ASIAN INFRASTRUCTURE INVESTMENT BANK

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Sovereign-backed Financings

Approval Project Document
P000936 Republic of Benin: Grand Nokoué Sustainable Urban Mobility Project

Currency Equivalents

As of April 30, 2025

Currency Unit – Franc CFA (XOF)
USD1.00 = XOF579
XOF1.00 = USD0.0017

Fiscal year

January 1 – December 31

Abbreviations

AIIB	Asian Infrastructure Investment Bank
AM	Accountability Mechanism
ANaTT	National Agency of Land Transport (Agence Nationale de Transports Terrestres)
APC	Autonomous Port of Cotonou
ATC	Development of Access Roads and Crossings in Cotonou (Aménagement des voies d'accès et Traversées de Cotonou)
BCEAO	Central Bank of West African States (Banque Centrale des Etats de l'Afrique de l'Ouest)
CNSR	National Center for Road Safety (Centre National de la Sécurité Routière)
DAPMF	Department of Port, Maritime and River-Lagoon Affairs Department (Direction des Affaires Portuaires, Maritimes et Fluvio-Lagunaires), MCVT
DGDU	General Directorate of Urban Development (Direction Général de Développement Urbain)
E&S	Environmental and Social
ESCP	Environmental and Social Commitment Plan
ESF	Environmental and Social Framework (of WB)
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESP	Environmental and Social Policy (of AIIB)
ESS	Environment and Social Standards
FM	Financial Management
GDIZ	Glo-Djigbé Industrial Zone
GDP	Gross Domestic Product
GFDRR	Global Facility for Disaster Reduction and Recovery
GFDT	Global Facility to Decarbonize Transport
GHG	Greenhouse Gas
GN-SUMP	Grand Nokoué Sustainable Urban Mobility Project
GRM	Grievance Redress Mechanism
GRS	Grievance Redress Service
GRSF	Global Road Safety Facility
IDA	International Development Association
IPF	Investment Project Financing
ITS	Intelligent Transport Systems
IWT	Inland Waterway Transport

LMP	Labour Management Procedures
M&E	Monitoring and Evaluation
MCVT	Ministry of the Environment and Transport in charge of Sustainable Development (Ministère du Cadre de Vie et des Transports, chargé du Développement Durable)
MEF	Ministry of Economy and Finance
NDCs	Nationally Determined Contributions
NGO	Non-Governmental Organization
NMT	Non-Motorized Transport
NPV	Net Present Value
OHS	Occupational Health and Safety
PAP	Project Affected Person
PCRT/SLT	Study of traffic regulation and control in the Grand Nokoué region (Poste de Contrôle et Régulation du Traffic/Signalisation Lumineuse Tricolore)
PIE	Project Implementation Entity
PIU	Project Implementation Unit
PPA	Project Preparation Advance
PPIAF	Public-Private Infrastructure Advisory Facility
PMU	Urban Mobility Plan (Plan de Mobilité Urbaine)
RAP	Resettlement Action Plan
RF	Resettlement Framework
RNIE	National Interstate Highway (Route Nationale Inter-Etats)
SEA/SH	Sexual Exploitation and Abuse and Sexual Harassment
SEP	Stakeholder Engagement Plan
SESA	Strategic Environmental and Social Assessment
SIA	Specialized Implementing Agencies
SIRAT	Road Infrastructure and Land Management Company (Société des Infrastructures Routières et de l'Aménagement du Territoire)
SPC	Shadow Price of Carbon
SSA	Sub-Saharan Africa
TA	Technical Assistance
USMEF	Strategic Support Unit of the Ministry of Economy and Finance (Unité d'Appui Stratégique du Ministère de l'Économie et des Finances)
WHO	World Health Organization

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(1) Context

1.1 **Country and Macroeconomic Overview:** Overall macroeconomic situation in Benin is provided in Annex 8 Country Credit Fact Sheet. The Republic of Benin is a lower-middle-income economy located in West Africa, northward of the Gulf of Guinea in the Atlantic Ocean, bounded by Togo in the west, Nigeria in the east, and Burkina Faso and Niger in the north. Benin has a diverse economy that is heavily reliant on agriculture, trade, and services. The country's GDP growth has been relatively stable, with an average growth rate of around 5% between 2012 and 2022, driven by agricultural exports, particularly cotton. At the same time, Benin faces persistent challenges, including poverty, underemployment, and gender inequality. Despite steady progress since 2020, domestic revenue mobilization remains one of the lowest in the West African Economic and Monetary Union (WAEMU). The poverty rate remains high at 36%, while underemployment affects 72% of the workforce. Additionally, 90% of the population is engaged in informal employment[1]. Gender disparities persist, particularly in labor force participation, with 57% of women compared to 69% of men participating.

1.2 Like many Sub-Saharan countries, Benin faces rapid demographic growth and urbanization. The population, estimated at 13.35 million people in 2020, is growing yearly at a rate of 2.73%. From 2000 to 2021, the urbanization rate increased from 38.3% to 49%, with about 6.1 million urban population. Around 80% of the urban population lives in the country's southern coastal area, which accounts for 10% of the land. With an average growth of 3.8%, the urban population is expected to reach 57% of the total population by 2025, with the Grand Nokoué region expected to grow from 2.38 million in 2020 to 3 million in 2025. The main urban areas are facing increasing pressure in terms of provision of social services, infrastructures, and access to development opportunities. In the absence of adequate land use planning and management, sprawling cities result in increasingly long trip distances which creates increasing dependency on motorized modes of transport.

1.3 The changing mobility pattern and accelerating motorization in Beninese cities lack proper management and raise concerns on congestion, road accidents, and air pollution. From 2014 to 2018, the number of vehicles increased from 100,000 to nearly 800,000, of which the number of motorcycles and tricycles increased by 6 times. In contrast, the number of surfaced roads remains low with limited dedicated parking spaces. The congested traffic and chaotic parking conditions make walking and biking extremely difficult and hazardous. Formal public transport services are practically non-existent, and most people rely on mototaxis (colloquially zémidjan) and informal minibuses (tokpa tokpa) to travel within and between cities. In 2016, 48,000 road crash injuries or fatalities incurred on a cost representing 9.1% of the country's GDP[2]. Moreover, most of the petrol used by vehicles is illegally imported fuel from Nigeria, often of subpar quality thus generating higher emissions. The local air pollution levels (46 µg/m³ of PM2.5 in 2019) have reached 4 times the amount recommended by WHO guidelines[3]. Similarly, for 2019, the country's transport sector-related GHG emissions stood as high as 0.5 tons of CO2 per capita, while the average in the region is 0.3[4]. The mortality

[1] The World Bank Data, https://www.worldbank.org/en/country/benin/overview
[2] Road Safety in Benin | Traffic accidents, crash, fatalities & injury statistics | GRSF (roadsafetyfacility.org)
[3] Exposure to air pollution with fine particulate matter, 1990 to 2017 (ourworldindata.org)
[4] Benin | Total including LUCF | Greenhouse Gas (GHG) Emissions | Climate Watch (climatewatchdata.org)

rate attributed to household and ambient air pollution is 205 per 100,000 population, higher than the average of 133 per 100,000 in the income group.

1.4 Benin is highly vulnerable to climate change and natural hazards, including river and urban flooding, water scarcity, extreme heat, and wildfires, which pose significant risks to its transport infrastructure. Ranked 159th in the ND-GAIN Country Index[5], Benin has experienced 19 major flood events between 1980 and 2020. Climate change is expected to exacerbate these challenges, with projected sea-level rise of up to 0.81 meters by 2100. Due to its coastal urban morphology, the Grand Nokoué agglomeration is particularly vulnerable. Coastal erosion is already threatening communities and sensitive ecosystems; some roads, beaches and buildings have already been destroyed by the coastline´s regression.

1.5 **Sector Overview:** Located along the Atlantic coast and bordering with Nigeria to the East, Grand Nokoué is Benin's most urbanized and economically dynamic region. The conurbation is Benin's largest urban area, hosting 20% of the country's population and generating over 60% of its GDP. It regroups 5 municipalities, around the Grand Nokoué lake, including Porto-Novo, Benin's capital city and Cotonou, its main economic center. Grand Nokoué is envisioned to be a competitive and attractive metropolitan area, vis-à-vis the rest of Benin and neighboring countries. With an urban framework marked by the presence of two major urban centers (Cotonou and Porto-Novo) and attractive secondary polarities, Grand Nokoué is characterized as the hub of economic development, job creation, academia, and innovation and tourism development.

1.6 The Republic of Benin is also supporting the freight and logistics sector to strengthen the competitiveness of the Autonomous Port of Cotonou (APC), planning to set up a Freight Management Office, encouraging the use of digital technology in freight management, modernizing the APC, and improving access to logistics areas. Several infrastructure projects are underway, such as new roads, interchanges, and a new airport near the Glo-Djigbé Industrial Zone (GDIZ). The Republic of Benin seeks to enhance the competitiveness of the APC by improving the quality of procedures, reducing costs, renovating and extending the existing infrastructure, and capitalizing on opportunities to develop value-added logistics services using the APC as a regional hub. The Republic of Benin aims to enhance the operational efficiency of existing facilities to meet the demands of international maritime traffic and reinforce the APC's competitiveness.

1.7 The APC is the main port of Benin and plays an essential role in connecting the landlocked countries of the hinterland, Niger and Burkina-Faso, to the world maritime trade routes and specifically to Asia. APC, contributes to 60% of Benin's GDP, handling 90% of Benin's international trade and 49% of transit traffic to Niger (37%), Burkina Faso (4%), Mali (3%) and Nigeria (5%), serving up to 100 million consumers. According to the United Nation's Comtrade database, in 2022, 57% of Benin's total USD 4.5 billion international trade (all transport modes) was with Asia, and 65% of Benin's USD 3.9 billion international trade by sea was with Asia. 91% of Benin's USD 737 million sea export went to Asia, and 60% of the country's USD 3.1 billion sea import came from Asia. Four of the five largest trading partners of Benin through the APC are Asian countries, namely India (15%, USD 680 million), China (12%, USD 533 million), Bangladesh (9%, USD 407 million), and the United Arab Emirates

[5] Notre Dame Global Adaptation Initiative, 2022

(6%, USD 251 million)[6]. In 2022, the Port of Cotonou handled 12.5 million tons of goods (5% more than in 2021). This figure could nearly double to 23 million tons by 2038, bolstered by current initiatives to upgrade and extend the Port[7]. Since 2018, the Republic of Benin has invested in the expansion of the APC, in relation GDIZ and the Wholesale Market ("Marche de Gros").

1.8 Nonetheless, these plans and visions are threatened by the serious challenges posed by the transport sector in Grand Nokoué, First, the transport sector suffers from a lack of a comprehensive governance arrangement at the agglomeration level with inadequate funding, unclear mandate and capacities, and lack of inter-agency/inter-communal collaboration. There are at least four organizations related to the transport sector. First, the Road Infrastructure and Land Management Company – Société des Infrastructures Routières et de l'Aménagement du Territoire (SIRAT) was established in 2021 to implement infrastructure projects. SIRAT has the mandate to build, manage, develop and maintain all road infrastructures, public buildings, landscaping and toll stations. Second, the National Agency of Land Transport – Agence Nationale de Transports Terrestres (ANaTT) regulates motorcycle taxi services, issues operation licenses and registers public transport vehicles. Third, the National Center for Road Safety – Centre National de la Sécurité Routière (CNSR) implements interventions on road safety, accident prevention, accident data collection in collaboration with the police and provides training to drivers. Finally, Municipalities enforce regulations for operators of vehicle and motorcycle taxi services and manage traffic in collaboration with the police.

1.9 Secondly, while offering a convenient point-to-point transport service, the proliferation of Zémidjans as the main motorized transport mode leads to serious associated externalities, accounting for around 70% of the motorized trips and a major contributor of congestion, road crashes and fatalities, and air pollution. Nationally, two-wheelers are involved in 77% of crashes resulting in personal injury and represent 82.13% of all crashes in urban areas in 2015; in Grand Nokoué, two-wheeler road crashes account for 52% of the total. As of today, most Zémidjans are not properly registered as transportation service providers with most drivers operating without holding a driving license. Consequently, these transport operators remain largely unidentified. This lack of identification causes issues regarding passenger safety and drivers' responsibility in case of crashes or traffic violations.

1.10 In addition, the existing transport infrastructure does not meet the demand. The current road network in Grand Nokoué is approximately 5,500 km in total of which about 1,100 km are paved mainly along trunk roads[8]. In addition, there is a constraint in the road capacity, with the main trunk roads being utilized both by commuters and heavy freight vehicles plying part of the Abidjan-Lagos corridor and the APC. This leads to unbalanced and constant competition between travel modes and purposes. The situation is expected to worsen with the expected upgrade and extension of the Port, which will add significant freight traffic to the already constrained roads. Current congestion management practice sees the imposition of restrictions on freight traffic which negatively impacts freight transportation and connectivity. Notably, freight transportation is also negatively impacted by the intermingling of commuter

[6] United Nation's Comtrade database, 2022
[7] Benin: African Development Bank Group extends €80 million loan for Port of Cotonou upgrading | African Development Bank Group - Making a Difference (afdb.org)
[8] Beninese National Geographical Institute - Institut Géographique National (IGN)

traffic and lack of dedicated freight transportation road infrastructure. Both these factors present a negative impact for the economies of Benin and its hinterland neighbors which depend heavily on the international connectivity and trade activity provided via the APC. Furthermore, there are more than a hundred intersections equipped with traffic light signaling systems, yet some systems are either not functional and/or lack synchronized or dynamic traffic regulation systems in place. Finally, there are very few designated parking areas, which motivates the indiscriminate use of sidewalks as on-road parking facilities. The situation is particularly critical around Dantokpa market.

1.11 Finally, the increasing demand for inter-city commutes is not accommodated with available and affordable public transport services. The growth of private motorized vehicles is accelerating, aggravating the associated negative impact. The main public transport mode in Grand Nokoué remains the zémidjan, less subject to congestion and able to provide a door-to-door service. This flexibility has contributed to the decline of minibuses use as medium-distance inter-city transport option. The latest attempt at developing a bus-based public transport service occurred in 2012 with “BenAfrique”. However, the company failed to meet and satisfy the market needs and dissolved in 2013, primarily due to an unattractive fare structure and operation challenges with competition from paratransit.

1.12 In parallel, gender disparities in mobility and transport sector participation severely limit women's economic opportunities in Grand Nokoué. The transport sector remains male-dominated, with women holding just 2.25% of jobs in the industry. Limited mobility options and high transport costs, combined with prevailing social norms, confine women to self-employment and family-based activities, contributing to the significant gender gap in labor force participation. These challenges particularly impact women in Grand Nokoué, where the combination of limited transport options, safety concerns, and affordability constraints creates significant barriers to women's full participation in economic and social activities.

1.13 **Addressing Key Development Challenges: Project Contributions:** Through its multi-dimensional approach, the Project will improve the transportation of goods and people within Grand Nokoué and address Benin’s national development priorities to foster economic prosperity and reach its greenhouse gas reduction national targets.

1.14 The Project will rehabilitate key transport infrastructure along priority corridors serving the major economic centers of the metropolitan area (GDIZ, Wholesale Market), rehabilitate direct access roads to the APC, improve traffic management and deploy Intelligent Transport Systems (ITS), including Control Posts and Traffic Light Signaling with fiber optics. It will also operationalize multimodal public transport services, including a public bus network and a river-lagoon public transport service on the Nokoué lake, implement specific road safety measures along the defined corridors, and establish a regulatory framework and professionalize paratransit operators.

1.15 The Project will create the conditions for increased mobility, supporting the sustainability and efficiency of the logistics and freight sectors. It will develop a sustainable transport strategy, including a freight transport strategy and a traffic management plan, create and operationalize the lead institution for the management of the transport sector in Grand Nokoué, and establish the financing mechanisms for the sustainability of this institution. The Project will contribute significantly to the objective of a 20% reduction in GHG emissions in the road

transport sector by 2030 by supporting the electrification of the two-wheeler fleet, the structuring of a local industry for electric mobility and the development of an electric bus in Grand Nokoué. The Project aims to enhance sustainability and climate resilience in the transport sector and of the communities served through the integration of climate resilience considerations in the project design, reducing exposure and the residual climate risks to a low level. Finally, it will strengthen the capacity of SIRAT and the future transport management institution through enhanced human and budgetary resources.

(2) Rationale

2.1 **Project Objective.** To enhance urban mobility, transport safety, and access to inclusive and sustainable transport services along selected corridors in Grand Nokoué.

2.2 **Expected Beneficiaries.** The primary beneficiaries will be the people and the businesses of the Grand Nokoué area, with reduced travel times, vehicle operating costs, local pollution, and increased road safety: (i) the population (including vulnerable persons such as women, children, people with disabilities, and the elderly) living in the project's area of influence (estimated to 2.8 million people) will benefit from safe, reliable and less polluting electric bus and electric river-lake public transport systems, improving their accessibility to social services and economic opportunities. (ii) Economic actors in the freight and logistics sectors, in Benin and the hinterland countries, will increase their trade efficiency from enhanced traffic conditions, transport services and road infrastructure, with the improved accessibility to the APC, whose activities largely contribute to connect West Africa and Asia. Other key beneficiaries include the GDIZ, the Wholesale Market ("Marché de Gros"), and other major economic centers of regional importance in Grand Nokoué, who will directly benefit from an improved accessibility to the APC and, consequently, increased trade efficiency with Asia. In addition, the business environment will benefit from the creation of new industries in the electric mobility sector, with potential employment and business opportunities. (iii) The informal transport operators, namely the 250,000 motorcycle taxis drivers ("Zemidjan"), will benefit from a fleet renewal to electric vehicles, improving their work conditions through reduced noise and pollution, and professionalization measures, improving their business management. (iv) the municipalities of Grand Nokoué and the Benin central government will be also key beneficiaries, with creation of a dedicated institution to manage urban transport with improved capacity building, governance and financing solutions in the transport sector.

2.3 **Expected Results.** The Project is expected to result in the improvement of the transport conditions of Grand Nokoué from several perspectives, including mobility, safety and accessibility. The Results Monitoring Framework is presented in Annex 1. The results are expected to be monitored through the following key indicators:

(i) Average weekday travel time in the morning peak between (1) Dantokpa (Cotonou) and Carrefour Kpota (Abomey Calavi), (2) Dantokpa (Cotonou) to PK 10 (Sèmè-Podji),
(ii) Satisfaction rating by public transport users of the public transport services, disaggregated by transport mode and gender (percentage),
(iii) Traffic crashes in the selected corridors, per year, disaggregated by fatalities (number),
(iv) Direct users that benefit from improved access to sustainable transport infrastructure and services (number of people),
(v) Population of Grand Nokoué benefiting from improved access to sustainable transport infrastructure and services, disaggregated by gender and age (number of people)

2.4 **Strategic Fit for AIIB.** The Project is aligned with the Bank's Strategy on Financing Operations in Non-Regional Members, with significant benefits to Asia in terms of:

(i) **Climate mitigation.** The Project will reduce GHG emissions through the introduction of e-mobility based on a public transport system with electric buses and electric boats, the deployment of a large-scale fleet renewal program to replace 60,000 conventional motorcycles with electric two-wheelers, and the development of a local e-mobility industry on electric motorcycles. These activities will significantly contribute to the Benin's greenhouse gas reduction targets, as detailed in Benin's latest updated Nationally Determined Contributions of 2021 (section "Promotion of energy efficiency in the transport sector"). Three measures (out of twenty) mentioned in the country's NDC are directly related to the Project:

i. Measure 18: "Continuation of urban road development in Cotonou, Porto Novo (...) and Calavi";
ii. Measure 19: "Development and implementation of a strategy and action plan to improve mobility in the medium and long term in the greater region of Cotonou and neighboring localities"
iii. Measure 20: "Development of river-lagoon transport (establishment of a lagoon transport service between Calavi and Cotonou then Cotonou and Porto-Novo").

In addition, the electrification of the two-wheeler fleet and the development of the new electric bus network in Grand Nokoué will contribute significantly to the objective of a 20%-reduction in the GHG emissions in the road transport sector by 2030.

(ii) **Trade and Connectivity.** The Project will improve the accessibility to the APC, the gateway for Benin and the hinterland countries (Niger, Burkina Faso and Mali), to facilitate the growth of trade and improve West Africa's connectivity with Asia, as four of Benin's top five trading partners are on the continent (India, China, Bangladesh, and the United Arab Emirates). The Project will finance the rehabilitation of transport infrastructure in the vicinity of the APC (ATC Lot 1 roads and Ganhi bridge), or on the scale of Grand Nokoué (RNIE1 and RNIE2 road corridors, PCRT/SLT – traffic management improvements, Djonou bridge). The Project will reduce travel time and operating costs, as well as increase transport efficiency and road safety on the main road corridors of Grand Nokoué. It will improve the mobility, accessibility, and safety of the road corridors connecting the APC with major economic hubs in the region (GDIZ, Wholesale Market) and hinterland countries, leading to enhanced cross-border connectivity between Benin and Asia, as well between the relevant hinterland countries and Asia.

2.5 The Project is aligned with AIIB's corporate strategy to finance infrastructure for tomorrow and the commitment to develop environmentally, socially, and economically sustainable projects.

2.6 The Project is well aligned with the thematic priorities of the Bank's Corporate Strategy:

(i) **Connectivity and Regional Cooperation:** The importance of road infrastructure serving the APC extends beyond Benin, serving as a crucial gateway for trade to hinterland countries of Niger, Burkina Faso, Mali, and Nigeria. This underscores its pivotal role in enhancing connectivity and fostering regional cooperation, facilitating the movement of goods and bolstering economic ties across West Africa. Improving infrastructure and efficiency at the Port not only benefits Benin but also

strengthens economic integration and regional cooperation among neighboring nations.

(ii) **Green Infrastructure:** The Project will be a significant milestone in developing a transport sector oriented towards climate change mitigation, and implementing a transport infrastructure adapted to climate change. This Project will build on the government's initiatives to promote electric mobility in Benin. It will include a motorcycle taxi fleet renewal program to replace ageing and highly polluting vehicles with two/three-wheeled electric vehicles. The Project will also establish scheduled fixed-route public electric bus and electric river-lake transport services, shifting modal share from private vehicles and reducing overall GHG emissions. All transport infrastructure included in the Project are designed according to climate-resilient standards for an adaptation to the climate risks identified in the region (flood and coastal erosion). Technical assistance, training and capacity building in the Project will support the development of policies, regulations, strategies, plans and project management including the climate change dimension.

(iii) **Technology-Enabled Infrastructure:** The Project will modernize traffic management practices and optimize traffic flows along priority mobility corridors by deploying technology-enabled ITS solutions, such as smart traffic signal controls and incident detection system, and communications technologies including fiber optic.

(iv) **Private Capital Mobilization:** The Project envisions USD 100 million participation from the private sector. It will support the operationalization of multimodal public transport services through the procurement, maintenance and operation of the e-bus and e-boat transport services. The private sector will also contribute to the financing of the local industry's development.

2.7 The Project is aligned with AIIB's **Transport Sector Strategy**. The rehabilitation of 15 km of existing roads, without capacity expansion, the reconstruction of two bridges, the development of an unpaved road into a green mobility road corridor, and the implementation of traffic management ITS equipment, fall into the Bank's priority to finance the "**upgrading of existing infrastructure**". Enhanced road access to the APC, a major infrastructure connecting the country to its international trade partners and the countries of its hinterland, will increase "**cross-border connectivity**". The implementation and operationalization of multimodal public transport services, including bus, boat and last-mile motorcycle taxi services, will enable seamless mobility within the Grand Nokoué transport network, aiming at the "**transport integration**" all of these modes.

2.8 The Project is aligned with AIIB's **Sustainable Cities Strategy**, enhancing urban mobility. The Project is a G.R.E.A.T. project:

(i) (G) The Project will provide a **greener** infrastructure, with roads in better surface conditions leading to lower consumption of fuel and spare parts per vehicle. The Project will also implement green transport services and contribute to reducing the GHG emissions through the electrification of the motorcycle taxi fleet and the operation of electric buses and electric lake boats;

(ii) (R) The Project will improve the climate **resilience** of infrastructure and urban areas to flood and coastal erosion, integrating climate risks considerations in road and bridge construction standards. It will also strengthen institutional adaptive

capacities for low-carbon climate resilient mobility and freight management strategies.

(iii) (E) The Project will increase the **efficiency** of the existing road infrastructure, without capacity expansion, by rehabilitating roads, installing ITS and traffic management systems on priority corridors, and implementing a new public transport network, significantly enhancing the urban mobility, reducing peak-hour congestion and travel times. The development of low-carbon mobility and freight management plans will further increase the efficiency of the transport network in Grand Nokoué;

(iv) (A) the Project will improve the freight transport operators' **accessibility** to the APC and other major economic activity centers of national and international importance, and the residents and businesses' accessibility to infrastructure, public services and economic opportunities in the Grand Nokoué urban area; and

(v) (T) the Project will contribute to Benin's **thriving** economy, increasing the economic development through connections to major economic areas. The Project will involve the private sector in the reformed paratransit sector and generate long-term job opportunities in the transport and e-mobility sectors.

2.9 This Project contributes to the following United Nations Sustainable Development Goals (SDGs):

(i) SDG 3 – "**Ensure healthy lives and promote well-being for all at all ages**", with a focus on reducing the "death rate due to road traffic injuries" (target 3.6.1) and the "mortality rate attributed to (…) ambient air pollution" (target 3.9.1).

(ii) SDG 9 – "**Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation**", targeting on the development of "quality, reliable, sustainable and resilient infrastructure (…) to support economic development and human well-being, with a focus on affordable and equitable access for all (target 9.1) and "facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries… (target 9.a).

(iii) SDG 11 – "**Make cities and human settlements inclusive, safe, resilient and sustainable**", providing "access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons" (target 11.2), and "reducing the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations" (target 11.5).

2.10 **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. Details of the assessment are provided in Annex 5. In line with the joint MDB methodology for tracking mitigation finance, it is estimated that USD 96.37 million of the project cost contributes to support mitigation; in line with the joint MDB methodology for tracking adaptation finance, it is estimated that USD 36.76 million of the project cost contributes to support adaptation. Details on these estimates are

provided in Annex 5. USD 9.27 million accounts for mitigation and adaptation dual benefits. The total climate finance amount is USD 133.13 million, equivalent to 66.57% of AIIB's finance.

2.11 The Project is estimated to trigger a yearly reduction of 151,000 tCO_2e by reducing mobility-related emissions in Grand Nokoué by 12% over the period. This reduction is primarily driven by the electrification of zemidjans, which accounts for 70% of the total GHG emissions reduction. Additional contributions come from the implementation of a multimodal public transport system (19%) and the reduction of road congestion through the construction of bridges, the rehabilitation of access roads to the Port, and the implementation of ITS and communication equipment (11%).

2.12 **Value Addition by AIIB.** Beyond the provision of financing, AIIB's participation has strengthened, and will further strengthen the Project by the following aspects:

(i) AIIB's participation has enhanced the Project since its inception, allowing for a more comprehensive approach to addressing the mobility challenges in Grand Nokoué region. While the WB initially focused on urban mobility of passengers, AIIB contributed to introduce project components aiming at improving freight transport, such as the accessibility to the APC and other major national and regional economic centers such as the GDIZ and the Marché de Gros wholesale market.

(ii) As the Project includes the electrification of the two-wheeler fleet and the establishment of an electric bus network in Greater Nokoué, AIIB will draw on the many successful experiences of implementing e-mobility projects in Asian and Chinese metropolitan area and participating in capacity building and knowledge sharing for the PIU and other relevant technical and planning units.

2.13 **Value Addition to AIIB.** Through this Project, the Bank will further develop its expertise and knowledge in proposing complex, comprehensive and sustainable infrastructure projects in a climate-sensitive area. The Project will be AIIB's first experience in Benin and the third in Africa, after Rwanda and Côte d'Ivoire. It will strengthen AIIB's brand as an infrastructure bank and enhance AIIB's capacity to operate in the region. The Project will also be AIIB's first experience in multimodal e-mobility, and specifically the first in implementing a new electric bus network as well as the first in an electric river-lake transportation system. Insights gained from this project will be important to broaden AIIB's engagement in the e-mobility sector, a field that presents numerous challenges in the cities of developing economies. The Project will also strengthen AIIB's partnership with the WB (lead co-financer) in Benin. The Project will contribute to the diversification of AIIB's sovereign-backed finance portfolio, increase AIIB's financing in non-regional members, and help maintain AIIB's healthy weighted average borrower rating of B+.

2.14 **Lessons Learned.** The Project is built on the findings of the BenAfrique experience, providing key insights into the project structure definition. The BenAfrique was a bus service in Cotonou, launched in 2012 with 52 buses and a target of 15,000 daily passengers, but failed within a year due to unplanned fare increases favoring informal unregulated modes (zemidjans), unreliable schedules, lack of financial support, poor intermodal connectivity, unaddressed environmental and safety concerns, and insufficient user and operator participation. This experience underscored the importance of offering affordable fares, inclusive and reliable service, fit-for-purpose design, financial stability for private sector

operators, transport multimodality and integration, and stakeholder engagement. These factors will be subject to close monitoring during the elaboration of feasibility analyses and industry transition plans during project implementation.

2.15 The Project benefits from the WB's experience in West Africa. It adopts a multi-sectoral approach that combines investments in infrastructure, development of the local industry, private sector participation, governance, and stakeholder engagement to achieve inclusive development. Lessons learnt from prior WB projects in West Africa highlight the following factors which have been incorporated into the Project: (i) it is crucial to adopt a comprehensive and multimodal approach, articulating the accessibility to transport services and the design of the infrastructure; (ii) early implementation of an institutional, stakeholder, and public communication strategy is key to project ownership and success; (iii) the importance of strong and continuous political leadership and ownership for the success of public transport projects, as it observed in the Project, with the strong commitment from the Republic of Benin at the highest level; (iv) fair competition, appropriate business models and risk sharing mechanisms, and attractive profits are proven key elements ensuring the successful participation of the private sector, and (v) policy, technology and investment are key aspects to accelerate the transition toward carbon neutral transport, specifically decarbonizing cities by deploying public transport, cleaner vehicles and charging infrastructure, prioritizing active mobility and unlocking and adopting green freight and logistics.

2.16 This Project is the second AIIB project to involve the WB – West Africa team as a joint co-financier, therefore the preparation of this Project has also benefited from the Bank's experience on the Inclusive Connectivity and Rural Infrastructure Project in Côte D'Ivoire (P000736), and confirmed the importance of an efficient coordination between the two project teams, during the preparation (joint preparation missions, preparation of co-lenders agreement), and implementation.

2.17 The Project was included in the WB project portfolio in December 2022, as part of the 19-23 Country Partnership Framework agreed with Benin. Since then, the WB has prepared the Project, mobilizing a Project Preparation Advance (PPA) and several Trust Funds (PPIAF, GRSF, GFDRR, GFDT), enhancing the technical quality of the preparatory studies and the overall project design for all components. The WB has approved the Project on May 19, 2025.

(3) Project Description

3.1 **Project components.** The Project adopts a holistic approach for transport development and transition to clean technologies. The Project will support:

(i) Improvement of the transport sector governance in Grand Nokoué,
(ii) Professionalization of paratransit operators and strengthening of road and waterway safety oversight and management
(iii) Improvement of transport conditions
(iv) Electrification of motorcycle taxis, and
(v) Capacity building and project management.

AIIB will jointly co-finance the Project with the WB. AIIB financing will be allocated to all components (except costs related to land acquisition and resettlement activities), aligning with AIIB's thematic priorities, and sector and non-sector strategies.

3.1.1 **Component 1: Improvement of the transport sector governance in Grand Nokoué (USD 14 million equivalent, of which USD 7 million financed by AIIB, USD 7 million financed by IDA).** This component will improve the institutional framework, financing mechanisms, and transport planning of the transport sector in Grand Nokoué, as these are essential for effective planning, budgeting, and stakeholder engagement for the operationalization of a climate resilient low carbon multimodal transport system, including public transport, non-motorized transport (NMT), inland waterway transport (IWT) and e-mobility. It will finance the following activities:

(i) Climate-resilient, low-carbon multimodal public transport and freight management studies for Grand Nokoué. This includes (a) a comprehensive transport strategy operationalizing the Urban Mobility Plan of Grand Nokoué (*Plan de Mobilité Urbaine*), observing climate mitigation and adaptation goals, emphasizing multimodal and public transport, NMT, efficient freight traffic management, e-mobility, climate resilience, and gender inclusivity; and (b) various studies to improve integrated land use and transport planning capacities with a climate mitigation and adaptation and a gender perspective, to define and implement policies and strategies for public transport, road traffic and parking management, climate resilient road asset management mechanisms, and road safety, as well as a Strategic Environmental and Social Assessment (SESA) to accompany the transport strategy, which are all key to promote modal shift towards public transport and NMT.
(ii) Support to the establishment and operationalization of a lead institution for the management of the transport sector in Grand Nokoué. This includes (a) TA to identify the most appropriate institutional model for the governance of the transport sector in GN; (b) TA and capacity building activities to strengthen institutional coordination among ministries and municipalities, facilitating the transition to the future transport lead institution and ensuring an integrated approach to transport and land use planning, with a strong emphasis on strengthening climate resilience and promoting low-carbon transport and NMT; and (c) technical support for the GN-SUMP.
(iii) Studies and TA to identify financing and funding mechanisms for the transport sector in Grand Nokoué, including to (a) identify the funding and financing sources,

(b) define investment plans, budgeting processes, and allocation mechanisms for the funding of transport. Prioritization of investments will be informed by the GFDRR financed climate risk assessment and will promote public transport and NMT to support modal shift from higher carbon modes.

(iv) Support to the establishment and management of a platform for dialogue between the government and the transport industry, serving as a consultative forum to ensure transparent communication among stakeholders.

3.1.2 **Component 2: Professionalization of paratransit operators and strengthening of road and waterway safety oversight and management (USD 16 million equivalent, of which USD 8 million financed by AIIB and USD 8 million financed by IDA).**

Sub-component 2.1 Professionalization of paratransit operators. This subcomponent will be managed by ANaTT, involve several institutions, and finance the following activities:

(i) Registration of paratransit operators in a centralized database, including the creation and operationalization of a digital centralized system, a cornerstone for the sector regulation, in view of addressing the oversupply of services.

(ii) Support to the training and testing of motorcycle taxi drivers in obtaining driving license, including (a) financial support to institutions to discount the fees to be paid by motorcycle taxi drivers; (b) the construction of testing infrastructure; and (c) related technical assistance. Drivers will benefit from reduced cost and special training programs for their license. Testing infrastructure will be developed to absorb the influx of candidates.

(iii) Support to the licenses verification by traffic police, including purchasing IT devices, vehicles, and related TA. Control systems will facilitate enforcement related to operator permits and driving licenses.

(iv) Provision of a social protection safety net for informal transport operators, including financial contributions to the institutions in charge of health coverage, occupational accidents and disease insurance, and pension plans, for eligible informal transport operators.

(v) Consolidation of informal transport industry, including conducting meetings and consultations to strengthen professional organizations representing informal transport operators, and associated TA.

Sub-component 2.2 Strengthening of road safety oversight and management practices. This subcomponent will finance activities to modernize Benin's existing road safety practices, procedures, and systems related to oversight, management, know-how, and capacity building. A special focus is provided to the most vulnerable road users such as pedestrians and cyclists, making NMT safer and more attractive. The proposed activities are part of the "SEcurité, SAnté et Mobilités au Bénin" (SESAM) project and will be managed by the CNSR, with support from the Ministry of Health (Ministère de la Santé, MS), academic and private sector partners.

(i) Establishment of a Road Safety Observatory to provide a comprehensive and accurate understanding of the reality of road-related crashes in Benin, including the correlation with climate and natural hazard hotspots.

(ii) Documentation of the specific features of the road network in Benin, including the identification and mapping of high-risk/accident-prone situations and areas, also considering climate and natural hazard hotspots.

(iii) Sensitization and capacity building activities, including (a) surveys to identify the primary factors and practices associated with road-related crashes, including the correlation with climate and natural hazard hotspots; (b) sensitization and communication campaigns, including on safe driving in extreme climatic conditions; (c) installation of driving simulator platform; and (d) training and capacity building programs for institutions and specific users or target communities/groups to encourage behavioral changes. Awareness raising will also be provided on road safety risks associated with climate and natural hazards and how to manage these risks.

(iv) Modernization of Benin's vehicle fleet control and monitoring systems through the procurement of equipment and conduct of training to verify the fleet's compliance with safety and pollution standards.

(v) Management, coordination, monitoring, and evaluation of the subcomponent's activities including technical assistance support.

Sub-component 2.3 Improving the safety of lake transport in the Nokoué lake. This subcomponent will strengthen the safety of IWT, including during extreme weather conditions which are expected to become more frequent with climate change. Safety is essential for IWT operations and will expand operational hours, reliability and overall attractiveness of this low-carbon transport mode for passenger and freight transport. This subcomponent will be managed by DAPMF of MCVT and will finance activities to develop and implement a regulatory framework that defines clear safety standards of boat operation:

(i) Implementing an operation control and monitoring system with penalties for safety non-compliance.

(ii) Establishment of a licensing and inspection system for boat operators to verify compliance with safety standards.

(iii) Procurement, installation and maintenance of beacons for navigation and security.

(iv) Raising awareness among boat operators and passengers on safety regulations and best practices, including extreme weather preparedness and emergency response.

(v) Construction of boatyards to maintain and repair the boats.

3.1.3 **Component 3: Improvement of transport conditions (USD 343 million equivalent, of which USD 146.5 million financed by AIIB, USD 146.5 million financed by IDA, and USD 50 million from Private Sector).** This component will improve the transport and livability conditions in Grand Nokoué by financing the following activities: (a) set up and operationalize an integrated multimodal bus and boat public transport system; and (b) rehabilitate/reconstruct/build roadway and IWT infrastructure, bridges, traffic management systems, and NMT facilities to support public transport operations and improve traffic flows and mobility in Grand Nokoué. This component is structured in two codependent subcomponents:

Subcomponent 3.1 – Operationalization of multimodal public transport services (USD 68 million equivalent, of which USD 9 million financed by AIIB,

USD 9 million financed by IDA, and USD 50 million from Private Sector). This subcomponent will finance activities supporting the setup, management, and operationalization of an inclusive, resilient, efficient, safe, and low-carbon public transport system, focusing on multimodal integration and interoperability, and social risk management. This subcomponent will be managed by a transitory structure to be set up by MCVT with all entities and stakeholders involved in transport services provision and management. The subcomponent will finance the following activities:

(i) Planning of a structured, low-carbon, multimodal public transport system, including collective/mass transit transport by land and water, complementary and first/last mile connectivity services.

(ii) Support to modernize and operationalize public transport including (a) studies to establish the multimodal public transport network; (b) transaction advisory services for PPP structuring of bus and boat public transport operations through concession agreements; (c) implementation and management of social risks mitigation measures to address Sexual Harassment and Abuse (SHA) through capacity building programs for police and public transport stakeholders, improve women and other vulnerable groups' safety and mobility through incorporation of safety-enhancing features within infrastructure, and support labor redeployment of stakeholders and people affected by the new public transport system (e.g., drivers, conductors, mechanics, and route managers).

(iii) Provision of an electric bus fleet that will be operated by private operator(s) in Grand Nokoué, notably along two priority mobility corridors: Abomey-Calavi - Cotonou and Ouidah - Sèmè-Podji corridors.

(iv) Provision of an electric boat fleet that will be operated by private operator(s) on Lake Nokoué, notably along some priority IWT routes: Cotonou - Porto-Novo and Cotonou - Abomey-Calavi.

Subcomponent 3.2 – Provision of infrastructure supporting sustainable and multimodal transport (USD 275 million equivalent, of which USD 137.5 million financed by AIIB, USD 137.5 million financed by IDA). This subcomponent will finance the construction and upgrading of infrastructure necessary to support the operation of the public transport system, improve traffic flows and enhance mobility, accessibility, and safety within Grand Nokoué. This subcomponent will be managed by SIRAT and will finance associated services, goods, works and equipment for the following activities:

(i) Climate-resilient rehabilitation, reconstruction, and reconfiguration of existing road infrastructure. This could include traffic lanes, upgrade and relocation of utilities (e.g. street lighting, sewage/water supply, drainage), intersections / interchanges, bridges, depot and NMT roadside facilities with a focus on:

a. Selected road sections along RNIE1 and RNIE2, including the Djonou bridge reconstruction and upgrading. These two roads are existing 2x2 lanes with a dedicated public transport corridor and provision for local traffic. The Project's interventions on these priority corridors and bridge will mainly focus on carrying out works to strengthen climate resilience and improve traffic flow.

b. ATC identified road segments including Ganhi bridge reconstruction and upgrading, to improve climate resilience, the traffic flow in the city center

and access to the APC. These urban road segments serve public transport and local traffic, including freight transit. The upgrades include improvement of NMT conditions and climate resilience, through provision of pedestrian and enhanced drainage facilities.

(ii) Construction of climate-resilient and inclusive land public transport infrastructure. This could include multimodal infrastructure and facilities to support public transport, such as segregated bus lanes, well-lit stations/shelters, terminals, multimodal transport hubs, depots, and integration areas, notably along the 2 main corridors RNIE1 and RNIE2.

(iii) Construction of climate-resilient and inclusive IWT infrastructure including piers, jetties, terminals, access roads essential for the operation of IWT.

(iv) Upgrading of an unpaved section into a green mobility corridor. This corridor promotes low-carbon transport modes, prioritizing NMT and featuring sustainable design of pedestrian urban areas, bicycle and public transport lanes. This section will adopt the complete-street concept with sidewalks and cycle lanes and accommodate two-wheelers that provide first and last mile access to public transport.

(v) Deployment of ITS and communication technologies (PCRT/SLT), including fiber optics to modernize traffic management practices and optimize traffic flows in Grand Nokoué, including directing traffic to safe locations during climate-related extreme events such as flooding.

(vi) Works implementation and supervision including (a) elaboration of detailed designs, construction supervision activities, and third-party monitoring; (b) E&S mitigation measures as recommended by safeguards plans before and during construction; and (c) financing the cost of involuntary resettlement measures. The costs incurred by these involuntary resettlement measures will be financed by the WB only.

3.1.4 **Component 4 - Electrification of motorcycle taxi (USD 108 million equivalent, of which USD 29 million financed by AIIB, USD 29 million financed by IDA, and USD 50 million from Private Sector).** This component, managed by the MEF, aims to support the Republic of Benin's decarbonization ambition with a vision of establishing Benin as a regional hub of electric mobility through (a) a fleet renewal program and (b) the development of an industrial sector for electric two-wheelers.

Sub-component 4.1 Supporting a pilot program. Prior to implementing the electrification strategy aimed at improving the transport services of zemidjans at scale, the Republic of Benin will launch a pilot project on 5,000 zemidjans with a combination of financial incentives and supportive measures to promote the transition to electric two wheelers. The pilot will allow testing different incentive models and will strengthen the Republic of Benin's ability to design and implement the comprehensive fleet electrification strategy at scale. The results of the pilot activities are expected to inform the design and implementation of the subsequent sub-components 4.2 and 4.3. This sub-component will finance the pilot program through the following activities:

(i) TA and capacity building activities to develop the fleet renewal strategy and implement a pilot to deploy 5,000 electric fleet renewal and the associated charging

infrastructure (charging facilities refer to charging stations or battery-swapping stations, as the decision on the technology remains to be made).

(ii) Measures to implement the pilot including: (a) scrapping premiums for the renewal of fuel-based motorcycles with new e2ws; (b) installation of charging facilities; (c) training programs for the workers in charge of the charging facilities; and (d) communication and awareness campaigns to promote the fleet renewal program.

Sub-component 4.2 Deploying a large-scale fleet renewal program. This sub-component will finance a large-scale fleet renewal program to replace 60,000 conventional mototaxis with electric two-wheelers. The program's operational modalities will be defined based on the final conclusions of two ongoing studies financed by Global Facility to Decarbonize Transport (GFDT) and the Private Infrastructure Advisory Facility (PPIAF) and will be further refined based on the results of the pilot implementation under subcomponent 4.1. Preliminary findings already indicate the mechanism's viability. This subcomponent will finance the following activities:

(i) Provision of scrapping premiums for the renewal of fuel-based motorcycles with new e2ws.

(ii) Construction and installation of charging facilities to be undertaken by private operator(s), with potential public sector support through CAPEX subsidies, reduced electricity tariffs, grid connection support, or land provision.

(iii) All costs necessary for the implementation and monitoring of the subcomponent by public sector entities.

Sub-component 4.3 Developing a local e-mobility industry on electric motorcycles. This subcomponent aims to support the development of a local e-mobility industry for electric two-wheelers. It will finance key investments, including the assembly of electric motorcycles, recycling of Internal Combustion Engine (ICE) motorcycles, battery repurposing or recycling, production of safety equipment for motorcyclists, and vocational training with a strong emphasis on gender inclusivity to ensure that women benefit from training and the newly created jobs. Private sector players will build, finance, and operate these industrial facilities, with potential public sector support through CAPEX subsidies. Preliminary findings already indicate strong interest from the private players and the viability of the ecosystem for private operators, who could leverage the broader market for private motorcycles. This subcomponent will finance:

(i) The construction and installation of industrial assembly facilities for electric motorcycles to ensure their distribution to local market players. Studies suggest that overall viability can be achieved with an initial launch CAPEX subsidy from the public sector.

(ii) The construction and installation of battery recycling plants. Regardless of battery technology, this sector could attract private operators, with viability appearing achievable with an initial CAPEX subsidy.

(iii) The construction and installation of scrappage plants for conventional ICE motorcycles.

(iv) The construction and installation of facilities for spare parts and protective equipment, including helmets.

(v) Activities to support the implementation of the subcomponent, including (a) vocational training programs to develop local skills, with a particular focus on promoting women's employment; (b) all necessary costs for program management by public authorities; and (c) the implementation of required regulatory measures.

3.1.5 **Component 5: Capacity Building and Project Management (USD 19million equivalent, of which USD 9.5 million financed by AIIB, USD 9.5 million financed by IDA).**

Sub-component 5.1 Project management cost for the Project Implementing Entity (PIE). This subcomponent will finance project management cost for the PIE for project coordination, supervision, monitoring, reporting, evaluation, financial management, procurement, environmental and social safeguards, communication and outreach, and technical assistance on specific topics such as e-mobility, lake transport, ITS, transport economics, road and lake transport safety, and implementation of social and environmental measures.

Sub-component 5.2 Capacity building and TA activities to the relevant technical units. This subcomponent will finance capacity building and TA activities to the relevant technical units, including: (a) TA on urban mobility and transport services planning, urban planning, traffic management, road safety, and cross-cutting issues like gender, citizen engagement, occupational health and safety, biodiversity preservation, air quality monitoring, Ramsar site protection and climate change and disaster risk; and (b) capacity building to strengthen internal capacity for project implementation and monitoring, including in supervision of works, studies, and coordination of stakeholders.

3.2 **Cost and Financing Plan.** The project has a total cost of USD 500 million. USD 200 million will be financed by AIIB, USD 200 million by IDA and USD 100 million by the private sector.

Table 1: Project Cost and Financing Plans

Item	Project Cost (USD m)	Financing (USD m)		
		AIIB	IDA	Private
Component 1: Improvement of the transport sector governance in Grand Nokoué	**14.00**	**7.00**	**7.00**	**0.00**
Development of climate-resilient, low-carbon urban mobility and freight management studies	7.00	3.50	3.50	0.00
Establishment and operationalization of a lead institution for the management of the transport sector in Grand Nokoué	5.00	2.50	2.50	0.00
Financing and funding mechanisms for the transport sector in Grand Nokoué	1.00	0.50	0.50	0.00
Establishment and management of a platform for dialogue between the government and the transport industry	1.00	0.50	0.50	0.00
Component 2: Professionalization of paratransit operators and strengthening of road and waterway safety oversight and management	**16.00**	**8.00**	**8.00**	**0.00**
Supporting the professionalization of paratransit operators	9.00	4.50	4.50	0.00
Strengthening of road safety oversight and management practices	6.00	3.00	3.00	0.00
Improving the safety of the lake transport system in the Nokoué lake	1.00	0.50	0.50	0.00
Component 3: Improvement of transport conditions	**343.00**	**146.50**	**146.50**	**50.00**
Operationalizing multimodal public transport services	68.00	9.00	9.00	50.00
Constructing and upgrading the infrastructure, *of which*	275.00	137.50	137.50	0.00
Road transport infrastructure (RNIE1, RNIE2, ATC lot 1, public transport facilities, green corridor, bridges)	*163.95*	*85.17*	*78.78*	*0.00*
Lake transport	*61.00*	*30.50*	*30.50*	*0.00*
Traffic management (PCRT/SLT)	*16.65*	*8.33*	*8.33*	*0.00*
E&S, supervision costs (incl. contingencies)	*27.00*	*13.50*	*13.50*	*0.00*
Costs related to land acquisition and resettlement activities	*6.40*	*0.00*	*6.40*	*0.00*
Component 4: Electrification of motorcycle taxi	**108.00**	**29.00**	**29.00**	**50.00**
Supporting a pilot program	3.00	1.50	1.50	0.00
Deploying a large-scale fleet renewal program	23.00	11.50	11.50	0.00

Developing a local e-mobility industry on electric motorcycles	82.00	16.00	16.00	50.00
Component 5: Capacity building and project management	**19.00**	**9.50**	**9.50**	**0.00**
Project management for the PIE	16.00	8.00	8.00	0.00
Capacity building for relevant technical units	3.00	1.50	1.50	0.00
Grand Total (USD m)	**500.00**	**200.00**	**200.00**	**100.00**

3.2.1 The co-financing between AIIB and IDA is on the entire project scope, with the exception of resettlement costs. The RAP implementation cost including land acquisition and compensation to the project-affected persons (PAP) will be financed through the IDA Credit as per the request from the Republic of Benin. The private sector contribution is detailed in the project assessment section.

3.3 Implementation Arrangements and Readiness

3.3.1 **Institutional Arrangements.** The Project's overall institutional structure will be composed of (a) a steering committee that ensures the coherence of activities with the sectoral strategy and intersectoral coordination among ministerial departments, companies, and local authorities; (b) a technical committee responsible for reviewing the progress and performance and providing quality assurance on the technical aspects; and (c) the PIU in the SIRAT to coordinate project implementation activities.

(i) The Steering Committee (SC) will be created specifically for the Project. This SC will include a representative of the following national authorities: the Presidency of the Republic; the MEF; the MCVT; the Ministry of Interior and Public Security; the Ministry of Energy, Water and Mines; the Ministry of Industry and Trade. It will also comprise 5 representatives from the Grand Nokoué municipalities: Cotonou, Porto Novo, Sèmè Podji, Abomey Calavi and Ouidah. The SC will be chaired by the MEF and will gather at least twice a year.

(ii) The Technical Committee (TC) will be created specifically for the Project and will include a representative of the relevant Specialized Implementing Agencies (SIAs) or ministries' directorates: MCVT's DGDU[9], MCVT's DAPMF[10], MCVT's DTTA, MEF's USMEF[11], ANaTT, CNSR, ADELAC, CAGD, SIRAT. The TC will be chaired by the MCVT's DGDU and will gather at least every trimester.

(iii) A transitory structure will be set up by the MCVT before the establishment of the lead institution for the management of the transport sector in Grand Nokoué. The establishment and operationalization of the new lead institution will take time to materialize. In the meantime, DGDU will implement an interim solution through the creation of an ad-hoc transitory structure. This structure will be responsible for: (a) facilitating dialogue between the government and the informal transport industry as part of

[9] General Directorate of Urban Development (Direction Général de Développement Urbain)
[10] Department of Port, Maritime and River-Lagoon Affairs Department (Direction des Affaires Portuaires, Maritimes et Fluvio-Lagunaires)
[11] Strategic Support Unit of the Ministry of Economy and Finance (Unité d'Appui Stratégique du MEF)

component 2.1, and (b) operationalizing multimodal public transport as part of component 3.1. Once established, the transport lead institution will take over these responsibilities.

3.3.2 **Implementation arrangements.**

(i) SIRAT will be the main implementing agency and will have overall fiduciary responsibility for all project related activities. SIRAT, as the PIE will set up a dedicated unit (PIU) that will be responsible for the management of fiduciary, environmental and social risks, communications, and monitoring and evaluation. This unit will need to be strengthened in terms of its fiduciary and technical skills required to manage the project, including ability to monitor the implementation of environmental and social risks mitigation measures. While Specialized Implementing Agencies (SIAs) or ministries' directorates, such as MCVT's DGDU and DAPMF, MEF's USMEF, ANaTT, CNSR, will implement project activities that currently fall within their respective institutional mandate, the PIU will retain overall fiduciary responsibility of the project. SIAs will have technical responsibilities under modalities that will be further defined under conventions signed with SIRAT. Capacity building has already started for the existing institutions that have been involved in project preparation, in particular the technical staff of the PIU. Additionally, the identification of the key PIU staff is completed.

Table 2: List of Technical Responsible Entities

Project Component / Activity	Technical Responsible Entity
Component 1: Improvement of the transport sector governance in Grand Nokoué	DGDU / DTTA
Component 2: Professionalization of paratransit operators and strengthening of road and waterway safety oversight and management	
Component 2.1: Professionalization of paratransit operators	ANaTT / DAPMF / DTTA
Component 2.2: Strengthening of road safety oversight and management practices	CNSR / DRFS
Component 2.3: Improving the safety of lake transport in the Nokoué lake	DAPMF / ADELAC
Component 3: Improvement of transport conditions	
Component 3.1: Operationalization of multimodal public transport services	DGDU / DTTA
Component 3.2: Provision of infrastructure supporting sustainable and multimodal transport	SIRAT / ADELAC
Component 4: Electrification of two-wheelers	USMEF
Component 5: Capacity Building and Project Management	SIRAT
Project Implementation Unit	SIRAT

(ii) Procurement arrangements: As WB is the lead co-financer, the Project procurement will be conducted by the PIU under WB supervision and in accordance with WB's "Procurement Regulations for IPF Borrowers" (Procurement Regulations) dated March 1, 2025 under the "New Procurement Framework (NPF) . WB's Procurement Policy is materially consistent with the Core Procurement Principles and Procurement Standards of AIIB's Procurement Policy and therefore deemed fit-for-purpose and acceptable to AIIB. The Project will be subject to WB's "Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD (International Bank for Reconstruction and Development) Loans and IDA Credits and Grants", dated July 1, 2016.

SIRAT was established in 2021 as a SOE (State Owned Enterprise) and an implementation arm for infrastructure projects under former MIT and MCVDD, with the MOEF chairing its Board of Directors. SIRAT is currently implementing WB funded projects like the Building Resilient and Inclusive City Program (BRIC P176653 PforR- that became effective on 13 March 2023) and Storm Water Management and Water Resilient Project (PAPC PGERU P167359 IPF) that became effective on 3 February 2020. SIRAT will set up the Project Implementation Unit (PIU) of the proposed Project and will be responsible for the procurement and contract management of the Project.

(iii) Financial Management arrangements: SIRAT's Finance Department will oversee the Project's Financial Management, which includes planning and budgeting, accounting, financial reporting, funds flow and disbursements, internal controls, and auditing. The department is headed by the Chief Accountant, who reports to the Director of Administration and Finance (DAF). While SIRAT will prepare the Project budget, it must submit the budget to the Ministry of Economy and Finance for approval and integration into the Government's Budget. As part of SIRAT's governance framework, the existing Internal Audit Department will provide oversight to ensure that periodic internal audits of the Project are conducted. External audits will be conducted by an audit firm appointed by the Court of Accounts. The Project's financial management and disbursement arrangements will be implemented in alignment with the WB's policies and guidelines, which closely align with AIIB's requirements. This approach has been adopted since the WB is the Lead Co-Financier of the project.

(iv) ES arrangements: SIRAT also has a central E&S Unit which supported the preparation of the project. The PIU in SIRAT will include one environmental, one social specialist and one gender specialist. The PIU will oversee E&S issues related to activities carried out by specialized implementation agencies (SIAs), responsible for implementing project activities that fall within their institutional mandate.
The PIU's capacity to meet Environmental and Social Framework (ESF) requirements will be reinforced and each will include environment and social specialists to ensure that the project implementation is consistent

with the requirements of the relevant applicable Environmental and Social Standards (ESS) of the proposed project, and as delegated by the PIU. The WB team will provide SIRAT and SIAs in charge of urban mobility with targeted training on ESF requirements, monitoring and technical assistance. The WB's E&S staff have committed to providing hands-on technical support to ensure effective environmental and social risk management for all the implementing entities.

(v) Project implementation plans and project manual: the Project Implementation Manual (PIM) are finalized. It includes the key institutional arrangements, detailed arrangements for tender preparation, invitation, evaluation and approval of contract awards. The PIM also defines clear procedures on financial management, contract management and implementation of E&S management plans.

3.3.3 **Implementation period.** The implementation period for the Project is expected to be 5 years. It would start in Q3 2025 and extend to Q4 2030.

3.3.4 **Implementation readiness.**

(i) Status of feasibility studies, procurement, land acquisition: Detailed design and bidding documents under subcomponent 3.2 (Provision of infrastructure supporting sustainable and multimodal transport) have already been prepared by the government for key interventions, including ATC Lot 1, traffic management (PCLT/SLT), and the green mobility corridor. The bidding process is expected to be launched shortly, ensuring timely implementation of critical infrastructure improvements. In addition, the WB has mobilized a Project Preparation Advance (PPA) to finance preparatory studies aimed at advancing project implementation. The WB has also mobilized various Trust Funds (PPIAF, GRSF, GFDRR, GFDT) to enhance the technical quality of these studies and the overall project design for all components. The Project has prepared several draft ES documents, namely SESA, ES Management Framework (ESMF) and Road Safety Study and Management Plan.

(ii) Required clearances/approvals for project implementation: The project has to prepare an Environmental and Social Impact Assessments (ESIA) for the various infrastructure works and obtain the corresponding environmental clearances for the various infrastructure projects, as required by the country systems. The Republic of Benin, in a letter dated 20 February 2025, requested WB to use proceeds from the loan (approx. USD 6.4 million) to finance resettlement. The WB's Vice President already approved this request.

3.3.5 **Monitoring and Evaluation.** The project-level Monitoring and Evaluation framework will track progress in implementation, measure intermediate outcomes, and evaluate project results and impacts. The results monitoring framework outlines the key indicators, data collection methods, frequency, and responsibilities

(see Annex 1). The PIU will be responsible for the project's Monitoring and Evaluation management and implementation. This will include collecting and maintaining data, managing the flow of information between government actors and the Banks, and producing semi-annual monitoring reports.

3.3.6 **AIIB's Implementation Support.** While WB will take the lead in supervising the Project, AIIB will work closely and cooperate with WB in conducting due diligence and providing Project oversight. Regular field visits will be jointly conducted by WB and AIIB at least twice a year to monitor progress, with additional field visits as and when required. A Project Co-Lenders' Agreement will be signed between the two institutions detailing the nature of their cooperation.

(4) Project Assessment

A. Technical

4.1 **Project Design.** The Urban Mobility Plan of Grand Nokoué (*Plan de Mobilité Urbaine*, PMU), completed in December 2020, formulates the path to achieve safe, efficient, and sustainable transport along with proper development. The PMU complements several strategic sectoral policies such as the Government Action Plan II (*Programme d'Actions du Gouvernement*, PAG) 2021–26[12], and the Grand Nokoué Master Plan for Development and Urban Planning (*Schéma Directeur d'Aménagement et d'Urbanisme du Grand Nokoué*, 2020). The PMU action plan constitutes the backbone of the Project, including the measures identified as the main Components: (a) strengthening the transport sector governance, (b) enhancing road safety, especially with mototaxis; (c) improving road network and traffic management; and (d) developing multimodal public transport networks and systems.

4.2 **Strengthening the transport sector governance.** Implementing the Project requires a shift in current governance of the transport sector across Grand Nokoué. Most transport planning responsibilities in the region are currently concentrated at the municipal level, but these municipalities lack the financial, technical, and human resources needed to assume these responsibilities. The municipalities have not established organizations that would enable them to carry out actions at the inter-municipal level, as required by the Urban Mobility Plan of Grand Nokoué. The developments to be implemented in this area are consistent with the recommendations contained in the SSATP (Sub-Saharan Africa Transport Program) report of March 2020 on the "Sustainable mobility and accessibility policy in Beninese cities". Accordingly, Component 1 will include:

(i) a comprehensive strategy operationalizing the PMU, observing climate mitigation and adaptation goals, and emphasizing multimodal and public transport, NMT, efficient freight traffic management, e-mobility, climate resilience, and gender inclusivity;

(ii) various studies to improve integrated land use and transport planning capacities with a climate mitigation & adaptation and a gender perspective, to define and implement policies and strategies for public transport, road traffic and parking management, climate resilient road asset management mechanisms, and road safety including a SESA to accompany the urban mobility strategy, which are essential to promote modal shift towards public transport and NMT.

(iii) Technical assistances to (a) identify the most appropriate institutional model for the governance of the transport sector in Grand Nokoué; (b) build capacities to strengthen institutional coordination among ministries and municipalities, facilitating the transition to the future Grand Nokoué transport lead institution and ensuring an integrated approach to transport and land use planning; and (c) support MCVT and the future Grand Nokoué transport lead institution throughout project implementation.

[12] The PAG (Programme d'Actions du Gouvernement), adopted in April 2021, focuses on accelerating Benin's economic and social development, prioritizing infrastructure modernization, economic diversification, climate change mitigation and adaptation, social inclusion and job creation (targeting 800,000 jobs), mobilizing private capital and strengthening domestic private sector development. It emphasizes improving public transit, fostering cleaner transportation, and enhancing road safety, with "strengthening sustainable urban mobility in Grand Nokoué" as one of the principal projects.

(iv) Technical assistance to (a) identify the funding and financing sources, (b) define investment plans, budgeting processes, and allocation mechanisms for the development of the transport sector in Grand Nokoué.

4.3 **Enhancing safety of mototaxis and reducing their externalities.** Motorcycles are now at the heart of the transport system in Grand Nokoué, particularly the mototaxis "zémidjans" which are the main means of transport for people without a private vehicle. No significant development of the transport sector in Grand Nokoué can be envisaged without considering the importance of this mode of transport from a mobility, but also political and social point of view, given the number of direct (drivers) and indirect (spare parts sellers, motorcycle repairers, etc.) jobs involved. Its informal and unstructured nature makes the sector difficult to reform without a comprehensive approach. The Project will address various challenges related to zemidjans: (a) promoting the professionalization of the sector and the emergence of representative bodies; (b) consultations to create the conditions for the development of new public transport services that complement zémidjans; (c) reducing the environmental pollution caused by zémidjans; (d) improving road safety for motorcycles.

4.4 While Component 4 will focus on the reduction of local pollution and greenhouse gases emissions, through the deployment of e-motorbikes and the development of an e-mobility industry, Component 2 will focus on professionalization of workforce in line with the broader sectoral transformation that will result from the introduction of a formal public transit system, ensuring that informal operators can adapt to the evolving landscape in the Grand Nokoué transport sector. In Benin, informal transport operators face challenging working conditions, often lacking essential protections like insurance, stable wages, and formal contracts. The Project's emphasis on professionalizing these operators aims to address these issues by improving driving skills, promoting the formation of associations, and expanding access to social protections. By formalizing roles, offering training, and establishing worker associations, the Project will enable safer, more stable, and dignified employment conditions. Additionally, the Project encourages insurance coverage for drivers and promotes regularized income, making work in the transport sector more secure and attractive. The primary beneficiaries of this subcomponent are zemidjans operators, as well as regulatory institutions. However, some activities will also extend to other modes of transport, including minibuses (tokpa tokpa) and IWT services. The professionalization of informal transport operators is essential to the successful implementation and operation of public bus and IWT systems and will benefit thousands of transport operators and enhance their quality of life.

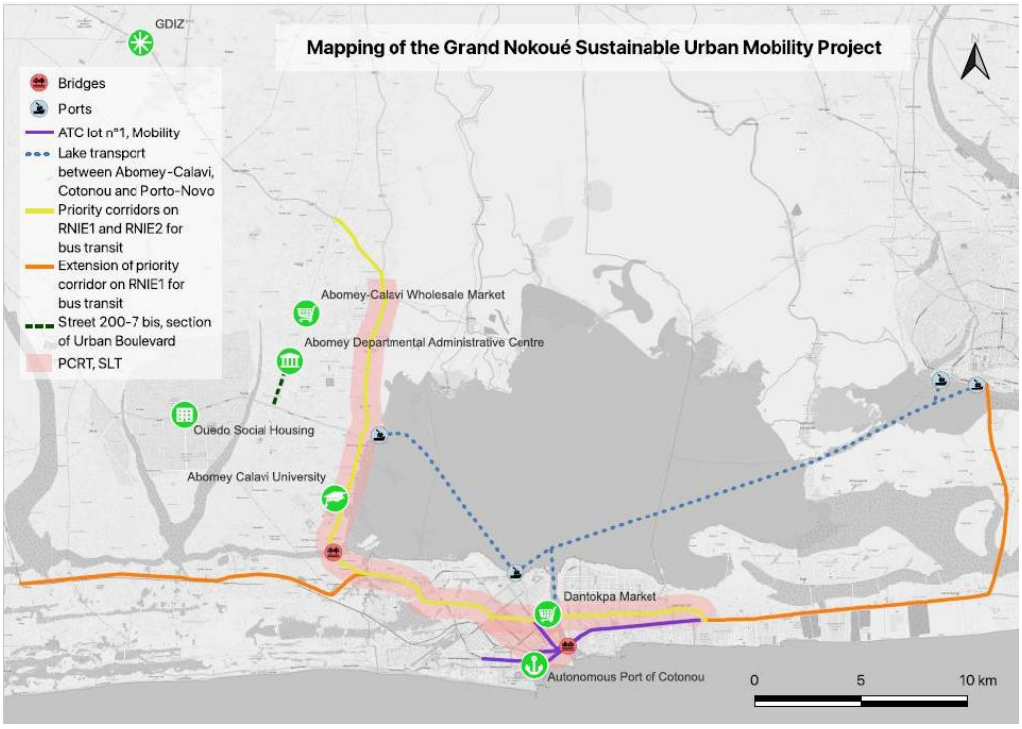

Figure 1: main infrastructure components of the Project

4.5 **Improving road network and traffic management.** The road infrastructure—notably along RNIE1, RNIE2, and ATC-identified segments—will be rehabilitated and upgraded to climate standards with enhanced drainage systems designed to accommodate current and projected climate conditions for an estimated cost of USD 51 million.

(i) RNIE1 (west-east main national corridor) and RNIE2 (north-south main national corridor) primarily consist of existing 2x2 lanes, with two additional lanes for public transport and local traffic (two-wheeler), except for some sections where upgrading to 2x2 lanes is already being addressed by other ongoing projects. As such there will be no major interventions on these priority corridors under the Project. Instead the Project will focus on minimal works to improve traffic flow, such as: (a) redevelopment of flat intersections, (b) development of crossroads, (c) rehabilitation by resurfacing of pavements on axes crossing Cotonou (done under ATC), (d) development or redevelopment of sidewalks, pedestrian walkways and counter-alleys, (e) development, rehabilitation and reinforcement of road safety equipment ; (f) rehabilitation of horizontal road markings, (g) rehabilitation and centralization of traffic lights (SLT/PCRT), (h) restoration of public lighting; etc...

(ii) The rehabilitation of existing ATC road segments, including Ganhi bridge, will improve the traffic flow in the city center and improve the access for freight transit and public transport to the APC. The ATC program has 4 lots and the Project covers the improvement of 15 km of road condition and upgrade of the Ganhi bridge. The Project will support the improvement of conditions of NMT and resilience, through provision of pedestrian and drainage facilities.

4.6 The existing unpaved “200-7 bis” street, parallel to RNIE 2 and alongside a high voltage transmission line, has been identified to provide an alternative for internal travel within Abomey-Calavi, helping to better distribute the traffic in this area. This km road section will

connect major national and regional infrastructures such as the Wholesale Market (“Marche de Gros”), the administrative area (“Cité Administrative”), the Maria-Gléta power plant. The road will be upgraded into a green mobility corridor to support mass transit, NMT, pedestrian, with enhanced drainage systems, and public parks to provide a cooling effect and manage rainwater runoff. The section will be constructed for an estimated cost of USD 18.67 million

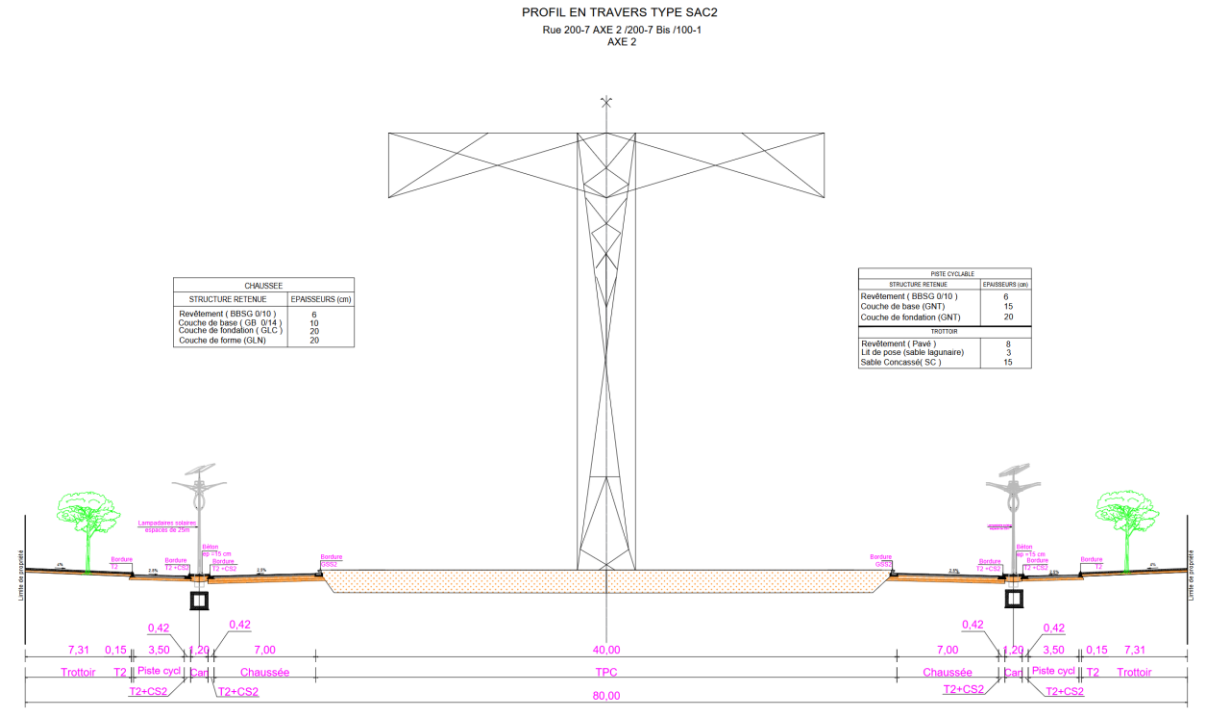

Figure 2: Development of the “rue 200-7 bis” section of the Boulevard Urbain into a green corridor – cross-section

4.7 **Developing public transport networks and systems.** The absence of structured public transport will not be sustainable in the medium or long term, given the demographic developments projected for Grand Nokoué. The improved road network, even supplemented by the structural projects currently under consideration, will not be able to cope with the planned growth in the transport demand. The Project will then intervene at various levels in order to promote bus, boat and e-zemidjans transport modes in the segments where they are most relevant. Along with a support to modernize and operationalize public transport, an electric bus fleet will be operated by private operators in Grand Nokoué, notably along the two high-capacity public transit corridors identified by the PMU: Abomey Calavi - Cotonou (RNIE1) and Ouidah - Sèmè-Podji corridors (RNIE2). This also involves the installation of equipment and other structures to support the low-carbon public bus transport service along these corridors, for an estimated cost of USD 15 million. These include: (a) segregated bus lanes (b) construction of solar-powered bus stops / stations / shelters in the approach and stop zones, (c) development of bus energy-efficient bus terminal/depots, and (d) park-and-ride facilities.

4.8 Waterways public transport (lake transport) is one of the solutions envisaged for modernizing and improving transport conditions in Grand Nokoué. Lake Nokoué has been selected as the most suitable body of water for this mode of transport, and the two priority

routes identified are: (a) Cotonou - Porto-Novo and (b) Cotonou - Abomey-Calavi. Currently lake transport operates informally on these routes, unstructured, with substandard boats and makeshift stations. The Project will finance jetties, terminals, and acquisitions of passenger boats, and related maintenance. Facilities will observe climate resilience and energy efficiency standards, including enhanced drainage facilities, resilient pavement, flood/erosion protection, shaded passenger shelters for an estimated cost of USD 66 million. The dredging of the lake transport channels will be financed by the Netherland cooperation.

4.9 **Operational Sustainability: strengthened governance and financing mechanisms.** The provision of an enabling environment starts with the improvement of governance, the institutional arrangements, capacity building on planning and regulation. Key actions are being undertaken: (a) the Republic of Benin has committed to addressing the fragmentation transport governance through the establishment of a lead institution for the management of the transport sector in Grand Nokoué. To this end, a study to assess the institutional options to establish this lead institution has been launched (financed by WB PPA). Its findings will inform the activities to be financed under Component 1; (b) a study, financed by PPIAF, has been launched with the objective of defining the most appropriate financing and funding mechanisms for the transport sector in Grand Nokoué. Its findings will inform the design of Component 1.3; (c) technical assistance and capacity building will be provided to MCVT and other stakeholders. This will include support for the interim structure put in place to operationalize the multimodal public transport system, as well as assistance to the new institution once established.

4.10 **Private sector mobilization.** The Project aims to leverage the private sector contribution in:

a) Electric bus operations. Private operator(s) will procure, maintain, operate the e-bus fleet, financing the fleet and ticketing system for a USD50M contribution. Revenues will come from the sale of transport tickets, covering OPEX, as assessed by preliminary traffic forecasts[13]. The need for capital subsidies from the public sector is being assessed. Typical investors would be an SPV including local and international asset managers and private transport operators.

b) Electric boat operations. Private operator(s) will procure , maintain and operate the e-boats. The operator will not finance the boats as it was estimated that the revenues may only cover OPEX. The costs of e-boats are included in the IDA/AIIB contribution.

   Detailed PPP structuring for the electric bus and boat operations will be undertaken with the support of transaction advisory services including a complete overview of risk allocation, private and public roles, financial analysis, business and financial models, legal issues, and market sounding. Preliminary findings expected in Q3/Q4 2025

c) Electrification and fleet renewal of Zemidjans, and structuring of a local industry (component 4). The private sector will contribute to the financing of the local industries development for an estimated total contribution of USD50 million, with estimated USD25 million subsidies from the public sector financed by IDA/AIIB contribution. Specifically, the private operator(s) will: (a) construct and install charging facilities (with potential public sector support through CAPEX subsidies,

[13] "Study on renewing and electrifying motorcycles in Grand Nokoué", KPMG, November 2023

reduced electricity tariffs, grid connection support, or land provision), (b) construct and install assembly industrial facilities for electric motorcycles to ensure their distribution to local market players (with an initial launch CAPEX subsidy), (c) construct and install battery recycling plants (with an initial CAPEX subsidy). Revenues for the private sector would come from the deployment of charging facilities, charging fees, the sale of electric motorcycles and the recycling of batteries. Typical investors would be an SPV including local and international asset managers, industry companies and private transport operators specialized in e-mobility and/or on-demand transport services. Detailed PPP structuring are being undertaken (studies financed by Global Fund for Development of Transport -GFDT - and Private Infrastructure Advisory Facility - PPIAF), with preliminary findings expected in Q3 2025.

B. Economic and Financial Analysis

4.11 **Economic Analysis.** The economic analysis was carried out for Component 3 (multimodal public transport services and transport infrastructure) and Component 4 (electrification of zemidjans). Components 1 and 2, which focus on improving the governance of the transport sector and the professionalization of paratransit operators and safety, are expected to yield significant benefits and magnify the impacts of components 3 and 4. While a specific economic analysis for components 1 and 2 is not carried out because of the difficulty of expressing their impacts in monetary terms, the economic analysis of components 3 and 4 assumes that components 1 and 2 will be successfully implemented.

4.12 The analysis follows a standard cost-benefit evaluation framework where economic costs incurred by (a) the electrification of zemidjans, (b) the establishment of the multimodal public transport system as well as its associated infrastructure (including the new green corridor), (c) road and bridge rehabilitation/reconstruction together with the installation of traffic management equipment (PCRT/SLT), are evaluated against their economic benefits. Given the varying cost-benefit structures of the different activities, the analysis was undertaken for the three specific activities and then aggregated to encompass both project components.

4.13 To gauge the project's economic viability throughout its lifespan (2025 to 2045), the Economic Internal Rate of Return (EIRR) and Net Present Value (NPV) were calculated using a discount rate of 5.5%, comparing the two scenarios and using the Shadow price of Carbon. A test with a discount rate of 8% was also carried out to assess the NPV variations. The assessment conducted considered the social, economic, and environmental impacts of both components by contrasting the “without-project” and “with-project” scenarios.

4.14 The economic costs of components 3 and 4 include a combined investment cost of USD 441m (accounting for 90% of the total project cost) and operating and maintenance costs. The economic benefits of the same components include (a) savings in vehicle operating costs (fuel, spare parts…) due to improved road conditions (better IRI – roughness index) and the conversion of part of the thermal two-wheeler fleet to electric, (b) travel time savings (increased travel speed, increased connectivity between the transport modes), (c) road safety savings (reduction of injuries and casualties associated with road accidents), (d) savings in GHG emissions, and (e) savings in local pollution.

4.15 Results indicate that the overall project is economically feasible, estimating a positive net present value (NPV) and an economic internal rate of return (EIRR) exceeding the discount rate. Furthermore, the choice of electric engine technology for the bus and boat systems significantly reduces GHG emissions and improve the economic benefits. These results are robust to different sensitivity scenarios, as displayed in the table below. The detailed methodology and results are summarized in Annex 3.

Table 3: Economic analysis summary aggregating fleet electrification and multimodal transport, and road and bridge infrastructure.

*in million USD	Base		+10% CAPEX		+10% OPEX		+10% CAPEX +10% OPEX	
	NPV*	EIRR	NPV*	EIRR	NPV*	EIRR	NPV*	EIRR
Pollutants and low SPC	928	326%	895	31%	868	31%	835	29%
Pollutants and high SPC	1042	29%	1009	33%	982	34%	948	32%

4.16 **Financial Analysis.** The Project adopts an approach that balances affordability for users with financial sustainability for operators in all activities involving private sector participation:

(i) Bus and boat public transport system: a flat fare of 400 FCFA was used in the demand assessment, significantly lower than current long-distance fares while ensuring financial viability for operators. Preliminary estimates indicate that (a) private operators are expected to procure, maintain, and operate the e-buses and could finance the fleet and ticketing system with an estimated private capital of USD 50 million (an ongoing study, to be completed by Q3 2025, is assessing the need for public sector CAPEX subsidy), and (b) private operators are expected to procure, maintain, and operate the e-boats but revenues could cover operating costs at best, requiring the cost of e-boats to be covered with AIIB/IDA contribution. OPEX costs for electric buses were estimated at USD 1.31 per kilometer and are based on similar transport services in the region and considering GN's own specificities (size of network, fleet and demand projections). OPEX costs for e-boats are similarly estimated at USD 2.1 per kilometer. Detailed PPP structuring will be supported by transaction advisory services, covering risk allocation, private and public roles, financial analysis, business and financial models, legal issues, and market engagement.

(ii) Electrification of mototaxis: As assessed by the study on renewing and electrifying motorcycles in Grand Nokoué, the Project will improve the financial profitability of electric two-wheelers compared to ICE motorcycles, combining financial incentives and supporting infrastructure to increase adoption rates. The private sector is expected to contribute approximately USD 50 million to finance local industry development under Component 4, supported by around USD 25 million in public sector subsidies financed by AIIB/IDA loan. OPEX costs for the e-zemidjans were estimated at USD 0.155 per kilometer. Detailed PPP schemes for mototaxis electrification and local industry development are being assessed through GFDT- and PPIAF-funded studies, which will analyze operational models, tailored incentives, financial instruments, and the regulatory framework needed to facilitate the transition to electric mobility.

C. Fiduciary and Governance

4.17 **Procurement:** SIRAT has experience handling complex programs with a cross-sectoral nature. It is currently implementing two WB funded projects and will set up the Project Implementation Unit (PIU) of the proposed Project, responsible for the preparation and implementation of the Project, including procurement and contract management of goods and works, and consulting services. Additional consultants will be also hired to support the PIU. This arrangement is expected to provide the PIU with adequate procurement capacity to implement the Project effectively.

4.18 The procurement capacity and risk assessment of SIRAT has been conducted by WB to identify potential procurement-related risk, which includes that the procurement capacity of SIRAT will need to be strengthened in terms of staffing and its fiduciary skills needed to manage the Project. The proposed measures to mitigate the procurement related risk include the following: (a) recruitment or designation of a qualified Procurement Specialist (PS) for SIRAT to ensure quality control of procurement activities; (b) recruitment or designation of a Procurement Assistant to assist the PS in the follow-up of files at the procurement and control structures and, also for the archiving of the Project procurement documents; (c) preparation of a Procurement Manual for the project, which is part of the Project Implementation Manual (PIM). These measures will be implemented before specific dates to be defined in the Legal Agreements during negotiations. Based on the assessment, the procurement capacity-related risk for the Project is rated as “Medium”.

4.19 **Project Procurement Strategy for Development (PPSD) and Procurement Plan (PP).** SIRAT has prepared a PPSD and PP covering the project implementation strategy ensuring proper sequencing of supported activities; institutional arrangements for procurement, roles and responsibilities, thresholds; and procurement arrangements, including contract packaging, cost estimates, selection of templates of tender documents, procurement methods, review methods, as well as procurement timelines, which will constitute the basis for the project procurement. The PPSD also includes a detailed assessment and description of state government capacity for carrying out procurement and managing contract implementation, within an acceptable governance structure and accountability framework. The final PPSD and the PP have been reviewed by WB and shared with AIIB and are found acceptable. Any updates to the PPSD and PP will be submitted to WB for review and no objection during the Project implementation. No advance contracting and retroactive financing will be expected under the proposed Project.

4.20 **Financial Management:** The Financial Management (FM) assessment conducted by the WB concluded that SIRAT's FM arrangements are adequate to accurately record and report on project transactions while **ensuring** the eligibility of expenditures and the safeguarding of project assets.

4.21 The key FM risk identified is the late submission of audit reports to the Banks resulting in non-compliance with the Legal agreement and delayed assurance on the use of funds. Although SIRAT has consistently produced regular, accurate, reliable, and timely interim financial reports, there were delays in the submission of entity and project audited reports under WB financed projects. However, as at appraisal, there were no outstanding audit reports.

4.22 Given the previous delays in audit report submissions, WB has assessed the residual FM risk rating as "Substantial ", which aligns with AIIB's "Medium" risk rating, as per its three-point risk rating scale.

4.23 **Staffing.** SIRAT's finance department has substantial experience in managing WB-financed operations, including two projects currently under implementation. A dedicated team, consisting of an Accountant and a Chief Accountant who report to the Director of Administration and Finance (DAF), will oversee the Project's financial management. The team's capacity has been assessed as adequate, with staff members qualified to manage the Project's financial management requirements effectively. Given the complexity of this Project, which involves multiple sources of financing, additional training will be provided throughout implementation to reinforce the team's capacity to meet the requirements under this Project.

4.24 **Planning and Budgeting.** The Finance department, in collaboration with the operations and technical teams, will prepare the Project's annual work plan and budget. This plan will be incorporated into the company's overall budget, which is reviewed by the Corporate Executive Committee Director (comprising all SIRAT directors). Following this review, the budget is submitted to the Board of Directors for approval. The consolidated budget includes all projects implemented by SIRAT, regardless of funding source.

4.25 Once approved, the budget is submitted to the Ministry of Economy and Finance for inclusion in the Government Budget. Budget execution is monitored through quarterly budget execution reports, which form part of the periodic interim financial reports. These reports highlight the execution rate and provide explanations for the level of achievement.

4.26 **Accounting and Reporting.** Project transactions will be accounted for and reported in accordance with the West African Accounting System (SYSCOA). The accounting system, "SUCCESS," which is used for the existing WB-funded projects, will also be utilized for this proposed Project. "SUCCESS" will be configured to incorporate this new project within three months of its effectiveness, ensuring it can accurately account for transactions by sources of financing, activities, components, and expenditure categories.

4.27 SIRAT will prepare quarterly project un-audited Interim Financial Reports (IFRs) which will be submitted to the Banks within 45 days after the end of each reporting. The quarterly IFR will include the following information: (i) Statement of Sources and Uses of Funds; (ii) Statement of Uses of Funds by project Activity/Component including comparison with budget for the quarter and cumulative; and (iii) the Designated and project Account Reconciliation Statements and related bank statements. SIRAT will also prepare annual project financial statements which will be subjected to annual audits.

4.28 **Internal Control and Internal Audit.** Overall internal controls have been assessed as adequate to support the successful implementation of the Project. These controls are reinforced by the existing Financial Accounting Procedures Manual, which will be updated to incorporate the specific requirements of this Project. Additionally, there is an internal audit function that further strengthens the internal control framework.

4.29 The Internal audit function operates under a charter approved by the Board of Directors, which outlines the roles and responsibilities of the Internal Audit function as well as the Audit Committee. The function is led by a Director of Internal Audit, supported by a team of two staff members, which reports to an appointed three-member Audit Committee of the Board that has been in place since October 2023.

4.30 The Internal Audit function is further assisted by an accounting and audit firm to execute the annual audit work plan. Audit reports are prepared quarterly, with a comprehensive annual report produced in the first quarter of the following year.

4.31 The audits are risk-based and encompass governance, processes, procedures, and project management. The new project will be incorporated into the existing Annual Audit Work Plan within three months of the project's effectiveness. Internal audit reports will be shared with the Banks within 45 days after June and December of each year under project implementation.

4.32 **External Auditing.** The annual audit of the Project will be conducted by an audit firm appointed by the Court of Accounts in accordance with the "Revised Arrangements No. 163 *Banque Mondiale avec la Cour de Comptes relatifs à l'audit des projets financés par la Banque Mondiale, décembre 2021*." The terms of reference for the audit will be mutually agreed upon by the Banks, the Court of Accounts, and SIRAT. The audit will be carried out in compliance with International Standards on Auditing. The audit report will include the auditor's opinion on the audited financial statements and a management letter highlighting observations, recommendations for improvements in the accounting system, and the internal control environment. The audit report will become due to the Banks no later than six months after the financial year end.

4.33 **Disbursements:** The primary disbursement modalities are direct payment, advance, and reimbursements.

4.34 In respect to the Advance method, two separate designated accounts will be opened: (i) a Designated Account at the Central Bank of the West African States (BCEAO) in F CFA to be managed by Ministry of Finance "Caisse Autonome de Gestion de la Dette" (CAGD) for IDA funds. (ii) a Designated Account at BCEAO in Euro (to be converted to F CFA as soon as it is disbursed to BCEAO from AIIB to be managed by CAGD for AIIB. Furthermore, two commercial bank accounts will also be opened to be managed by the Project for each of the financiers in an interest earning account as guided by CAGD.

4.35 The Project will utilize the Statement of Expenditure (SoE)-based method for expenditure documentation and disbursement requests. SIRAT will prepare the withdrawal applications, which will then be submitted to the WB for approval and processing. Upon notification from the WB, AIIB will disburse the corresponding funds.

4.36 The project management costs (subcomponent 5.1) to be incurred by SIRAT, will be financed through a delegated project management contract (Convention de Maitrise d'Ouvrage déléguée) to be signed between SIRAT and MCVT. The payment to SIRAT will be made only after MCVT has authorized the respective supporting documentation confirming that SIRAT has met the conditions/milestones set in the Convention.

4.37 **Financial Crime and Integrity (FCI) and Counterparty Due Diligence/Know Your Counterparty (CDD/KYC).** Following AIIB's applicable policies and guidelines, KYC/FCIDD has been conducted to assess Financial Crime (FC) risks, including Money Laundering and Financing of Terrorism (ML/FT) risks, sanction risk, and risk deriving from integrity unsoundness when dealing with its Counterparties and Connected Parties in the financing. Integrity screenings have been performed on the state representatives of the Republic of Benin, as well as senior management of the MEF and SIRAT. No critical findings were found.

4.38 **Governance and Anti-corruption.** AIIB is committed to preventing fraud and corruption in the projects it finances. For this Project, WB's Anti-corruption Guidelines and AIIB's Policy on Prohibited Practices (2016) will apply. WB will take the lead in any inquiry or investigation. AIIB may conduct assurance and integrity activities in line with its financing agreement.

4.39 **Cybersecurity.** The infrastructure financed is considered a Critical Infrastructure, according to AIIB's guidance note on Cybersecurity Assessment in Projects of October 2023, covering the Project's components related to mass transit and ships. Cybersecurity risks lie in component 2 that includes the creation of a database of paratransit operators, as part of the efforts to professionalize the sector. This database will organize critical personal data. There are concerns that such data could be unrightfully used by individuals or organizations with malicious intent or that services could be disrupted if proper cybersecurity measures are not implemented. Additionally, the Project will implement a center for remote monitoring of the lake transport and Benin may also seek to implement digital payment and digital passenger information systems as it further develops mass transit infrastructures in the future. Such systems are also subject to risks, because they may be targeted by terrorist or criminal attacks intended at disrupting the services. Recent instabilities in countries in the region increase these concerns.

4.40 Nonetheless, Benin has a cyber-protection framework in place and has not experienced large scale cyber-attacks to date. The Agency for Information and Digital Systems ("*Agence des Systèmes d'Information et du Numérique*"), created by decree in June 2022, is the organization in charge of cybersecurity and public policies related to digital transformation. The agency includes a department of digital security, responsible for protecting critical digital infrastructures and data managed by public organizations. ANaTT's management system is subject to the protection of the agency.

4.41 Benin has previous experience handling transport-related data. The ANaTT has implemented an integrated system for managing road freight ("*Système Intégré de Gestion du Fret Routier*"). This system will be expanded and adapted to handle data concerning paratransit operators. ANaTT has already included cybersecurity measures in the design of the current system and the new data will be subject to the same measures. A consultant will be hired to implement the necessary updates to the current system and a contractor will be mobilized to collect the data that will feed the system. Cybersecurity and personal data handling procedures will be required from the consultant and the contractor.

D. Environmental and Social

4.42 **Environmental and Social Policy (ESP) and Categorization:** The Project is cofinanced with WB as the lead co-financier, and its ES risks and impacts have been assessed in accordance with WB's ESF. To provide a harmonized approach to addressing the ES risks and impacts of the Project, and as permitted under AIIB's ESP, WB's ESF applies to the Project in lieu of AIIB's ESP. AIIB has reviewed WB's ESF and is satisfied that: (a) it is consistent with AIIB's Articles of Agreement and materially consistent with the provisions of AIIB's ESP, including the ES Exclusion List and the relevant ES standards; and (b) the monitoring procedures that are in place are appropriate for the Project.

4.43 WB has categorized both ES risks of the Project as "High" and is rated as Category A per AIIB's ESP. The environmental risk category is assessed as high due to the high environmental and social risks attendant to the development of complex and large-scale infrastructure and operation of activities within a sensitive coastal lagoon ecosystem, which includes several protected areas, notably the 652,760 hectare declared Ramsar site 1018 (which encompasses Lower Valley of the Ouémé, Porto-Novo Lagoon, and Lake Nokoué).

4.44 Equally, WB's categorization of the social risk as "High" is mainly due to the potential risk related to land acquisition and resettlement. The Project activities include rehabilitation and construction of roads and bridges located in dense urban areas. Along these roads and bridges, residential and commercial buildings and informal businesses are located. The possible widening of the roads beyond the right-of-way, as part of the Project scope, may result in impacts on structures/assets of these residents and businesses, thereby affecting their incomes and livelihoods. Other Project activities that involve replacing petrol-powered motorcycles with electric motorcycles, for example, may cause mototaxis operators to lose their livelihoods. Other social risks and impacts extend to labor and working conditions, occupational health and safety (OSH) of workers, as well as community health and safety of those communities living around construction sites. These potential risks and impacts include traffic accidents, community impacts resulting from construction activities such as noise, dust, pollution, and poor waste management. Local communities may also be impacted from influx of labor including migrant workers, thereby compounding the conditions of sexual exploitation abuse and sexual harassment (SEA/SH) in the Project area of influence. There are potential risks of exclusion of vulnerable groups from Project benefits and excluding them from close and informative consultation and engagement.

4.45 **Environmental and Social Instruments:** The Project consists of an extensive range of activities across the Project components that include Components 1, 2 and 4 - policy interventions (i.e., to address mobility sector governance/institutional framework and the financing); Components 3 and 4 - investment in infrastructure supporting sustainable and multimodal urban mobility; Component 5 - technical assistance and capacity building measures. To manage E&S risks and impacts, , the following ES instruments, both at policy, framework and site-specific levels, have been prepared: (1) an Environmental and Social Commitment Plan (ESCP); (2) a Stakeholder Engagement Plan (SEP); (3) an Environmental and Social Management Framework (ESMF); (4) a Resettlement Policy Framework (RPF); (5) Labor Management Procedures (LMP); (6) a Strategic Environmental and Social Assessment (SESA), covering proposed activities related to lake transport infrastructure in and around Lake Nokoué and Porto-Novo Lagoon; (7) a preliminary site-specific Environmental and

Social Assessment (ESA) for lake transport; (8) a site-specific Resettlement Action Plan (RAP) for Lot 1; (9) a site-specific Environmental and Social Impact Assessment (ESIA) for the Development of Access Roads and Crossings for Cotonou (ATC) for Lot 1; and (10) Road Safety Management Plan. The ESCP, disclosed by the WB on April 9, 2025, stipulates a timeline for E&S deliverables, in compliance with the WB and AIIB's ESF requirements.

4.46 At a framework level, an ESMF for the entire Project was prepared by the Borrower and its attendant ES instruments, cleared and disclosed by the WB on March 29, 2025. The ESMF outlines the applicable legislative frameworks, baseline environmental and social conditions, as well as anticipated project risks and impacts. It includes a screening tool for assessing risks at the sub-project level and procedures to assess, manage ES risks and impacts, and prepare site-specific instruments. The ESMF has also provided (a) detailed principles for assessing cumulative impacts in site-specific ESIAs to ensure that short and long-term cumulative and indirect adverse impacts of the Project and any ancillary facilities on the biophysical and social environment are minimized. These principles will also address potential significant downstream ES impacts of the proposed technical assistance activities; (b) environmental and social clauses to be considered during the preparation of the tender documents.

4.47 The ESMF has provided clear roles, responsibilities, and budget allocations for the preparation of the additional SESA, site-specific ESIAs and ESMPs. Contractors will be required to prepare and implement a Construction-ESMP, a Dredging Management Plan and an Integrated Waste Management Plan (IWMP) in line with these guidelines. The Project will implement measures outlined in the WB Group's General Environmental Health and Safety (EHS) Guidelines, including Industry-Sector Guidelines applicable to the infrastructure works such as material extraction, dredging, waste management, ensuring that mitigation actions are technically and financially feasible and proportionate to the Project's risks. ESS 1 is applicable to the Project, requiring the avoidance or minimization of pollution and hazardous and non-hazardous waste while promoting sustainable energy use. Construction activities could generate significant environmental impacts, particularly related to waste disposal, dust emissions, and GHG emissions, which may pose risks to workers and public health. The replacement of gasoline-powered vehicles, including Zémidjan motorcycles, buses and boats, with electric alternatives is expected to produce substantial waste, particularly from batteries and spare parts. Thus, the mitigation measures that need to be put in place include occupational and community health and safety.

4.48 The ESMF has a Chance Finds Procedure to guide the Borrower on how to handle cultural heritage discoveries. While known heritage sites exist in several locations across Grand Nokoué, including the Étoile Rouge monument, which is situated along a major road corridor within the Project's priority areas, the technical designs will follow the mitigation hierarchy to ensure that all identified heritage sites are avoided. The technical designs will incorporate measures to avoid known cultural and ecological sensitive zones.

4.49 At a planning and program level, under Component 1, the Borrower will develop a SESA, during implementation that aims to support the development of the urban mobility strategy and long-term transport planning, including traffic and parking management, road safety, and environmental improvements. This SESA will help the Project to assess ES impacts that may be induced from the urban mobility strategy and will seek to ensure that the management of these ES impacts areas integrated into the decision-making process.

4.50 Under Component 3, a SESA entitled; “Preparatory studies for the development and rehabilitation of Lake Nokoué and the lagoon of Porto-Novo, Benin” was prepared by the Beninese Agency for the Integrated Development of Lake Ahémé and its Channels (*Agence pour le Développement intégré du Lac Ahémé et de ses Chenaux,* French acronym ADELAC) and approved by the Benin Environment Agency (ABE), the Benin Ramsar Convention focal point and Benin’s national regulatory authority whose mandate is to ensure compliance to the national legislation on Environment and Social Safeguards (EESS). The SESA covered proposed activities related to the road infrastructure and the proposed Lake Nokoué’s waterway passenger transport infrastructure and associated facilities (piers, jetties, terminals, access roads). The Borrower and the WB disclosed the SESA on November 18, 2024.

4.51 The SESA, which considered cumulative and long-term impacts, evaluated the potential risks related to the expansion of the existing ports and additional ferry and freight ports in Abomey-Calavi, Cotonou (Vossa) and Porto-Novo, are all land-based, including the connection infrastructure. The road public transport operating routes follow the existing corridor right-of-way. The locations of terminals, depots, park-and-ride lots, and transfer stations are in densely populated and urbanized areas of Grand Nokoué, with little or no interaction or interference on the natural habitats, to avoid the disruption of Lake Nokoue’s sensitive ecosystems. Following the UNESCO Biosphere Reserve Model, the Lake is divided into three zones: 1) core, 2) buffer, and 3) transition. according to its ecological sensitivity and human activity. The core zone is a strict protection area, whose purpose is to preserve critical habitats with minimal human disturbance. It is around 13,740 hectares, about 15% of the lake and is found at the deepest parts of the Lake which is a permanent part of the waterbody, including the mangrove forests and bird nesting islands. Restricted activities are fishing, construction, and dredging. The buffer zone is a designated sustainable use area. It is around 54,960 hectares, around 60% of the lake, which was designated to balance conservation and regulated human activities. It is found in the shallower lake margins, with fishing villages which practice artisanal fishing and controlled agriculture, ecotourism (boat tours), birdwatching) and mangrove honey harvesting. Restricted activities are oil spills and pollution and deforestation. The transition zone is 22,900 hectares, around 25% of the lake, It is the area where human settlements and development areas are allowed to accommodate communities but need to be controlled to avoid damaging the environment. It is where peripheral urban areas, farmlands, and roads are located. Permitted activities are housing and infrastructure (need for ESIA), commerce and transport (including ferries). Dredging activities will occur as the coastal port construction in Cotonou involves the removal of houses and structures founded on waste materials. The current navigable routes of the boats will be maintained which may entail dredging, removal of structures, waste materials and sediments and can provide clear delineations between the core, buffer and transition zones, thus limiting the movement of boats inside the transition zone, aside from contributing to the improvement of the Lake’s water quality.

4.52 Labor Management Procedures (LMP) have also been developed to manage risks and impacts associated with labor and working conditions and OHS. In addition, a Resettlement Framework (RF) has also been prepared to provide a framework to manage risks and impacts related to land acquisition and resettlement. Another important instrument that the client has prepared is a Stakeholder Engagement Plan (SEP) which serves as a tool to identify key stakeholders and establish a mechanism for inclusive and effective engagement with them.

The SEP includes requirements for information disclosure and Grievance Redress Mechanisms (GRMs).

4.53 At a site-specific level, ESIAs will be prepared for the civil works in the different components that entails baseline surveys of environmental quality conditions for air, water, noise, vibration, etc. and assessment of risks and impacts and the preparation of ESMPs to mitigate soil and water contamination, control dust and noise emissions, manage hazardous and non-hazardous waste, and ensure the use of approved sites for borrow pits and quarries, including its proper operation and closure during and after construction. Two site-specific ES assessments were prepared: one, a site-specific ESIA/ ESMP and Road Safety Plan (RSP) for the Lot 1 ATC road, alongside a site-specific Resettlement Plan (RP) for the ATC road sections. and another, a preliminary Environment and Social Assessment (ESA) of the waterway transport activities in Lake Nokoué to complement the SESA.

4.54 To provide a more detailed analysis on the potential risks and impacts under Component 3, a full-blown ESIA of the road connectivity and the waterway transport activities will be prepared during Project implementation to adequately assess the risks and impacts of the project activities, including the cumulative impacts of the proposed, ongoing projects and associated facilities, in order to properly guide the site selection and detailed design of the expansion and new port and ferry facilities as well as guide the deepening of the channels of the existing routes of the current operational boats. Moreover, the ESCP stipulates that SIRAT and ABE will jointly collaborate in the management of ES risks and impacts of waterway transport activities.

4.55 The Borrower has developed an ESCP, outlining a timeline and commitments for the preparation and disclosure of relevant environmental and social instruments throughout the project cycle, in compliance with ESF requirements. Resource Efficiency and Pollution Prevention and Management is applicable to the Project, requiring the avoidance or minimization of pollution and hazardous and non-hazardous waste while promoting sustainable energy use. Construction activities could generate significant environmental impacts, particularly related to waste disposal, dust emissions, and GHG emissions, which may pose risks to public health. The replacement of gasoline-powered vehicles, including Zémidjan motorcycles and buses, with electric alternatives is expected to produce substantial waste, particularly from used batteries and spare parts. During implementation, additional E&S instruments and site-specific ESIAs and ESMPs will be prepared, implemented, monitored and reported to address the projected risks and impacts.

4.56 **Environment Aspects:** The Project will have a number of positive environmental and social benefits through the improvement of mobility conditions, decreased long queues at the transportation corridors and reduced greenhouse gas emissions. From an environmental perspective, collective and public transport systems such as high-capacity buses have an overall net positive impact on environmental parameters, mainly air quality and noise. The proposed design of a public transport system that uses high-capacity buses could reduce air emissions and noise pollution, especially if the buses are powered by electricity. The project design considers new advances in climate resilience in subproject design standards with the electrification of buses and two-wheeler mototaxis. Nonetheless, the Project is expected to have significant potential environmental risks and impacts. Despite ES risks, the Project is

expected to generate low GHG emissions and reduced water and energy consumption, owing to the promotion of electric vehicles and improved traffic flow.

4.57 The following are environmental risk factors that the Project has assessed and will address in the ES instruments: i) resource efficiency and pollution prevention and management including raw materials sourcing for civil works such as quarrying, water and energy use, GHG emissions, dust, noise, potential contamination of water sources from spills and run-off of petroleum products, infiltration into storage areas and improper disposal of fuels; (ii) occupational and community health and safety; (iii) land degradation, loss of vegetation, poor soil conditions, unstable slopes, soil erosion during land clearing, civil works and quarrying; (iv) potential impact on cultural heritage from civil works and excavations; (v) the introduction of electric 2-wheeler (e2w) mototaxis equipped with batteries presents risks associated with battery storage, recycling and disposal; (v) during boat operation: oil spills, hazardous and non-hazardous wastes, as well as boats capsizing and sinking; (vi) threats to biodiversity due to habitat destruction, dredging, land reclamation, disturbance of sensitive ecosystems, erosion, sedimentation, alteration of water flow, mortality of aquatic species including removal of wetlands around Lake Nokoué, (vii) road safety and traffic management to address road congestion, road mishaps, and involving vehicle drivers, passengers, pedestrians, roadside users, and local communities.

4.58 Lake Nokoué, a nationally legislated protected wetland, has been selected as the most suitable body of water for the lake transport, The RAMSAR Convention (through the ABE-Agence Béninoise pour l'Environnement / Beninese Agency for the Environment, being the administrative authority for the RAMSAR Convention in Benin) has approved the Project, confirming ABE, as mandated by law, to be responsible for managing the RAMSAR sites in Benin (including Lake Nokoué). In compliance with the requirements of the RAMSAR Convention, ABE has reviewed and agreed on the ESMF, as well as reviewed, approved and published on their website the lake transport SESA and the preliminary site-specific ESA to ensure the conservation and sustainable use of Lake Nokoué. As prescribed in the ESCP, the Project will sign an agreement with the ABE to support the management of the E&S risks and impacts of the Project on the Ramsar 1018 site, in accordance with the WB ESS6 policy for the preservation of biodiversity. The ESMF details the roles and responsibilities of ABE, in collaboration with concerned agencies and stakeholders, to review, validate and approve all ESIAs, E&S instruments, E&S monitoring, audit, quarterly and annual progress reports.

4.59 Under Component 4, the Project introduces electric motorcycles equipped with batteries to replace traditional petrol-powered "zémidjan" taxis, presenting environmental risks related to hazardous waste disposal. This component will be managed by the Ministry of Economy and Finance (MEF), while the private sector will co-finance and operate key activities like the e2w assembly, recycling of Internal Combustion Engine (ICE) motorcycles, battery repurposing or recycling, and other related services. To ensure sustainability, the Project will establish closed-loop battery recycling systems in each municipality, involving local partners to maximize collection and secure materials like lithium, cobalt, and nickel. Additionally, the initiative will include a structured recycling process for old motorcycle spare parts to prevent environmental contamination. Likewise, under this component, the Project will promote the integration of Extended Producer Responsibility (EPR) measures in bidding documents for private sector investors, encouraging sustainable product design, lifecycle management, and recycling—particularly for batteries. The ESCP stipulates that corresponding ES instruments

will be prepared during Project implementation, to include the ES systems and procedures to address the potential ES risks and impacts of the various activities under Component 4.

4.60 **Community health and safety.** WB's ESS4 is applicable to the Project, as activities aimed at modernizing and consolidating Benin's road safety systems—including oversight, management, and capacity building—could impact the health and safety of project-affected communities. The Project will finance initiatives to improve road safety practices, while the ESMF provides guidelines for assessing community exposure to noise, nuisance, and public health risks related to air and water pollution throughout the project cycle.

4.61 Civil works under Component 3 will require the movement of construction equipment and materials in urban areas, potentially causing traffic congestion and road accidents. To mitigate these risks, the ESMF outlines traffic management principles, which will guide the preparation of site-specific Traffic Management Plans (TMPs) to be incorporated into contractors' ESMPs. The Borrower has also developed a Road Safety Management Plan for the ATC segment, with a draft disclosed on March 20, 2024. The technical design of roads and water transport infrastructure will align with Good International Industry Practice (GIIP), ensuring safety standards are met during operations.

4.62 During construction, activities such as heavy machinery use, earthworks, trenching, and traffic system installations may generate strong vibrations, potentially damaging nearby homes, businesses, and public infrastructure. These impacts will be closely monitored to prevent structural harm. Additionally, open excavations and trenches pose significant safety risks, particularly for children, who may unknowingly enter hazardous areas. To address this, the Project will implement strict safety measures, including signage, barriers, and supervision, ensuring the community is well-informed about potential dangers.

4.63 The ESMF also contains a dedicated section on Sexual Exploitation, Abuse, and Harassment (SEAH) risks, outlining preventive measures and response mechanisms to safeguard the community, particularly vulnerable groups. It further provides detailed guidance on mitigating broader construction impacts, including noise and dust control, waste management, and natural resource protection, ensuring the Project is carried out in an environmentally and socially responsible manner.

4.64 To prevent damage to existing infrastructure, thorough pre-construction assessments will identify vulnerable structures, and protective measures will be implemented throughout the construction process. By integrating comprehensive safety, environmental, and social management frameworks, the Project aims to deliver high-quality, sustainable road infrastructure while minimizing risks and ensuring long-term benefits for all stakeholders.

4.65 **Biodiversity Conservation and Sustainable Management of Living Natural Resources.** WB's ESS6 is relevant to the Project, as public transport routes follow existing corridor rights-of-way, with terminals, depots, park-and-ride lots, and transfer stations located in the densely populated urban areas of Grand Nokoué. Given this setting, interactions with natural habitats or ecosystems are expected to be minimal, resulting in a low risk of direct adverse impacts on natural habitats as defined under ESS6.

4.66 However, medium-scale construction and maintenance activities under Component 3 could have some environmental effects. These include bridge construction and widening, which may impact green spaces, downstream water bodies, and coastal areas due to runoff pollution; site clearance for construction purposes; and the use of borrow pits for material storage and quarrying. To address these risks, mitigation measures have been incorporated into the ESMF and will be reflected in sub-project level ESIAs and ESMPs.

4.67 The lake transport activity under Component 3, particularly dredging, is expected to have a significant impact on the lake ecosystem. To mitigate these effects, the Borrower has prepared a SESA, disclosed on November 18, 2024, along with a standalone draft preliminary ESIA, as an addendum to the ESMF, which was cleared by the WB and disclosed on January 24, 2025. These assessments identify potential environmental and social risks and propose mitigation measures to ensure compliance with relevant environmental and social standards.

4.68 Dredging associated activities may disturb the aquatic ecosystem, particularly benthic species and fish habitats, while also increasing water turbidity, which could negatively affect aquatic life. The proposed mitigation measures aim to minimize these disruptions and protect the lake's biodiversity and ecological balance.

4.69 Technical designs will incorporate measures to avoid known cultural and ecological sensitive zones. This will be implemented in densely populated urban areas. While known heritage sites exist in several locations across Grand Nokoué, including the Rouge Étoile monument, which is situated along a major road corridor within the project's priority areas, the technical designs will follow the mitigation hierarchy to ensure that all identified heritage sites are avoided.

4.70 However, the possibility of undiscovered archaeological heritage within the project areas cannot be ruled out. To address this, the ESMF includes chance find procedures, which will be applied if any cultural heritage artifacts or structures are discovered during construction activities.

4.71 Additional mitigation strategies include the implementation of sediment traps, dust suppression techniques, and noise barriers. Project corridors will be realigned to avoid critical habitats, and strict wastewater treatment and sediment control measures will be enforced during construction. Dredged spoils and waste materials from removed structures will be disposed of safely, minimizing their impact on the environment.

4.72 **Social Aspects:** While the Project will provide positive impacts to local communities through enhanced access to the mobility sector, the Project's social risk is classified as high. This is due to its potential resettlement risks and impacts, as the Project involves construction/rehabilitation of roads located in densely populated urban areas. Small businesses and vulnerable people, including street vendors, operating their formal and informal businesses along narrow urban roads will be adversely impacted, and thus their livelihoods. The activity under Component 4, that seeks to replace petrol-powered "Zémidjan" motorcycle taxis with electric motorcycles could cause some informal motor taxi drivers to lose livelihoods, as passengers will be diverted to other forms of transport such as minibuses and boat transport. To address the impacts on livelihoods of informal mototaxis operators, the Project design includes incentives provided to them, through a pilot (electrification strategy)

program to transition them to electric motorcycles, before turning the program to scale. For those who are unable to participate in the program, the ESMF and the SEP have assessed these risks and impacts and propose measures, including meaningful consultation with them, to enhance their capacity for alternative livelihoods (such as in electric motorcycle repair). Other social risks are related to labor and working conditions, OHS, and community safety concerns such as traffic disruptions, traffic accidents, influx of labor and gender-based violence which is assessed as low by WB. There are also risks for the Project activities related to support of law enforcement activities; however, these risks are addressed in the Project design through capacity building provided to relevant agencies including law enforcement officers. As part of this, it is anticipated that law enforcement officers will receive appropriate training and comply with code of conduct and use proportionate force in enforcing traffic management.

4.73 The main negative social risks and impacts of the Project consist of losses of property, sources of income and livelihoods, mainly due to the release of the right-of-way required for work. The disruption of access to commercial and residential properties on the roads concerned by the ATC project; destruction of residential and ancillary infrastructures; destruction of socio-community property and public facilities; disruption of economic activities and sources of income; loss of trees of economic value or used as shade; restricting access to various workplaces. To manage these risks and impacts, the client has prepared a draft site-specific Resettlement Action Plan (RAP) to assess risks and impacts induced by the Project activity. Although the rights-of-way are generally well defined, road expansion beyond existing boundaries may require land acquisition, resulting in permanent livelihood losses for some vendors. The RAP, for the ATC road sections, identifies 746 PAPs and 1,918 dependents. Among the affected individuals, 271 are property owners, 312 are tenants. In line with WB's ESS5, the RAP includes measures to avoid, minimize resettlement in a manner that is technically and financially feasible in close consultation with affected people and relevant stakeholders. Where resettlement cannot be avoided or minimized, compensation measures at full replacement cost as defined in an entitlement matrix, and a livelihood restoration plan, have been prepared. 28 vulnerable people have been identified for provision of additional support, including women-headed households, the elderly above 65 years of age, people with disability, and those having income below minimum wage. Other specific measures extend to the provision and facilitation of support provided to some affected people who do not have an identity document to have one. These measures aim to ensure that affected people can improve or, at least, restore their ability to generate income, compared to their production levels prior to the Project.

4.74 **Occupational Health and Safety, Labor and Employment Conditions:** Construction and rehabilitation activities under the Project's scope may expose workers to poor labor and working conditions and occupational health and safety (OHS) risks and impacts. To manage risks and impacts related to OHS, Labor Management Procedures (LMP) will need to be prepared for the Project, in compliance with Benin's labor legislation and WB's ESS2. The LMP applies to different categories of workers (direct workers, who are defined as PIU staff and personnel and consultants; indirect workers refer to those staff and workers employed by contactors; and those workers work in the supply chains of goods and services procured for the Project). The LMP includes provisions related to working conditions, including minimum age, the need to ensure fair treatment and non-discrimination and equal opportunity of Project workers, provisions and measures to manage risks related to use of labor and working

conditions, procedures to assess and manage work related hazards, including OHS that consider the General Environmental Health and Safety Guidelines (EHSGs) and other Good International Industry Practice (GIIP). The LMP will establish a worker-specific GRM as an inclusive and accessible means for workers to raise workplace related concerns.

4.75 **Stakeholder Engagement, Consultation and Information Disclosure:** WB's preliminary assessment has resulted in institutional stakeholders being identified. These stakeholders include the Ministry of Economy and Finance (MEF), Ministry of Living Environment and Sustainable Development (or Ministere du cadre de vie et du Developpement durable (MCVDD), Ministry of Infrastructure and Transports (MIT), Road Infrastructure and Land Management Company (SIRAT), National Agency for Land Transport (ANaTT), National Road Safety Centre (CNSR), Urban Development Directorate of the MCVDD, Cotonou Municipality, Sèmè-Podji Municipality and the National Association of Municipalities in Benin (ANCB). Other non-institutional stakeholders identified include market women associations, religious groups, street vendors, fishers, small business owners (e.g., fish and sand sellers), water transport operators, bus drivers, Zémidjan drivers and users, businesspeople, religious groups, tourism promoters, youth organizations, women's associations, the national association for persons with disabilities, and public and private business groups along project areas. These stakeholder identification and assessment is part of a comprehensive Stakeholder Engagement Plan (SEP) that the client prepared and disclosed. The SEP, which includes a budget, outlines strategies for engaging different stakeholder groups, including vulnerable populations, throughout the project cycle. This will be supported by information campaigns, radio broadcasts, and community meetings to ensure that PAPs are fully aware of their rights.

4.76 As documented in the SEP, key concerns and feedback emerged from a series of consultation conducted during Project preparation include concerns around access to project benefits (i.e. the program to promote electric buses/motorcycles), employment and training opportunities, retention of advantages, provisions of existing contracts and agreements within the transport sector. Other concerns are related to electronic waste management, fair compensation affected people and the street lighting improvements.

4.77 **Project Grievance Redress Mechanism:** As part of the Project's SEP, a project-level grievance mechanism that builds on existing national entry points, including the complaints and suggestion section will be accessible on the website of the MCVDD. The SEP establishes a four-tier grievance mechanism at the neighborhood, district, municipal, and national levels. This aims to ensure that GRM will be functional and address, in a timely manner, concerns related to ES risk and impact management of the Project, such as issues related to land acquisition and resettlement, community health and safety. Complaints related to SEA/SH and other sensitive issues will be handled exclusively at the national level through specialized national systems. Benin already has established institutions for managing gender-based violence (GBV), which will be engaged as necessary. Discussions with the client indicate that there is an existing GRM that will be used for the Project.

4.78 **Bank's Project-Affected People's Mechanism:** Pursuant to AIIB's agreement with WB, AIIB will rely on WB's corporate Grievance Redress Service (GRS) and the independent Inspection Panel to handle complaints relating to environmental and social issues that may arise under the Project. Consequently, in accordance with the Bank's Policy on the Project-

affected People's Mechanism (PPM), submissions to the PPM under this Project will not be eligible for consideration by the PPM. As aforementioned, WB's ESF will apply to this Project instead of AIIB's ESP. WB's Independent Accountability Mechanism, the Inspection Panel, which reviews WB's compliance with its policies and procedures, will handle complaints relating to WB's compliance with its ESF with respect to the Project. Information on WB's Inspection Panel is available at http://www.inspectionpanel.org.

4.79 **Proposed Follow-Up** / **Monitoring and Supervision Arrangements:** To ensure that client is ready for Project implementation, the client has prepared the Project Implementation Manual which has been approved by WB. To complement SIRAT's monitoring and reporting of the project's ES performance, a third-party monitoring group composed of the responsible agencies, local government and CSO representatives will be organized during project implementation, guided by the ESMF, the respective ESIAs and ESMPs for the various components. All aspects related to the RAMSAR site will be reviewed, approved and even monitored by the RAMSAR authority itself, as detailed in the existing ES safeguards documents (SESA, ESCP, ESMF), as negotiated and agreed by the WB and AIIB with the Government of Benin. AIIB, alongside the WB, will conduct a detailed review and clearance process for all ESA documents before granting approval for the corresponding activities to ensure full compliance with E&S requirements. To maintain ongoing oversight, AIIB will join WB's six-monthly implementation support missions as part of its due diligence process to provide support to client and guide them to ensure their compliance with WB's ESF and relevant policies.

E. Climate Change

4.80 **Climate Change:** Due to the difference in nature of the different Project Components, the Project team has analyzed them from the Paris Alignment perspective, individually.

4.81 Components 1, 2, and 5, given their research and policy nature, can be classified as aligned both for adaptation and mitigation goals of the Paris Agreement due to their neutral impact on climate mitigation and the immateriality risk from the climate resilience perspective. Components 3 and 4 will finance some material items that will be analyzed one by one.

(i) Sub-Component 3.1 consists of the provision of an electric bus fleet and an electric boat fleet. These two elements are universally aligned for the mitigation goals of the Paris Agreement and due to their mobile nature, can be considered aligned as well for the adaptation goals of the Paris Agreement following AIIB's methodological notes.

(ii) Sub-Component 3.2 includes (among other elements) the rehabilitation, reconstruction, and reconfiguration of existing road infrastructure (RNIE1 and RNIE2), construction of climate-resilient and inclusive IWT infrastructure and re-construction and reconfiguration of a 2.4-km green mobility corridor. The Road reconstruction and reconfiguration alongside RNIE1 and RNIE2 (2x2 lanes) and the 2.4-km green mobility corridor (2x2 lanes) will not have any capacity expansion and thus they are considered universally aligned with the mitigation goals of the Paris Agreement. The IWT component is on the list of universally aligned activities and will not handle nor transport fossil fuels and present no material risk of contributing to deforestation, thus it is aligned with the mitigation goals of the Paris Agreement. These Components are subject to a Climate Resilience Assessment to determine its alignment with the adaptation goals of the Paris Agreement.

(iii) Sub-components 4.2 and 4.3 consist of the deployment of electric mototaxis fleet in Grand Nokoué and will finance the rollout of a large-scale fleet renewal program aimed at replacing 60,000 conventional mototaxis with electric two-wheelers and build and electric mobility industry. These two elements are universally aligned for the mitigation goals of the Paris Agreement and due to their mobile nature, can be considered aligned as well for the adaptation goals of the Paris Agreement following AIIB's methodological notes.

4.82 In line with the co-financier in this Project (WB), we conclude that all the project components are universally aligned with the mitigation goals of the Paris Agreement. All the components except 3.2 are aligned with the adaptation goals of the Paris Agreement as well, whereas 3.2 is subject to a Climate Resilience Assessment to determine its alignment with BB2.

4.83 The Project incorporates measures tackling the climate hazards found (on the CRVA) as likely to materially affect the Project such as rainwater discharge, floods, and coastal erosion. These measures incorporated structural elements (enhanced drainage and bridge design for increased rainwater discharge, elevated road and pier infrastructure in flood-prone areas and flood and erosion protection measures) and non-structural elements technical assistance (TA) to support the development and operationalization of climate resilient low-carbon urban mobility strategies and freight management plans for Grand Nokoué, and TA and training activities to support the establishment and operation of an urban mobility authority

in Grand Nokoué. Given these measures and that the Project is not incompatible with the NDCs and other national adaptation strategies, it is considered aligned with the adaptation goals of the PA (BB2).

4.84 Some elements of the project qualify as Climate mitigation finance following the JMDB common principles. AIIB's amount of climate mitigation finance has been estimated as USD 96.37 million or approximately 48.2%. Using AIIB's incremental approach based on the JMDB methodology for tracking climate adaptation finance, it Is possible to the Project climate adaptation finance equivalent to the sum of the cost of the elements abovementioned minus the dual benefit contribution. The net climate adaptation finance is equal to USD 36.76 million, equivalent to 18.38% of AIIB's financing. The total climate finance of the Project would be the sum of the climate mitigation finance and the climate adaptation finance after deducting the dual benefits. The net climate mitigation finance would be USD 96.37 million whereas the net climate adaptation finance would be USD 36.76 million, being the total climate finance USD 133.13 million, equivalent to 66.57%. Dual benefits account for USD 9.27 million.

4.85 Results show an estimated yearly reduction of 151,000 tCO_2e. The Project is expected to reduce mobility-related emissions in Grand Nokoué by 12% over the project period. This reduction is primarily driven by the electrification of zemidjans, which accounts for 70% of the total GHG emissions reduction. Additional contributions come from the implementation of a multimodal public transport system (19%) and the reduction of road congestion through the construction of bridges, ATC, and PCRT/SLT (11%).

F. Gender Aspects

4.86 Gender inequality and women's economic empowerment remain a key development issue in Benin, as the country ranks among the most inequal in the world. Beninese women face a constrained access to educational and health services compared to their male counterpart. Only about 18.3% of adult women access secondary education, compared to adult male at 34%. These factors coupled with other cultural barriers place a constraint on women to participate in formal employment or to access job in technical fields. Women may face harassment and social bias, discouraging them from benefiting from transport sector reforms. Gender disparities in mobility and transport sector participation severely limit women's economic opportunities in Grand Nokoué. Furthermore, the presence of construction workers increases risks of sexual exploitation, abuse, and harassment (SEA/SH) for women and vulnerable groups in public spaces. However, the WB assessed SEA/SH risks as low taking into consideration the existing legislation, national action plan to address gender-based violence, national referral system for GBV service provision, and the Project contexts where construction will take place in urban areas, not in a conflict zone. The management of SEA/SH risks will be through various measures embedded in the site specific environmental and social management plans, including sensitization of SEA/SH issues among workers and community, ensure workers' compliance with code of conduct and a grievance redress mechanism.

4.87 A "Social and Vulnerability Assessment" and a Stakeholder Engagement Plan have been conducted by the Client, with a view to addressing the risk of exclusion of socially disadvantaged groups. Gender has been integrated into the Project design through key interventions and various Project components, providing direct benefit for women in their access to socio-economic activities, and elevating women's safety. Gender specific engineering designs have also been part of the Project requirements that will benefit women, greatly contributing to a more equitable mobility for women as they are more predominantly proportionally pedestrians.

4.88 Equally, addressing gender equality issues has been mainstreamed to ES risk management at site-specific level. For instance, to ensure that women are not impacted by influx of labor during construction and operations of roads and transport, civil works TORs for contractors include their obligation to implement actions to prevent sexual exploitation abuse (SEA) and sexual harassment (SH) of female pedestrians, hawkers, workers and other female road users by construction workers. This will oblige the contractors to develop operational plans that include educational campaigns and enforcement actions to avoid SEA and SH in areas of agglomeration, particularly onboard buses and ferries and at stations. Other measures will be entailed to ensure safety for women at buses, ferries stations, such as secure separate safe place for women, with proper lighting, and activities to sensitize gender-based violence issues in the Project areas. Similarly, the civil works contracts with contractors will include clauses to ensure equal pay for both men and women for similar functions, and the need for the contractors to consult with women to understand their needs, priorities, concerns and feedback.

4.89 More details are provided in Annex 6 – Gender Equality and Social Inclusion.

G. Operational Policy on International Relations

4.90 **Operational Policy on International Relations:** AIIB's OPIR applies to the Project because the project activities will involve international waterways as defined in paragraph 2.1(b) of the Policy. The proposed Project activities (specifically under component 3) will be located on the Lake Nokoué, which is fed by the Ouémé River (shared by Benin, Nigeria and Togo) and connected to the Porto Novo Lagoon system (shared by Benin and Nigeria). Lake Nokoué qualifies as an international waterway under OPIR 2.1 (b)(i)(A) as it is a body of surface water that flows through two countries (Benin and Nigeria), and OPIR 2.1(b)(i)C) as Lake Nokoué is a tributary of the Oueme River, itself flowing through three countries (Benin, Nigeria and Togo).

4.91 The WB approved an exception to the notification requirement under Policy 7.50 on March 17, 2025. The Bank is satisfied with the WB's assessment capacity and process, and with its assessment.

4.92 Based on WB assessment, the Project Team is of the view that the Project's impacts during dredging, construction and operation phases are localized, short-term and reversible and mitigated through a Dredging Management Plan (including sediment and pollution control) and an integrated Waste Management Plan, without no material transboundary harm for downstream riparians. In addition, it is to mention the Benin–Nigeria cooperation under the Abidjan Convention and the 2022 Action Plan provides a framework for joint ecosystem protection. In conclusion, the Project is expected to have a minimal effect on any of the other riparians. According to 3.3 (c) (i) of OPIR, "Projects that are expected to have minimal or no effect on any of the other riparians", AIIB is not requested by OPIR to notify the riparians.

H. Risks and Mitigants

Table 4: Summary of Risks and Mitigating Measures

Risk Description	Assessment (H/M/L)	Mitigation Measures
Program/Project Preparation Risks		
Technical designs		
▪ This is Benin's first major effort to modernize public transport services, and the first two-wheeler fleet renewal and electrification initiative. Key challenges include designing an integrated multimodal public transport network, professionalizing transport operators, ensuring technical and financial viability of fleet renewal, and addressing environmental impacts of vehicle scrappage.	Medium	▪ These risks will be mitigated by: (i) conducting preparatory studies to refine design and financial models, (ii) exploring various technical options through pilot projects before selecting solutions (ii) engaging qualified experts, construction and supervision firms, (iii) hiring transaction advisor(s) for bus and boat operation contracts.
Program/Project Implementation Risks		
Implementation capacity		
▪ There is a large number of stakeholders, complex division of responsibilities across institutions.	Medium	▪ This risk will be mitigated by (i) engaging all stakeholders from the project's onset ; (ii) strong commitment from the Republic of Benin to set up an urban mobility lead institution, which shall be established before project's completion; (iii) a well-staffed PIU with the necessary technical skills; (iv) technical support to support the institutional stakeholders during project implementation; (v) hiring qualified transaction advisors to recruit public transport operators.
Land acquisition and resettlement		
▪ There are potential significant risks and impacts related to land acquisition and resettlement due to activities related to rehabilitation and construction of roads and	High	▪ The PT will work closely with WB to provide capacity support to client during Project implementation to ensure that the RPF (Resettlement Policy

Risk Description	Assessment (H/M/L)	Mitigation Measures
bridges in urban environment.		Framework), RAP for ATC road section are implemented according to the Plan, together with ensuring the establishment of a functional GRM.
Financial management		
▪ Potential delays in submitting audit reports as per the legal agreement, which could affect the timely assurance of fund utilization.	Medium	▪ SIRAT will submit the audit ToR to the Bank(s) for review and clearance within six months after Project effectiveness to enable a timely procurement process.
Procurement of large and complex packages		
▪ Timely processing and approval of procurement packages	Medium	▪ The PIU will be equipped with technical and non-technical staff for the overall management of the project. The consultants will also be engaged to support the PIU.
E&S risks and impacts during construction and operation		
▪ Air pollution, noise, vibration from motor vehicles ▪ Traffic, road congestion, obstructions ▪ Water pollution from polluted runoff, dredged spoils ▪ Road hazards, causing accidents, incidents ▪ Construction impacts ▪ Occupational and community health and safety risks are significant ▪ SEA/SH risks in the context of client's as well as contractors' limited capacity in ES risk management ▪ Resource efficiency and pollution prevention – Includes sourcing of materials, water and energy use, GHG emissions, and improper fuel disposal. ▪ Health and safety – Risks	High	▪ ES risks and impacts to be covered by the ESMP, site specific ESIA and SESA ▪ In discussion with WB and with their agreement, arrangements will be put in place, including additional support provided to clients, and the engagement of an independent monitor, to strengthen client's capacity and ES monitoring system. ▪ Close supervision by the WB team in conjunction with the AIIB team will be envisaged. ▪ A Social and Vulnerability Assessment to address the risk of exclusion of socially disadvantaged groups and the increased vulnerabilities among at-risk populations. This assessment will be disclosed before project

Risk Description	Assessment (H/M/L)	Mitigation Measures
affecting both workers and communities. ▪ Biodiversity loss – Impact from vegetation removal and quarrying activities. ▪ Cultural heritage risks – Potential effects due to excavations and construction activities. ▪ Waste management and pollution control – Essential for minimizing environmental risks and ensuring project sustainability. ▪ Risks associated with electric two-wheelers (e2w) – Challenges related to battery storage, disposal, and recycling. ▪ Lake transport hazards – Risks including boat capsizing, sinking, and dredging impacts, such as ecosystem disturbance, erosion, sedimentation, and changes in water flow.		appraisal. ▪ A Stakeholder Engagement Plan (SEP) outlining key engagement measures to address concerns related to fleet renewal under Component 4. The SEP also details stakeholder consultations on project implementation risks, particularly regarding the needs of women, children, and persons with disabilities, ensuring they are not excluded from project benefits during implementation and in the operational phase. ▪ Livelihood restoration plans will be developed as needed to mitigate livelihood losses, based on findings from the Social and Vulnerability Assessment and the final technical designs.

Annex 1: Results Monitoring Framework

Project Objective (PO):	**To enhance urban mobility, transport safety, and access to inclusive and sustainable transport services along selected corridors in Grand Nokoué.**								
Indicator Name	**Unit of measure**	**Base-line Data 2025**	**Cumulative Target Values**				**2030**	**Data source / Methodology**	**Responsibility**
			2026	**2027**	**2028**	**2029**			
Project Objective Indicators:									
Improved mobility along selected corridors in Grand Nokoué									
1. Average weekday travel time between Dantokpa (Cotonou) and Carrefour Kpota (Abomey Calavi) in the morning peak	Minutes	60	60	60	60	60	45	SIRAT Measured by departure and arrival time of each point (between GDIZ and APC) on weekdays. This data will be collected either manually by surveyors in motorcycles or private cars, or through GPS tracking devices installed on the cars or bikes. Sampling for the trip will occur at various times, and after gathering enough data (a sufficient number of trips over multiple weekdays), the average weekday travel time will be calculated.	SIRAT
2. Average weekday travel time between Dantokpa (Cotonou) and PK 10 (Seme Podji) in the morning peak	Minutes	45	45	45	45	45	25	SIRAT Measured by departure and arrival time of each point (between Dantokpa and PK10) on weekdays. The methodology is the same as described above.	SIRAT
3. Satisfaction rating by public transport users of the public transport services	Percentage	0	0	0	0	0	70	SIRAT and later the MCVT/the future urban mobility lead institution will appoint a specialized survey firm or an academic partner to collect data and compute the satisfaction index through customized surveys. Yearly public transport user intercept surveys will be conducted among the bus and boat public transport users. The	SIRAT / MCVT / lead institution for the management of urban transport in Grand Nokoué

Project Objective (PO):	To enhance urban mobility, transport safety, and access to inclusive and sustainable transport services along selected corridors in Grand Nokoué.							
Indicator Name	**Unit of measure**	**Base-line Data 2025**	**Cumulative Target Values**				**2030**	**Data source / Methodology**	**Responsibility**
			2026	**2027**	**2028**	**2029**			
								survey will be implemented by a specialized consulting firm or an academic partner. The ToRs, the methodology of the survey, including the construction of the satisfaction index, and the sample size will be reviewed by the Banks and validated by the WB. The composite satisfactory index will include the different dimensions of the services offered. These dimensions include (but are not limited to): affordability, reliability, safety, accessibility, comfort, and travel time. The following 5-level Likert scale (1: unsatisfied; 2: moderately unsatisfied; 3: neutral; 4: moderately satisfied; 5: satisfied) will be used for each dimension and the average of the scores attributed by all surveyed users will be computed and translated into a percentage to obtain the composite indicator.	
4. Satisfaction rating by public transport users of the public transport services - female	Percentage	0	0	0	0	0	70	SIRAT and later the MCVT/the future urban mobility lead institution will appoint a specialized survey firm or an academic partner to collect data and compute the satisfaction index through customized surveys. The surveys will be conducted among the female bus and boat public transport users. The methodology of the survey and data collection is the same as described above.	SIRAT / MCVT / lead institution for the management of urban transport in Grand Nokoué

Project Objective (PO):	**To enhance urban mobility, transport safety, and access to inclusive and sustainable transport services along selected corridors in Grand Nokoué.**								
Indicator Name	**Unit of measure**	**Base-line Data 2025**	**Cumulative Target Values**				**2030**	**Data source / Methodology**	**Responsibility**
			2026	**2027**	**2028**	**2029**			
5. Satisfaction rating by public transport users of the bus public transport services	Percentage	0	0	0	0	0	70	SIRAT and later the MCVT/Urban mobility lead institution will collect the data and information through customized surveys. The methodology of the survey and data collection process is the same as for the public transport	SIRAT / MCVT / lead institution for the management of urban transport in Grand Nokoué
6. Satisfaction rating by public transport users of the boat public transport services	Percentage	0	0	0	0	0	70	SIRAT and later the MCVT/Urban mobility lead institution will collect the data and information through customized surveys. The methodology of the survey and data collection process is the same as for the public transport	SIRAT / MCVT / lead institution for the management of urban transport in Grand Nokoué
Improved safety along selected corridors in Grand Nokoué									
7. Number of accidents in the selected corridors	Number	751	751	751	751	751	525	CNSR, Police, Health centers To measure the number of road accidents, CNSR will rely on different sources consolidated in the national road safety database to count the number of reported incidents where two or more vehicles collide on a road, using data collected from police reports, official crash databases, or other relevant sources.	CNSR
8. Number of fatalities in the selected corridors	Number	74	74	74	74	74	50	CNSR, Police, Health centers To assess the number of fatalities, CNSR will rely on the same methodology for data collection as for	CNSR

Project Objective (PO):	To enhance urban mobility, transport safety, and access to inclusive and sustainable transport services along selected corridors in Grand Nokoué.								
Indicator Name	**Unit of measure**	**Base-line Data 2025**	**Cumulative Target Values**				**2030**	**Data source / Methodology**	**Responsibility**
			2026	**2027**	**2028**	**2029**			
								the indicator on road accidents.	
Improved accessibility along selected corridors in Grand Nokoué									
9. Direct users benefiting from improved access to sustainable transport infrastructure and services	Number of people	0	0	0	0	0	360,000	Bus and boat operator(s) Example of possible methodology includes a manual count of passengers using clickers, questionnaires, tablets, or other counting tools to be used by the operator(s). These methods will allow the operators to capture data disaggregated by category of user. A second option is an Automatic Passenger Counting (APC) system which electronically count passengers boarding and alighting from vehicles through sensors. Such systems are better suited to provide agregated figures to compute total passenger volumes.	SIRAT / MCVT / lead institution for the management of urban transport in Grand Nokoué
10. Direct users benefiting from improved access to sustainable transport infrastructure and services - female	Number of people	0	0	0	0	0	180,000	Bus and boat operator(s) The methodology is the same as described above.	SIRAT / MCVT / lead institution for the management of urban transport in Grand Nokoué
11. Direct users benefiting from improved access to sustainable transport infrastructure and services - youth	Number of people	0	0	0	0	0	108,000	Bus and boat operator(s) The methodology is the same as described above.	SIRAT / MCVT / lead institution for the management of urban transport

Project Objective (PO):	To enhance urban mobility, transport safety, and access to inclusive and sustainable transport services along selected corridors in Grand Nokoué.								
Indicator Name	**Unit of measure**	**Base-line Data 2025**	**Cumulative Target Values**				**2030**	**Data source / Methodology**	**Responsibility**
			2026	**2027**	**2028**	**2029**			
									in Grand Nokoué
12. Population of Grand Nokoué benefitting from improved access to sustainable transport infrastructure and services	Number of people	0	0	0	0	0	1,950,000	Bus and boat operator(s) This indicator will be measured using geographic information system (GIS), by defining a 2 km buffer around the project bus and boat systems and combining it with a population map layer to calculate the number of beneficiaries.	SIRAT / MCVT / lead institution for the management of urban transport in Grand Nokoué
13. Population of Grand Nokoué benefitting from improved access to sustainable transport infrastructure and services - female	Number of people	0	0	0	0	0	975,000	Bus and boat operator(s) The methodology is the same as described above.	SIRAT / MCVT / lead institution for the management of urban transport in Grand Nokoué
14. Population of Grand Nokoué benefitting from improved access to sustainable transport infrastructure and services - youth	Number of people	0	0	0	0	0	585,000	Bus and boat operator(s) The methodology is the same as described above.	SIRAT / MCVT / lead institution for the management of urban transport in Grand Nokoué

Project Objective (PO):	To improve mobility, safety, and accessibility along selected corridors in Grand Nokoué.								
Indicator Name	**Unit of measure**	**Base-line Data 2025**	**Cumulative Target Values**				**2030**	**Data source / Methodology**	**Responsibility**
			2026	**2027**	**2028**	**2029**			
Intermediate Results Indicators:									
Component 1									
1. Establishment of a lead institution in charge of coordinating and managing urban transport in Grand Nokoué	Y/N	N	N	N	N	N	Y	MCVT The indicator will be triggered by the signing of a legal text (decree/law or any formal decision) by the Republic of Benin that establishes a lead institution for the management of urban transport in Grand Nokoué.	MCVT
2. Development of an action plan and recommendations for the financing of the urban transport sector in Grand Nokoué	Y/N	N	N	N	N	N	Y	MCVT The indicator will be triggered by the adoption of the action plan and recommendation by the Republic of Benin	MCVT
3. A dialogue platform has been established to engage public transport industry stakeholders	Y/N	N	N	N	N	N	Y	MCVT The indicator will be triggered by the existence of the platform, and the number of meetings held per year	MCVT
Component 2									
1. Existence of a centralized digital database for the registration of paratransit operators in Grand Nokoué	Y/N	N	N	N	N	N	Y	ANaTT The indicator will be triggered by the development and operationalization of a digital paratransit operator's database in Grand Nokoué. The Project will provide support and technical assistance to ANaTT to design this system.	ANaTT
2. Number of motorcycle taxi drivers with driver's license	Number	12,500	12,500	12,500	12,500	12,50	42,500	ANaTT The indicator will be computed by	ANaTT

Project Objective (PO):	To improve mobility, safety, and accessibility along selected corridors in Grand Nokoué.								
Indicator Name	**Unit of measure**	**Base-line Data 2025**	**Cumulative Target Values**				**2030**	**Data source / Methodology**	**Responsibility**
			2026	**2027**	**2028**	**2029**			
						0		counting the number of Category A driver's licenses delivered by ANaTT.	
3. Road Safety Observatory for road-related crashes established in Benin	Y/N	N	N	N	N	N	Y	CNSR The indicator will be triggered by the development and operationalization of a centralized digital database for road-related crashes in the Grand Nokoué.	CNSR
4. Benin's vehicle fleet inspection and monitoring systems modernized	Y/N	N	N	N	N	N	Y	ANaTT The indicator will be triggered by the procurement of equipment and training to improve Benin's vehicle fleet inspection, control and monitoring systems.	ANaTT
Component 3									
1. Signature of a contract agreement with a private company to invest in and operate the public bus system.	Y/N	N	N	N	N	N	Y	MCVT The indicator will be triggered when the concession agreement between the private operator and the Republic of Benin is signed.	MCVT
2. Signature of a contract agreement with a private company to invest in and operate the public boat system.	Y/N	N	N	N	N	N	Y	MCVT The indicator will be triggered when the concession agreement between the private operator and the Republic of Benin is signed.	MCVT
3. Share of women employed in the bus and boat operations.	Percentage	0	0	0	0	0	25	Bus and boat operators The indicator will be measured by the share of women recruited by the bus and boat operators. The data and information will be extracted from the bus operator human resource database and project	SIRAT / MCVT

Project Objective (PO):	To improve mobility, safety, and accessibility along selected corridors in Grand Nokoué.								
Indicator Name	**Unit of measure**	**Base-line Data 2025**	**Cumulative Target Values**				**2030**	**Data source / Methodology**	**Responsibility**
			2026	**2027**	**2028**	**2029**			
								documents and reports.	
4. Number of intersections improved with traffic lights and climate resilient features in central Cotonou.	Number	0	0	0	0	0	165	Supervision/construction firm SIRAT will collect the data and information from the supervision/construction firm	SIRAT
5. Number of kilometers of climate resilient urban road sections constructed and rehabilitated along the main corridors.	Number	0	0	0	0	0	17.50	Supervision/construction firm SIRAT will collect the data and information from the supervision/construction firm	SIRAT
Component 4									
1. Number of ICE motorcycles replaced with electric motorcycles during the main roll out phase	Number	0	0	0	0	0	65,000	MEF The indicator will be measured by the count of the number of electric motorcycles rolled out during the pilot electrification phase extracted from the project documents and reports.	MEF
2. Development and mobilization of a private sector ecosystem in the e-mobility sector	Y/N	N	N	N	N	N	Y	MEF The indicator will be triggered by the mobilization of private capital to strengthen the domestic private sector in relevant e-mobility industries.	MEF
Component 5									
1. Technical assistance to improve the skills of the PIU and relevant implementing agencies	Y/N	N	N	N	N	N	Y	SIRAT/MCVT/CNSR/ANaTT/MEF documents and reports The indicator will be measured by the number of staff of the PIU and relevant implementing agencies who have benefitted from training courses and	SIRAT / MCVT/ CNSR / ANaTT / MEF

Project Objective (PO):	To improve mobility, safety, and accessibility along selected corridors in Grand Nokoué.							
Indicator Name	**Unit of measure**	**Base-line Data 2025**	**Cumulative Target Values**				**2030**	**Data source / Methodology**	**Responsibility**
			2026	**2027**	**2028**	**2029**			
								capacity building activities to improve their skills. The data and information will be extracted from the project documents and reports.	
2. Number of beneficiaries of the apprenticeship program	Number	0	0	0	0	0	50	SIRAT/MCVT/CNSR/ANaTT/MEF documents and reports The indicator will be measured by number of beneficiaries recruited through the project for the internship programs. The beneficiaries mostly recruited from schools will improve their skills through hands-on experience in urban transport and mobility. The data and information will be extracted from the project documents and reports.	SIRAT / MCVT/ CNSR / ANaTT / MEF
2. Share of female beneficiaries of the apprenticeship program	Number	0	0	0	0	0	40	SIRAT/MCVT/CNSR/ANaTT/MEF documents and reports The indicator will be measured by the share of female beneficiaries recruited through the project for the internship programs. The beneficiaries mostly recruited from schools will improve their skills through hands-on experience in urban transport and mobility. The data and information will be extracted from the project documents and reports.	SIRAT / MCVT/ CNSR / ANaTT / MEF

Annex 2: Detailed Project Description

This section provides additional details of the activities presented under the (iv) Project Description.

The provision of an enabling environment starts with the improvement of governance, the institutional arrangements, capacity building on planning and regulation. Key actions are being undertaken: (i) the Republic of Benin has committed to addressing the fragmentation in urban transport governance through the establishment of a lead institution organizing the transport sector in Grand Nokoué. To this end, a WB-PPA-financed study financed to assess the institutional options has been launched. Its findings will inform the activities to be financed under Component 1; (ii) a PPIAF-financed study has been launched to define the most appropriate financing and funding mechanisms for the transport sector in Grand Nokoué. Its findings will inform the design of Component 1.3; (iii) CODATU, a renowned organization, will provide technical assistance and capacity building to MCVT and other stakeholders, including support to the interim structure put in place to operationalize the multimodal public transport system, as well as assistance to the new institution once established.

The Project will support the professionalization of transport operators as a key element of developing a comprehensive, multimodal public transport system. Grand Nokoué's current oversupply of mototaxis (250,000 operators, a 1:11 taxi-to-inhabitant ratio) leads to excessive competition, low productivity, and significant negative externalities. Under subcomponent 2.1, the Project will improve service quality and safety through: (i) implementing a regulatory framework establishing minimum service standards, formal driver qualifications and quotas for licensed operators; (ii) strengthening institutional coordination between ANaTT, municipalities, police, and driver associations for registration, licensing, and enforcement; and (iii) engaging ANPS to facilitate health insurance coverage and retraining opportunities for formal sector transition. A phased approach will allow operators time to comply with new regulations before enforcement intensifies, enabling gradual operator control and reduced competition along planned bus corridors. Additionally, the fleet renewal program will be fully integrated with the professionalization strategy, ensuring that access to fleet electrification subsidies is contingent on meeting professional standards, including registration, licensing, and training requirements. This interdependence will create strong incentives for operators to formalize, improving service quality and safety while ensuring the long-term financial and operational sustainability of the sector. A WB-PPA-funded study is underway to inform detailed activity design.

Road safety will be strengthened through a comprehensive approach combining infrastructure design, oversight, and management improvements. The program addresses road safety through two complementary pillars. First, all infrastructure investments will incorporate safe system principles in their design, including segregated lanes for two-wheelers in high-traffic corridors, secured pedestrian infrastructure with adequate lighting and crossing facilities, and traffic calming measures. This "safety by design" approach particularly focuses on vulnerable road users who account for the majority of casualties. Second, the road safety initiative (SESAM), spearheaded by the CNSR and the Ministry of Health, will modernize Benin's road safety practices through enhanced data collection and monitoring systems, systematic assessment of high-risk zones, vehicle safety inspections, and targeted public awareness campaigns. To build trust and to minimize the risk of abuse, all national data protection regulations and international best practices will be followed, including record and audit

processes, interoperability controls and limiting system integration wherever possible. The project will also strengthen post-crash response through improved coordination between CNSR and the Ministry of Health, aiming to reduce fatalities and severe injuries. The preparation of the detailed activities is ongoing with support from the Global Road Safety Facility (GRSF), ensuring alignment with international good practices.

4.93 The project aims to transform mobility in Grand Nokoué through the development of safe, inclusive, efficient and climate-resilient transport corridors. The project prioritizes three key corridors:

(i) RNIE2 (North-South) over 31 km, including the GDIZ-Green Corridor over 13 km, the Green Corridor-Abomey-Calavi over 10 km, and Abomey-Calavi-Cotonou over 8 km.
(ii) RNIE1 (East-West), over 71 km, including Ouidah-Pahou over 16 km, Pahou-Cotonou/Sème-Podji over 25 km, Cotonou/Sème-Podji-Porto Novo over 30 km.
(iii) a newly paved 'green corridor' parallel to RNIE2 to serve densely populated but underserved areas.

Using an Integrated Corridor Management Approach and Universal Access design guidelines, the project will accommodate all road users, enhance public and NMT facilities, and address road deterioration, traffic management, and parking needs. A GFDRR-funded assessment will inform the design of climate adaptation measures for all transport infrastructure and services and strengthen institutional capacity for climate-resilient urban mobility planning.

4.94 The Project will enhance freight connectivity to support economic growth in Grand Nokoué. Key interventions include streamlining freight movements between industrial areas and international gateways (APC, GDIZ and Cadjéhoun International Airport), through the rehabilitation of urban infrastructure (ATC), technology improvement projects (PCRT/SLT), and rehabilitation of critical bridges (Djonou and Ganhi), will enhance accessibility and connectivity, especially within Cotonou’s central business district and the regional freight network. In addition, civil works along the three main corridors will involve resurfacing, road rehabilitation, and integration with key areas like the Marché du Gros and the Abomey-Calavi administrative district.

4.95 The Project will establish a comprehensive e-bus-and e-boat based public transport system designed to serve 270,000 in a first phase and 360,000 daily passengers ultimately. A preliminary passenger demand analysis, conducted in mid-2024, has guided the development of a comprehensive service plan covering 177 km with seven operational bus lines, six boat corridors operated by a fleet of approximately 279 12-meter e-buses for primary routes and 42 9-meter e-buses for feeder routes (including 7% reserve fleet) and 100 e-boats. The system targets a commercial speed of 22 km/h with 2–3-minute peak hour headways for bus, 15km/h for boats, prioritizing low to low-emission technologies. A first phase comprising a fleet of 221 e-buses in total and 15 e-boats will be implemented under the proposed project. A WB-PPA-funded feasibility study and detailed design has started to comprehensively assess mobility conditions and define necessary operational and infrastructure interventions for the integrated multimodal transport system.

4.96 Since 2021, the country has been seeking to diversify its sources of electricity production with (i) the commissioning of a photovoltaic power plant in 2022 and (ii) the maintenance of a

hydroelectric power plant. The hydroelectric power plant has a production capacity of 60 MW, the production of which is shared with Togo. By 2030, the capacity should increase to 275 MW. The Illoulofin photovoltaic solar power plant, located in the municipality of Pobè, Plateau department, has a capacity of 25 MW (95 MW by 2030). Benin also benefits from an imported energy mix, combining hydroelectricity and thermal, especially gas, for its electricity supply. Electrification is a catalyst for developing a local e-mobility industrial ecosystem.

4.97 The Republic of Benin aims to pioneer low-emission multimodal transport, including e-buses, e-boats, and e-two wheelers to advance its decarbonization goals (The Republic of Benin has the ambition of replacing 50% of the mototaxis fleet (125,000) with new e2ws by 2028). In addition, the mototaxis fleet electrification is seen as an opportunity to transform the sector. The project will therefore support the e2w fleet renewal program and contribute to developing a local e-mobility industrial ecosystem. The project builds on a study that demonstrated the feasibility of the program and provided cost estimates and targets, identifying the need for 1,675 charging facilities, smart grid management systems, and grid reinforcement to enable the renewal of 65,000 mototaxis under the project by 2028. Two ongoing studies are refining this analysis: a (i) GFDT-funded study is developing a detailed fleet renewal mechanism, examining the operational model of zemidjans, and designing tailored incentives, regulatory frameworks, and financial instruments to encourage the transition to e2ws; (ii) a PPIAF-funded study is assessing the market potential for e2ws and related products, with a focus on supporting local industrial activities for e2w assembly lines and battery recycling plants. Finally, the pilot under Component 4.1 will assist the Republic of Benin in scaling up, by first deploying 5,000 e2ws and the charging infrastructure, testing various financial incentives and support mechanisms, to inform broader implementation. The completion of these studies is expected by Q3 2025.

Annex 3: Economic and Financial Analysis

4.98 The objective of the economic analysis is to identify and quantify the benefits and costs associated with the project with respect to Component 3 (civil works, buses and boat fleet) and Component 4 (electrification of two-wheelers), and assess the economic viability comparing with and without project scenarios over the project lifespan. The cost benefit analysis is carried out by using the discounted cash flow technique to obtain the economic internal rate of return (EIRR) and net present value (NPV) for the proposed investments linked with the project, using a discount rate of 5.5%. This is followed by a 'sensitivity analysis' carried out by increasing or decreasing the critical factors affecting the cost and benefit streams of the proposed project, in order to ascertain their effect on the economic feasibility indicators i.e. NPV, EIRR. An additional sensitivity analysis of the discount rate is carried out, to assess the impact on the NPV. This cost benefit study is carried out using the guidelines stipulated by WB in "the Shadow Price of Carbon in Economic Analysis – 2024 Guidance Note" and "Measurement for Mitigation: Greenhouse Gas Analysis for Low-Emissions Transport. 2016" (for the estimations of GHG emissions savings) and HDM - 4 Version 2 (for the road and bridge infrastructure sub-component).

4.99 **Methodology.** The project network is analyzed for the two situations: (ii) "with-project" situation, corresponding to 1 - the electrification of two-wheelers, 2 - the establishment of the multi-modal public transport system as well as its associated infrastructure (including the new green corridor), and 3 - road and bridge rehabilitation/reconstruction together with the installation of traffic management equipment (PCRT/SLT); (i) "without-project" situation, corresponding to the existing situation without any of the project components being implemented. Given the varying cost-benefit structures of the different activities, the analysis was undertaken for the three specific activities and then aggregated to encompass both project components. To check the reliability of the results, sensitivity tests were conducted: (i) a 10% capital cost overrun for the fleets of buses, boats, and two-wheelers; (ii) a 10% increase in operational costs; and (iii) a combined effect of all previous scenarios: a "Worst Case Scenario". A separate sensitivity test on the discount rate (from 5.5% to 8%) is performed.

4.100 **Electrification of 65 000 two-wheelers ("zemidjans").** The economic analysis of electrifying 65,000 two-wheelers ("zemidjans") compares two scenarios: a project scenario, converting part of the thermal zemidjan fleet to electric, and a no-project scenario, where the fleet remains thermal. As a result, the main benefits include reductions in GHG emissions and pollutants due to electrification, as well as lower vehicle operating costs for electric motorcycles compared to fuel-powered ones. The investment costs are estimated at 127 million USD (present value at 5.5% discount rate) over the project's lifespan, which spans 21 years[14], covering the purchase of e-zemidjans, the installation of charging stations, and the acquisition of batteries, forming a foundation for the energy transition. Switching to electric vehicles results in an annual reduction of 15% in operating costs, totaling 95.3 million USD[15] in savings over the period due to lower energy costs and reduced maintenance compared to thermal vehicles.

[14] Source: KPMG, "Study on renewing and electrifying motorcycles in Grand Nokoué", November 2023
[15] Source: KPMG (ibid)

4.101 Modeling the impact over the project's lifetime indicates that a rapid transition to 25% electric zemidjans in Grand-Nokoué could result in an annual reduction of 105 tons of CO_2 emissions, translating to a total decrease of 67% in greenhouse gas emissions compared to the no-project scenario where zemidjans remain internal combustion engines. There is an estimated valuation of 55.5 million USD for the gains associated with reduced pollutants, and 164.2 million USD for the gains associated with reduced GHG emissions under a low shadow price of carbon (SPC), over the project's lifetime. By discounting cash flows over the project's duration and assuming a low SPC, the NPV reaches 140.1 million USD, accounting for operating savings, environmental benefits, and investment costs, demonstrating that the project offers attractive economic returns and sustainable environmental benefits. At 8% discount rate, the NPV is 104.0 million USD (low SPC).

Table 5: Economic analysis summary for Component 4 related activities.

*in million USD	Base		+10% CAPEX		+10% OPEX		+10% CAPEX +10% OPEX		Discount rate 8%
	NPV*	EIRR	NPV*	EIRR	NPV*	EIRR	NPV*	EIRR	NPV
Pollutants and low SPC	140	54%	116	40%	110	44%	86	32%	104
Pollutants and high SPC	225	77%	200	60%	195	67%	169	50%	169

4.102 **Establishment of a public transportation system along with associated civil works.** The economic costs and benefits of bus and lake public transport were calculated based on traffic and passenger demand analysis. Travel demand matrices were derived using data collected for the elaboration of the GN-SUMP. Assumptions for population growth and distribution are based on the GN-SUMP's estimates for the period 2025-2045. The fare structure is based on assumptions from existing practices in Grand Nokoué and will be refined by the feasibility analysis during the early stage of the project implementation. The current structure includes a flat fare of FCFA 400 (approx. USD0.66) for bus and boat services. The travel demand model estimates passenger ridership, vehicle-kilometers traveled, generalized travel time, and fleet size by mode for each scenario during the morning peak hour. Expansion factors of 10.13 and 312 were applied to derive daily and annual results, respectively.

4.103 The bus and boat fleet implementation scenario considered a fully electric-powered bus and boat fleet. The socio-economic analysis results show a net present value (NPV) and an economic internal rate of return (EIRR) for the development, maintenance of a multimodal public transport system, the construction works of RNIE1, RNIE2 and Boulevard Urbain (the Costs), aggregated with the residual value of infrastructure and vehicles (buses and boats). The main benefits are travel time savings (modal shift to faster and more reliable transport services, running on rehabilitated road corridors with priority at junctions), reduced vehicle operating costs (modal shift from private car to public transport modes), road safety savings, pollutants and carbon emissions savings (modal shift from ICE electric modes). The demand analysis led to an estimated need for an initial fleet of 111 buses and 8 boats, to reach target numbers of 221 buses and 15 boats at the project's completion.

4.104 The expected CAPEX for the project full lifetime with all electric fleet amounts to 75 million USD, while the infrastructure cost enabling the development of the multimodal system

amounts to 202 million USD. Over the project's lifetime, the cost of operating an electric fleet is estimated at 161.8 million USD. When accounting for the social cost of GHG emissions, the NPV fluctuates between USD 79.5 million and USD 276.8 million, depending on low and high shadow price of carbon (SPC) values. At 8% discount rate, the NPV is from 104.0 million USD (low SPC) to 179.0 million USD (high SPC).

Table 6: Economic analysis summary for Components 3 related activities, all electric bus and boat fleet scenario.

*in million USD	Base		+10% CAPEX		+10% OPEX		+10% CAPEX +10% OPEX		Discount rate 8%
	NPV*	EIRR	NPV*	EIRR	NPV*	EIRR	NPV*	EIRR	NPV
Pollutants and low SPC	178	15%	14561	13%	118	12%	85	10%	104
Pollutants and high SPC	276	209%	244	17%	217	17%	183	14%	179

4.105 **Road rehabilitation, bridge and ITS/communication equipment.** To evaluate the economic impacts of road and bridge works and the installation of traffic management equipment, a standard cost-benefit analysis was employed. The total CAPEX for PCRT/SLT (traffic signaling and communication…), ATC (rehabilitation of access roads to the APC), Ganhi and Djonou bridges amounts to 161.1M USD, forming a critical component of the overall project costs.

4.106 The benefits of these investments can be understood in both economic terms, through monetizable effects, and more broadly in the context of passenger and goods transportation, connectivity in the city and to major regional economic areas, and environmental considerations. The primary benefit of the bridges is the reduction in travel times through the removal of bottlenecks, which also positively affects the existing transport services in the Grand Nokoué area. The rehabilitation of ATC roads and PCRT/SLT equipment will also have a significant impact in reducing the travel time in the major corridors of Grand Nokoué. Overall, the main benefits road users will be in the form of reduced vehicle operating and time costs for passengers and freight traffic, reduced road maintenance costs as well as reduced vehicle emissions.

4.107 By applying a cost-benefit analysis, a comparison is established between the economic benefits with the costs associated with capital and operational expenditure (construction, rehabilitation, administrative, and vehicle operations costs). The Highway Development and Management (HDM)-4 model is used to estimate the costs and benefits associated with both the with- and without-project scenarios to establish the economic viability of the proposed infrastructures under the project. Results for the bridges analyzed indicate that the benefits surpass the costs by more than 470%. A sensitivity analysis, which examines how changes in various criteria impact the underlying assumptions, further confirms the positive relationship between the costs and benefits.

Table 7: Economic analysis summary for Components 3 related activities, ATC, Bridges and PCRT/SLT

*in million USD	Base		Discount rate 8%
	NPV	EIRR	NPV
Pollutants and low SPC	750	49%	572
Pollutants and high SPC	765	49%	584

4.108 **Summary.** Overall, the project is economically viable as the EIRR and NPV with and without accounting for GHG emissions are positive and well above the opportunity cost. The following summary table shows the aggregated results for 1) the electrification of zemidjans, (2) the establishment of a public transportation system along with associated civil works, (3) road, bridge and ITS/communication works. The NPV fluctuates between USD 814 million and USD 1042 million and the EIRR between 30% and 35% depending on the estimate of carbon price. Sensitivity analyses were carried out to investigate the robustness of the economic viability of the project to cost overruns and benefit reductions. The results of the sensitivity analyses, and the project economic internal rate of return is still above the opportunity cost.

Table 8: Economic analysis summary aggregating Components 3 and 4 related activities (without variation for PCRT/SLT, ATC, Bridges)

*in million USD	Base		+10% CAPEX		+10% OPEX		+10% CAPEX +10% OPEX		Discount rate 8%
	NPV*	EIRR	NPV*	EIRR	NPV*	EIRR	NPV*	EIRR	NPV
Pollutants and low SPC	928	32%	895	31%	868	31%	835	29%	676
Pollutants and high SPC	1042	35%	1009	33%	982	34%	948	31%	764

4.109 **Wider economic benefits**. The introduction of multimodal public transportation systems, such as bus and lake transport, is expected to transform accessibility to healthcare, education, business centers and job opportunities in Grand Nokoué. With the Project's completion, it is estimated that the number of people able to access the Central Business District (CBD) within 60 minutes by public transport will reach 67.4%, expanding the job market reach for residents. This improvement in access is crucial in Grand Nokoué, where limited, costly, and time-consuming transportation options currently hinder employment participation, especially for low-income and peri-urban residents. With reduced travel times and costs, individuals from underserved areas will have more reliable options to reach economic centers, thereby increasing job inclusion and boosting local productivity.

4.110 One of the core elements of the Project is the professionalization and formalization of transport services through the introduction of organized, public transport. This development will create a range of skilled job opportunities, such as trained bus drivers, lake transport operators, and maintenance technicians. It is anticipated that several hundred skilled jobs will emerge, with formal contracts and standardized working hours, benefiting a segment of the workforce traditionally employed informally:

Table 9: Impact on the jobs related to two-wheelers in Grand Nokoué (Study on the renewal and electrification of the two-wheelers in Grand Nokoué, 2023)

Zemidjans drivers	65,000
Energy distribution	10,000
Assembly and recycling workers	6,000
Other jobs (e.g., Battery swapping station, charging infrastructure maintenance, Customer support, Digital service providers etc)	20,000
Total	**101,000 (FTEs)**

4.111 The shift to electric vehicles also presents an opportunity to develop technical competencies in managing electric mobility systems, aligning with Benin's environmental sustainability goals. In addition, training and certification programs for new workers—covering both technical skills and customer service—will be introduced, improving the employability of these workers in the formal sector and facilitating long-term career growth.

4.112 The construction phase of the project is set to provide short- to medium-term employment opportunities across a range of skill levels. Local civil works will require significant labor, from skilled workers for complex tasks to day laborers for general support. This phase is expected to create up to 1,000 direct and indirect jobs, providing income for households and stimulating local demand for goods and services. Furthermore, the phased construction approach will ensure steady labor demand over the project period, contributing to consistent economic activity within the region.

Annex 4: Environmental and Social

4.113 **Beyond gender issues, the project raises other social concerns.** The Project will take place in urban areas. There is a possibility of traffic disruptions during construction and a possibility of land acquisition. Loss of livelihoods is also possible with the professionalization of the informal paratransit sector and the works associated with the lake transport infrastructure, as passengers will be diverted to other forms of transport such as minibuses and boat transport.

4.114 The civil works associated with road and water transport infrastructure under Components 3 and 4 could lead to land acquisition, involuntary resettlement and loss of livelihoods. The selected road sections are surrounded by residential and commercial buildings, street vendors and other economic activities. The temporary or permanent loss of livelihoods for some street vendors is likely and it is possible that large numbers of street vendors and small businesses and markets along the major road alignments could be affected, thus requiring some type of compensation. Furthermore, the proposed lake transportation will impact economic activities related to fish farms; the owners will have to be compensated for loss of livelihood. Livelihood restoration plans will be developed as necessary to address loss of livelihoods as identified in the social and vulnerability assessment and based on technical designs

4.115 There are concerns about the proposed replacement of the gasoline Zémidjan motorcycle taxis by electric motorcycles under Component 4. The team has included consultations in the terms of reference for the preparation of technical studies and designs, under Component 3 to consider stakeholder feedback in technical design. The SEP will also engage stakeholders on any concerns they have during project implementation.

4.116 Construction works could generate a large volume of complaints related to traffic congestion, road diversions, blocked access to residential or commercial areas, accidents and road traffic management. The Borrower has prepared an Environmental and Social Impact Assessment (ESIA) and resettlement plan (RP) for the ATC road sections.

4.117 SIRAT is the agency that will house the project implementing unit. At preparation stage, SIRAT's existing E&S unit will be responsible for overseeing the preparation of the project. SIRAT will establish a project-specific unit to include one environmental, one social specialist and one gender specialist.

Annex 5: Paris Agreement Alignment

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

4.119 **BB1: Alignment with the Mitigation Goals of the Paris Agreement.** The use of proceeds will finance five components:

(i) Improvement of the governance of the transport sector in Grand Nokoué
(ii) Professionalization of paratransit operators and strengthening of road and waterway safety oversight and management
(iii) Improvement of Transport Conditions, including a) Operationalization of multimodal public transport services, b) Provision of infrastructure supporting sustainable and multimodal transport
(iv) Electrification of two-wheelers, including a) Technical assistance for Fleet Renewal Strategy and Pilot Program Implementation, b) Deployment of a fleet of electric motorcycle taxi in Grand Nokoué, and b) Structuring a local electric mobility industry.
(v) Capacity Building and Project Management.

4.120 Due to the difference in nature of the Project Components, we have to analyze them from the Paris Alignment perspective, individually:

(i) Components 1, 2, and 5, given their research and policy nature, can be classified as aligned both for adaptation and mitigation goals of the Paris Agreement due to its neutral impact on climate mitigation and the immateriality risk from the climate resilience perspective.
(ii) Components 3 and 4 will finance some material items that will be analyzed one by one.
    i. Sub-Component 3.1 consist of the provision of an electric bus fleet and an electric boat fleet. These two elements are universally aligned for the mitigation goals of the Paris Agreement and due to their mobile nature, can be considered aligned as well for the adaptation goals of the Paris Agreement following AIIB's methodological notes.
    ii. Sub-Component 3.2 includes (among other elements) the rehabilitation, reconstruction, and reconfiguration of existing road infrastructure (RNIE1 and RNIE2), construction of climate-resilient and inclusive IWT infrastructure and re-construction and reconfiguration of a 2.4-km green mobility corridor. The Road reconstruction and reconfiguration alongside RNIE1 and RNIE2 (2x2 lanes) and the 2.4 green mobility corridor (2x1 lanes) will not have any capacity expansion and thus they are considered universally aligned with the mitigation goals of the Paris agreement. The IWT component is on the list of universally aligned activities and will not handle nor transport fossil fuels and present no material risk of contributing to deforestation, thus it is aligned with the mitigation goals of the Paris

Agreement. These Components are subject to a Climate Resilience Assessment to determine its alignment with the adaptation goals of the Paris Agreement.

iii. Sub-component 4.2 and 4.3 consist of the deployment of electric mototaxis fleet in Grand Nokoué and will finance the rollout of a large-scale fleet renewal program aimed at replacing 60,000 conventional mototaxis with electric two-wheelers and build and electric mobility industry. These two elements are universally aligned for the mitigation goals of the Paris Agreement and due to their mobile nature, can be considered aligned as well for the adaptation goals of the Paris Agreement following AIIB's methodological notes.

4.121 In line with the other co-financier in this Project (WB), we conclude that all the project components are Universally aligned with the mitigation goals of the Paris Agreement. All the components except 3.2 are aligned with the adaptation goals of the Paris Agreement as well, whereas 3.2 is subject to a Climate Resilience Assessment to determine its alignment with BB2.

4.122 **BB1 conclusion: All the project components are on the JMDB list of universally aligned activities and thus, the Project can be considered to be aligned with the PA's climate mitigations goals (BB1).**

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

4.124 **Climate Risk and Vulnerability Assessment (CRVA):** A high-level Climate and Disaster Risk Screening (showing exposure and sensitivity below) has identified floods and coastal erosion as primary hazards. A detailed flood risk assessment and management plan is being developed with GFDRR support, ensuring climate resilience measures are embedded throughout project implementation.

4.125 **Exposure:** Benin is already experiencing the impacts of climate change, and these are expected to worsen over time with rising temperatures, greater weather variability and more extreme weather events. Over the past 60 years, annual temperatures have increased by 1°C and precipitation has decreased by about 10%. However, in coastal regions precipitation increased by about 7% (Cotonou station) and there has been an increase in the frequency of extreme precipitation events. The regions of Cotonou, Atlantique, Oueme, in the coastal area of Benin and where the project is located, have a combination of high river and urban floods and wildfire hazards, and medium level of coastal floods, water scarcity and extreme heat hazards. The urban areas of Cotonou and Porto Novo experience recurrent floods, and these are becoming increasingly severe and destructive. Coast regions already have one of the highest rates of coastal erosion in the Gulf of Guinea. Hazard levels are expected to increase with the rise in temperatures, intensification of extreme rainfall events and sea level rise. Sea level is projected to rise by 30 centimeters by 2050 and by 50 to 81

centimeters between 2070 and 2100. Climate change impacts pose a threat to coastal regions and especially to the urban areas surrounding Lake Nokoué, due to the increasing risk of strong winds, high storm surge, flooding and erosion.

4.126 **Sensitivity:** Benin is highly vulnerable to the impacts of climate change, which present significant risks for sustainable urban mobility. Benin ranked 170 out of 187 countries in the ND GAIN Country Vulnerability Index. River, urban and coastal floods impact the transport sector with increased infrastructure deterioration, service disruptions and hindered circulation, causing transport delays, raising maintenance and rehabilitation costs. In a 1-in-100-year flood scenario it is estimated that almost 4,000 kilometers (12%) of urban road networks would be exposed to flooding. The National Interstate Roads – RNIE 1 and 2 - are highly exposed to extreme heat which can cause short-term deformation of bitumen, leading to traffic disruptions, and long-term damage when alternating with heavy rainfall. The ability of the road network to withstand adverse climatic conditions is crucial for the resilience of economic activities. Climate risks are not consistently considered in the planning of construction or maintenance interventions on the transport network. This lack of an adequate road asset management strategy exacerbates the country's exposure to climate-related disasters. The APC is highly vulnerable to coastal erosion. The APC could benefit from extending the dikes to reduce coastal exposure to erosion and inundation and developing an adaptation plan to counter coastal erosion risks downstream of its dikes**.**

4.127 **Climate adaptation measures:** The project incorporates measures tackling the climate hazards found (on the CRVA) as likely to materially affect the project such as rainwater discharge, floods, and coastal erosion. The whole list of measures is as follows:

Table 10: Climate adaptation measures

Climate Hazard	Measure and justification
Rainwater discharge, floods, and coastal erosion.	Structural: ▪ Enhanced drainage and bridge design for increased rainwater discharge. ▪ Elevated roads and pier infrastructure in flood-prone areas. ▪ Flood and erosion protection measures. Non-structural: ▪ Technical assistance (TA) to support the development and operationalization of climate resilient low-carbon urban mobility strategies and freight management plans for Grand Nokoué. The TA supports the development of a Strategic Environmental and Social Assessment including climate risks, the integration of a climate risks module and resilience protocols and practices in road asset management systems, and the establishment of climate risks monitoring and early warning systems. ▪ TA and training activities to support the establishment and operation of an urban mobility authority in Grand Nokoué. This includes the provision of TA and training specifically on climate risk management and resilience measures, including nature-based solutions, as well as on regulatory, planning, financial and social-economic elements of public transport, NMT and electric mobility.

4.128 The project does not pose risk for maladaptation.

4.129 **Non-incompatibility with the NDC and other Adaptation Strategies.** The proposed project is consistent with Benin´s climate commitments, policies and strategies[16][17][18], including the NDC targets of 20.15% reduction in GHG emissions by 2030. The proposed project also aligns with WBG's Country Climate and Development Report (CCDR) for Benin[19]. The NDC and NAP highlight the importance of strengthening the climate resilience of infrastructure, urban areas and coastline, strengthening institutional adaptive capacities, integrating climate risks considerations in construction standards and in policies and strategies of the transport sector. The project supports these objectives through investment in public transport, Inland waterways transport, electric mobility, active mobility, climate-resilient transport infrastructure, capacity building for low-carbon climate resilient urban mobility and freight management strategies.

4.130 **Climate Mitigation Finance.** Some elements of the project qualify as Climate mitigation finance following the JMDB common principles. AIIB's amount of climate mitigation finance has been estimated as USD 96.37 million or approximately 48.2%.

16 The Nationally Determined Contribution (NDC). *Contribution déterminée au niveau national actualisée du Benin au titre de l'Accord de Paris, GoB, 2021*. Accessible via Benin First NDC (Updated submission) | UNFCCC.
17 The National Adaptation Plan (NAP), *Plan national d'adaptation aux changements climatiques du Bénin, GoB, 2022*. Accessible via the https://unfccc.int/sites/default/files/resource/PNA_BENIN_2022_0.pdf
18 National Climate Change Management Policy (PNGCC 2021-2030). *National Climate Change Management Policy. Republic of Benin. 2020*. Available at https://climate-laws.org/document/climate-change-management-policy-for-2030_ba82
19 Country Climate and Development Report, Benin, The World Bank Group, 2023.

Climate mitigation Activity	Justification	Climate mitigation finance allocation (m USD)
Component 1: Improvement of the transport sector governance in Grand Nokoué	Assigned CCA across the following activities financed based on the activity level financing breakdown: ▪ Development of studies: 100% Climate mitigation finance assigned for promoting low carbon transport under 12.6: Policy support and technical assistance for climate change mitigation of the Joint MDB List of Eligible Mitigation Activities. ▪ Establishment and management of a platform for dialogue between government and the transport industry: Pro-rated to project.	3.86
Sub-component 2.3 Improving the safety of lake transport in the Nokoué lake.	Assigned climate mitigation finance to the entire subcomponent for enabling/improving low-carbon IWT under 8.5: Low-carbon mode and efficiency improvement in maritime and inland waterway transport of the Joint MDB List of Eligible Mitigation Activities.	0.50
Subcomponent 3.1 – Operationalization of multimodal public transport services.	Assigned climate mitigation finance across the following activities financed assuming an equal split of financing: ▪ Planning of a structured, low-carbon, multimodal public transport system and modernize and operationalize public transport: 100% Climate mitigation finance under 12.6: Policy support and technical assistance for climate change mitigation of the Joint MDB List of Eligible Mitigation Activities. ▪ Provision of an electric bus fleet: 100% Climate mitigation finance under 8.1: Urban and rural transport of the Joint MDB List of Eligible Mitigation Activities. ▪ Provision of electric boat fleet: 100% Climate mitigation finance under 8.5: Low-carbon mode and efficiency improvement in maritime and inland waterway transport of the Joint MDB List of Eligible Mitigation Activities.	6.50
Subcomponent 3.2 – Provision of infrastructure supporting sustainable and multimodal urban mobility.	Assigned CCM across the following activities financed using the financing information provided (pro-rated to AIIB financing). ▪ Road infrastructure (USD 25.43m): 10% Climate mitigation finance for NMT facilities under 8.2: Urban and rural transport of the Joint MDB List of Eligible Mitigation Activities. ▪ Land public transport infrastructure (USD 7.48m): 100% Climate mitigation finance for supporting public transport operations such as bus lanes under 8.1: Urban and	56.40

	rural transport of the Joint MDB List of Eligible Mitigation Activities. ▪ Construction of climate-resilient and inclusive IWT infrastructure including associated facilities (USD 32.92 million): 100% Climate mitigation finance under 8.5: Low-carbon mode and efficiency improvement in maritime and inland waterway transport of the Joint MDB List of Eligible Mitigation Activities. ▪ Construction of a section of the green mobility corridor (USD 9.31 million): 100% Climate mitigation finance for the design of pedestrian, bicycle and public transport under 8.1 and 8.2: Urban and rural transport of the Joint MDB List of Eligible Mitigation Activities. ▪ Deployment of ITS and communication technologies (USD 8.3 million): 50% Climate mitigation finance for use of ITS to prioritize public transit/NMT, under 8.1: Urban and rural transport of the Joint MDB List of Eligible Mitigation Activities. ▪ Works implementation and supervision (USD 16.66 million): Pro-rated to subcomponent	
Sub-component 4.1 Technical assistance for Fleet Renewal Strategy and Pilot Program Implementation.	Pro-rated to Subcomponent 4.2	1.50
Sub-component 4.2 Deployment of electric mototaxis fleet in Grand Nokoué.	Assigned Climate mitigation finance across the following activities financed assuming an equal split of financing: ▪ Purchase of electric two wheelers: Assigned 100% Climate mitigation finance for scrappage premiums granted to support the rollout of electric two wheelers under 8.6: Low-carbon vehicles and associated infrastructure of the Joint MDB List of Eligible Mitigation Activities. ▪ Installation of charging or battery-swapping stations: Assigned 100% Climate mitigation finance for investments in charging infrastructure to support e-mobility under 8.6: Low-carbon vehicles and associated infrastructure of the Joint MDB List of Eligible Mitigation Activities. ▪ Implementation and monitoring: Assigned 100% Climate mitigation finance for implementation and monitoring of the regulatory measures and activities that create an enabling environment to deploy the electric motor taxi fleet 12.6: Policy	11.50

	support and technical assistance for climate change mitigation of the Joint MDB List of Eligible Mitigation Activities.	
Sub-component 4.3 Structuring of local electric mobility industry.	Pro-rated to 4.2	16.00
Component 5: Capacity Building and Project Management	Pro-rated to project	4.80
Gross Climate Mitigation Finance (USD m)		**101.06**
Net Climate Mitigation Finance (USD m)		**96.37**
AIIB's share amount (out of USD 200 million)		**48.185%**

4.131 **Climate Adaptation Finance.** The joint MDB methodology specifies three criteria that need to be met simultaneously for a project or activity to be considered as adaptation finance. These criteria and the justification for this project is explained below:

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

(ii) **Criteria 2, a statement is explicitly made for the project to reduce the climate vulnerability and/or to enhance the climate resilience**: The project construction related costs will include climate resilience measures, identified through a thorough climate risk and vulnerability assessment. It is therefore the explicit intent of those activities to develop a sustainable Urban mobility Project that is 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 BB2 section above.

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

Climate Adaptation Activity	Justification	Climate adaptation finance allocation (m USD)
Component 1: Improvement of the transport sector governance in Grand Nokoué	Assigned CCA across the following four activities financed based on the activity level financing breakdown: ▪ Development of studies: 50% Climate Adaptation Finance assigned for development and integration of climate risk module to strengthen climate resilience of road assets and operations. ▪ Establishment and management of a platform for dialogue between government and the transport industry: Pro-rated to project.	1.85
Sub-component 2.3 Improving the safety of lake transport in the Nokoué lake.	Assigned 10% Climate Adaptation Finance to the entire subcomponent for raising awareness on safety regulations and best practices for extreme weather preparedness and emergency response.	0.05
Subcomponent 3.1 – Operationalization of multimodal public transport services.	Assigned Climate Adaptation Finance across the following four activities financed assuming an equal split of financing: ▪ Planning for a structured, low-carbon, multimodal public transport system: 10% Climate Adaptation Finance for rehabilitating and upgrading infrastructure to climate standards with enhanced drainage systems designed to accommodate current and projected climate conditions. ▪ Modernize and operationalize public transport: 10% Climate Adaptation Finance for climate resilience measures included in rehabilitation/ construction of bridges and drainage facilities.	0.33
Subcomponent 3.2 – Provision of infrastructure supporting sustainable and multimodal urban mobility.	Assigned Climate Adaptation Finance across the activities financed, using the financing information provided (pro-rated to AIIB total of USD 140m): ▪ Road infrastructure (USD 25.43m): 50% Climate Adaptation Finance for upgrading of roads to climate-resilient standards. ▪ Bridges (USD 39.9m): 50% Climate Adaptation Finance for upgrading to climate-resilient standards including climate change considerations in height. ▪ Land public transport infrastructure (USD 7.48m): 10% Climate Adaptation Finance for including climate resilience measures. ▪ Construction of climate-resilient and inclusive IWT infrastructure including associated facilities (USD 32.92): 10% Climate Adaptation Finance. ▪ Works implementation and supervision	36.71

	(USD 16.66m): Pro-rated to subcomponent.	
Component 5: Capacity Building and Project Management	Pro-rated to project	1.96
Gross Climate Adaptation Finance (USD m)		**40.9**
Net Climate Adaptation Finance (USD m)		**36.76**
AIIB's share amount (out of USD 200 million)		**18.38%**

4.132 Using AIIB's Incremental approach based on the JMDB methodology for tracking climate adaptation finance, we can allocate to the Project climate adaptation finance equivalent to the sum of the cost of the elements abovementioned minus the dual benefit contribution. The net climate adaptation finance is equal to USD 36.76 million, equivalent to 18.38% of AIIB's financing.

4.133 The total climate finance of the project would be the sum of the climate mitigation finance and the climate adaptation finance after deducting dual benefits. The net climate mitigation finance would be USD 96.37 million whereas the net climate adaptation finance would be USD 36.76 million, being the total climate finance USD 133.13 million, equivalent to 66.57%. Dual benefits account for USD 9.27 million.

4.134 **GHG Assessment:** The socio-economic analysis of the project made by the WB includes an estimation of its impact on GHG emissions by comparing a with-project and without-project scenario. The methodology follows a standard approach, using vehicle-kilometers traveled (vkm) as the key indicator and applying emission factors per mode to quantify the reduction in emissions.

4.135 For electrified transport modes, since direct tailpipe emissions are zero (Tank-to-Wheel, TTW), the analysis considers the emissions associated with electricity generation (Well-to-Wheel, WTW). Specifically, the carbon intensity of Benin's electricity mix was factored into account for the emissions resulting from energy production and consumption by electrified modes.

4.136 The following key project components were identified as having an influence on GHG emissions:

(i) Electrification of Zemidjans: The transition from ICE to electric motorcycles results in a reduction in emissions due to the elimination of direct fuel combustion.

(ii) Electric Multimodal Public Transport and Associated Infrastructure: While the project enables a shift from thermic motorcycles to electric public transport, a significant share of induced demand is expected, leading to a net impact that balances massification benefits with additional travel demand.

(iii) Bridges, ATC, and PCRT/SLT: These components aim to reduce congestion, leading to lower fuel consumption and emissions from idling and inefficient traffic flows.

4.137 Results show an estimated yearly reduction of 151,000 tCO_2e. The project is expected to reduce mobility-related emissions in Grand Nokoué by 12% over the period. This reduction is primarily driven by the electrification of zemidjans, which accounts for 70% of the total GHG emissions reduction. Additional contributions come from the implementation of a multimodal public transport system (19%) and the reduction of road congestion through the construction of bridges, ATC, and PCRT/SLT (11%).

Annex 6: Gender Equality and Social Inclusion

4.138 **Gender Assessment.** With a value of 0.612, Benin ranks 148th (2019) in the United Nations (UN) gender inequality index (GII) *(UNDP, 2020)*, significantly above the global average of 0.436. Similar to the GINI coefficient the GII indicates male and female equality across health, empowerment and labor market dimensions. Higher numbers indicate more inequality. Also, Benin fairs below the world average of 0.943 in the UN gender development index (GDI) where it measured 0.88 in 2019. The GDI is a ratio of the UN female and male human development indicators, if above 1 the human development indicator is higher for women than for men. Benin also ranks 134th (2024) in the World Economic Forum global gender gap index which measures the gender gap across economic participation and opportunity, educational attainment, health and survival and political empowerment. The report also reveals severe inequalities among men and women in access to education, political and job market participation *(WEF, 2024)*. These results indicate that Beninese women are in particularly fragile economic conditions and raise concerns that they may become targets of Gender-based violence (GBV), sexual exploitation and abuse (SEA) sexual harassment (SH) of a level of severity and frequency higher than other countries.

4.139 Benin acknowledges the problems outlined above and has taken steps to improve gender equality. The legal framework recognizes gender equality at the highest level, through New Article 26 of the 1990 Constitution. Furthermore, Benin has signed and ratified international instruments, approved several legal instruments and instituted a range of policies and programs to promote gender equality (AfDB, 2024). Some examples are: The Convention on the Elimination of All Forms of Discrimination against Women; The Protocol to ACHPR on the Rights of Women; The National Gender Promotion Policy; The National Policy for the Promotion of Women in Agriculture; and The National Action Plan to Combat Gender-Based Violence.

4.140 **Gender Equality Instruments.** A “Social and Vulnerability Assessment” and a Stakeholder Engagement Plan have been conducted by the Client, with a view to address the risk of exclusion of socially disadvantaged groups. The assessment includes gender issues, and the results of the assessment will be used to update various ES documents to ensure that women and vulnerable groups will be able to access project benefits, and specific measures will be introduced to address ES risks and impacts on women, vulnerable and disadvantaged groups.

4.141 To contribute to addressing the gender gap in the transport sector, gender has been integrated into the Project design through key interventions and various Project components. The Component 1 seeks to expand transit coverage and enhance women’s mobility, which will provide direct benefit for women in their access to socio-economic activities. In particular, Component 1 extends Project activities to support people’s access to engineering skills by giving priority to women. Other gender promotion activities are embedded in Project component 1 through improved gender-responsive transport planning. Likewise, Components 2 and 3.2 will include activities crucial to elevating women’s safety such as anti-harassment campaigns, GBV training for police, transport operators and law enforcement agencies, and safer road designs with walkways and lighting. Components 3.1 and 4, in particular, will provide training for women to access employment and their participation in public transport sector (i.e., engineers, bus drivers, e-mobility). Other gender specific engineering designs as

part of the Project requirements that will benefit women directly include street lighting, horizontal signaling, including pedestrian crossings, pedestrian walkways and vertical signing. All of these features will greatly contribute to a more equitable mobility for women as they are more predominantly proportionally pedestrians.

4.142 During implementation, the Project will implement actions to prevent negative impacts on women. Civil works TORs will include the obligation to implement actions to prevent sexual exploitation abuse (SEA) and sexual harassment (SH) of female pedestrians, hawkers, workers and other female road users by construction workers. The TORs will also include the obligation to ensure proper lighting and other safety conditions for road users around construction sites. The Project will implement actions to maximize positive impacts on women's economic empowerment and security. Civil works will include clauses in contracts to ensure equal pay for men and women in similar functions. Women only focus groups will be organized to ensure concerns are acknowledged and addressed before the operational phase starts.

4.143 During the operational phase, an operational plan will be prepared, including educational campaigns and enforcement actions to avoid SEA and SH in areas of agglomeration, particularly onboard buses and ferries and at stations. Introduction of female only areas on buses, ferries and stations will be considered, and proper lighting and safety conditions in and around stations will be ensured. In addition, capacity building for women operators of public transport will be provided, and actions to promote female entrepreneurship associated with public transport, such as formalizing female vendors around stations will be considered, as well as actions to promote female ridership.

4.144 **Gender indicators.** In addition to these specific interventions through various Components, gender has also been integrated into the Project's Monitoring Framework, which includes various development objective indicators (e.g., average daily passenger using public transport, including buses and boats and users accessible to sustainable transport infrastructure). Project Objective Indicators will allow the Project to monitor both men's and women's access to public transport during implementation, while Intermediate Results Indicator will monitor the impact on women's economic empowerment:

(i) Project Objective Indicators:
   i. Satisfaction rating by public transport users of the public transport services - female
   ii. Population of Grand Nokoué benefitting from improved access to sustainable transport infrastructure and services - female

(ii) Intermediate Results Indicators:
   i. Share of women employed in the bus and boat operations.
   ii. Share of female beneficiaries of the apprenticeship program

Annex 7: Member and Sector Context

4.145 **Benin transport sector.** Due its geographical location, Benin is a natural corridor connecting several West African countries, such as landlocked Burkina Faso and Niger. The country is strategically located at the junction of two important regional trade routes, the East-West Lagos-Abidjan and the South-North Cotonou-Niamey corridors. However, despite this favorable comparative advantage, weaknesses were identified in key infrastructure in general and transport infrastructure in particular. Since 2016, the Republic of Benin has made transport infrastructure a strategic lever for the country's development, placing particular emphasis on improving transport, logistics, and trade infrastructure, in line with the vision of the structural transformation needed for the country. The transport infrastructure development program implemented during the 2016-2021 five-year period resulted in the following achievements:

(i) In the road transport infrastructure subsector, the development and paving of 771 km of roads have been fully completed, 1,385 km are under construction, 445 km are under preparation, and 502 km are prepared and require financing.

(ii) In the air transport subsector, the renovation, modernization, and expansion of Cotonou International Airport, as well as the project to build a new international-class airport in GDIZ (for which technical studies have been completed).

(iii) In terms of maritime transport, the improved governance of the APC, concurrently with the gradual renovation and modernization of existing port infrastructure. Furthermore, the redevelopment of the road axes around the Port of Cotonou will help to improve the movement of people and goods in the port area.

4.146 Certain constraints continue to affect the infrastructure and transport sector in Benin, including inadequate integration of different modes of transportation within the infrastructure sector, the insufficient organization of transport services, and the inefficient management of freight transportation. These highlight the need for further efforts to enable Benin to effectively play its role as a logistics and export hub.

4.147 For the five-year period 2021-2026, to support the significant increase in planned investments in the infrastructure and transport sectors, Benin is increasingly seeking support from international partners such as the European Union, the AfDB and the IsDB for the development of major transport infrastructure (North Cotonou bypass, reconstruction of the RNIE2 between Cotonou and Dassa, Seme-Porto Novo road widening…), surfacing, rehabilitation and strengthening of 1,112 km of roads, construction of 12,600 km of rural roads and development of 1,415 km of unpaved roads and associated structures, and other projects in the airport, port and maritime sectors.

4.148 **The development of Grand Nokoué.** Two major infrastructure projects symbolize the strengthening of Grand Nokoué as a regional economic hub.

(i) The APC. Looking ahead to 2026, the Port is undergoing a FCFA 450 billion (USD 745 million) modernization and expansion plan, which includes the construction of the new terminal 5, the expansion of the harbor basin, the renovation of the northern quays, the development of a logistics zone and a second oil terminal, the construction of a new fishing port and maritime business center, etc. These developments aim to enhance efficiency, increase capacity, and strengthen the

Port's global competitiveness, cementing its role as a leading trade hub in the region.

(ii) The construction of a northern bypass road around Cotonou "CONOCO" (37 km) and its connecting road to the APC (5.7 km). This bypass represents the central part of the Beninese section of the Abidjan-Lagos transnational highway under development (total 1,028 km, USD 15.6 billion, technical studies are already prepared by the AfDB). CONOCO will efficiently connect Greater Nokoué and its trade, industrial and economic infrastructures, to the emerging Abidjan-Lagos megalopolis, spanning 5 countries (Côte D'Ivoire, Ghana, Togo, Benin and Nigeria), and home to more than 50 million people by 2035.

4.149 The implementation of these transport infrastructure projects, in parallel with the Sustainable Urban Mobility Project, is part of a global approach to the economic and urban development of Grand Nokoué. Benin aims to enhance its economic, industrial, and commercial capabilities in the upcoming years by developing internationally recognized equipment and infrastructure, such as:

(i) **Glo-Djigbé Industrial Zone (GDIZ -** connected to RNIE2 and the green mobility corridor). Located 45 km from Cotonou, the GDIZ spans 1,640-hectares and serves as an integrated industrial hub designed to boost local processing of key agricultural products, including cotton, cashews, pineapples, shea nuts, and soybeans. Developed as a public-private partnership, GDIZ is projected to attract USD 1.4 billion in investment and create approximately 300,000 jobs by 2030. Strategically positioned along a major highway, the zone benefits from direct access to Cardinal Bernardin Gantin International Airport, the APC, and a future railway corridor, ensuring efficient freight transport. As a cornerstone of Benin's industrialization strategy, GDIZ aims to drive economic diversification, attract foreign investment, and reduce the export of raw materials by fostering value-added manufacturing and agro-processing industries.

(ii) **Abomey-Calavi Wholesale Market** (connected to RNIE2 and the green mobility corridor). Designed to relocate and modernize the wholesale market currently located at Dantokpa Market, in Cotonou's city center, this new facility will be located in Zopah, covering 200,000 m² and hosting 600 wholesale operators, a slaughterhouse, and administrative buildings. The market is part of a 150-hectare site, accessible via Pavés Kérékou Road from RNIE 2. While two access junctions are planned, detailed designs are ongoing. Initial projections estimate 500 UVP/h at morning peak hours, with a significant presence of heavy goods vehicles. Further recalibration of traffic estimates will be necessary once the official traffic impact study is finalized. The development may also necessitate a direct northern connection to alleviate congestion at the Missè-Sinto junction.

(iii) **Dantokpa Market Relocation** (connected to RNIE2 and the green mobility corridor). The Dantokpa Market, one of West Africa's largest open-air markets, has been set to be relocated to the new Abomey-Calavi Wholesale Market in Zopah, 1.5 km from RNIE 2. Spanning 168 hectares, the new market is expected to become a major economic hub for Benin and the wider region by 2026, as part of the government's efforts to modernize commercial spaces and improve traders' working conditions.

Annex 8: Country Credit Fact Sheet

4.150 **Background.** Benin is a lower-middle-income country located in Sub-Saharan West Africa with income per capita of around USD 1,500 (or USD 4,500 in purchasing power parity), and a population of 14 million. More than two thirds of the population is under the age of 30. Agriculture accounts for 27% of GDP, over 40% of exports, and employs over two-thirds of Benin's workforce, making the country vulnerable to climate risks and commodity cycles.

4.151 Benin's membership to the West Africa Economic and Monetary Union (WAEMU) which has a common currency (the CFA franc), pegged to the euro, has provided a long history of macroeconomic stability. Furthermore, Benin is strategically located at the intersection of two significant regional corridors, the Abidjan-Lagos and Cotonou-Niamey routes.

4.152 **Recent developments.** In the past decade Benin made significant strides in macroeconomic management, supported by the Government Action Program (2016-21). For much of this time, Benin has been under various IMF programs, which have provided an anchor for economic policies and have helped to sustain confidence. Growth has been strong, averaging around 6% per year since 2017 (with a temporary slowdown in 2020, due to the covid pandemic), while inflation has been contained below 3%. This enhanced Benin's credibility allowed it to access international capital markets, with two Eurobond issuances (in 2019 and 2025) and a first-ever SDG bond by an African sovereign in 2021, which reflects investor confidence, supported by reforms and the strong economy. The country is seeing the emergence of new industries, with exports of higher value-added goods, along with growth in information technology and tourism sectors. It has also invested in special economic zones (SEZ).

4.153 According to the IMF, performance under the current program remains strong, with all recent targets and reform measures achieved. In December 2023, the Fund approved additional USD200 million under its new climate facility (RSF), designed to bolster country's resilience to climate change. The most recent program review took place in December 2024.

Key Economic Indicators	2020	2021	2022	2023	2024*	2025*	2026*	2027*
Real GDP growth 1/	3.8	7.2	6.3	6.4	6.5	6.5	6.2	6.2
Inflation (CPI, e.o.p.) 1/	1.2	5.0	2.8	0.4	2.0	2.0	2.0	2.0
Fiscal balance	-4.7	-5.7	-5.5	-4.1	-3.7	-2.9	-2.9	-2.9
Public debt	46.1	50.3	54.2	54.5	54.0	52.6	51.5	50.5
Gross public financing needs	10.8	14.2	16.0	11.4	8.5	7.4	6.5	6.3
Current account balance	-1.7	-4.2	-6.0	-6.4	-5.7	-5.1	-4.5	-4.3
External debt	28.4	36.8	37.6	38.8	43.0	42.8	42.7	42.4

Source: IMF country report 24/356, country's authorities; in % of GDP, unless indicated otherwise
Notes: 1/ % change, year-on-year

4.154 **Outlook and risks.** Growth is projected to remain strong, exceeding 6% in the near term, driven by agroindustry, construction, textile, and trade. While the current account temporarily weakened due to high investments, a gradual recovery is expected as the local processing of local commodities in SEZs boosts exports. Over the medium term, growth is expected to be around 6%, reflecting higher infrastructure spending under the new Government Action Plan, increased agricultural output and wider regional growth.

4.155 Inflation in Benin can be volatile, reflecting volatile commodity prices and exchange rate movements of its main trading partners, but remains generally under control, thanks to

Benin’s membership in WAEMU. Prices are expected to increase by around 2% in the near term.

4.156 Risks include escalating security threats posed by a militant insurgency in the region, and also the impact of Niger border closures amidst regional sanctions on that country. However, these events are concentrated in the north, away from the country’s economically important south.

4.157 According to the IMF, Benin is at moderate risk of external debt distress. Benin's debt burden has risen through the pandemic, from 41% of GDP in 2019 to around 55% in 2023. Public debt is most vulnerable to commodity price shocks and natural disasters. Public debt is expected to gradually decline in the medium term. Revenue mobilization by the government (around 15%) has been improving thanks to sustained government efforts supported by the IMF. The authorities’ plan is to further increase revenues and reduce the fiscal deficit to 2.9% of GDP in 2025, below the WAEMU threshold of 3%.

4.158 Moody’s and Fitch have affirmed Benin’s sovereign credit ratings at B1 and B+, respectively, both with a stable outlook. In April 2024, S&P upgraded Benin’s rating to BB- from B+, citing strong economic growth, effective fiscal management, and resilience to external uncertainties. S&P highlighted significant improvements in budget performance, driven by steady revenue growth and ongoing structural reforms. Most recently, S&P revised the outlook to positive in October 2024.