iv) freight carrying capacity. Project objective and intermediate indicators can be found in Annex 1.

3.7 **Strategic Fit for Türkiye.** The Project aligns with key national policy goals, including those outlined in the 12th National Development Plan (2024-2028), the Türkiye Updated First

Nationally Determined Contribution under the Paris Agreement, the Transport and Logistics Master Plan 2053, and the GoT's goal of achieving a net-zero economy by 2053.

3.8 **Strategic Fit for AIIB.** The Project is aligned with AIIB's thematic priorities of connectivity and regional cooperation, green infrastructure, and technology-enabled infrastructure, as well as with the Bank's Transport Sector Strategy.

a) Connectivity and Regional Cooperation, as the Project will improve the railway network through increased capacity and quality, reduced journey time, and improved safety along the Divriği-Kars-Georgia border railway, part of the MC and key for regional integration.

b) Green Infrastructure, through the reduced carbon emissions by shifting passenger and freight traffic from road to rail. Over the 31-year period of analysis, it is estimated that the Project will result in the cumulative avoidance of 5.0 million tons of CO2eq. Given the climate components incorporated, the Project qualifies not only as climate mitigation finance (USD248.5 million, equivalent to 99.4 percent of AIIB's investment), but also as climate adaptation finance (USD49.7 million, equivalent to 19.88 percent of AIIB's investment).

c) Technology-enabled Infrastructure, as the financed rail corridor will use European Rail Traffic Management System (ERTMS)/European Train Control System (ETCS) Level 1 signaling and telecommunication systems along the entire 660 km alignment; this train control technology is compliant with EU Trans-European Transport Network (TEN-T) standards and is expected to (i) significantly increase the line's train carrying capacity and average train speeds, (ii) make the line safer, and (iii) make train maneuvers more responsive to climate and other disruptions, thus contributing to strengthening the climate resilience of line operations.

d) Transport Sector Strategy, specifically with: (i) upgrade of existing infrastructure, through the financing of rehabilitation and improvement of an existing railway line, (ii) investment in trunk linkages, being the Divriği-Kars-Georgia border corridor a core section of the MC, (iii) transport integration, by improving connectivity with neighboring countries and other regions by rail, and (iv) cross-border connectivity, as this Project is an integral part of the MC, an international corridor.

3.9 **Paris Agreement Alignment (PAA) and Climate Finance.** In line with AIIB methodology for assessing the alignment with the mitigation and adaptation goals of the Paris Climate Agreement, the Project is assessed as aligned. The Project aims to achieve Paris-Alignment in both mitigation (BB1) and adaptation (BB2) aspects. Rail infrastructure projects fall under automatically aligned activities for mitigation. As for adaptation alignment, an initial climate risk screening utilizing the Aware tool categorized the Project as High risk due to temperature increase, snow loading, and flooding. Consequently, a climate risk assessment was conducted during Appraisal stage as part of the Environmental and Social Impact Assessment (ESIA). The Project aligns with Türkiye's Nationally Determined Contribution (NDC) and long-term net-zero emissions targets, as well as its Climate Change Adaptation Strategy and Action Plan. Component 1 will incorporate resilience-enhancing measures, with the potential to generate significant climate co-benefits, thus enabling the Project to be eligible for both mitigation and adaptation finance. The specific amount of climate finance is USD250 million. Please see further details in Annex 4.

3.10 **Value Addition by AIIB.** Since its inception, AIIB has approved several operations in Türkiye, including the Ispartakule-Cerkezkoy Railway Project (P000345), providing AIIB with a significant comparative advantage in understanding the country's government institutions, policies, and the role of the private sector. AIIB's engagement will, therefore, bring this knowledge in the form of innovative solutions, leveraging insights from other rail initiatives in Central and East Asia to offer strategic guidance on the MC's national and regional perspectives. AIIB's involvement ensures enhanced scrutiny of the government's capacity to manage multiple railway projects, fostering regional collaboration and coordination with neighboring countries. Additionally, AIIB supports inclusive growth by promoting economic activity and access to employment in less developed areas, contributing to spatial economic convergence. The Bank's alignment with the WB's policies and frameworks simplifies client interactions in a complex three-MDB financing, adding financial value and convenience.

3.11 **Value Addition to AIIB.** AIIB's participation in the Project will further strengthen the Bank's internal capacity in relation to the integration of core transport investments. As the second sovereign-backed financing in the railway sector for the country, the Project will consolidate the existing relationship with the Ministry of Transport and Infrastructure (MoTI), fostering closer collaboration and mutual benefits. Additionally, as the first cofinancing with both the World Bank (WB) and Islamic Development Bank (IsDB) in Türkiye, this Project will enhance the Bank's capabilities to work with these two partners in the country.

3.12 **Lessons Learned.** The General Directorate of Infrastructure Investment (AYGM) is currently implementing the WB-financed Railway Logistics Improvement Project (RLIP)[3] and the AIIB-financed Ispartakule-Cerkezkoy Railway Project[4]. Through these two projects, the WB and AIIB have established a strong partnership with AYGM, fostering close coordination that will facilitate the effective implementation of the Project. Lessons learned from the experience include:

a) Implementation of design-build contracts for civil works, which integrate both engineering design and construction activities under a single tender procedure. This will reduce implementation delays by consolidating the procurement requirements into fewer procurement packages;

b) Project design informed by best international practices in railway infrastructure development. International experience shows that fragmentation in the provision of signalization and telecommunication systems in railways can create compatibility risks, leading to higher vulnerability to system failures. To mitigate this risk, the Project design calls for the provision of electrification, signalization, and telecommunication systems by the same provider along the entire length of the target line;

c) Comprehensive assessment of the construction market and relevant costs in Türkiye, allowing for more accurate calculations of reference values and budget;

d) The Project allocates more resources to staffing and equipping AYGM's PIU compared to RLIP, with an integrated consulting services model to fill expertise gaps, creating knowledge spillovers for AYGM staff; and

e) To mitigate risks associated with construction quality and linkage between contracts, a single construction supervision consultant (CSC) will be engaged for all works, and

[3] Rail Logistics Improvement Project.
[4] Ispartakule-Cerkezkoy Railway Project.

the CSC will be mobilized early to contribute to tender documentation for design-build contracts.

4. Project Description

4.1 Components

4.1.1 **Component 1: Rehabilitation and modernization of the Divriği – Kars – Georgia border railway corridor (Total USD1,339.2 million; WB USD656.0 million; AIIB USD248.5 million; IsDB USD250.7 million; GoT USD183.9 million).** This component involves the rehabilitation and modernization of the Divriği-Kars-Georgia border railway line, a 660km long brownfield project in eastern Türkiye. This existing, outdated international railway link is crucial for connecting Türkiye with Georgia and the broader MC to the east. It also plays a vital role in providing essential connectivity between Türkiye's eastern and western provinces and is a key segment of the MC within Türkiye, ultimately linking the country with the rest of Europe to the west. This component will comprise three subcomponents, as follows:

i. Sub-component 1.1: Design, infrastructure and superstructure, electrification and signalization works (USD1,066.7 million, including contingencies and excluding VAT; WB USD640.2 million, AIIB 242.5 million, and GoT USD183.9 million). The WB and AIIB will jointly cofinance this subcomponent, complemented by the GoT's counterpart financing contributions, including the following activities:

   a) Design, infrastructure and superstructure works for the Divriği-Kars section of the line; and

   b) Electrification and signalization works for the entire Divriği-Kars-Georgia border railway line.

ii. Sub-component 1.2. Design, infrastructure and superstructure works for the Kars-Georgia border section of the target line (USD250.7m, fully financed by IsDB). On a parallel financing basis, IsDB's contribution will be allocated exclusively to the design, infrastructure and superstructure works for the Kars-Georgia border section of the railway line. This will be the sole activity funded by IsDB under the Project.

iii. Sub-component 1.3. Design supervision and construction supervision services for the rehabilitation and modernization of the Divriği-Kars-Georgia Border Railway Line (USD21.8 million; WB USD15.8 million, and AIIB USD6.0 million). This sub-component involves the provision of supervision consultancy services for all design and construction/installation works under Sub-components 1.1 and 1.2. These services will be financed (pre-VAT) solely by WB and AIIB contributions on a joint co-financing basis. The supervision will cover the entire length of the Divriği-Kars-Georgia Border railway line, including the infrastructure and superstructure works along the Kars-Georgia border section to be financed by IsDB. This integrated approach to design and construction supervision is expected to enhance construction quality, resilience, and overall operational performance.

4.1.2 **Component 2: Project Management (Total USD5.5 million; WB USD4.0 million; AIIB USD1.5 million).** This component comprises the financing and mobilization of a specialized firm with expertise in project management, construction, engineering (including climate resilience), social and environmental monitoring, citizen engagement, results monitoring and evaluation, and other aspects of project implementation oversight.

This firm will support the Project Implementation Unit (PIU) to ensure effective execution of the Project.

4.2 Cost and Financing Plan

Table 1. Project Cost and Financing Plan

Item	Project Cost (USD m excl. VAT)*	Financing (USD m and %)			
		AIIB	**WB**	**IsDB**	**GoT**
Component 1	1,339.2	248.5	656.0	250.7	183.9
- *Subcomponent 1.1*	1,317.4	242.5	640.2	-	183.9
- *Subcomponent 1.2*	250.7	-	-	250.7	-
- *Subcomponent 1.3*	21.8	6.0	15.8	-	-
Component 2	5.5	1.5	4	-	-
Grand Total	1,344.6 (100%)	250.0 (18.6%)	660.0 (49.1%)	250.7 (18.6%)	183.9 (13.7%)

** All VAT payments due from project activities will be financed by GoT counterpart funds.*
Source: AYGM.

4.3 Implementation Arrangements and Readiness

4.3.1 Implementation Arrangements.

(i) The Project will be implemented by AYGM, the lead agency for rail infrastructure development under MoTI. A dedicated PIU sub-unit will be established within AYGM, working alongside the existing PIU team responsible for implementing the RLIP and Ispartakule-Cerkezkoy Railway Project. The PIU will be led by AYGM's Deputy Director General as Director, with the Director of the Railway Construction Department serving as PIU Deputy Director. The team will include 10 members, covering roles in engineering, procurement, financial management, social development, environment, health and safety, gender, and citizen engagement, along with an administrative assistant. These positions will be filled during project implementation by a specialized firm with expertise in project management and related fields. The Terms of Reference (ToR) for these roles are under preparation by AYGM and will be reviewed by the co-financiers, ensuring they meet the relevant procurement, environmental and social, and Financial Management requirements for all the lenders.

(ii) Procurement arrangements.

a. **Procurement Policy.** In line with AIIB's cofinancing agreement with the WB, the components jointly co-financed with the WB (i.e., Subcomponents 1.1 and 1.3, and Component 2) will follow the WB Procurement Policy in Investment Project Financing (IPF) (November 2017), the WB Procurement Regulations for IPF Borrowers (September 2023), and the provisions outlined in the Loan Agreement and Procurement Plan (PP).

b. **Project Procurement Strategy for Development (PPSD) and PP.** The WB PPSD and PP for the first 18 months of Project implementation have been submitted to the WB. These documents initial agreed versions will be finalized prior to Loan Negotiation and will then be updated by AYGM as needed. The PP will require approval from both WB and AIIB prior to implementation, and

will be reviewed annually, or as necessary during Project implementation to reflect the Project needs, institutional capacity improvements, and adjustments to procurement risk. The PP and the Specific Procurement Notices will be published on the co-financiers' Project websites.

c. **Project Procurement Packages**. The Project is expected to include the following contracts:

i. Large Value Design-build Works Contracts:

- For the infrastructure and superstructure of the line from Divriği to Kars (587 km) and electrification of the whole line from Divriği to the Georgian Border (667 km). This procedure may be initiated as two or more contracts/lots, with the total number depending on AYGM's decision regarding the final contract/lot structure, in consultation with the co-financiers.

- For the signalization and telecommunication of the whole line from Divriği to the Georgian Border (667 km).

The procurement of both contracts will follow international open competitive bidding (single stage, two envelop system) with rated evaluation criteria. The WB Standard Procurement Document (SPD) "Request for Proposal - Works (without initial selection)" (July 2023) will be used, adopting the FIDIC "Yellow Book" (Conditions of Contract for Plant & Design-Build) for the General Conditions of the Contract.

ii. Consulting Services. Two consulting firms are expected to be hired under the Project:

- A large value consulting contract for the Design Supervision and Construction Supervision for Rehabilitation Works for Divriği – Kars – Georgian Border Railway Line. As described under the Project Subcomponent 1.3, this Contract is expected to review designs and supervise works across the full length of the railway line, including the infrastructure and superstructure works along the Kars-Georgia border section that will be financed only by the IsDB. The consultant will supervise the works in the role of "Engineer" as specified in the FIDIC "Yellow Book" during the implementation of the works contracts.

- A PIU Support consultant firm will be engaged to strengthen the capacity of the PIU in areas such as project management, construction oversight, engineering (including climate resilience), ES monitoring, citizen engagement, results monitoring and evaluation, and other key aspects of Project implementation oversight.

The selection of both consulting firms will follow International Open Competitive Selection – Quality and Cost Based Selection (QCBS) method, and WB Request for Proposal (RFP) Documents for selection of consultants (July 2023 and updates) will be used.

d. **Advance Procurement**. Advance procurement or the works contracts and consulting services may be launched prior to loan agreement signing.

(iii) Financial Management (FM) Arrangements. AYGM will be responsible for the overall Project financial management and disbursement work and will establish a PIU for the proposed Project. The WB has conducted an FM assessment focusing on a review of funds flow, staffing, accounting policies and procedures, financial reporting and monitoring, and audits. AIIB is satisfied with WB's FM assessment capacity and progress. AIIB's assessment and results are mainly based on the WB's findings. The WB will provide FM and disbursement-related services as a lead co-financier per the WB-AIIB co-financing agreement's standard terms. Such services will include sharing the results of periodic financial report reviews, annual audits of Project financial statements, review of withdrawal applications, and any other FM-related activities.

(iv) Environmental and Social (ES) Arrangements. AYGM will oversee the implementation of all ES aspects through the dedicated PIU sub-unit. This PIU will ensure that contractors and subcontractors fully comply with the Environmental and Social Management Plan (ESMP). Construction contractors will directly implement the ESMP during land preparation and construction, monitoring their activities and reporting to AYGM.

(v) Project Operations Manual (POM). A POM will be developed to guide the implementation of the Project. The POM will detail the internal procedures that the PIU must follow to ensure adherence to relevant procurement, financial management, social and environmental standards, and citizen engagement policies. To support the effective use of the POM, periodic training sessions, regular implementation support missions, and ongoing communication between AYGM PIU and the co-financiers will be conducted.

4.3.2 **Implementation Period.** The implementation period for the Project is expected to be five years, from January 2025 to December 2030.

4.3.3 **Implementation Readiness.**

(i) A feasibility study with an assessment of alternatives and basic technical characteristics was developed by AYGM in 2021 and updated with the support of the WB to ensure a thorough consideration of the regional connectivity aspect. The civil works contracts will follow a design-build approach, and designs and works will be independently supervised by consultants financed by the Project.

(ii) Regarding FM, the funds flow mechanism, financial reporting, and auditing arrangements have been discussed and agreed upon. The Project team is aware of the system of oversight, and recruitment of dedicated staff resources is expected to be completed within a few months of commencing implementation through the engagement of a specialized firm with expertise in project management, construction, engineering, and monitoring.

(iii) The PP and the PPSD have been prepared by AYGM and are currently under review by the co-financiers. Their finalization is a requirement for negotiation.

(iv) The POM will delineate the internal procedures and coordination between the different stakeholders are clear and will be further detailed in the POM. This POM will be a loan effectiveness condition and will need to be followed by the PIU to

ensure compliance with the relevant policies regarding procurement, FM, ES standards, and citizen engagement.

(v) Detailed implementation readiness checklist is included in Annex 6**.**

4.3.4 **Monitoring and Evaluation.** AYGM PIU will have the overall responsibility for monitoring the Project progress and performance based on the results indicators defined in the Results Monitoring Framework (Annex 1) through quarterly and annual reports. The measurement of some of these indicators will require market research and/or consultations with other government agencies, whether within or outside MoTI. Formal implementation support missions will be conducted jointly by the Project's co-financiers twice a year throughout the Project period. Additionally, just-in-time support will be provided by the co-financiers as needed, using various formats. A mid-term review (MTR) will take place midway through the Project, expected around December 2027, to assess progress, capture lessons learned, address key issues, and establish a time-bound action plan. The Project is scheduled to finish implementation on December 31, 2030.

4.3.5 **AIIB's Implementation Support.** While the WB, being the lead co-financier, will assume primary responsibility for supervising the Project in accordance with the WB's relevant policies and procedures, and aligned with the co-financing framework agreement signed between the Banks, AIIB will closely collaborate and cooperate with the WB in conducting thorough assessments and overseeing the Project. To establish clear guidelines for their collaboration, a Project Co-lenders' Agreement will be executed between the two institutions, outlining the specific nature of their cooperation.

5. Project Assessment

A. Technical

5.1 **Project Design.** The Project will be implemented using 'Yellow FIDIC' design-build principles. Detailed engineering designs will be prepared by the contractor under the monitoring and review of the supervision consultant, and particular attention will be given to addressing climate related risks to deliver resilient infrastructure consistent with both national standards and European/TEN-T practice. As most of the railway line was completed at least 55 years ago, and any rehabilitated or newly constructed parts were last completed around 10 years ago, there are infrastructure and drainage vulnerability spots all along the line, especially due to changing meteorological conditions due to climate change. To address these, hydraulic analyses of drainage systems and flooding effects on all culverts and bridges along the line, based on up-to-date climatic conditions data, will be carried out at the detailed design stage. All drainage systems, culverts, and bridge renovation or reconstruction works will be defined within the technical specification, design documentation, and Bill-of-Quantity (BOQ) accordingly. To address the seismicity-related issues in the Project corridor, site specific seismic surveys, engineering studies and solutions, and renovation or reconstruction works will also be developed. The detailed design will address leakage prevention as well as control and provision of required clearance in existing tunnels.

5.2 **Interfaces Management.** The Project comprises the management of multiple contracts for the main infrastructure, including two for civil works, one for signaling, and one for electrification, presenting a significant risk for the PIU due to the complexity of handling interfaces between these contracts. The risk involves potential delays, miscommunication, and integration challenges among the contractors. To mitigate these risks, the Project includes (i) a dedicated Project Management component, which involves mobilizing a specialized firm with expertise in project management, engineering, ES monitoring, and other aspects of oversight to support the PIU in ensuring effective coordination and execution, thereby minimizing interface risks and ensuring timely project delivery; and (ii) the Supervision Consultant firm, which will oversee the entire Divriği-Kars-Georgia Border railway line, with an integrated supervision strategy aimed to improve the quality of construction, strengthen resilience, and optimize the overall operational performance.

5.3 **Minimizing Operational Disruptions during Rail Construction.** To minimize operational disruptions during rail construction, a key strategy involves AYGM comprehensive planning to synchronize construction timelines with TCDD's operational requirements. This includes in-depth discussions to identify peak operational periods and strategically plan construction activities to reduce impact. The civil works contracts are expected to follow a phased construction approach, breaking down the intervention into smaller, manageable segments, ensuring that portions of the rail corridor remain operational while construction continues on other sections. Continuous communication and coordination between AYGM and TCDD are crucial to swiftly addressing any arising issues, ensuring that all stakeholders are updated on progress and necessary changes.

5.4 **Operational Sustainability.** The GoT, through the Strategy and Budget Office (SBO) of the Presidency, the Ministry of Treasury and Finance (MoTF), and the MoTI, is fully committed to this Project and its long-term sustainability. The Project's strong policy foundation (see

paragraph 3.7) is expected to support the Project well beyond its implementation phase. Additionally, Türkiye's strategic goal of expanding trade with Central Asia and China, positioning itself as a key transit hub for the MC, underscores the Project's significance. Potential future branches of the MC through the South Caucasus, connecting to the target line at Kars, further enhance its strategic value.

5.5 The SBO has fully integrated the Project into the Government's 2024 Investment Program, ensuring sustained budgetary support for the national railway network, including the Project line. Upon the completion of civil works, AYGM will transfer the project-financed infrastructure to TCDD, which has the mandate for the maintenance and operation of all public rail infrastructure. The Project's international scope, its role as part of the BTK line spanning Türkiye, Georgia, and Azerbaijan, and its strategic position within the MC, create both policy and market incentives to ensure the asset's full utilization and consistent maintenance in line with operational needs.

B. Economic and Financial Analysis

5.6 **Economic Analysis.** A standard cost-benefit analysis (CBA) was carried out to assess the economic viability of the Project comparing "with-" and "without-project" scenarios. The analysis covers an operating life span of 31 years and a rehabilitation/construction period of five years, discounted at a social discount rate of 9 percent[5]. All costs and benefits are expressed in foreign currency, net of transfers and financial charges.

5.7 The CBA for the Project considers the analysis conducted by WB across Components 1 and 2. The economic costs consider shadow prices of construction and maintenance costs. The model evaluates four key sources of net economic benefits from the Project-funded investments: (i) reduced transport costs for shippers when choosing freight routes; (ii) decreased in-transit inventory costs due to routing decisions; (iii) lower GHG emissions resulting from route and mode choices; and (iv) within Türkiye, the reduced cost of traffic accidents due to the safety advantages of rail freight over trucking.

5.8 Beyond these directly attributable benefits, the proposed Project is expected to generate wider economic benefits which, though not explicitly quantified in the CBA, are part of the Project's investment rationale. These include (i) increases in firm-level productivity by reducing inputs like inventory and transportation costs per unit of output, and enhancing firms' ability to integrate into global value chains and access export markets; (ii) job creation in the transport and logistics sectors, as well as for businesses benefiting from improved market access to Central and East Asia, including China; and (iii) enhanced spatial economic convergence between the Project's host provinces and the rest of Türkiye, driving local economic growth and reinforcing Türkiye's role as a MC transit hub.

5.9 Comparing quantifiable economic costs and benefits under with- and without-project scenarios, the Project yields an Economic Internal Rate of Return (EIRR) of 11.4 percent. This is above the AIIB-recommended social discount rate for Türkiye of 9.0 percent. At this social discount rate, the Project interventions generate an Economic Net Present Value (ENPV) of USD308 million over the appraisal period. A sensitivity analysis was undertaken comprising (i) a 20 percent decrease in traffic and (ii) a 20 percent increase in construction costs. The

[5] AIIB Internal Guidance.

analysis indicates that the Project yields a higher return than the discount rate across both scenarios. Details on the methodology and disaggregated results are provided in Annex 3.

5.10 **Financial Analysis.** TCDD, as a state-owned entity reliant on substantial public subsidies, does not require a detailed financial analysis such as calculating the Financial Internal Rate of Return (FIRR) for this Project. Its operational revenues, including track access charges, are insufficient to cover the full costs of maintaining and expanding the railway network. This financial structure aligns with other mainline railway systems in Europe, where public subsidies are essential to sustain non-commercially viable operations. The primary objective of providing infrastructure to TCDD is to support strategic public policy goals rather than to generate financial returns.

5.11 The significant subsidies TCDD receives ensure that all operations and maintenance (O&M) activities are fully supported, maintaining the safety and functionality of the national railway network. Backed by a contractual agreement with the Ministry of Treasury and Finance (MoTF) guaranteeing funding through 2033, TCDD benefits from a stable financial structure. Additionally, capital investments in capacity expansion and modernization are funded by the state or through external financing via AYGM. Sectoral reforms and access to international financing further enhance TCDD's financial resilience, allowing it to meet its responsibilities despite ongoing financial challenges.

C. Fiduciary and Governance

5.12 **Procurement.** AYGM will be responsible for implementing this Project, including the procurement activities. As a public entity, AYGM operates under the Public Procurement Law and is subject to external audit by the Court of Accounts. The procurement process within AYGM is well-structured, with clear responsibilities and accountability in place. On contract management in general, AYGM effectively manages contracts to ensure delivery as per the contract conditions. Procurement for the Bank financed activities will follow WB's Procurement Policy and Regulations (see paragraph 4.3.1). The Bank has determined that the WB's Procurement Policy is consistent with the Bank's Core Procurement Principles and Procurement Standards.

5.13 The PIU under AYGM, staffed with personnel with adequate experience in WB procurement policy and regulations, as well as with rated evaluation criteria in civil works, will conduct the procurement processes following the WB rules. The PIU will comprise professional staff from AYGM Railways Construction Department, as well as other relevant AYGM departments and individual consultants. The PIU will be supported by a PIU consulting firm to effectively manage and monitor the Project, including procurement.

5.14 The procurement risk is Medium due to several factors: (i) the large and complex design-build contract, encompassing multiple activities, increasing the risk of subjective interpretation during the technical evaluations; (ii) potential delays caused by the lack of readiness of key technical prerequisites (e.g., ES studies, land acquisition, etc.); (iii) challenges in coordinating procurement activities, such as ensuring the Design Supervision and Construction Supervision Consultant is on board when the design-build construction works contracts are awarded; and (iv) the complexity of coordination among co-financiers (due to parallel cofinancing with IsDB). However, AYGM has market experience to manage these risks effectively, and the following mitigation actions will be applied to the Project: (i) a dedicated

procurement team within AYGM will be confirmed, supported by a PIU Support consulting firm, with WB providing additional training prior to the PIU Support consultant's mobilization and throughout the Project lifecycle; (ii) the RFP for the selection of the PIU Support consultant is expected to be ready by loan effectiveness, and the RFPs for the procurement of the two design-build works contracts and the selection of the Design Supervision and Construction Supervision_Consultant will follow promptly, with all contracts are expected to be awarded within 8 months of issuing the RFPs; and (iii) key technical pre-requisites will be timely ready, in line with the procurement processes and contract implementation.

5.15 **Financial Management (FM).** The Project is expected to use the existing FM arrangements of AYGM with its PIU for the ongoing WB-financed project (RLIP) and a newly established sub-unit under PIU for the proposed Project. Based on the assessment, the FM risk is rated Medium, given the ongoing satisfactory FM implementation performance under the RLIP with the same PIU to support the sub-unit under the proposed Project. In addition, a few mitigation measures have been proposed to strengthen the FM arrangements: (i) the engagement of a consulting firm to staff the PIU sub-unit should be done within one month after effectiveness; (ii) the software adaptation for the Project's accounting and financial reporting should be done within two months after effectiveness; and (iii) the update of the existing FM Manual for the proposed Project's purposes should be completed together with the POM, effectiveness condition.

5.16 The proposed Project will follow the national planning and budgeting procedures and must be included in the Investment Program. Project expenditures each year, regardless of the source of funding, can only be made up to the amount allocated in the annual budget law. The overall responsibility for budget preparation and monitoring lies with the Strategy Development Directorate (SDD) of MoTI. The SDD must send the proposed MoTI budget to the Presidency's Strategy and Budget Office in the year's third quarter. Upon agreement, the institutional budget is then included in the general budget. It becomes effective upon enactment of the Budget Law by the Turkish Grand National Assembly before the start of the new fiscal year. As AYGM is the spending unit for the proposed Project, it should ensure that the allocations are made and reflected in the correct budget codes timely to prevent any delays regarding expenditures.

5.17 AYGM will recruit a consultancy firm to staff the PIU, including one Financial Management Consultant with Terms of Reference acceptable to the lead co-financier. MoTI's accounting is maintained in the Integrated Public Financial Management Information System (PFMIS) of the MoTF in Turkish lira, following the chart of accounts predetermined by MoTF. The PFMIS does not allow the maintenance of the accounting in foreign currency and in sufficient detail to enable detailed project reporting; therefore, the PIU maintains a complementary accounting software to follow up the funds flows on a cash basis in foreign currency and to generate regular project reports. The same accounting system will be used for the proposed Project's accounting.

5.18 MoTI has an internal audit department that is responsible for auditing the selected processes of the whole Ministry based on its risk analyses and annual audit plans. For that reason, the Project will not be subject to MoTI's internal audit arrangements. MoTI applies the internal control mechanisms outlined in the Public Financial Management and Control (PFMC) Law. Accordingly, AYGM will be the accountable spending unit and utilize the proposed

Project funds as per agreed in the Project documents. AYGM will submit the payment orders with the supporting documents to the MoTF and the MoTF's Finance Accounting Officer based in MoTI. The authorized personnel will sign the payment orders. Still, the FM Consultant will verify the completeness of documentation and the accuracy of the payment orders and prepare the payment/bank transfer orders to execute payments. The FM Consultant, through the authorized signatories in AYGM will be responsible for the disbursement arrangements from the Loan account to the Designated Account in line with the WB's Disbursement and Financial Information Letter. All procedures and workflows will be described in the FM Manual, which is considered an integral part of the POM.

5.19 PIU will maintain records, have custody of supporting documents and ensure appropriate accounting for the funds provided on a cash basis. The interim unaudited financial reports (IFRs) will be prepared quarterly and submitted to the AIIB through the WB no later than 45 days after the end of the quarter. The Treasury Controllers will audit the annual project financial statements based on the International Standards on Auditing and in line with a term of reference acceptable to the WB. The audit reports, including a Management Letter (ML), will be provided to the WB and AIIB within six months of the end of each fiscal year. The PIU will publicly disclose the audit reports, excluding the ML, on the AYGM website.

5.20 **Disbursements.** Considering the joint co-financing approach, the WB will handle all Project disbursements related to the jointly cofinanced components according to its disbursement procedures. Disbursements will follow the transaction-based method, including the following procedures: Advance procedure (through advances to the Designated Account), Direct Payment procedure, and Reimbursement procedure with full documentation, including reimbursements under the Retroactive Financing procedure.

5.21 MoTI, through the MoTF, will open a designated account (DA) at the Central Bank of Türkiye in the currency of the -loan. Payments to the contractors, suppliers, and consultants will either be made directly from the loan account or the DA with the authorization of the responsible personnel. Advances from the loan account to the DA should be requested based on project needs and planned project expenditures.

5.22 **Governance and Anti-corruption.** Following WB and AIIB agreement, each co-financier will apply to this Project their own anti-corruption framework, namely the WB's Anti-Corruption Guidelines (Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants, 2016), and AIIB's Policy on Prohibited Practices (2016). AIIB is committed to preventing fraud and corruption in the projects it finances. It places the highest priority on ensuring that projects it finances are implemented in compliance with the policy. The co-financiers will monitor the work related to tender document preparation and tender/proposal evaluation and award under the financing. Implementation will be monitored regularly by the co-financiers. Each co-financier will promptly notify the other about any credible allegation or indication of prohibited practice, as defined in the respective anti-corruption frameworks, in connection with the Project, and any resulting investigation will be led by WB for the harmonized prohibited practices of fraud, corruption, collusion, coercion and obstruction following its own anti-corruption framework and decision-making process, with AIIB assistance, if as agreed upon by the co-financiers. AIIB will lead the investigation into any allegations of misuse of resources and theft, which are not harmonized with the WB. Notwithstanding the above, AIIB also reserves the right to investigate,

directly or indirectly through its agents, any alleged Prohibited Practices relating to the Project and to take and/or require the borrower to take necessary measures to mitigate the risk of such practices and address any issues in a timely manner, as appropriate.

5.23 **Cybersecurity.** In the context of a railway construction project, cybersecurity is a critical concern, particularly given the increasing reliance on interconnected systems such as Operations Control Centers, Passenger Information Systems, and SCADA system (Supervisory Control and Data Acquisition). These systems are highly vulnerable to cyberattacks, which could lead to cascading disruptions across the entire railway network. While the General Directorate of Communication under the MoTI oversees cybersecurity efforts, AYGM currently lacks a specialized department dedicated to this area. However, Türkiye's 2024-2028 strategic plan[6] emphasizes the development of robust cybersecurity measures to protect critical railway infrastructure, including signaling systems and control centers, aligned with international best practices.

5.24 TCDD, as the state railway operator, has been proactive in addressing cybersecurity vulnerabilities by collaborating with leading technology companies. These partnerships aim to assess and enhance the cybersecurity maturity level, improve risk management, and develop a national signaling system designed to withstand cyber threats. Given the strategic importance of the Project, these efforts are crucial to maintaining operational security and safeguarding against potential cyber threats.

D. Environmental and Social

5.25 **Environmental and Social Policy.** The Project will be co-financed with the WB, and the Project's ES risks and impacts will be assessed in accordance with WB's Environmental and Social Framework (ESF). To provide for a harmonized approach to addressing the ES risks and impacts of the Project, and as permitted under AIIB's Environmental and Social Policy (ESP), the WB's ESF will apply to the Project in lieu of the AIIB's ESP. AIIB has reviewed the WB's ESF and is satisfied that: (a) WB's ESF is consistent with AIIB's Articles of Agreement and is materially consistent with the provisions of AIIB's ESP, including Environmental and Social Exclusion List and the relevant Environmental and Social Standards; and (b) appropriate environmental and social arrangements and monitoring procedures are in place for the Project.

5.26 **ES Categorization.** WB has classified the Project's Environmental and Social risks as Substantial, equivalent to Category B if AIIB's ESP were applicable. Main environmental and social risks are detailed in the following paragraphs.

5.27 **Environmental and Social Instruments.** To mitigate the ES risks, AYGM has prepared a project-level ESIA including an ESMP and various sub-management Plans including Community Health and Safety Management Plan (CHSMP), Emergency Preparedness and Response Plan (EPRP), Pollution Prevention and Waste Management Plan (PPWMP), Traffic Management Plan (TMP), Biodiversity Management Plan (BMP), Cultural Heritage Management Plan (CHMP) and Occupational Health and Safety Management Plan (OHSMP). Also, Environmental and Social Commitment Plan (ESCP), Resettlement Framework (RF), Stakeholder Engagement Plan (SEP) and Labor Management Procedure (LMP). These

[6] https://www.uab.gov.tr/uploads/pages/stratejik-yonetim/uab-2024-2028-nihai-stratejik-plani-5-1-2024.pdf.

instruments outline how these ES risks will be avoided, minimized and mitigated. Further, site-specific ES documentation will be developed and implemented during project implementation. The ESIA/ESMP, BMP, and contract-specific ESMPs (C-ESMPs) will be updated based on the findings of additional biodiversity studies to be conducted prior to start of construction works during the Project's implementation phase.

5.28 **Environment Aspects.** The Project will support large-scale civil works for the rehabilitation and reconstruction of an existing railway corridor with a total length of 667 km from Divriği to the Georgia border, along with the installation of signaling and electrification, and improvement of railway stations and the Kars logistics center within Kars station area.

5.29 During the construction and operational phase, key environmental risks associated with the Project include (i) air pollution, noise and vibration; (ii) soil disturbance; (iii) vegetation management; (iv) waste management and the disposal of outdated technology; (v) management of construction camps; (vi) occupational and community health and safety risks, including traffic safety and emergency response; (vii) environmental risks related to snow removal and snow barriers; (viii) risks associated with routine maintenance activities; (ix) increased energy consumption and associated greenhouse gas emissions of enhanced systems; and (x) potential impacts on culturally and naturally protected areas, including habitat loss, fragmentation, and displacement. These risks will be managed by implementing the various management sub plans prepared for the Project. The management plans contains both Construction-ESMP and Operations-ESMP to manage the risks associated with operations in addition to the construction phase risks.

5.30 The Project alignment is close to a few protected areas and Key Biodiversity Areas (KBA), which include areas of local, national and international importance. These areas host threatened and endemic species. These have been identified and assessed using the IUCN Red List using defined criteria. The railway route passes through a couple of these protected areas and it is also adjacent to a few additional protected areas. However, the sections within protected areas are minimal, and the habitat in those areas is already modified due to 60 years of railway operations. The new construction in these areas will remain within existing rail corridors, and any new land development will be outside protected areas, avoiding impacts on critical habitats and species. The ESIA completed for the Project has concluded that the existing railway route will not encroach into the critical habitats. In addition, the ESIA sets a firm requirement that all project activities will not to be conducted in the areas identified as critical habitats. To further manage these risks, a comprehensive Biodiversity Management Plan (BMP) has been prepared by the Project. This plan includes requirements to establish buffer zones around sensitive habitats, timing construction activities to avoid critical periods for wildlife and ongoing monitoring of biodiversity.

5.31 **Social Aspects.** During the Project implementation, social risks and impacts are associated with potential livelihood impacts due to land acquisition, physical and economic displacement, as well as risks related to labor and working conditions, labor influx, community health and safety, cultural heritage, and risk of Sexual Exploitation and Abuse and Sexual Harassment (SEA/SH) due to the Project being implemented across five provinces including in hard-to-reach areas.

5.32 Considering the primarily brownfield nature of the Project and the GoT's existing ownership of surrounding land within the corridor's right-of-way (RoW), the Project's land needs are expected to be met without significant land acquisition. Land acquisition beyond the existing RoW is anticipated for the following purposes: a) temporary requisition of land for associated services (e.g. labor camp, storage of goods) during replacement of railway lines; b) installation of electric power systems, including substations, neutral zones, and power transmission lines; d) rehabilitation of bridges; e) renewal of culverts; f) construction of new overpasses and snow barriers; g) improvement of selected station buildings, facilities, and signaling, telecommunications, and electrification systems, including the construction of signaling/telecommunication and electrification systems at the Kars logistics center.

5.33 Furthermore, the rehabilitation of infrastructure may result in moderate physical displacement and relocation of houses and other fixed assets, loss of land and non-land assets, and temporary access restrictions to land use within the railroad RoW. Land-induced livelihood impacts, such as restrictions of access to pasturelands and agricultural lands, particularly affecting vulnerable communities in some Project areas, are also anticipated. The extent of land acquisition will be determined once detailed engineering designs, including power transmission lines and access roads, are completed by the contractors and the PIU. Efforts will be made to avoid environmentally sensitive, agriculturally significant and residential areas. An RF has been prepared, and Resettlement and Livelihood Restoration Plans (RP/LRP) will be developed as needed during Project implementation. The RF outlines the regulatory framework on resettlement and provides means and actions to bridge the gaps between the national law and the WB ESF. The RF also includes an entitlement matrix addressing physical displacement actions and compensation measures.

5.34 The WB rated the SEA/SH risk as Moderate. An SEA/SH action plan will be prepared before starting construction works. The Action Plan will include SEA/SH mitigation measures, including SEA/SH response mechanisms, a Code of Conduct for workers, a mechanism to report SEA/SH grievances, and training and awareness sessions for Project workers and affected communities.

5.35 **Persons with Disabilities.** The lack of safe and reliable access to public transport disproportionately affects people with disabilities, as it hinders their access to public facilities and services. Social protection measures have been integrated into the prepared ES documents to support efforts in providing equal opportunities for people with disabilities. These measures include access support to consultations and information as well as prioritizing the creation of accessible platforms during the design and construction phases. It is essential to ensure that boarding areas have ramps or lifts and meet the accessibility standards outlined in the relevant regulations of Türkiye.

5.36 **Occupational Health and Safety (OHS), Labor and Employment Conditions.** During construction, the primary OHS risks include exposure to high levels of noise and vibration, risks of falling from heights, and hazards associated with the handling of chemicals and heavy machinery. To mitigate these risks, an OHSMP has been developed. The construction of railway tracks for the Project will primarily utilize mechanized and automated methods, significantly reducing the need for manual labor. Most direct and contracted workers will be technical and skilled staff, utilizing on-site accommodation facilities. The LMP also emphasizes the importance of safety, ensuring that these align with both national legislation

and the WB ESS2. Contractors will also develop and implement their own management plans and safety plans.

5.37 The comprehensive EPRP prepared for the Project includes provisions to address emergencies related to occupational and traffic accidents, with a focus on railway operations. Contractors will be required to provide all employees with training on occupational health and safety, including emergency preparedness and response. Training sessions, emergency drills and OHS awareness initiatives have been included as a KPI in the reporting and monitoring plan.

5.38 The Project will enforce fair labor practices and ensure fair treatment, non-discrimination, and the protection of workers' rights. The LMP prepared for the Project, prevents risks associated with labor and working conditions and outlines the need for written contracts for all workers, including their job descriptions, working hours, salary and their rights. A code of conduct will be implemented for all workers to prevent SEA/SH, alongside a Grievance Redress Mechanism (GRM) that will allow workers to report grievances anonymously, particularly those related to SEA/SH. This mechanism will be accessible to all project workers, including those employed by contractors and subcontractors.

5.39 The Project anticipates limited labor influx due to the mechanized nature of the work, with most workers being skilled technical staff. To manage the potential risks associated with labor influx, including those related to worker accommodation and interactions with local communities, the contractors will prepare a Labor Influx Management Plan and a Workers' Camp Management Plan prior to commencement of works based on the Good International Industry Practice. These plans will involve sensitization and awareness campaigns among the Project workers and the local community, including but not limited to Code of Conduct and GRM.

5.40 For the operation phase, AYGM will apply existing regulations on railway safety, addressing risk management and accident regulations, ensuring compliance with national safety standards. The Borrower has developed an Occupational Health and Safety Management Plan aligned with WB Environment, Health, and Safety (EHS) Guidelines, ensuring that stringent standards are used throughout the Project. This plan is included in the ESMP, and will be included in the bidding documents. The contractors will be required to develop their own OHS Implementation Plans, covering risk assessments, safety procedures, training, monitoring, incident investigation, and reporting. Implementation of OHS plans will be contractually mandated for the contractors and reviewed by WB and AIIB Project teams for compliance during implementation review missions.

5.41 **Stakeholder Engagement, Consultation and Information Disclosure.** The SEP document identified the stakeholders (including vulnerable and disadvantaged groups, such as people with disabilities) and provided guidelines and program for communicating with them. The SEP provides a thorough plan for involvement and communication that will guarantee Project goals are met, and that the Project is carried out in a transparent, responsive, inclusive, and participatory manner. It also establishes a procedure for handling grievances from stakeholders including Project-affected people. Regular information sharing will cover the Project, ES risks and impacts, proposed mitigation measures, resettlement plans, and GRM. The PIU sub-unit will keep continued engagement with communities around the RoW during

Project implementation to manage risks, ensure benefits for affected local communities and handle labor influx-induced impacts and GRM arrangements. All draft ES documents have been disclosed by AYGM prior to Project appraisal and consultations with relevant stakeholders on draft documents are ongoing. Based on these consultations, the documents will be revised and re-disclosed by AYGM within two weeks of Project Negotiations by the WB. The PIU sub-unit will maintain and disclose a documented record of stakeholder engagement, including a description of the stakeholders consulted, feedback summaries, and an explanation of how feedback has been considered. The SEP is a living document and can be updated during the implementation phase as necessary.

5.42 **Project-level Grievance Redress Mechanism (GRM).** AYGM and the PIU will establish a project-level GRM, housed within AYGM's existing Environmental and Social Management System. The established GRM will promptly receive, and address grievances raised by Project-affected people in relation to Project activities. The principal duty of the Project sub-unit of the PIU is to document and oversee grievances, including those related to environmental issues, land acquisition process, calculation or payment of compensation, provision of assistance, or other relevant matters. The SEP outlines a procedure for handling grievances from stakeholders. The grievance procedure is designed to allow anonymous complaints to be filed and handled. The GRM does not preclude Project-affected people from pursuing legal remedies available to them. A project-internal appeals option will be activated to provide a solution before legal recourse is sought. Should the complainant find that the grievance has not been satisfactorily addressed by the PIU sub-unit, the complainant may request the matter to be escalated to the next level. The Grievance Redressal Committee (GRC) will be activated if a resolution cannot be reached at the initial level. The GRC will be established, comprising local representatives and relevant institutional representatives. This allows complaints previously considered by AYGM or contractors, yet unresolved, to be re-evaluated by the Committee. The PIU is tasked with updating the GRC on the discussions from the first stage of redressal and presenting the perspectives of both involved parties.

5.43 Grievances related to SEA/SH will be differentiated and reported to relevant institutions. To protect the victims/survivors of SEA/SH and GBV, the GRM should ensure confidentiality. To implement separate Workers' GRM, AYGM and the contractors will actively listen to complaints made by workers and subcontractor workers. They will collaborate with relevant units to resolve these issues and will work with Social Specialists to record grievances in the Grievance registration table. Employees should have several ways to raise complaints, and the resolution of grievances should ideally include the involvement of the worker representative. To facilitate the process, a grievance box will be provided to workers, enabling them to submit requests, concerns, and complaint forms. The worker representative will document the date, time, source, location, and nature of each request in the complaint forms when received from the social specialist. This comprehensive approach ensures a transparent and responsive mechanism for addressing worker grievances. The contractors will send a copy of the GRM database to the social specialist of the PIU sub-unit once a month, within the framework of standard reporting. The PIU will maintain a master database of all complaints during the Project and keep regular monitoring.

5.44 **Independent Accountability Mechanism (IAM).** As noted above, the WB's ESF will apply to this Project instead of AIIB's ESP. The WB's Inspection Panel, which reviews the WB's compliance with its policies and procedures, will handle complaints relating to the WB's

compliance with its ESF with respect to the Project. In accordance with AIIB's Policy on the Project-affected People's Mechanism (PPM), submissions made to the PPM regarding such complaints under the Project will not be eligible for consideration by the PPM. Information on WB's IAM is available at https://www.worldbank.org/en/programs/accountability.

5.45 **Monitoring and Supervision Arrangements.** The detailed monitoring and reporting arrangements for the Project are listed in the Project's ESMP. KPIs have been defined for various ES aspects, including noise levels, soil contamination, dust emissions, waste management, and community health and safety, among others. An external monitoring mechanism will be established through which the competent resettlement experts will monitor implementation progress and provide advice to the PIU sub-unit on any necessary corrective actions and will conduct an implementation review when all mitigation measures in the RP are completed. The implementation review will evaluate the effectiveness of mitigation measures in achieving RP and WB ESF objectives and recommend corrective measures to meet objectives not yet achieved. Reporting requirements and reporting responsibilities have also been allocated between the contractor, supervision consultant, PIU support consultant, and AYGM.

E. Climate Change

5.46 **Climate Change.** The Project is universally aligned with the mitigation goal of the Paris Agreement (BB1) as it falls under the category of "Rail Infrastructure" and its economic feasibility does not depend on external fossil fuel exploitation, processing or transport. The Project has been assessed as aligned under the adaptation goals of the Paris Agreement (BB2) after the successful completion of a comprehensive Climate Resilience Assessment following the AIIB's methodology and the non-incompatibility of the Project with the NDC or any other national climate resilience strategies. As found on the CRVA performed by the WB, the Project is likely to be materially affected by flooding and landslides. To mitigate these risks, several measures have been incorporated into project design, as well as into the preliminary engineering design of the target line itself. Project design features that are expected to contribute to the delivery of climate-resilient infrastructure include the use of design-build procurement approaches, the use of rated criteria in procurement to incentivize innovation and stronger climate and social and environmental outcomes, and the engagement of key stakeholders at the local and national level during the design and construction phases.

5.47 **Climate Mitigation and Adaptation Finance.** The main component of the Project (Component 1, Rehabilitation of the Divriği – Kars – Georgia Border Railway Corridor), qualifies as climate mitigation finance under the Category "8.3. Inter-urban railway projects for freight or passengers". The CAPEX of this component (which equals to the climate mitigation finance of the Project) amounts USD248.5 million, which represents 99.4 percent of AIIB's investment. Given the climate resilience measures adopted into the Project design, a portion of AIIB's financing can be classified as climate adaptation finance under the category of adapted activities (type 1). Following the AIIB's climate adaptation finance proportional approach methodology (based on the JMDB common principles for tracking climate adaptation finance) a 20 percent climate adaptation finance can be allocated to Component 1, 'Rehabilitation of the Divriği – Kars – Georgia Border Railway Corridor). The final climate adaptation finance of the Project is USD49.7 million, equivalent to 19.88 percent of AIIB's investment. The final climate finance on this Project (adding adaptation and mitigation) is

USD298.2 million. As the total climate finance is greater than the total AIIB's investment, the climate finance of the Project is rounded to 100 percent of the AIIB's investment, which is USD250 million.

5.48 **GHG Assessment.** The GHG assessment performed by the WB estimates that in 2030 the Project will result in the avoidance of 72,332 tons of CO2, and that the annual volume of avoided emissions due to the Project will grow to 245,835 tons by 2060. In aggregate, over the 31-year period of analysis, it is estimated that the Project will result in the cumulative avoidance of 5.0 million tons of CO2.

F. Gender Aspects

5.49 The gender analysis identifies employment and labor force participation gender gaps. The analysis notes that there is a gender gap in the employment of women as engineers and that women are more likely than men to engage in informal economic activity. The Project aims to close the gender gap by undertaking the following four project-financed interventions:

(i) To promote the participation of female professionals in roles that require engineering degrees, the Project will include, as part of the rated criteria for the procurement and selection of design-build contractors and the construction supervision consultant, the engagement of well-qualified women in professional roles that require engineering degrees.

(ii) To further promote participation of female professionals in roles that require science, technology, engineering, and mathematics (STEM) degrees or degrees in areas relevant to the oversight and management of infrastructure development, such as financial management and procurement, AYGM will also utilize rated criteria in procurement that will incentivize the engagement of female specialists as part of the consulting services team to be mobilized to staff the Project-dedicated PIU sub-unit.

(iii) To enhance the employment prospects of young women in the transportation and logistics sector, a historically male-dominated sector in Türkiye, AYGM and its PIU will build on their experience providing internships to last-year female university students in transport and related fields in the Ankara area. Specifically, under this Project, AYGM will introduce an enhanced internship program for female last-year university students in the Ankara area that will prioritize access to permanent employment. The enhanced program will cover a few students per year (e.g., 2-3) but will provide greater focus on preparing interns for the workforce, for example through mentoring or by customizing their internship activities to their employment interests or to any particular requirements for obtaining their degrees. It will also provide support to interns as they search for and apply to jobs. The implementation of this program will continue to use proven coordination practices, such as formal AYGM-led consultation and collaboration with Ankara-area universities to share information with and recruit interested intern candidates. Progress on this intervention will be tracked by the Project's Monitoring and Evaluation framework, through the indicator "Share of female interns receiving full-time employment 18 months after internship program at AYGM," with a target of 60 percent.

(iv) Finally, to support female traders earn their livelihoods more sustainably, the Project will finance the provision of improved workspaces—dedicated, cleaner, safer, with

gender-specific amenities—for female entrepreneurs selling merchandise at selected train stations along the target line.

G. Risks and Mitigants

Table 2: Summary of Risks and Mitigating Measures

Risk Description	Assessment (H/M/L)	Mitigation Measures
Program/Project Implementation Risks		
Technical Risks		
▪ Delay in project execution due to technical challenges. ▪ Poor interface management.	Medium	▪ Key lessons from past experiences will be incorporated into the Project's design/technical specifications. ▪ Interface risk will be carefully considered for systems, signaling, electrification and civil works, through (i) hiring of a firm to provide comprehensive support to PIU, and (ii) Supervision Consultant to be engaged early in the process, covering the whole line from Divrigi to the border with Georgia.
Operational Risks		
▪ Disruption in existing line services while upgrading is being implemented. ▪ Lack of coordination with the rehabilitation contractor currently working on the BTK section from the border to Akhalkhalaki, in the Georgian side.	Medium	▪ AYGM will implement comprehensive planning in collaboration with TCDD to synchronize construction timelines with operational needs and minimize disruptions. ▪ AIIB is facilitating the dialogue and coordination between AYGM and Marabda-Kartsakhi Railway LLC, within Georgian Railway LLC, to ensure smooth interfaces and a coordinated timeline.
Implementation capacity		
▪ Low AYGM PIU capacity.	High	▪ Engagement of newly recruited PIU members to expand AYGM's ability to implement this Project, along with RLIP and Ispartakule Cerkezkoy Railway Project. ▪ Detailed roles and coordination mechanisms for implementation will be established in the Project Operations Manual, condition of effectiveness. ▪ Training, capacity building, and targeted support will be provided by the co-financiers during implementation.

Risk Description	Assessment (H/M/L)	Mitigation Measures
Financial management		
▪ The annual allocation in the budget law for both IFI-financed and government-financed portions of the Project may become insufficient due to foreign exchange rate fluctuations. ▪ The recruitment of the consulting firm to provide an FM Consultant may be delayed so that the Project may start its implementation without a dedicated FM person. ▪ The software adaptation for the Project's accounting and financial reporting may be delayed, so the Project accounting and reporting may not be adequate without keeping any records.	Medium	▪ The PIU will monitor the budget figures to ensure smooth implementation. ▪ The existing finance staff of PIU shall be temporarily assigned to support the Project. ▪ As a temporary measure until the systems are ready, PIU should ensure that it has Excel spreadsheets for project accounting and reporting.
Procurement		
▪ Delays in procurement process and possibility of mis procurement.	Medium	▪ A specialized procurement team will be established under AYGM, supported by the PIU Support consulting firm. The WB will provide guidance, especially before the PIU Support Consultant's mobilization, but also throughout the Project lifecycle. ▪ The RFP for the selection of the PIU Support Consultant will be ready by loan effectiveness, and RFPs for the procurement of the two design-build works contracts and the selection of the Design Supervision and Construction Supervision Consultant will be prepared promptly. Procurement for construction works and supervision should be completed within eight months of RFP issuance. ▪ Key technical pre-requisites will be timely ready, in line with the procurement processes and contract implementation.
E&S risks and impacts during construction and operation		

Risk Description	Assessment (H/M/L)	Mitigation Measures
▪ Land footprint is unknown at this stage. Unplanned land acquisition may lead to Project delays.	Medium to High	▪ An RF is prepared to guide the preparation of Resettlement Plans (RP) and their implementation. The PIU will work in close cooperation with the Department of Real Estate and Expropriation of the AYGM to ensure that land acquisition activities are carried out in accordance with relevant national laws and WB's ESF. ▪ AYGM bears full responsibility for meeting all costs associated with obtaining project sites, including compensation and other considerations due to displaced persons. RP(s) will include an estimated budget for all costs, including contingencies for price inflation and unforeseen costs, as well as organizational arrangements for meeting financial contingencies.

Annex 1: Results Monitoring Framework

Project Objective (PO):	To improve the rail connectivity of eastern Türkiye along the Divriği-Kars-Georgia border railway section of the Trans-Caspian Middle Corridor.				
Indicator Name	**Unit of measure**	**Base-line Data 2024**	**End Target 2030**	**Data source / Methodology**	**Responsibility**
Project Objective Indicators: *(Outcome indicators measure each aspect of the PO statement and are to track progress toward the achievement of the PO)*					
1. Rail freight travel time between Divriği and the Georgia border.	hours	55	22	TCDD will provide systems data on train movements and time of departures and arrivals. Should systems data not be available, AYGM, in collaboration with TCDD, may gather data from train station managers or other direct sources.	AYGM
2. People benefiting from improved access to sustainable transport infrastructure and services.	number	0	590,000	Standard methodology developed by the WB to measure number of project beneficiaries based on geospatial and demographic data. This will be informed by data provided by AYGM on construction investment progress. Beneficiaries will only receive the full benefit of the project-financed infrastructure upon completion of project-financed improvements across the full length of the target line.	AYGM
3. People benefiting from improved access to sustainable transport infrastructure and services – youth.	number	0	120,000		AYGM
4. People benefiting from improved access to sustainable transport infrastructure and services – female.	number	0	300,000		AYGM
5. Predictability of rail freight travel time between Divriği and the Georgia border (coefficient of variation of rail travel time).	percentage	35	18	Coefficient of variation is defined as the sample standard deviation divided by the sample mean and is expressed as a percentage. TCDD systems data or field reports from train station managers will be used.	AYGM
6. Well-to-wheel GHG emissions per ton-km transported on the Divriği-Kars-Georgia border railway line.	grams	45	18	Two methodologies may be used: (i) emissions factor method: calculated based on energy source and emissions factors appropriate for Türkiye; (ii) direct measurement method: calculated based on systems data from TCDD.	AYGM
7. Maximum freight carrying capacity of the Divriği-Kars-Georgia border railway line.	Tones/ year	750,000	20,000,000	Infrastructure configuration method. The target line's maximum freight carrying capacity is not expected to change until completion of project-financed rehabilitation and modernization works. TCDD and AYGM will confirm the new maximum capacity metric at project completion.	AYGM
Intermediate Results Indicators: *(To measure key intermediate results under each component that are necessary for showing progress toward achieving PO. They can capture outputs or short-term outcomes.)*					

Project Objective (PO):	To improve the rail connectivity of eastern Türkiye along the Divriği-Kars-Georgia border railway section of the Trans-Caspian Middle Corridor.				
Indicator Name	**Unit of measure**	**Base-line Data 2024**	**End Target 2030**	**Data source / Methodology**	**Responsibility**
1. Length of railway line rehabilitated and modernized to a higher climate resilience standard.	km	0	660	The description of this indicator as length of railway line "rehabilitated and modernized" means that electrification and signalization must have been completed. Therefore, the Project can only claim progress on this indicator upon completion of all typologies of works – infrastructure, superstructure, electrification, and signalization – for any given line section.	AYGM
2. Share of female interns receiving full time employment 18 months after internship program at AYGM.	%	0	60	After completion of their internship, interns will continue to benefit from AYGM support in the form of follow-up conversations, advice, and mentoring by PIU specialists. AYGM's PIU will stay in contact with interns to support their job search efforts. Only students that are interested in this kind of extended support would be allowed to participate in AYGM's enhanced internship program.	AYGM
3. Freight stakeholders consulted during project implementation on design and operational aspects of target line.	number	0	60	AYGM to develop a stakeholder engagement outreach program and keep track of the number of entities (shippers, carriers, logistics service providers, ancillary service providers, government entities, and the like) that are consulted, irrespective of consultation format.	AYGM
4. Percentage of grievances responded and resolved within an agreed time frame	%	0	85	AYGM will maintain a Grievance Redress Mechanism (GRM) with multiple ways for stakeholders of any kind to submit grievances related to the Project. AYGM will keep track of the number, content, and nature of all grievances (or comments of any nature) received through the GRM, and the timeline to response and resolution.	AYGM

Annex 2: Detailed Project Description

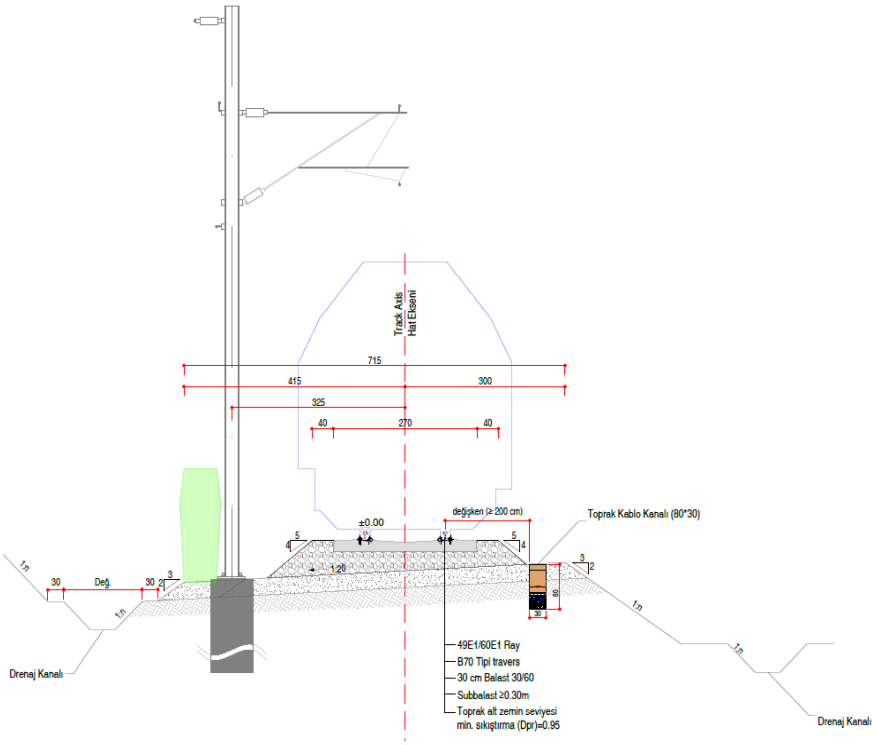
1. The Project includes the rehabilitation and expansion of infrastructure and superstructure, along with the installation of modern signaling, telecommunication, and electrification systems. These upgrades aim to increase the line's operating capacity, enhance resilience to natural hazards, and improve operational safety. The capacity of the trackway is expected to reach 20 million tons per year through these interventions, which include building 10 new siding tracks, extending siding tracks at 30 existing stations, and reconfiguring tracks at Kars Station. Additionally, the maximum train length that can operate will increase to 700 meters, with provisions for future extensions to accommodate 750 m or 1,050 m long trains.

2. Based on the existing conditions of the trackway, the Project scope is defined for Divriği-Kars and Kars-Georgia border sections separately, as follows.

A. Civil Works

3. **Divriği-Kars Section.** The typical cross-section to be taken as a basis for at-grade trackway, new siding tracks, and platform track extensions at stations is shown below.

Figure A2.1. Divriği-Kars Typical Section for At-Grade Trackway, New Sidings, and Platform Extensions



Source: AYGM.

4. Concrete sleepers will be used along the track at 60cm intervals, each sleeper being 2.4 meters long. The rail contact surface will adhere to specific fastening standards. The ballast layer beneath the rails will be at least 30cm thick. Special welding techniques will be applied at switches and along the track to ensure durability. The switches will have specific

curvature preferences, with new switches installed for additional siding tracks at Kemah, Aşkale, Erzurum, Kars stations, and the Kars Logistics Center.

5. Based on trackway extensions and re-arrangements at stations, the following works will be conducted:

- Construction of new trackway with infrastructure and superstructure;
- Construction of two new bridges with a total length of 130 m: a new bridge parallel to the existing one at İliç Station and before Geçit Station;
- Renewal and extension of existing passenger platforms at Kemah and Demirkapı stations;
- Construction of retaining walls with a total length of 1,050 m at Kemah, Güllübağ, and Erbaş stations;
- Extension or renewal of 72 culverts;
- Demolition and reconstruction of 4 overpasses.
- Construction of 10 km long snow trench;
- Renovation of the bored tunnel to expand the clearance for the installation of electrification devices;
- Renovation of tunnel ceiling in 68 tunnels with a total length of 12.5 km;
- Renovation by ballast tamping in 18 tunnels with a total length of 6.2 km; and
- Installation of electrification devices in all 157 tunnels with a 39.6 km total length (Figure A2.2).

6. **BTK Section (Kars – Georgia Border and Kars Logistics Center).** This section will undertake the construction of 76.4 km dual gauge single trackway superstructure, construction of connection roads; excavation and lining construction of head and slope drainage channels; construction of wire fencing, surface drainage, earth and cable channels at the stations; construction of riprap, high snow trenches, slow protection with shotcrete. Construction of culverts; construction of two double-track steel railway bridges, insulation works for existing and incomplete tunnels, installation of water insulation and protection layers. Construction of incomplete reinforced retaining walls, installation of precast concrete cable ducts and handrails. Installation of tunnel lighting system. Completion of bored tunnel portals. Construction of Canbaz Station Building and Social Facility Building, and construction of perimeter wall and two platforms.

B. Electrification Works

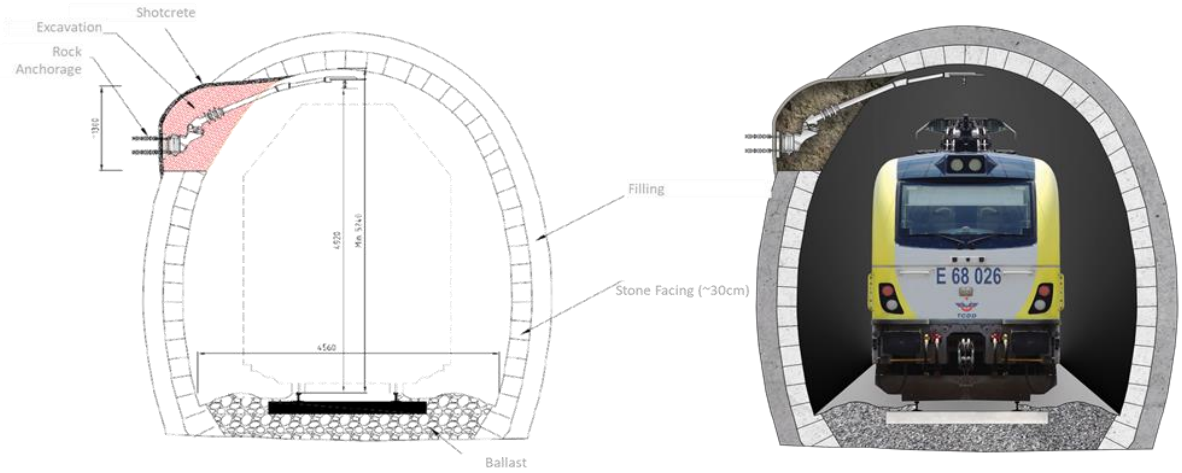
7. The railway sections of both Divrigi-Kars and the Baku-Tbilisi-Kars (BTK) lines, which are currently operated using diesel locomotives, will be electrified to enable faster, more economical, and comfortable railway operations.

8. For the Divrigi-Kars section, the electrification works will include the installation of a catenary system and the construction of traction power transformer stations. This will cover the existing 587 km standard gauge single track main railway line, station and siding tracks (including additional ones), and 13 traction power transformer substations (each with a

capacity of 2x25 MVA). However, the infeed lines from the national power supply network to the transformer stations are not included in this scope.

9. In contrast, the BTK section, from Kars to the border with Georgia, electrification works will be applied to an 82.5 km standard gauge double track main railway line, along with 9.7 km of existing and additional station and siding tracks, and 15.3 km of the standard gauge single track at the Kars Logistics Center connection railway line. Additionally, three traction power transformer substations (each with a capacity of 2x25 MVA) will be installed in this section.

Figure A2.2. Installation of Catenary in Tunnels with Cantilever Application



Source: AYGM.

C. Signaling and Telecommunication Works.

10. Both the Divrigi-Kars and BTK sections will receive the installation of ERTMS/ETCS Level 1 signaling and telecommunication systems to enhance safety and efficiency.

11. For the Divrigi-Kars section, these systems will cover a total of 684.7 km, including 587 km of the main railway line and 97.7 km of siding tracks. An Axle Counter System will be deployed for train detection at signal blocks and level crossings, with LED signals installed at these locations. The switches will be motorized, equipped with heaters, and controlled by interlocking. Central Traffic Control (CTC) for this section, as well as the BTK section, will be based at Erzurum or Kars Station. Additionally, 120 level crossings will be integrated into the signaling system, with necessary infrastructural improvements made based on existing conditions. The telecommunication system will include the installation of Multi-Protocol Label Switching (IP/MPLS) routers, station switches, and other network communication devices. A telephone system for operational and emergency communication, a passenger information system at stations, and an uninterrupted power supply (UPS) system will also be installed.

12. For the BTK section, the signaling and telecommunication systems will cover 113 km, including 79.1 km of the railway line, 9.7 km of siding tracks, and 20.8 km of the Kars Logistics Center connection line. Like the Divrigi-Kars section, an Axle Counter System will be used for train detection, with LED signals placed in signal blocks and stations. The system will support a 120 Km/h operating speed and a 4,500 m signal block distance criterion. The switches will be motorized, with heaters and controlled by interlocking. The signaling system will be powered by both catenary and network sources. Additional works include the installation of

Multi-Protocol Label Switching (IP/MPLS) routers, network switches, a telephone system, a passenger information system at Canbaz Station, and an 8-hour autonomy UPS system with valve-regulated lead-acid (VRLA) batteries. Moreover, 10 ETCS train on-board units will be installed, with locomotives from the Georgian border equipped with ERTMS/ETCS on-board systems. A GSM-R mobile communication system will also be implemented.

D. Distributed Acoustic Sensing (DAS) System

13. The DAS system will be implemented along the most vulnerable 320km of the railway section to detect and monitor potential risks such as trespassing, loose fastenings, flat wheels, loose ballast, and natural disasters including tree, stone, or rock falls, flooding, landslides, and avalanches. The system will be divided into four blocks, each with an 80km detection range along the mainline, and will provide real-time warnings to the Central Traffic Control (CTC). Monitoring screens will be installed and integrated within the CTC to facilitate immediate response and ensure safety.

Annex 3: Economic and Financial Analysis

1. **Economic Analysis Approach.** A CBA was carried out to assess the economic viability of the Project, comparing “with-project” and “without-project” scenarios over the period 2024-2060, with a rehabilitation and modernization period of five years. The scenario of without-project is assumed to be the case when the current infrastructure limitations and capacity constraints along the Divriği-Kars-Georgia border railway line will persist. This would result in the continued reliance on trucking for most freight transport, both in the Middle Corridor and within the domestic market. Specifically, it suggests that Türkiye's MC cargo would continue to use more circuitous bypass routes, and that trucking would remain the dominant mode of freight transport domestically, with minimal shift to rail due to the existing service limitations and inefficiencies in the rail network. All costs and benefits are expressed in USD, net of taxes and financial charges. The discount rate selected for the Project is 9.0 percent as per internal guidance.

2. **Traffic Baseline.** The Divriği-Kars-Georgia border railway line in Türkiye serves two primary freight markets: the MC and domestic freight within Türkiye. The MC consists of third-country freight flows between Central/East Asia and Europe and Türkiye's own MC flows. The MC offers multiple routing options, with the Project interventions expected to enhance the logistics competitiveness of Türkiye's route. Currently, only 10-11 percent of third-country freight uses the Türkiye branch due to capacity and service limitations. The Project investments aim to increase the competitiveness and reduce the carbon footprint of this route, making it a more attractive option for third-country flows. As a result, Türkiye's share of this segment is expected to grow over time.

3. Türkiye's national logistics system is heavily reliant on trucking, with trucks accounting for 78 percent of freight transport in 2022, compared to just 4 percent for rail. Rail freight use is particularly limited on outdated and capacity-constrained lines like the Divriği-Kars-Georgia border railway. Currently, nearly all freight in this region is transported by truck, even though many shipments, especially bulk commodities, could be suited for rail. The Project’s investments aim to remove these capacity constraints, encouraging a shift from truck to rail, especially for long-distance bulk shipments. The analysis distinguishes between bulk commodities, which are cost-sensitive but less time-sensitive, and containerized goods, which are more time-sensitive but less cost-sensitive. These distinctions are key to understanding the potential impact of the Project-supported improvements.

4. Tables 3-1, 3-2, and 3-3 detail the demand flows for the MC market during 2021-2023. Most of the freight on the Divriği-Kars-Georgia border railway line is MC cargo either originating in or destined for Türkiye, with third-country MC traffic making up a smaller share. Due to capacity constraints, only a portion of Türkiye's MC cargo uses this line, with the rest taking longer, bypass routes.

5. Table 3-3 offers an overview of the distinct segments within the MC market for 2021-2023. It covers both the broader third-country MC market that Türkiye's transportation network can serve, such as flows between Central Asia and Europe, and those that it generally cannot, like flows across the Caspian Sea between Central Asia and the South Caucasus. Since crude oil and oil products transported across the Caspian Sea are primarily moved by pipeline after

reaching the shore, they are excluded from the analysis. The focus is on non-oil MC freight flows that can utilize rail and sea-rail routes.

6. Table 3-4 summarizes and breaks down Türkiye's domestic trucking market in 2022. Specifically, it disaggregates, out of the full national trucking market (914 million tons), the trucking lanes (10.3 million tons in 2022) that would compete with rail freight alternatives in the "with-project" scenario of improved mainline rail connectivity to/from the provinces of Sivas, Erzincan, Erzurum, and Kars and domestic points west, facilitated by a more capable Divriği-Kars-Georgia border railway line.

Table 3-1. Divriği-Kars-Georgia Border Railway Line: Demand and Capacity Trends (Thousands of metric tons)

	2021	2022	2023[1]
Total tons	**480**	**427**	**127**
Bulk	295	259	92
Containerized	185	168	35
Of which:			
Türkiye's own MC tons	**407**	**360**	**109**
Bulk	247	216	81
Containerized	159	144	28
Third-country MC tons	**73**	**67**	**18**
Bulk	48	43	11
Containerized	25	24	7
Estimated effective capacity	750	750	750

Table 3-2. Türkiye: Own Middle Corridor Tonnage (Thousands of metric tons)

	2021	2022	202
Total	**1,324**	**1,350**	**1,377**
Bulk	883	901	918
Containerized	441	450	459
Of which:			
Via target railway line[1]	407	360	109
Via alternative routes	917	990	1,268

Table 3-3. Non-oil Middle Corridor Tonnage (Thousands of metric tons)

	2021	2022	202
Non-oil freight flows across the Caspian Sea	2,582	2,655	2,731
Of which:			
Third country MC flows serviceable by Türkiye	**649**	**679**	**711**
Third country MC flows not serviceable by Türkiye	609	626	643
Türkiye's own MC flows	1,324	1,350	1,377

Table 3-4. Türkiye: 2022 Truck Tonnage by Market Segment (Millions of metric tons)

National trucking volumes	**914**
Intra-provincial flows	292
Inter-provincial flows	621
Of which: ETMIC-relevant truck market segments	
To/from Erzincan Province and domestic points west	2.5
To/from Erzurum Province and domestic points west	5.6
To/from Kars Province and domestic points west	2.2
Inter-provincial to Sivas, Erzincan, Erzurum, and Kars provinces	0.1
Total ETMIC-relevant truck market segments	**10.3**

MC = Middle Corridor.
1\ Impacted by Baku-Tbilisi-Kars (BTK) line closures due to capacity expansion works in Georgia.
Source: TCDD Taşımacılık A.Ş.; World Bank analysis and estimates.

7. **Traffic Forecast**. Traffic projections were made for the "with-project" and "without project" scenarios. Demand projections were based on three key factors: (i) historical and anticipated economic and trade growth rates in Türkiye, the main MC countries, and their trading partners, as forecasted by the WB (2023); (ii) historical growth rates in Türkiye's transportation system, particularly rail and truck tonnage, as reported by the Turkish Statistical Institute; and (iii) infrastructure capacity constraints, travel times, and assumptions about the likely sources of MC demand and operational needs, such as differences between bulk and containerized trade. The main demand projections for the target railway line are summarized in Table 3-5.

Table 3-5. Demand Projections for the Divriği-Kars-Georgia Border Railway Line by Market Segment and by Scenario, 2024-2060 (Thousands of metric tons and number of trains per day)

	Target line operational ->							
	2024	**2030**	**2035**	**2040**	**2045**	**2050**	**2055**	**2060**
Without project	**388**	**505**	**541**	**702**	**691**	**708**	**669**	**623**
Middle Corridor market	**388**	**505**	**541**	**702**	**691**	**708**	**669**	**623**
Third countries via Türkiye	84	161	184	309	253	208	152	116
Türkiye's own MC flows	304	344	357	393	438	501	517	507
Domestic market	-	-	-	-	-	-	-	-
Total trains per day	1	2	2	2	2	2	2	2
With project	**388**	**2,047**	**2,888**	**5,041**	**6,574**	**8,686**	**10,233**	**11,426**
Middle Corridor market	**388**	**1,789**	**2,514**	**4,497**	**5,706**	**7,297**	**8,524**	**9,459**
Third countries via Türkiye	84	206	597	2,081	2,687	3,479	4,116	4,639
Türkiye's own MC flows	304	1,584	1,917	2,416	3,019	3,818	4,407	4,820
Domestic market	**-**	**258**	**374**	**544**	**868**	**1,389**	**1,709**	**1,967**
Total trains per day	1	4	6	11	14	18	20	23

8. **Economic Costs**. Implementation costs for the proposed investments include the cost of civil works and acquisition and installation of equipment, inclusive of construction supervision consulting services and PIU staffing and equipping costs. Financial costs were converted to economic costs by (a) removing VAT, (b) conservatively assuming an 8.0 percent rate of savings during procurement[7], and (c) excluding land acquisition and resettlement compensation payments, which are considered net economic transfers. The economic cost estimates are shown in Table 3-6. It was further assumed that (a) routine maintenance on all facilities is to be conducted yearly, with an economic cost equal to 0.5 percent of the economic cost of civil works and equipment; and (b) periodic maintenance is conducted every 5 years, with an economic cost equal to 1.5 percent of the economic cost of civil works and equipment.

Table 3-6. Project Costs (USD million)

	Financial costs including VAT	**Financial costs excluding VAT**	**Economic costs\1**
Construction and equipment	1,375	1,146	1,054
Contingencies	206	172	-
Construction supervision	26	22	20
PIU staffing and equipping	7	5	5
Total project costs	**1,614**	**1,345**	**1,079**
Routine maintenance (yearly)			4.8
Periodic maintenance (every 5 years)			15.3

VAT = Value added tax.
1\ Economic cost excludes VAT and includes an estimated 8 percent in procurement savings.
2\ Estimated economic cost to provide dual-gauge track for the Akhalkalaki-Türkiye border section of the BTK line.
Source: AYGM; World Bank analysis and estimates.

9. **Economic Benefits**. The economic benefits include changes in transport costs incurred by shippers when deciding how to route freight from origin to destination; (ii) changes in in-transit inventory carrying costs associated with routing decisions; (iii) changes in the emissions of GHG associated with routing and modal choice; and (iv) for the domestic market,

[7] AYGM bases its cost estimates on pre-procurement market costs and typically achieves 10 percent or more savings during bidding.

the cost of traffic accidents associated with the freight transport safety profile differential between trucking and rail freight services within Türkiye.

Table 3-7. Key Transport Parameters Used to Model Economic Benefits

Transport costs (2024 US$ per ton-km transported, except where otherwise noted)	
Long-haul trucking (Türkiye)	0.067
Truck drayage (Türkiye) *(US$ per ton)*	7.5
Rail freight (Türkiye)	0.024
Rail freight (Georgia)	0.040
Rail freight (EU)	0.045
Black Sea vessel	0.032

Value of freight (2024 US$ per ton)					
	2030	**2035**	**2045**	**2055**	**2060**
Bulk	553	567	596	622	629
Containerized	6,552	6,832	7,975	8,663	8,846

Well-to-wheel emission factors (grams of CO_2 per ton-km transported)					
	2030	**2035**	**2045**	**2055**	**2060**
Diesel heavy-duty trucks (Türkiye)	109	103	86	74	70
Diesel rail	43	42	40	37	37
Electric rail (Türkiye)	17	14	7	5	4
Electric rail (Georgia)	5	5	3	1	1
Electric rail (EU)	13	8	4	2	2
Black Sea vessel	20	19	14	12	11

Source: World Bank analysis, research, and estimates.

10. **Greenhouse Gas Emission Reduction**. The Project will reduce GHG emissions by electrifying an outdated railway line, replacing diesel-powered trains with electric ones, thus eliminating tank-to-wheel emissions. Additionally, modern signalization and telecommunication systems will enhance efficiency, further lowering the carbon footprint. In order to preserve comparability with the other AIIB projects and internal guidance, the Project Team utilized the midpoint of the Stiglitz-Stern recommendation for carbon pricing whereas WB team utilized standard guidance on the shadow price of carbon based[8]. It is estimated that in 2030 the Project will result in the avoidance of 72,332 tons of CO2, and that the annual volume of avoided emissions due to the Project will grow to 245,835 tons by 2060 (Table 3-8). In aggregate, over the 31-year period of analysis, it is estimated that the Project will result in the cumulative avoidance of 5.0 million tons of CO2, with an estimated present economic value of USD79 million as per AIIB calculations vs. USD236 million according to WB calculations.

[8] World Bank (2024), “Guidance Note on the Shadow Price of Carbon in Economic Analysis”.

Table 3-8. CO2 Emissions Accounting[9]

	CO2 emissions (000 tons)		Carbon pricing (USD per ton)	
	Net	Gross	WB	AIIB
2030	72.3	49.0	$ 124	$ 75
2031	75.8	52.2	$ 126	$ 76
2032	79.8	55.2	$ 130	$ 78
2033	82.6	59.6	$ 133	$ 80
2034	87.2	62.3	$ 135	$ 82
2035	92.2	64.7	$ 139	$ 83
2036	96.6	67.7	$ 141	$ 85
2037	101.7	71.6	$ 145	$ 87
2038	107.1	77.6	$ 149	$ 89
2039	113.0	86.9	$ 151	$ 91
2040	120.2	101.1	$ 155	$ 93
2041	127.5	100.3	$ 159	$ 95
2042	134.3	99.5	$ 162	$ 98
2043	141.4	98.8	$ 166	$ 100
2044	148.9	98.0	$ 170	$ 102
2045	156.7	97.3	$ 173	$ 104
2046	165.3	98.7	$ 177	$ 107
2047	174.4	100.1	$ 181	$ 109
2048	184.1	101.5	$ 185	$ 112
2049	194.5	103.0	$ 190	$ 114
2050	205.0	104.8	$ 193	$ 117
2051	211.6	105.6	$ 198	$ 118
2052	218.4	106.4	$ 202	$ 119
2053	225.4	107.2	$ 207	$ 120
2054	228.2	106.1	$ 211	$ 121
2055	230.5	105.4	$ 216	$ 122
2056	232.9	104.7	$ 221	$ 123
2057	235.4	104.0	$ 226	$ 123
2058	238.8	103.4	$ 231	$ 124
2059	242.3	102.9	$ 236	$ 124
2060	245.8	102.3	$ 241	$ 125
Cumulative	**4,970.1**	**2,797.9**		

11. **Safety Benefits**. Safety benefits were quantified using the parametric method, which estimates the cost of accidents per ton-kilometer transported. This parameter includes all related costs, such as fatalities, injuries, infrastructure damage, and equipment loss, making it comprehensive and easier to apply. The source of the accident cost parameters is a study by Kirbas and Bas (2018) specific to Türkiye, and the trucking parameter was cross-checked with U.S. data from the American Transportation Research Institute (ATRI) for validation. This approach prioritizes simplicity and reliability over more complex methods that separately account for different types of accident costs. Safety benefits yielded an estimated present economic value of USD4 million.

Table 3-9. Accident unit cost per ton-km (USD)

Türkiye generalized unit cost of accidents (2024 US$ per ton-km transported)	
Trucking	0.002
Rail freight	0.0004

Source: World Bank analysis, research, and estimates.

[9] Net CO2 emissions are those expected to be avoided due to the Project; gross CO2 emissions are expected emissions in the with-project scenario. Source: World Bank analysis and estimates

12. **Results**. Based on the estimated economic costs and benefits, the EIRR of the Project is 11.4 percent and the economic net present value (ENPV) is USD308 million at 9.0 percent social discount rate, indicating the Project's economic viability. Refer to Table 3-11.

13. **Sensitivity Analysis**. The EIRR was tested by a sensitivity analysis against the (i) 20 percent increase in construction costs, (ii) 20 percent decrease in economic benefits and (iii) the combination of two. The model has confirmed the robustness of the net economic benefits. Results of the cost-benefit and sensitivity analyses are illustrated in Table 3-10.

Table 3-10. Sensitivity Analysis, USD million

No.	Sensitivity test	ENPV	EIRR
1	Capital expenditures increase by 20%	141	10.0%
2	Economic benefits decrease by 20%	79	9.7%
3	Combination of (1) and (2)	(88)	8.4%

Table 3-11. Table 3-8. Streams of Costs and Benefits, USD million

		Economic Costs		Economic Benefits				Net Benefit
Year		Capital	O&M	Transport	ICC	CO2	Safety	
2024		-	-	-	-	-	-	-
2025		(10.8)	-	-	-	-	-	(10.8)
2026		(43.2)	-	-	-	-	-	(43.2)
2027		(269.9)	-	-	-	-	-	(269.9)
2028		(359.2)	-	-	-	-	-	(359.2)
2029		(442.4)	-	-	-	-	-	(442.4)
2030		-	(4.8)	40.2	35.0	5.4	0.2	76.1
2031		-	(4.8)	42.1	34.6	5.8	0.3	77.9
2032		-	(4.8)	44.1	33.8	6.2	0.3	79.6
2033		-	(4.8)	46.2	32.7	6.6	0.3	80.9
2034		-	(15.3)	48.4	35.6	7.1	0.3	76.2
2035		-	(4.8)	50.9	39.0	7.6	0.3	93.0
2036		-	(4.8)	53.5	43.7	8.2	0.4	100.9
2037		-	(4.8)	56.2	50.3	8.8	0.4	110.9
2038		-	(4.8)	58.9	60.0	9.5	0.4	124.0
2039		-	(15.3)	61.7	74.7	10.3	0.5	131.8
2040		-	(4.8)	64.1	98.6	11.2	0.5	169.5
2041		-	(4.8)	67.8	106.8	12.1	0.6	182.4
2042		-	(4.8)	71.8	115.5	13.2	0.6	196.3
2043		-	(4.8)	76.1	124.9	14.1	0.7	211.0
2044		-	(15.3)	80.7	134.8	15.2	0.7	216.1
2045		-	(4.8)	85.6	145.5	16.3	0.8	243.4
2046		-	(4.8)	90.9	156.8	17.7	0.9	261.5
2047		-	(4.8)	96.6	168.9	19.0	1.0	280.6
2048		-	(4.8)	102.7	181.7	20.6	1.1	301.3
2049		-	(15.3)	109.3	195.3	22.2	1.2	312.6
2050		-	(4.8)	116.4	209.9	24.0	1.3	346.8
2051		-	(4.8)	121.4	221.8	25.0	1.4	364.7
2052		-	(4.8)	126.6	234.4	26.0	1.4	383.6
2053		-	(4.8)	132.1	247.7	27.0	1.5	403.5
2054		-	(15.3)	135.1	256.3	27.6	1.5	405.2
2055		-	(4.8)	138.1	265.0	28.1	1.6	428.0
2056		-	(4.8)	141.3	273.7	28.7	1.6	440.4
2057		-	(4.8)	144.5	282.4	29.0	1.7	452.7
2058		-	(4.8)	147.8	291.3	29.6	1.7	465.6
2059		-	(15.3)	151.1	300.6	30.0	1.8	468.2
2060		80.7	(4.8)	154.6	310.1	30.7	1.8	573.1
Total		(1,044.7)	(213.0)	2,856.9	4,761.4	543.0	28.8	6,932.3

**ICC = In-transit Inventory Carrying Costs*

EIRR **11.4%**

ENPV **$** **308**

Annex 4: Paris Agreement Alignment and Climate Finance

1. The Bank has committed to align all its new financing operations with the PA's goals by July 1, 2023. To achieve that target, in July 2023, the Bank launched its Methodology for Assessing the Alignment of AIIB Investment Operations with the PA[10]. The document elaborates the application of the joint multilateral development bank (MDB) methodological framework to aligning AIIB investment operations with the PA (specifically, the mitigation dimension or Building Block 1- BB1 and the adaptation aspects or BB2). The AIIB Methodology has been followed to assess the alignment of the Project with the PA.

BB1: Climate Mitigation goals

2. The Project can be labelled as Universally Aligned for the mitigation goals of the Paris Agreement (BB1) as per the Joint MDB Methodological Principles for Assessment of Paris Agreement Alignment of New operations as it falls under the category of *"Rail Infrastructure"* and its economic feasibility does not depend on external fossil fuel exploitation, processing or transport.

BB2: Climate Adaptation and Resilience goals

3. To determine the adaptation alignment of the Project, the team hired a consultancy firm to run a comprehensive Climate resilience assessment. The Climate resilient assessment follows the 3-steps-process described on the Joint-MDB methodology for Paris Alignment.

4. **Under the first step**, the context of vulnerability has been established identifying the physical climate risks that might materially affect the Project.

5. Türkiye is highly exposed to the impacts of climate change. According to the World Bank's Türkiye Country Climate and Development Report (CCDR)[11], the country faces significant vulnerability to climate change shocks, including floods, forest fires, and water stress. This is in part evidenced by the recent onset of unprecedented climate-related disaster events. In the summer of 2021 Türkiye suffered—simultaneously—the worst catastrophic floods (Black Sea region) and the worst wildfires (Mediterranean region) in the country's history, resulting in significant loss of life, thousands of people evacuated, and physical losses estimated in the hundreds of millions of dollars. A 2022 survey of 52 Türkiye-based firms found that 27 percent of them had suffered detrimental financial impacts from water-related events, such as flooding and droughts, during the most recent 12-month period, compared to the survey's global average of 8 percent.[12] The CCDR found that Türkiye's transport system—and above all its national railway network—are more vulnerable to climate hazards than those of comparable countries.

6. The provinces that host the Divriği-Kars-Georgia border railway line are highly exposed to extreme weather events and natural hazards. Specifically, there is a high risk of urban floods, landslides, and wildfires in all four provinces, as well as a medium to high risk of earthquakes

[10] AIIB; "Methodology for Assessing the Alignment of AIIB Investment Operations with the Paris Agreement"; July 2023; https://www.aiib.org/en/how-we-work/paris-alignment/overview.html
[11] World Bank Group (2022), *Türkiye Country Climate and Development Report*, Washington DC.
[12] CDP Climate Change and Water Report 2022, Türkiye Edition.

(table below). This underscores the need for Türkiye to invest in connectivity infrastructure in the subregion that can withstand the impact of these hazards and provide higher levels of operational continuity as a matter of improved service delivery.

Risk dimension	Province			
	Sivas	Erzincan	Erzurum	Kars
Urban flood	High	High	High	High
Earthquake	High	High	High	Medium
Landslide	High	High	High	High
Wildfire	High	High	High	High
River flood	Low	High	Medium	Medium
Water scarcity	Low	Low	Low	Low
Extreme heat	Low	Medium	Low	Low

Source: GFDRR ThinkHazard! database.

7. The sensitivity analysis carried out by the World Bank indicates that out of all the climate and natural hazards listed above, the Divriği-Kars-Georgia border railway poses a high risk of being materially affected by flooding and landside risks.

8. **Under the second step,** we assess if adaptation and resilience measures have been identified to reduce material physical climate risks and enhance climate resilience.

9. As found on the CRVA, the Project is likely to be materially affected by flooding and landslides. To mitigate these risks, several measures have been incorporated into project design, as well as into the preliminary engineering design of the target line itself. Project design features that are expected to contribute to the delivery of climate-resilient infrastructure include the use of design-build procurement approaches, the use of rated criteria in procurement to incentivize innovation and stronger climate and social and environmental outcomes, and the engagement of key stakeholders at the local and national level during the design and construction phases. Please see full list of measures and justification below.

Climate Hazard	Measures and Justification
All Climate Hazards	Preparation of detailed engineering designs for the construction and installation works to be carried out within the scope of the Project; this will be conducted under a design-build implementation approach, which international experience has shown to improve infrastructure quality outcomes, including climate and natural hazard resilience, due to the integration of these interdependent functions under the same provider.
All Climate Hazards	Renewal of 143 km of standard/dual gauge railway line, including 67km of infrastructure and superstructure, and 76 km of superstructure only—to be built to Türkiye's national standards of structure integrity, which have been recently revamped to better withstand natural hazards, including climate-related hazards.
All Climate Hazards	Installation of European Rail Traffic Management System (ERTMS)/European Train Control System (ETCS) Level 1 signaling and telecommunication systems along the entire 660 km alignment; this train control technology is compliant with EU Trans-European Transport Network (TEN-T) standards and is expected to (a) significantly increase the line's train carrying capacity and average train speeds, (b) make the line safer, and (c) make train maneuvers

Climate Hazard	Measures and Justification
	more responsive to climate and other disruptions, thus contributing to strengthening the climate resilience of line operations.
Flooding/Landslide	Implementation of a 320 km-long 4-zone DAS early-warning and detection system, and deployment of a Central Traffic Control (CTC) facility; this will reduce the line's vulnerability to disruption, including from climate hazards such as floods and landslides, enable preventive maintenance in anticipation of major disruption, and improve safety, thus increasing resilience and contributing to Türkiye's transport sector climate adaptation goals.
Flooding/Landslide	Construction of 4 new bridges (144 m), which will increase operational efficiency and make the line less vulnerable to climate hazards like flooding and landslides;
Flooding/Landslide	Construction of a 1,050 m retaining wall and a 10 km snow barrier, for protection against climate hazards.
Flooding/Landslide	Renewal of 77 culverts and reconstruction of 7 overpasses, all for protection against climate hazards.

10. **The third step** is the Assessment of Inconsistency with Climate Adaptation and Resilience Strategies Relevant for the Operation. The Project is not inconsistent with the priorities set forth in national or sectorial policies/strategies/plans for climate resilience such as Türkiye's National Adaptation Strategy or the NDC of Türkiye. Türkiye's updated NDC seeks to reduce GHG emissions by 41 percent by 2030 compared to 2012 levels. It is considered an interim goal towards the long-term objective of reaching a net-zero target by 2053. The updated NDC filing further specifies that to meet the target, the main mitigation policies to be supported in the transport sector through 2030—roughly coinciding with Project's implementation period—include (i) ensuring a balanced utilization of modes in freight transport, (ii) expanding freight transport by rail for international and inter-city itineraries, and (iii) increasing the efficiency and coverage of the intercity railway network and its electrification.[13] The Project operationalizes all 3 of these stated policies. With regard to adaptation, the Project is in line with Türkiye's National Climate Change Adaptation Strategy and Action Plan 2011-2023[14], which calls, inter alia, for a "more strategic and long-term approach" to transportation planning in the face of "extreme climate events [that] cause considerable economic and social impacts."[15]

Climate Mitigation Finance

11. The main component of the Project (Component 1, Rehabilitation of the Divriği – Kars –Georgia Border Railway Corridor), consisting of the design, construction, and supervision to rehabilitate and modernize an existing and outdated 660km-long international railway corridor in eastern Türkiye, qualifies as climate mitigation finance under the Category '8.3. Inter-urban railway projects for freight or passengers'. The CAPEX of this component (which equals to the climate mitigation finance of the Project) amounts USD248.5 million, which represents 99.4 percent of AIIB's investment.

[13] Republic of Türkiye (2023), *Updated First Nationally Determined Contribution*.
[14] A new National Adaptation Strategy for the period 2024-2030 is under preparation by the GoT, with support of the United Nations Development Program (UNDP). The GoT has also committed to preparing a 2023-2030 Climate Change Action Plan and a 2050 Climate Change Strategy.
[15] Ministry of Environment and Urbanization of the Government of Türkiye (2012), *Türkiye's National Climate Change Adaptation Strategy and Action Plan 2011-2023*.

Climate Adaptation Finance

12. The Project has some elements that qualify as climate adaptation finance. To quantify the amount, the Project Team has followed the 3-steps methodology set forth on the JMDB methodology for tracking climate adaptation finance

13. **Step 1,** Setting out the Project's context of vulnerability to climate change: Please refer to the CRVA in the BB2 section above.

14. **Step 2,** Making an explicit statement of intent of the Project to reduce the climate change vulnerabilities identified: The railway line rehabilitation related costs will include climate resilience measures, identified through a thorough climate risk and vulnerability assessment. It is therefore the explicit intent of those activities to rehabilitate a railway line to make it resilient to the impacts of climate change. Project has allocated appropriate climate change measures as part of climate adaptation solutions, which are listed in the table below.

15. **Step 3**, Articulating a clear and direct link between specific project activities and the climate change vulnerability identified in Step 1: Climate change adaptation features envisioned in the Project design and associated costs are summarized in the BB2 section above.

16. Given the climate resilience measures adopted into the Project design (some of which can be considered as substantial contributors), a portion of the financing can be classified as climate adaptation finance under the category of adapted activities (type 1).

17. Following the AIIB's climate adaptation finance proportional approach methodology (based on the JMDB common principles for tracking climate adaptation finance) and taking into account these measures, we can allocate a 20 percent climate adaptation finance to Component 1, 'Rehabilitation of the Divriği – Kars – Georgia Border Railway Corridor), being the breakdown as follows: 15 percent for the structural measures plus an additional 5 percent for the non-structural. The final climate adaptation finance of the Project is 49.7 million, equivalent to 19.88 percent of AIIB's investment.

18. The final climate finance on this project (summing adaptation and mitigation) is USD298.2 million. As the total climate finance is greater than the total AIIB's investment, the climate finance of the Project is rounded to the 100 percent of the AIIB's investment, which is USD250 million.

GHG Emissions Accounting

19. A GHG emissions accounting and valuation exercise was conducted by the World Bank as part of the economic analysis of project investments. It is estimated that in 2030 the Project will result in the avoidance of 72,332 tons of CO2, and that the annual volume of avoided emissions due to the Project will grow to 245,835 tons by 2060 (Table below). In aggregate, over the 31-year period of analysis, it is estimated that the Project will result in the cumulative avoidance of 5.0 million tons of CO2.

Project CO_2 Emissions Accounting, 2030-2060[\1]

Tons of CO_2

	Net	Gross		Net	Gross
2030	72,332	48,994	**2046**	165,289	98,672
2031	75,845	52,218	**2047**	174,405	100,062
2032	79,775	55,164	**2048**	184,114	101,488
2033	82,643	59,569	**2049**	194,458	102,954
2034	87,159	62,253	**2050**	205,042	104,820
2035	92,152	64,726	**2051**	211,584	105,631
2036	96,629	67,725	**2052**	218,355	106,433
2037	101,696	71,605	**2053**	225,358	107,230
2038	107,142	77,650	**2054**	228,157	106,070
2039	113,038	86,940	**2055**	230,541	105,394
2040	120,192	101,076	**2056**	232,950	104,719
2041	127,488	100,320	**2057**	235,383	104,044
2042	134,313	99,537	**2058**	238,819	103,445
2043	141,447	98,756	**2059**	242,303	102,851
2044	148,909	98,029	**2060**	245,835	102,260
2045	156,727	97,314			
		2030-2060 cumulative		**4,970,078**	**2,797,949**

1\ Net CO_2 emissions are those expected to be avoided due to the Project; gross CO_2 emissions are expected emissions in the with-project scenario.

Source: World Bank analysis and estimates.

Annex 5: Türkiye Sovereign Credit Fact Sheet

1. **Background**. Türkiye is an upper-middle-income country with income per capita of around USD15,600 (or around USD40,000 in purchasing power parity) and a population of around 87 million. Türkiye is a large, diversified, dynamic and business-oriented economy. Since the early 2000s, it enjoyed robust growth, around 5.5 percent per year on average, underpinned initially by a strong focus on development, macroeconomic stability, strong fiscal frameworks, trade openness and institutional reform. During this time, income per capita has tripled, while poverty fell significantly.

2. However, from 2016 until mid-2023, Türkiye's sovereign credit rating deteriorated, due to reliance on short-term stimulus to boost growth, unpredictable and often unorthodox policies, declining fiscal and FX buffers, high dependence on external finance, perceived erosion of institutional checks and balances, as well as rising geopolitical risks—according to observers. This led to periods of financial vulnerability, market anxiety, and macroeconomic stress.

3. During 2021-23, the monetary policy was accommodative despite high and accelerating inflation, which led to capital outflows and a sharp depreciation. The currency lost around two-thirds of its value in nominal terms, while inflation reached 85.5 percent at the peak in October 2022. Complex macro-prudential measures were put in place to stem depreciation, guide credit, and sustain high growth. Additionally, Türkiye was hit by several shocks, including high global energy prices, which led to a doubling of the energy import bill, and a devastating earthquake. While growth was still high (5.1 percent in 2023), the economy accumulated significant imbalances.

4. **Recent Developments**. Following the 2023 elections, a policy normalization is taking place under a new economic team, reputed to be supportive of more orthodox policies. Since June 2023, the Central Bank has increased interest rates to 50 percent and has been gradually dismantling the many distorting macroprudential regulations.

5. In response to these positive developments all three major rating agencies upgraded Türkiye's credit rating by two notches, Fitch and S&P to 'BB- stable' and Moody's to 'B1 positive'.

Selected economic indicators 1/	2022	2023	2024*	2025*	2026*	2027*	2028*
GDP growth 2/	5.5	5.1	3.0	2.7	3.2	3.4	3.7
Inflation (end-of-period) 2/	64.3	64.8	43.0	24.0	17.2	15.3	15.0
Fiscal balance 3/	-2.7	-5.4	-5.3	-3.7	-3.1	-3.2	-3.1
Gross public debt	30.8	29.3	25.2	26.0	26.0	26.0	25.9
Gross public financing needs	7.2	7.6	7.4	5.4	5.1	5.9	6.4
Current account balance	-5.1	-4.0	-2.2	-2.1	-2.0	-1.9	-1.9
Gross external debt 4/	50.5	45.2	41.3	39.8	40.9	40.4	39.9
Gross external financing needs	22.9	21.2	19.1	20.0	20.5	20.1	20.0
Gross FX reserves (USD billion) 4/	128.7	140.9	157.4	..	..	..	..
Exchange rate (TRY/USD) 4/	18.7	29.4	34.2	..	..	..	..

Sources: IMF World Economic Outlook October 2024; IMF Country Report 24/312, CBRT

Notes: 1/ In percent of GDP, except where noted; 2024-28 are projections; 2/ Percent change, year-on-year; 3/ Nonfinancial public sector, IMF definition; 4/ data from central bank, end-of-period, for 2024: most recent as of October 23

6. The first major driver of the upgrade is the CBRT's return to orthodox monetary policy—a continued tight monetary policy stance that has started showing positive results. Several indicators are pointing in a favorable direction. By September 2024, the annual rate of inflation

has decreased to 49.4 percent. Growth in domestic credit volume has steadily softened since June 2023, reaching 39.7 percent in September 2024.

7. The authorities have also ruled out a mid-year minimum wage hike this year, which is likely to support disinflationary momentum going forward. Fiscal policy is expected to remain supportive of the tight monetary policy. Fiscal reforms, including broadening the tax base and reducing budget deficits, will help to further improve public debt that is already at a low level. All these factors are reflected in market participants' annual inflation expectations for the next 12 months—a forward-looking measure of inflation—which stood at 27.5 percent in September 2024 and has steadily declined.

8. The second, and an associated, driver of the rating upgrade is Türkiye's reduced external vulnerability, with the current account deficit narrowing to 2.1 percent of GDP (on a 12-month rolling basis, as of June 2024). FX reserves have increased and stabilized at USD157.4 billion (as of October 2024), spreads have declined, and capital inflows have accelerated.

9. Growth was still high, at 5.3 percent in Q1 2024, but the effects of tighter policies became more evident in the Q2, with growth at 2.5 percent. The ongoing rebalancing in domestic demand is expected to contribute to disinflation and external balances. The fiscal deficit has been high recently, reflecting the post-earthquake reconstruction. In May 2024, the government announced a fiscal tightening program, including freeze on some construction projects and cuts to goods and service purchases, which will help arrest fiscal deterioration and promote economic rebalancing.

10. **Outlook and Risks**. Growth is projected to decelerate in 2024, to around 3.0 percent, due to policy tightening, and ultimately align with the medium-term potential of around 3.5-4.0 percent—according to the IMF. The shift towards more orthodox policies is a welcome development, improving economic resilience and creditworthiness. However, the track record on that is still being built, as such normalizations have been prone to reversals. The policy tightening may need to be more sustained and is likely to come at the cost of growth, while disinflation and restoring external balances may take a few years. Political space exists for such reforms, with no scheduled national elections until 2028. Other risks to the outlook relate to tight external liquidity, the volatile market sentiment, and geopolitics.

11. As an important risk mitigant, the private sector has demonstrated resilience and has considerable experience in navigating the volatile environment. Large firms report sufficient liquidity, positive short-term net open FX positions and sufficient natural FX hedges. Regarding the banking sector, despite recent shocks, reported capitalization remains adequate, non-performing loans are low, while reported liquidity and profitability metrics are adequate. Domestic banks have been able to rollover their funding, even amid high market uncertainty. Ultimately, the system hinges on residents' confidence and willingness to keep their sizeable dollar deposits in domestic banks, which so far has been sustained.

12. According to the IMF, public debt is sustainable. It is expected to stabilize over the medium term, at around 25 percent of GDP. Key factors anchoring Türkiye's debt sustainability include government's strong balance sheet, uninterrupted access to financial markets, a track record of economic resilience, and a dynamic economy with substantial growth potential. Likewise, Türkiye's external debt is expected to remain sustainable over the medium term.