PRE-FEASIBILITY STUDY

Developing the Green Climate Fund (GCF) Project: Enabling Low-emission Urban Transport (LEUT) in Greater Lomé, Togo

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Developing the Green Climate Fund (GCF) Project: Enabling Low-emission Urban Transport (LEUT) in Greater Lomé, Togo

GGGI tasked CPCS to revise technical documentation and develop a pre-feasibility study for the Low-Emission Urban Transport Programme in Greater Lomé, aligning it with GCF requirements.

Pre-Feasibility Study

This report presents the pre-feasibility assessment of the project concept, including an evaluation of institutional/regulatory, technical, environmental and social, and financial and economic aspects. It will serve as an Annex to the GCF concept note.

Acknowledgements

The CPCS Team acknowledges and is thankful for the input of those consulted, as well as the guidance and the input of representatives from the GGGI.

Opinions and Limitations

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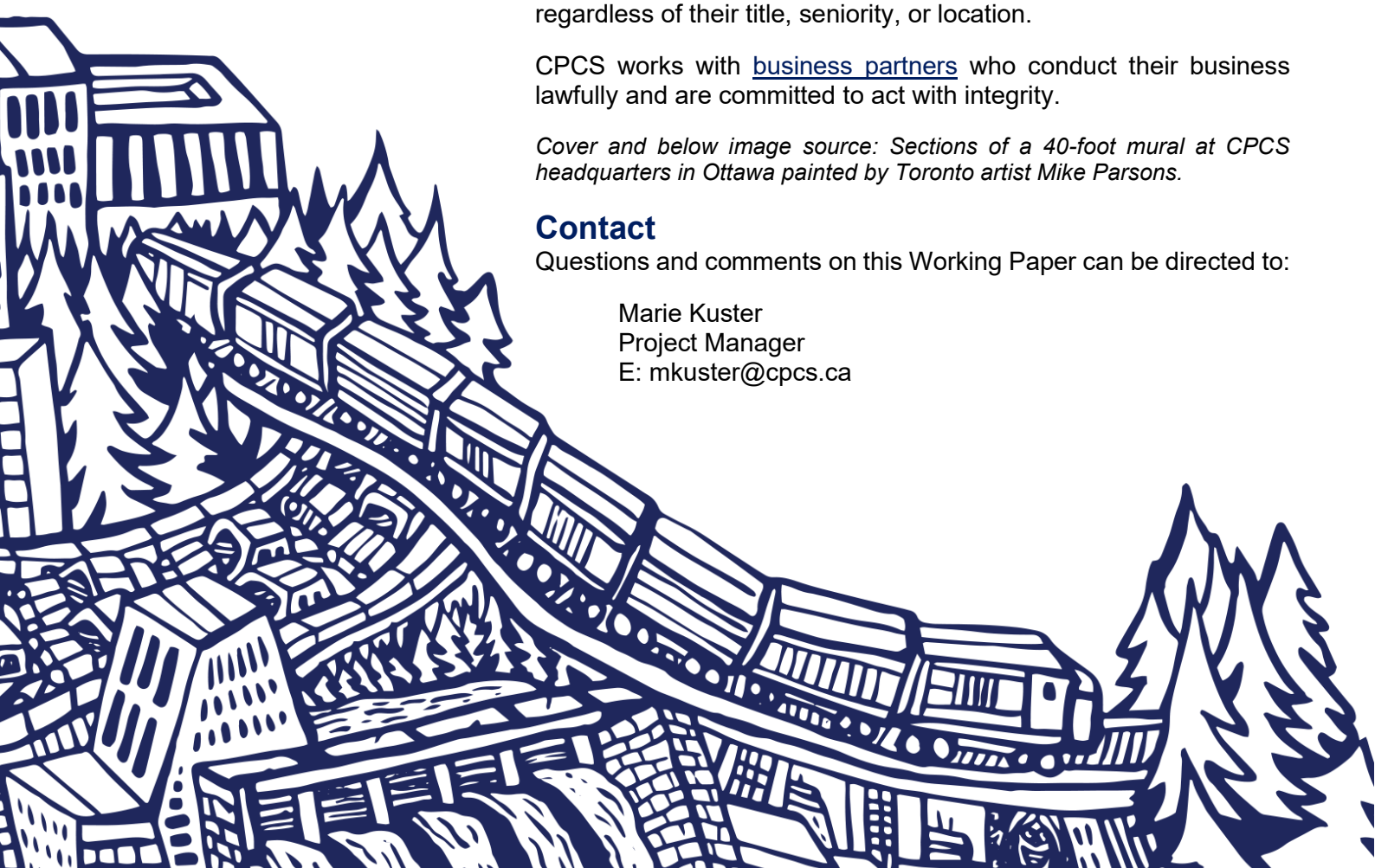


Table of contents

List of figures

List of Tables

Acronyms

AE	Accredited Entity
AfDB	African Development Bank
AFD	Agence Française de Développement
AGEROUTE	Agence de gestion des travaux d'infrastructures routières
AOM	Autorité Organisatrice de la Mobilité
BHLS	Bus with High Level of Service
BRT	Bus Rapid Transit
CEET	Compagnie Énergie Électrique du Togo
CPCS	CPCS Transcom Limited
DAGL	District Autonome du Grand Lomé
DBSA	Development Bank of Southern Africa
EIB	European Investment Bank
EBID	ECOWAS Bank of Investment and Development
ESMP	Environmental and Social Management Plan
GAP	Gender Action Plan
GCF	Green Climate Fund
GGGI	Global Green Growth Institute
GL	Greater Lomé
GHG	Greenhouse Gas
IFC	International Finance Corporation
IsDB	Islamic Development Bank
ITS	Intelligent Transport System
JICA	Japan International Cooperation Agency
LEUT	Low-Emission Urban Transport
MERF	Ministry of Environment and Forest Resources
MTP	Ministry of Public Works
MTRAF	Ministry of Road, Air and Railway Transport
NDC	Nationally Determined Contribution
NMT	Non-Motorized Transport
ONSR	Office National de la Sécurité Routière
OTT	Observatoire Togolais des Transports
PMUD	Plan de Mobilité Urbaine Durable
PPF	Project Preparation Facility
SDG	Sustainable Development Goal
SOTRAL	Société des Transports de Lomé
STILTS	Sustainable Transport and Infrastructure for Low-Carbon Transition Support
UNEP	United Nations Environment Programme

Executive Summary

The document is a pre-feasibility study for the Low-Emission Urban Transport (LEUT) project in Greater Lomé, Togo, developed for the Green Climate Fund (GCF). It assesses the project's viability and alignment with GCF investment criteria, focusing on institutional, technical, environmental, social, and financial aspects. The study aims to provide a structured assessment to support the Government of Togo in securing funding for sustainable urban transport initiatives.

Context and Rationale

Rapid urbanization in Greater Lomé has intensified mobility needs and led to rising greenhouse gas (GHG) emissions. To address these challenges, the Government launched the LEUT program in 2023. The original concept focused on a Bus Rapid Transit (BRT) system, but has since evolved – based on feasibility constraints and stakeholder feedback – into a more flexible design centered on high-service bus lanes (BHLS) and complementary sustainable mobility infrastructure.

The updated project concept includes three integrated components:

- **Component 1**: Construction of Bus with High Level of Service (BHLS) corridors and complementary facilities including park-and-ride hubs, bus depots, terminals, and pedestrian and cycling infrastructure.
- **Component 2**: Deployment of smart and green mobility systems, including the procurement of 100 electric buses, solar-powered charging infrastructure, and Intelligent Transport Systems (ITS).
- **Component 3**: Establishment of an enabling environment through policy and regulatory reforms, the creation of an Urban Mobility Authority (AOM), capacity building, and implementation of monitoring and evaluation systems.

The report aims to present a comprehensive pre-feasibility study of the revised LEUT project, assessing its technical, institutional, financial, and environmental dimensions. It seeks to demonstrate the project's alignment with GCF investment criteria and to identify key risks and barriers to implementation.

Technical and Institutional Feasibility

The BHLS approach replaces the more rigid Bus Rapid Transit (BRT) design from the 2023 concept, offering a more context-appropriate solution adapted to urban density, cost, and right-of-way constraints. Technical assessments confirm the feasibility of selective interventions across five priority bus lines, while detailed studies will determine the optimal configuration for electric bus operations. Institutionally, the project supports the creation of the AOM to coordinate mobility services and harmonize mandates across key stakeholders such as SOTRAL (Société des Transports de Lomé), CEET (Compagnie Énergie Électrique du Togo), national ministries, and the local authorities.

Environmental and Social Impact

The project is expected to reduce over 620,000 tonnes of CO_2 over 15 years (an 89% reduction compared to business-as-usual), while significantly improving urban air quality and public health. It promotes climate resilience through green infrastructure and flood-mitigation design. Socially, the project improves transport access for low-income groups, enhances road safety, and promotes gender inclusion. A Gender Action Plan and Environmental and Social Management Plans (ESMPs) will ensure equitable and safe outcomes for all user groups.

Economic and Development Benefits

Economic analysis indicates strong co-benefits including job creation, time savings, and fuel import reductions. The project will impact an estimated 585 million bus passengers, 3.4 million NMT users, and generate over 14,000 job-years across its lifecycle (15 years). Fuel savings are estimated at more than USD 190 million in petrol and over USD 7 million in diesel, driven by the modal shift toward public transport and the electrification of the SOTRAL fleet. The introduction of electric buses and ITS is expected to lower SOTRAL's operating costs and increase service quality and ridership.

Financing Strategy

The total estimated investment for the LEUT project is USD 146.1 million, with a blended financing structure involving GCF grants and loans channelled through the ECOWAS Bank for Investment and Development (EBID) and GGGI. Given fiscal constraints and underdeveloped local green finance markets, GCF concessional funding is essential to bridge viability gaps, support upfront capital costs, and crowd in private sector engagement. The breakdown of budget items (by physical and non-physical investments), timelines, and costs is summarized in the table below:

Table 1 Budget and Financing

Item	Spending start date	Spending duration (months)	Total cost USD
Physical investment			**144 285 000**
Output 1.1: Construction of Bus with High Level of Service (BHLS)	1-Jan-27	48	66 500 000
Output 1.2: Construction of public transit depots and facilities	1-Jan-27	48	31 800 000
Output 1.3: Implementation of Non-Motorized Transport (NMT) networks	1-Jan-27	48	6 190 000
Output 2.1: Procurement of low-carbon bus fleet	1-Jan-27	48	30 200 000
Output 2.2: Development of sustainable energy infrastructure	1-Jan-27	48	7 250 000
Output 2.3: Installation of an Intelligent Transportation System (ITS)	1-Jan-27	48	2 345 000
Non-physical investment			**1 870 000**
Output 3.1: Policy and regulatory framework	1-Jan-27	24	470 000
Output 3.2: Institutional development and strengthening	1-Jan-27	24	500 000
Output 3.3: Capacity building	1-Jan-27	24	400 000
Output 3.4: Monitoring and evaluation system	1-Jan-27	60	500 000
Total budget			**146 155 000**

Theory of Change and GCF Strategic Alignment

The LEUT project is designed to catalyze a transformational shift in Greater Lomé's mobility system – from fragmented, informal, and emissions-intensive transport to a modern, structured, low-emission public transport network. This transformation is anchored in a comprehensive and context-sensitive Theory of Change that links infrastructure investments, institutional reform, and behavioral shifts toward sustainable urban mobility.

This transition is supported by investments in Intelligent Transport Systems (ITS), non-motorized transport networks, and targeted capacity-building across institutions and operators. These

interventions are designed to remove systemic constraints to low-emission mobility, enhance service quality, and enable long-term scalability of climate-smart transport solutions.

The project's Theory of Change rests on the following logic:

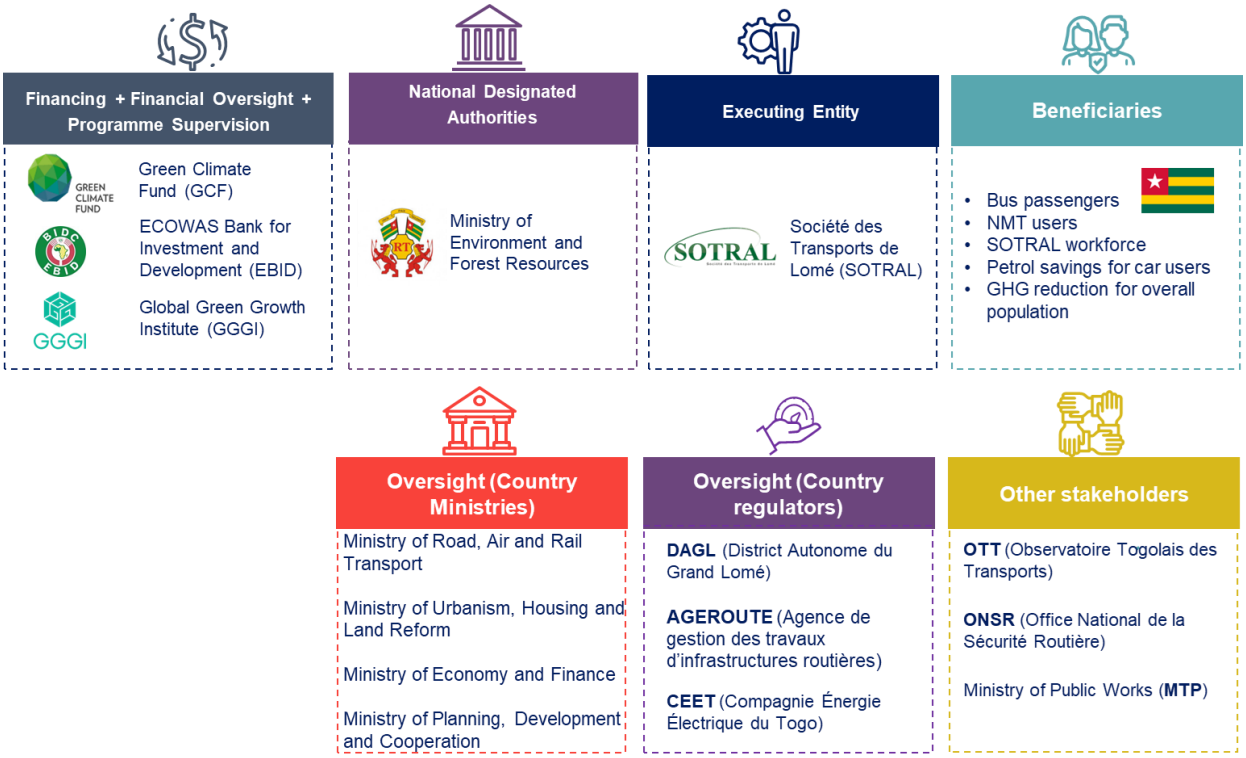
> **If** Greater Lomé is equipped with a modern, energy-efficient and inclusive public transport system, **then** Togo will be on a replicable and transformative path toward low-emission urban mobility, **because** these coordinated interventions remove systemic barriers, improve service delivery, and shift mobility behaviours toward cleaner and more inclusive modes.

This approach is fully aligned with the Green Climate Fund's investment criteria. The project delivers strong mitigation outcomes—avoiding over 620,000 tonnes of CO_2 over 15 years—while contributing to adaptation through climate-resilient infrastructure and inclusive design. It catalyzes a paradigm shift by embedding sustainability into both the physical transport system and the institutional ecosystem, enabling replication in other urban areas. Furthermore, it demonstrates strong country ownership, efficient use of concessional resources, and high potential for long-term socioeconomic and environmental co-benefits.

Stakeholder and beneficiary mapping

The successful implementation of the LEUT project depends on the coordinated engagement of a wide range of stakeholders. The mapping below illustrates the institutional ecosystem involved in project design, financing, execution, oversight, and benefit delivery. Key actors include GCF, EBID, and GGGI for financing and supervision; national authorities such as the Ministry of Environment (National Designated Authority in Togo); the executing entity SOTRAL; and beneficiaries including public transport users and urban residents. Additional oversight and regulatory bodies – such as District Autonome du Grand Lomé (DAGL), CEET, and AGEROUTE—alongside public safety and infrastructure agencies, will play critical roles in ensuring effective coordination and delivery of project outcomes.

Figure 1-1 Stakeholder and beneficiary mapping



1 Introduction

1.1 Context

Rapid urbanization in Togo, particularly in the Greater Lomé (GL), coupled with the absence of a cohesive urban development policy, has resulted in urban sprawl and impacted mobility in the area leading to rising greenhouse gas (GHG) emissions. These trends have created an urgent need for a low-emission urban transport (LEUT) system in the GL.

Despite the pressing demand, several systemic barriers persist to the development of a LEUT system, including limited legal, policy, and institutional frameworks, suboptimal technical and institutional capacity at both national and local levels, inadequate funding, low public awareness, and insufficient data to inform decision-making.

As transport is one of Togo's highest-emitting sectors, the government has taken proactive steps to address its impact. One key initiative is the development of a Concept Note for a LEUT Programme to secure funding from the Green Climate Fund (GCF). n 2023, this program aimed to design, build, and operate a Bus Rapid Transit (BRT) system and non-motorized transport (NMT) facilities in the Greater Lomé area, while also strengthening stakeholder capacity to develop, implement, and monitor low-emission transport systems. In 2024, the Government of Togo has adjusted the project concept, replacing the BRT system with a high-service bus lane, while retaining the other components.

1.2 Assignment objectives

The Global Green Growth Institute (GGGI) previously supported the Government of Togo in preparing the GCF Concept Note and a Project Preparation Facility (PPF) application, referred to collectively as the "technical documentation," for the LEUT Programme. This technical document was submitted in 2023. Following a review by the GCF, GGGI is now tasking CPCS to:

- Revise the technical documentation to reflect the updated project concept and incorporate feedback from the GCF;
- Develop a pre-feasibility study report for the project concept, ensuring that the revisions strengthen the technical documentation's alignment with GCF requirements and enhance its overall quality ; and
- Develop a request under the Project Preparation Facility (PPF).

These efforts will help advance the LEUT Programme, positioning it as a robust and actionable plan for achieving sustainable, low-emission urban transport in the GL.

1.3 Purpose of this report

The purpose of this report is to present a pre-feasibility study of the revised Low-Emission Urban Transport (LEUT) project in Greater Lomé. It builds on earlier technical documentation and integrates updated design features, implementation pathways, and strategic alignments required by the Green Climate Fund (GCF).

The report is intended to:

- Provide a structured assessment of the project's technical, institutional, financial, and environmental dimensions

- Demonstrate the project's alignment with GCF investment criteria, including mitigation and adaptation potential, sustainable development co-benefits, and paradigm shift potential
- Identify key risks, assumptions, and barriers to implementation
- Provide the necessary elements for the development of the PPF
- Support the Government of Togo and GGGI in preparing a strong GCF Funding Proposal by laying the analytical foundations necessary for further due diligence

1.4 Structure of this report

The remainder of this Report is structured as follows:

- **Chapter 2:** Transport sector baseline
- **Chapter 3:** Technical feasibility
- **Chapter 4:** Financing Needs
- **Chapter 5:** Theory of change and alignment with GCF

2 Transport sector baseline

2.1 Institutional, legal, and regulatory frameworks

Togo's transport sector is overseen by national and local institutions, notably the Ministry of Road, Air, and Rail Transport (MTRAF) and the Ministry of Public Works (MTP). In Greater Lomé, governance is characterised by the absence of a dedicated urban mobility authority.

To improve coordination, the government is in the process of finalizing the Plan de Mobilité Urbaine Durable (PMUD), a planification document that will guide future urban transport reforms. Climate policy frameworks, including the 2021 Nationally Determined Contribution (NDC), the Green Mobility Program (P36), and the upcoming Gender-Sensitive Electric Mobility Strategy (2025–2029), further priorities for low-emission and inclusive transport. These efforts are reinforced by the Strengthening Togo's Institutional Capacity for a Low-Carbon Transport System (STILTS) programme, which aims to strengthen institutional capacity, improve coordination, and prepare a pipeline of low-carbon mobility projects.

2.1.1 Legal and Policy Framework

Togo's legal and policy architecture for transport and climate action has gradually evolved from a focus on road design and safety to a more comprehensive system integrating sustainable and low-emission mobility.

Key Legal instruments include:

- Law No. 98-21 (1998): Establishes the legal regime for all transport modes, mandating energy-efficient and environmentally sound mobility policies.
- Law No. 99-011 (1999): Competition law ensuring non-discriminatory pricing, relevant for regulating new transport operators.
- Law No. 2008-005 (2008): Environmental framework law recognizing environmental protection as a national and human heritage concern.
- Law No. 2011-18 (2011): Defines industrial free zones, which can incentivize domestic electric vehicle manufacturing (e.g., through the PIA platform and M Auto Electric Mobility initiative).
- Law No. 2013-011 (2013): Road code applicable to all vehicles nationwide.
- Finance Law 2020 and related decrees: Introduced fiscal incentives to import cleaner and newer vehicles. These were extended in Finance Law No. 2022-032 (2022) to cover electric and hybrid vehicles, including 100% customs duty exemptions for new electric vehicles and motorcycles.

Key Policy instruments include:

- National Transport Policy (2016–2030): Sets the strategic vision for all transport sub-sectors.
- Road Sector Policy (2011–2016) and National Road Safety Policy (2020): Focused on preserving infrastructure, enhancing safety, and building institutional capacity.
- National Transport Development Strategy (2013): Targets doubling the sector's Gross Domestic Product (GDP) contribution from 7% to 14% by 2030.

- Industrialization Policy and associated Industrial Platform of Adétikopé (PIA): Support electric mobility manufacturing and public-private partnerships (PPPs) – e.g., Spiro[1] aims to produce up to 30,000 EVs per month with a strong gender employment component.
- Gender Equality Policy: Promotes equal access to mobility and economic opportunities.
- Research and Innovation Policy: Encourages knowledge transfer in transport innovation.
- National Electrification Strategy: Aims to ensure universal electricity access by 2030, a precondition for electric mobility scale-up.

Climate and Green Mobility Framework

Togo's climate strategy acknowledges the significant contribution of the transport sector to national greenhouse gas (GHG) emissions and positions the sector as a key priority for both mitigation and adaptation. In its 2021 Nationally Determined Contribution (NDC), Togo outlines targeted actions including:

- Promotion of low-emission public transport;
- Development of non-motorized transport (NMT) infrastructure;
- Introduction of electric and hybrid vehicles.

This aligns with several complementary frameworks:

- National Environmental Policy (PNE) ;
- National Sustainable Development Strategy (SNDD) ;
- Strategic Investment Framework for Environment and Natural Resource Management (CISGERN) ;
- Gender-Sensitive Electric Mobility Strategy (2025–2029), led by the Ministry of Environment with UNEP support, which calls for inclusive and climate-resilient mobility across all demographics ;
- Project 36 of Togo 2025 Government Roadmap (FdR 2025): targeting 3% electric vehicle penetration in annual sales ;
- The Sustainability Plan de Mobilité Urbaine Durable (PMUD)

2.1.2 Institutional Framework

The transport sector is primarily governed by the Ministry of Road, Air, and Rail Transport (MTRAF) and the Ministry of Public Works (MTP).

- MTRAF oversees regulation, road transport planning, and the public transport sector.
- MTP is responsible for the construction, rehabilitation, and maintenance of national infrastructure.

These ministries play a central role in policy development, project oversight, and technical coordination.

[1] Ex M-Auto

Key institutions are presented in Table 2.

Table 2 Transport Instititional Framework

Institution	Type	Key Role and responsibility
Ministry of Road, Air, and Rail Transport (MTRAF)	Government Ministry	Transport policy definition and o**versight**; regulation of road, air, and rail transport; driver licensing; technical inspections; public transport management. Lead executing agency for STILTS; oversees electric mobility pilot planning.
Ministry of Public Works (MTP)	Government Ministry	Construction and maintenance of national and regional roads and infrastructure; planning road maintenance; coordination with safer for toll roads.
Ministry of Environment (MERF)	Government Ministry	Leads environmental policy, including GHG monitoring, NDC implementation, and electric mobility strategies (e.g., Gender-Sensitive Electric Mobility Strategy).
Ministry of Energy and Mines (MEM)	Government Ministry	Energy policy and planning; oversight of electricity production and distribution; coordination with IPPs and CEET for electric mobility readiness.
Ministry of Economy and Finance (MEF)	Government Ministry	Manages national budget and tax policies, including fiscal incentives for cleaner transport and vehicle imports.
Ministry of Territorial Administration / Decentralization	Government Ministry	Oversees decentralization process and coordination with local governments, including District Autonome du Grand Lomé (DAGL) and communes.
DAGL (District Autonome du Grand Lomé)	Local Government	Coordinates mobility planning at the metropolitan level; interface between state and communes; manages certain road and mobility projects. Participates in STILTS urban coordination working group.
Communes (Municipalities)	Local Government	Responsible for local mobility management, minor road works, and collaboration with DAGL; capacities still limited due to ongoing decentralization. Targeted for institutional capacity-building under STILTS.
SOTRAL (Société des Transports de Lomé)	Public Enterprise	Operates public urban bus services under an agreement with the State; ensures the mobility of the population of Greater Lomé, including the students of the University of Lomé.
CEET (Compagnie Énergie Électrique du Togo)	Public Utility	Manages power distribution; supports infrastructure for electric bus charging and energy reliability.
ONSR (Office National de la Sécurité Routière)	Government Agency	Leads road safety awareness, prevention, and driver training programs.

Institution	Type	Key Role and responsibility
SAFER	Public Agency	Handles routine and emergency road maintenance; manages toll collection and road asset preservation.
AGETUR	Delegated Public Works Agency	Carries out urban infrastructure studies and acts as delegated contracting authority.
AGEROUTE	Road Agency	Supports road network management and engineering.
OTT (Observatoire Togolais des Transports)	OTT (Observatoire Togolais des Transports)	Intended to analyse transport sector performance and issue recommendations; not currently operational.
ANPGF	Government Agency	Promotes financing for SMEs/SMIs; could support local businesses involved in e-mobility value chains.

2.1.3 Institutional challenges and coordination gaps

Despite the multiplicity of legal instruments and policy documents, the institutional landscape remains fragmented. Urban mobility planning in Greater Lomé is still marked by overlapping mandates and fragmented responsibilities across ministries, agencies, and municipalities. This significantly increases the chances of planning and implementation efforts to be carried out in parallel, with limited integration or structured communication between stakeholders.

Existing coordination tends to be bilateral rather than system-wide, and there is currently no central mechanism for aligning transport planning with climate and urban development strategies. Although the Observatoire Togolais des Transports (OTT) was created in 2021 to support data collection and policy guidance, its operations have not yet been fully activated[2].

At the operational level, SOTRAL (Société des Transports de Lomé), the public bus operator, plays a vital role in urban mobility service delivery. However, the company operates with limited financial and institutional autonomy, and its role in broader mobility planning is not formally defined.

In response to these challenges, the government – with support from the Green Climate Fund (GCF) – is implementing the STILTS programme (Strengthening Togo's Institutional Capacity for a Low-carbon Transport System)[3]. This initiative aims to build national and local institutional capacity, establish a functional coordination mechanism, and enable the development of a pipeline of low-emission mobility projects. STILTS directly addresses existing gaps and is expected to lay the foundation for more integrated, resilient, and climate-aligned urban transport governance.

2.2 Socio-economic context and mobility patterns (transport demand)

Togo is classified by the United Nations as a Least Developed Country (LDC), with a GDP estimated at USD 9.8 billion and a GDP per capita of around USD 1,000 in 2024[4]. The economy is primarily service-based, with Lomé's port and trade infrastructure positioning the city as a major regional logistics hub. The government's Togo 2025 Roadmap targets a 7% growth rate and is structured around three strategic pillars: (i) positioning Togo as a regional logistics hub,

[2] Plan de Mobilité Urbaine Durable du Grand Lomé (PMUD), Rapport Final, Octobre 2024
[3] Readiness Proposal, with GGGI for the Togolese Republic, Green Climate Fund, 1 March 2024,
[4] Togo Datasets, IMF, 2024

(ii) accelerating industrialization and value chain development – particularly in phosphates, cotton, soy, and timber – through the Adétikopé Industrial Platform (PIA), and (iii) enhancing social inclusion and access to essential services.

In this context, Greater Lomé – home to 2.1 million people[5] in 2022 – is undergoing rapid urbanization and demographic expansion. **These trends are driving demand for affordable, safe, and accessible transport systems**.

Mobility is however shaped by low household income, limited motorization, and gender - and age-related inequalities, which influence transport needs, affordability, and access.

2.2.1 Urbanization and mobility dynamics

Lomé is experiencing sustained demographic and spatial growth. With an urban population already exceeding 2.1 million, and projections anticipating continued expansion at an annual rate of 2.7% (and up to 4% under high-growth scenarios), the city faces rising pressure on its transport systems and urban services[6]. This rapid urbanization is part of a broader trend across the coastal West African corridor stretching from Lagos to Abidjan.

As the city expands, transport is essential for accessing food, healthcare, education, and employment. The efficiency of the transport system is a key factor in promoting social equity. However, current public transport coverage remains limited. SOTRAL, the public urban bus company, mainly operates on paved roads, leaving some peripheral neighbourhoods underserved. In these areas, residents often rely on walking, informal motorcycle taxis (Zémidjans), or private vehicles, limiting affordable and safe transport access.

2.2.2 Demographic profile and Transport Demand

Lomé's demographic composition has direct implications for mobility. Young people under 17 represent about half of the population, with students and schoolchildren alone making up 36% of residents in the metropolitan area[7]. This youth cohort exhibits high mobility demand, particularly for school-oriented transit services.

Women's mobility patterns also reveal key socio-economic disparities. Although they tend to travel less frequently and cover shorter distances than men, they spend more time and money on transport due to safety concerns, caregiving responsibilities, and limited access to affordable options suited to their needs. This reinforces mobility-related inequalities, especially among low-income women. Moreover, while the transport sector could offer significant employment opportunities, women remain underrepresented in transport jobs, a gap that transport planning must address[8].

The elderly population, though still a minority, is growing. Their mobility is more constrained and will require accessible infrastructure and inclusive design in the years to come.

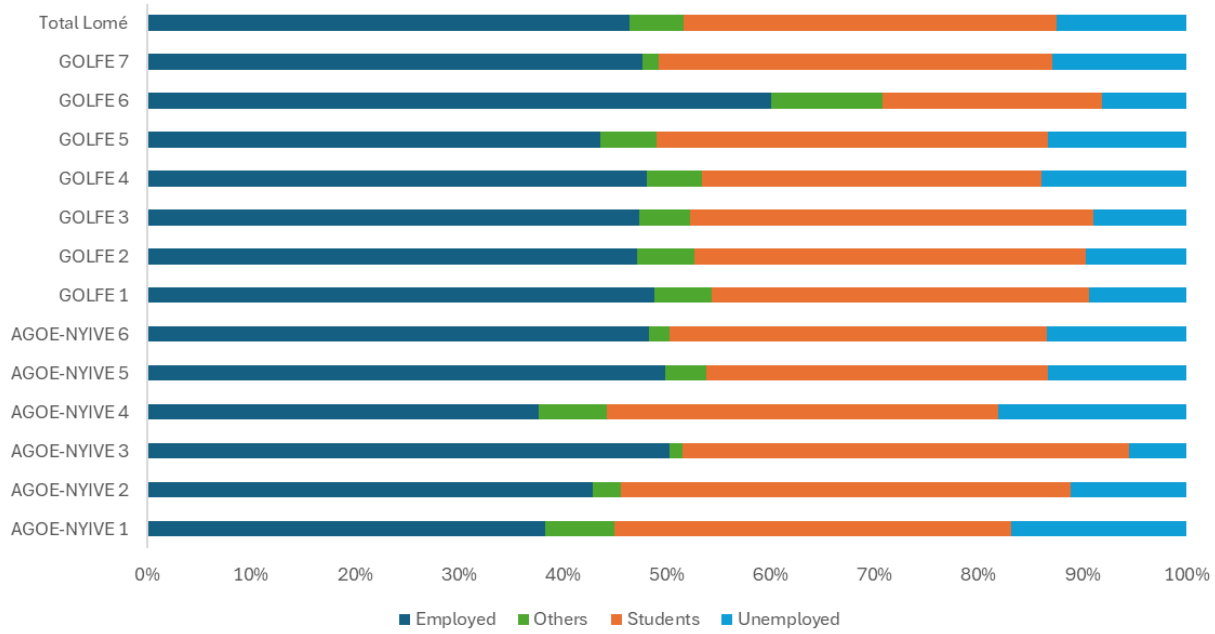
2.2.3 Employment and Income

The labour market in Lomé is characterized by relatively low and uneven participation. The average employment rate in the city stands at 46%, with local variations – from 60% in Golfe 6 to under 50% in several other communes[9].

[5] Plan de Mobilité Urbaine Durable du Grand Lomé (PMUD), Rapport Final, Octobre 2024
[6] Plan de Mobilité Urbaine Durable du Grand Lomé (PMUD), Rapport Final, Octobre 2024
[7] Plan de Mobilité Urbaine Durable du Grand Lomé (PMUD), Rapport Final, Octobre 2024
[8] Ibid.
[9] Ibid.

The diagram below shows the population occupation distribution in Greater Lomé, demonstrating that a large proportion of the population is in demand of efficient, reliable urban transport.

Figure 2-1 Population occupation in Greater Lomé



Source: CPCS adapted from EMD 2023

While demand in absolute terms is significant, household income levels remain however low and skewed. The median monthly income ranges between 35,000 and 50,000 FCFA, with 56% of households earning below 50,000 FCFA and only 10% earning above 100,000 FCFA[10]. Although the minimum wage was increased in 2023 to 52,500 FCFA, a significant share of workers remains active in the informal sector, where earnings are unstable and often below this threshold. This economic reality strongly shapes transport affordability and access choices.

2.2.4 Modal split and accessibility patterns

Walking remains the dominant transport mode in Greater Lomé. According to the Sustainable Urban Mobility Plan (PMUD), an estimated 51% of all trips are made on foot while 48% rely on motorised transportation – of which 80% are made by motorcycles, including both privately owned two-wheelers and informal motorcycle taxis (Zémidjans).

Formal public transport remains marginal: less than 3% of motorized trips are made via collective transport (bus or minibus), and under 1% are on SOTRAL buses. These patterns highlight the need for better integration of pedestrian and informal modes into the city's overall mobility strategy.

Despite growing demand, motorization levels remain relatively low[11]:

- Only 45% of households own a motorized vehicle, mostly two-wheelers.
- Car ownership is limited to less than 8% of households, peaking at 13% in Golfe 7.

[10] Ibid.
[11] Ibid.

- The overall ratio is around 220 motorized vehicles per 1,000 inhabitants, with just 30 private cars per 1,000.

Lomé's demographic and economic dynamism is expected to persist over the next 20 to 40 years, reinforcing the need for an inclusive and resilient transport system.

2.2.5 Trip purposes and peak demand

In Greater Lomé, 49% of trips are related to school commutes (home-to-school or school-to-home), while 34% are work-related (home-to-work or work-to-home). The remaining 17% are primarily for shopping or other personal reasons.

In this context, mobility patterns reflect clear time-of-day peaks, concentrated between 6:00–8:00, 12:00–14:00, and 17:00–19:00, aligned with school schedules, market hours, and work hours (commuting flows).

Most trips are short in distance and duration: the average trip spans 3.7 km (as-the-crow-flies) and lasts 27 minutes, usually without requiring a transfer.

For 57% of daily trips, the origin and destination are located within the same municipality. Residents of more peripheral municipalities mainly travel to neighbouring areas or to key urban hubs known for employment and commercial activity, such as the Grand Marché of Lomé, the airport, the port zone, and the administrative districts.

2.3 Public transport supply

Urban transport in Greater Lomé is characterized by a dual system: a public transport offer, primarily operated by SOTRAL, and a dense, informal network of motorcycle taxis, shared taxis, and private minibuses. Despite some level of coordination, the overall supply remains insufficient, particularly for vulnerable populations and those living in underserved peripheral areas.

2.3.1 SOTRAL services and ridership patterns

Fleet and associated facilities

SOTRAL is currently the only formal public transport operator in Lomé. In 2024, it operates a fleet of 91 vehicles, including 84 buses and 7 coaches, with 72 buses in daily operation.

From a logistical standpoint, SOTRAL currently relies on a main depot located near the airport[12]. This is the only fully equipped and functional facility, comprising fuel tanks, a specialized maintenance workshop, technical repair facilities, and a coordination center. However, given the increase in operational needs, this depot is nearing its maximum capacity, leading to significant inefficiencies. These are further exacerbated by the depot's location, which results in substantial dead mileage due to the positioning of buses at the start of service and their return to the depot at the end of the day.

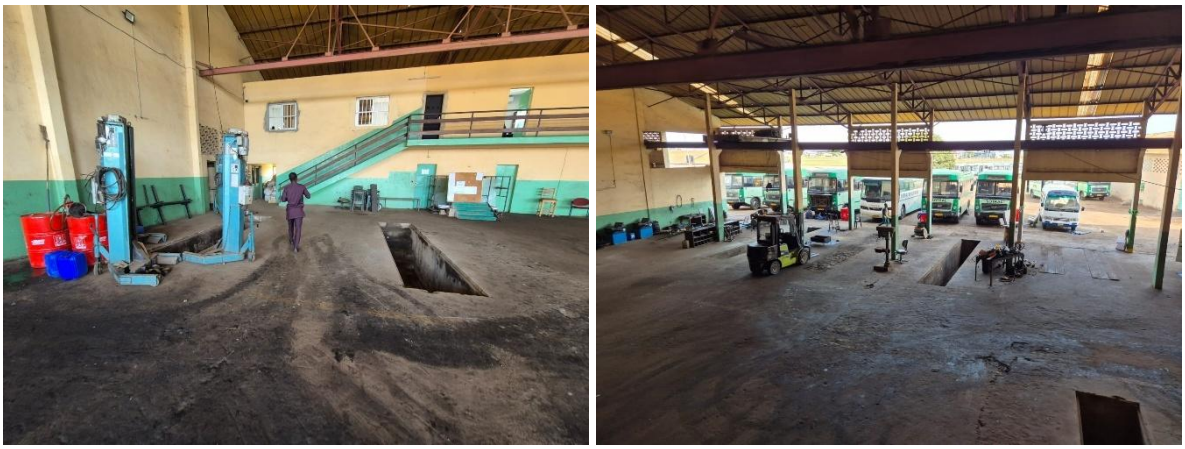
In addition, SOTRAL manages two small auxiliary sites in the city center: the first is a depot that can accommodate up to 20 buses, while the second, located within the CFT area, is a mechanical workshop currently non-operational, used mainly for minor repairs and routine inspections.

There is also a fourth site on Boulevard de la Kara[13], a 5,000 m² plot belonging to the municipality. This depot was used by SOTRAL until 2008–2009 and remains structurally intact but in poor condition. It has been non-operational for several years and would require renovation

[12] Google Maps location
[13] Google Maps location

to be brought back into service. However, its location offers potential for conversion into a decentralized operational base.

Figure 2-2 SOTRAL depot – Maintenance workshop



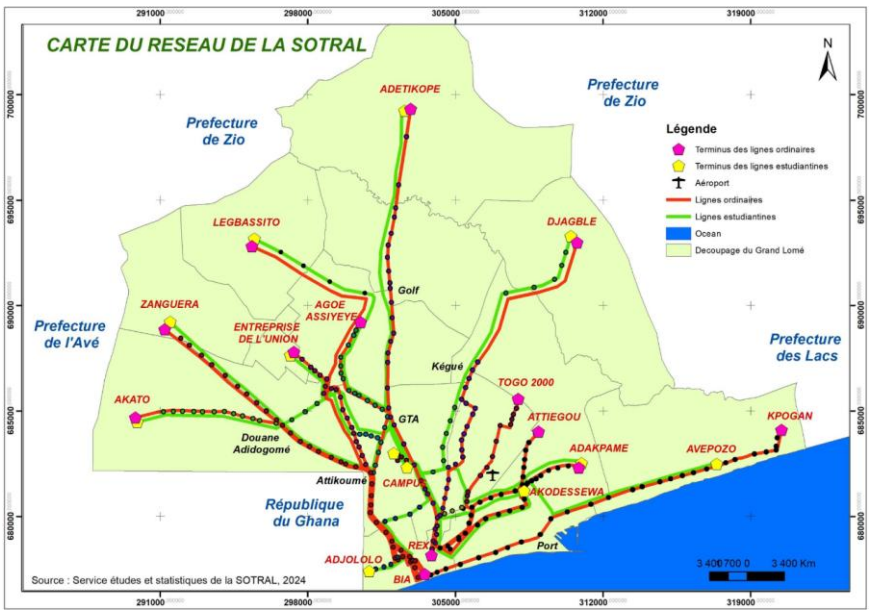
Source: Photos taken by CPCS during the field mission in Lomé

Recognizing the logistical and geographic limitations of current facilities, the SOTRAL has proposed the construction of four additional depots in peripheral zones. These would relieve pressure on the main depot, reduce fuel costs, improve working conditions for drivers and mechanics, and enhance bus deployment efficiency across the wider metropolitan area.

Network

The network covers 19 routes, including 9 regular routes and 10 student routes exclusively dedicated to transporting students of the University of Lomé. Services run from Monday to Saturday, with 539 bus stops and 6 ticketing kiosks spread across major transfer points (BIA, REX, Campus Nord/Sud, etc.).

Figure 2-3 Lomé SOTRAL network



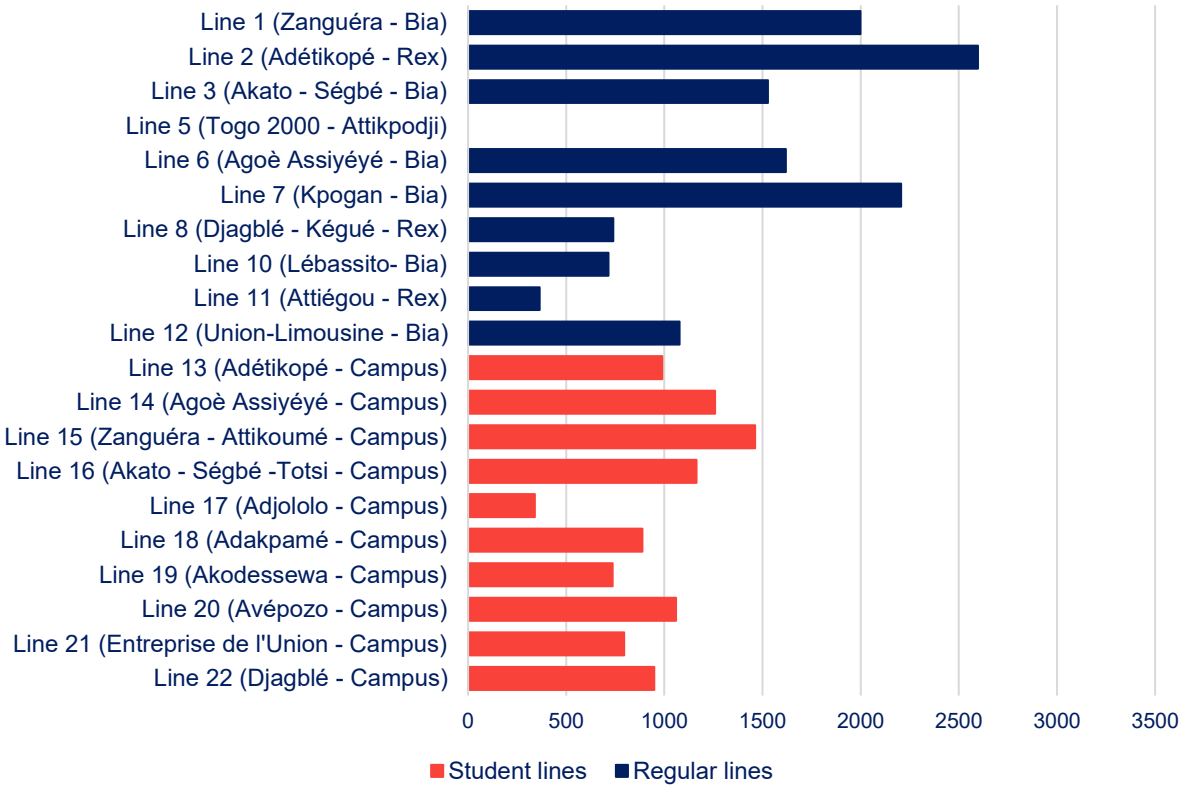
Source: Rapport d'activité de la SOTRAL 2024

Ridership

Daily ridership on SOTRAL lines varies significantly across the network (see Figure):

- Two main lines – Rex-Adétikopé and BIA – Kpogan – stand out with over 2,000 passengers per day each, accounting for 21% of total system ridership.
- They are followed by eight high-demand routes carrying between 1,000 and 1,900 daily passengers, including four regular lines (e.g., BIA - Zanguéra, BIA–Agoè Assiyéyé) and four university lines.
- Seven mid-level lines, such as Campus–Adétikopé or BIA - Légbassito, attract between 500 and 1,000 passengers per day.
- At the lower end, two routes (Rex - Attiégouvi and Campus - Adjololo) register fewer than 400 passengers daily.

Figure 2-4 Daily Ridership on SOTRAL Lines (Px Average January to December 2024)



Source: CPCS adapted from SOTRAL, Activity report, November 2024

User expectations and system constraints

According to the SOTRAL 2023 survey on the understanding of daily users[14], passenger feedback confirms that the bus service quality is a pressing concern:

- 46% of respondents cite overcrowding as their top complaint
- 17% want improved punctuality and reliability
- 15% call for better customer service at stops and terminals
- 14% seek real-time information on delays and service status

[14] Rapport de l'enquête sur la "Connaissance des Clients Quotidiens" de la SOTRAL, CocliQuot 2023, SOTRAL.

These expectations point to a growing need not only for expanded service capacity, but also for modernization, including digital tools, improved communications, and customer-oriented infrastructure.

Tariffs

Fares are socially oriented, ranging from 100 to 300 FCFA, with student routes set at the lowest tier. This supports affordability; however, it limits SOTRAL's ability to recover operating costs and expand services. In practice, the system is overburdened: SOTRAL serves approximately 24,000 passengers per day[15].

SOTRAL's operations are further constrained by:

- Heavy dependence on **state subsidies**
- Use of **Euro 3 diesel buses**, driven by limited fuel quality in the country
- High **fuel costs** (fuel represents 40% of total operating costs)
- Limited **spatial coverage**, especially in areas with unpaved roads

2.3.2 Infrastructure and service gaps

Greater Lomé's urban transport infrastructure remains insufficient to meet current and projected mobility demands. While notable progress has been made in national road rehabilitation, port expansion, and energy sector investments, the infrastructure dedicated specifically to urban mobility remains underdeveloped and fragmented, particularly for public and low-emission transport,.

Road and Transport Infrastructure

Lomé's urban road network suffers from limited coverage, inadequate surfacing, and low modal integration:

- Only 6.9% of the urban road network is paved, with most secondary and peripheral roads in poor condition[16].
- No dedicated bus lanes exist. Buses operate in mixed traffic, leading to low average commercial speeds (around 15 km/h) and longer travel times (see Figure 2-5)
- Street sharing is poorly managed, with sidewalks often encroached upon by informal vendors or motorcycles, reducing pedestrian safety and obstructing flow.

[15] According to information shared by SOTRAL, daily ridership has risen to 35,000–38,000 passengers per day since January 2025.
[16] Plan de Mobilité Urbaine Durable du Grand Lomé (PMUD), Rapport Final, Octobre 2024

Figure 2-5 SOTRAL buses in mix traffic, March 2025

Source: Taken by CPCS during field mission in Lomé

Intersections and traffic management systems are also under-equipped:

- Traffic signals are limited or non-functional, especially at key junctions
- Traffic is frequently regulated manually by police officers, leading to inconsistent prioritization for buses or emergency vehicles
- Signage and road markings lack uniformity, affecting both driver behaviour and pedestrian safety

The integration of transport services across modes remains weak. Transfer points are often informal or fragmented, with no signage, facilities, or multimodal coordination. This reduces accessibility for low-income populations who rely on mixed-mode journeys involving walking, informal taxis, and SOTRAL buses.

Depots, Terminals, and Support Infrastructure

The city's main depot, located near the airport, is operating over capacity. In addition, the two main bus terminals, BIA and REX, are strategically located in downtown Lomé but lack basic facilities, lighting, and pedestrian safety features. In the absence of bays or secure arrangements at many stops and terminals, boarding frequently takes place directly on the roadway, exposing passengers – particularly women, children, and the elderly – to the risks of accidents and to pollution from diesel emissions.

Figure 2-6 REX and BIA bus terminus, March 2025

Source: Taken by CPCS during field mission in Lomé

Park-and-ride facilities are currently non-existent, although the Ministry of Transport has mentioned during the consultations plans to develop 10 multimodal hubs that integrate informal shared transport with formal bus services and safe pedestrian access.

Service Quality and operational gaps

The absence of high-capacity infrastructure affects service quality in several key areas:

- Bus frequencies remain low, often 15 – 20 minutes during peak hours, insufficient to accommodate high demand.
- Although the 2023 and 2024 surveys show a relatively high satisfaction rate (70% in 2023 and 73.5% in 2024), a significant share of passengers (30% in 2023 and 26.5% in 2024) still express dissatisfaction. This is mainly due to the discomfort caused by vehicle overcrowding.
- Fuel consumption remains high, as buses idle in traffic without dedicated lanes. The current fleet relies on Euro 3 diesel, further exacerbated by low-quality fuel and contributing to GHG emissions and urban air pollution.

2.4 Rationale for e-mobility transition in Togo

Reducing fuel dependence and operating costs

Beyond its climate benefits, the shift toward electric mobility is increasingly viewed as a strategic opportunity to enhance energy security. The country remains heavily reliant on imported fossil fuels, particularly diesel, which fuels SOTRAL's current Euro 3 bus fleet. This dependency exposes the transport sector to global price volatility and external supply disruptions, making transport fuel one of the largest components of the national energy bill.

Togo's dependence on imported petroleum products places a significant strain on public finances. Given the absence of domestic fossil fuel production, the country's entire fuel demand must be met through imports, paid in foreign currency. This structural vulnerability has been exacerbated by recent international oil price shocks, such as those following the COVID-19 pandemic and geopolitical instability in energy-exporting regions. Rising global prices directly

translate into increased fuel costs for the public transport sector, with ripple effects across the economy.

By shifting to electric mobility, Togo has the potential to reduce its exposure to such external shocks and free up valuable fiscal space. Lower dependence on diesel imports would reduce pressure on foreign exchange reserves and allow the government to reallocate subsidies and budget support currently directed toward fuel to other pressing investment needs.

SOTRAL's own operations are significantly impacted: fuel represents around 40% of its operating costs. In 2024, the operator generated approximately 1.8 billion FCFA in revenue, compared to 2.1 billion FCFA in expenses—despite government subsidies. Transitioning to electric buses could thus help reduce operational costs and improve the long-term financial viability of public transport services.

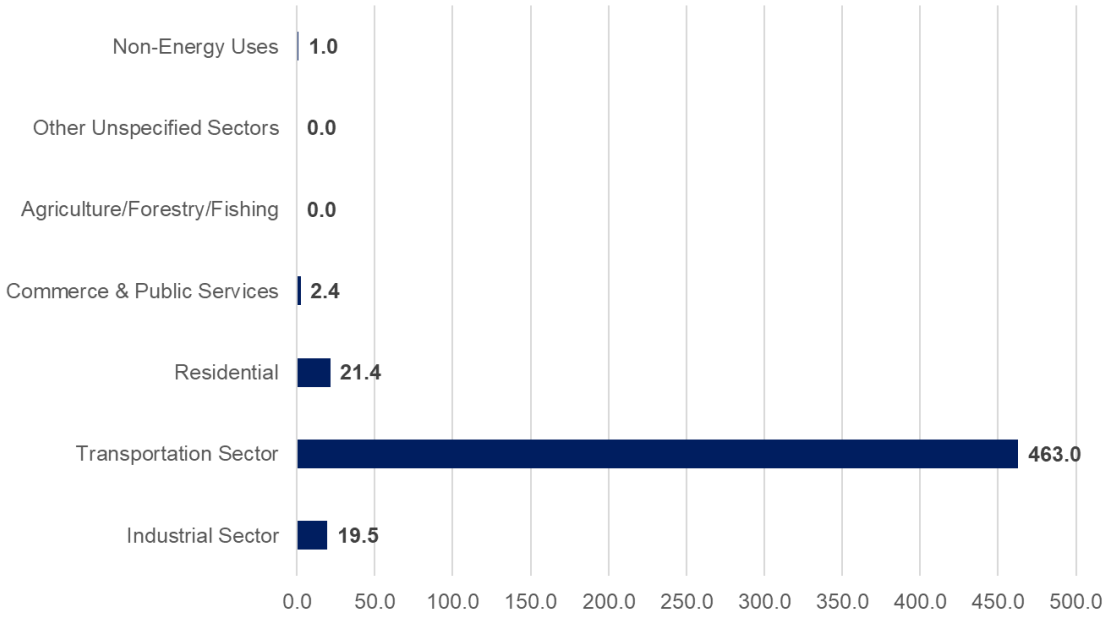
Addressing transport sector's carbon footprint

There is no official emissions monitoring system in place for the transport sector, but fuel import data suggests high and growing energy use, with 100% of transport energy coming from fossil fuels, primarily in the road sector in 2022[17].

According to the International Energy Agency (IEA), Togo's oil supply amounted to 21,295 terajoules (TJ) in 2022, resulting in 1.6 million tonnes (Mt) of CO_2 emissions. This accounts for over 80% of the country's CO_2 emissions from fuel combustion. Approximately 77% of this oil is consumed by the transport sector, which corresponds to around 50 litters of oil per inhabitant. Almost 65% of the total energy-related CO2 emissions comes from the Transport Sector.

Figure 2-7 below illustrates that the transport sector is the largest consumer of petroleum products in Togo and that 99% of transport sector energy is used by road transport (**Error! Reference source not found.**2-8).

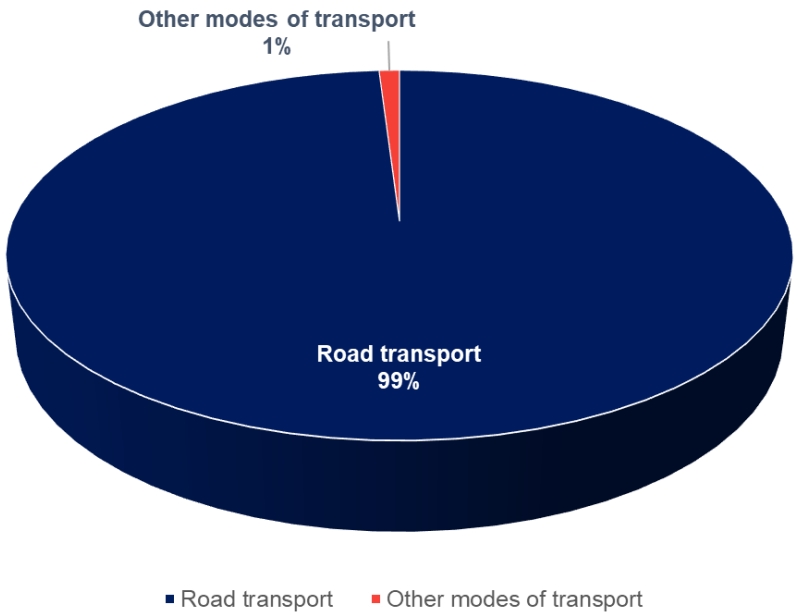
Figure 2-7 Energy balance by sector (in thousand Ktoe) in 2020



Source: CPCS adapted from Ministry of Mines and Energy of Togo

[17] Understanding energy end uses, Togo, IEA, 2022

Figure 2-8 Breakdown of petroleum product consumption by mode of transport



Source: CPCS adapted from Ministry of Mines and Energy

2.5 Low emission and resilient transport

Climate Context and Commitments

Togo submitted its first NDC in 2015 and updated NDC in 2021[18]. Togo's revised Nationally Determined Contribution (NDC) recognizes transport as a priority sector for both mitigation and adaptation, highlighting the need to reduce fossil fuel dependency, develop clean and efficient transport modes, and enhance resilience to climate shocks. Planned reduction in GHG emissions in the revised NDC (2021 – 2025) are presented in Table 3.

Table 3 Planned reduction in GHG emissions in the revised NDC (2021 – 2025)

Item	Emissions Targets
Current Emissions	40,990.59 GgCO2-eq in 2018
Unconditional Reduction Target	20.51%
Conditional Reduction Target	30.06%
Overall Reduction Target	50.57%

The NDC also aligns with broader national strategies such as the National Environmental Policy, the National Sustainable Development Strategy, and the Strategic Investment Framework for Natural Resource Management (CISGERN).

Ongoing and planned initiatives

A number of complementary initiatives are underway to operationalize Togo's green mobility vision:

[18] Togo, NDC Partnership, 2021

- Plan de Mobilité Urbaine Durable (PMUD) for Greater Lomé, supported by AFD, provides the city with a long-term strategy (to 2040) focused on sustainable, inclusive, and low-emission transport development.
- The Gender-Sensitive Electric Mobility Strategy (2025–2029), currently led by the Ministry of Environment with support from UNEP, aims to mainstream gender equity in electric transport policy. The Ministry of Transport serves as a key stakeholder, with a focal point actively contributing to the study.
- As part of the LEUT project, the Ministry of Transport and SOTRAL have outlined a phased electrification plan targeting the deployment of up to 100 electric buses. This plan includes an initial pilot phase (10 buses), a scale-up phase (40-50 buses), and a potential final stage involving local assembly of an additional 40-50 buses. It also incorporates charging infrastructure development and the integration of Intelligent Transport Systems (ITS) to enhance fleet management and passenger information services.
- Plans for multimodal integration are being developed to connect formal bus services with informal modes (e.g., Zémidjans, shared taxis), including 10 proposed park-and-ride hubs designed for safe last-mile connectivity.
- The improvement and securing of pedestrian access to bus stops through the development of safe sidewalks and designated pedestrian routes.
- Pilot infrastructure improvements, including the creation of coastal cycling routes and green mobility corridors, are being considered to promote modal shift and improve air quality in urban areas.

Financial needs and climate finance constraints

Low-emission urban transport in Togo faces important financing constraints. The sector remains heavily reliant on public subsidies and development partner support, which limits the scale and pace of investment in transformative infrastructure and technologies.

In addition, access to climate-related concessional finance has so far been limited, in part due to gaps in project preparation capacity and the need for closer alignment with the requirements of funds such as the Green Climate Fund (GCF).

Nevertheless, efforts to access Green Climate Fund (GCF) support are ongoing, with revised documentation being developed to respond to initial GCF feedback on the LEUT (Low Emission Urban Transport) programme. There is also potential to explore innovative financing models, such as public-private partnerships (PPPs) and green bonds.

Opportunities for transition

Despite these challenges, there are substantial opportunities to accelerate progress:

- Strong government engagement under Project 36 (P36) of the Togo 2025 roadmap, which aims to increase the share of electric vehicles in new vehicle sales to 3% by 2030;
- Broad stakeholder buy-in for pilot electrification and digital solutions such as ITS;
- Donor interest from institutions including the World Bank, AFD, AIIB, and the GCF, reflecting strong alignment with global climate investment goals;
- Opportunities to align e-mobility deployment with solar energy expansion and grid modernization, in partnership with CEET and potential Independent Power Producers (IPPs).

3 Technical feasibility

3.1 Overview of the LEUT project design and rationale

3.1.1 Overview of project concept, rationale, objectives, approach (components)

The Low-Emission Urban Transport (LEUT) project aims to enhance urban transport in Greater Lomé, Togo, by increasing public transit ridership and use low-emission solutions for its services. This involves the development of high-level service bus corridors, the deployment of smart and green bus systems, and the creation of an enabling environment for effective public transport management.

By focusing on low-emission transport and sustainable energy infrastructure, the project seeks to mitigate the environmental impact of urban transport and improve the quality of life for residents. The project's objectives focus on two main areas: mitigation and adaptation.

- The mitigation objective aims to reduce emissions from transport and power generation
- The adaptation objective seeks to increase the resilience of infrastructure and built environment to promote non-motorized transportation (NMT) and improve access to public transit lines

Together, these objectives aim to create a balanced approach to addressing climate change and promoting sustainable development.

The project will help curb the fast-growing GHG emissions in the transport sector while providing numerous socio-economic benefits.

The project is structured into three main components, each with specific outputs and activities.

- Activities of Component 1 include **constructing Bus with High Level of Service (BHLS) corridors**, focusing on improving commercial speed and identifying critical points along priority lines. The construction phase will implement BHLS corridors selectively on critical segments. In addition, the **construction of park-and-ride facilities, bus stations, and depots** that will support efficient operation. **Non-Motorized Transport (NMT) networks** will also be developed, including infrastructure for walking and cycling, fitness and bicycle trails, and pedestrian paths and green spaces.

- Activities of Component 2 involve **detailed studies for electric bus deployment and the procurement of electric buses and charging systems.** Sustainable energy infrastructure will be developed, including securing energy supply, upgrading electrical infrastructure, and deploying solar power plants. An Intelligent Transportation System (ITS) will be installed, involving concept design, acquisition of ITS equipment, and organizing a geolocation/routing app competition.

- Activities of Component 3 include **establishing a green mobility plan, developing quality standards for public transit services, and creating a financial/incentive mechanism for urban transport**. Institutional development will involve establishing a sustainable urban mobility organizing authority. Capacity building will focus on improving public transport services and promoting the inclusion of NMTs. A monitoring and evaluation system will be implemented to track greenhouse gas (GHG) reductions and project performance, along with environmental and social management requirements.

The total LEUT project cost is estimated at USD 146 155 000, with funding provided through grants and loans. The implementation period of the TUFE project is estimated at 5 years.

3.1.2 Description of how the project is intended to address recipient needs

The "Togo 2025" Strategic Plan, commonly referred to as the Government's Roadmap for 2020–2025, is built around three main pillars:

1. Strengthening social inclusion, harmony, and maintaining peace
2. Boosting job creation by leveraging the country's economic strengths
3. Modernizing the country and reinforcing institutional capacity through 42 priority projects and reforms

Through this strategic plan, the Government of Togo has committed to sustainable development, particularly in the energy and transport sectors, by promoting a Green Mobility Program[19]. The country is also implementing a Sustainable Urban Mobility Plan (SUMP)[20] which objective is to define and implement a realistic, inclusive, and sustainable urban mobility strategy for Greater Lomé by 2040, based on strong stakeholder engagement, institutional strengthening, and improved public transport services.

However, implementing this vision presents a significant challenge due to limited resources. The country must simultaneously address gaps in transport infrastructure and transform the sector to reduce its environmental impact. Budgetary resources remain insufficient, and Togo continues to face difficulties in mobilizing additional funding from climate finance mechanisms and development partners.

The (LEUT) project is designed to address a set of recipient needs outlined in the Green Mobility Program and the Greater Lomé SUMP by focusing on sustainable development in the energy and transport sectors. The project aligns with and addresses these needs in the four (4) different ways.

[19] Green Mobility Program, Ministry of the Environment and Forest Resources, Togo.
[20] Greater Lomé Sustainable Urban Mobility Plan, Final report, MobiliseYourCity, October 2024.

How the project is intended to address recipient needs

1. **The project aims to enhance social inclusion by improving access to reliable and efficient public transport**. By constructing high-level service bus corridors and complementary facilities, the project will provide better connectivity and mobility options for all residents, including those in underserved areas.
2. **The project will create numerous job opportunities during both the construction and operational phases**. The development of bus corridors, depots, and park-and-ride facilities will require a significant workforce, thereby boosting employment in the construction sector. In addition, the deployment of electric buses and the establishment of a sustainable urban mobility organizing authority will create long-term jobs in public transport operations, maintenance, and management.
3. **The project will modernize Togo's urban transport infrastructure by addressing critical gaps in transport infrastructure with high-level service bus corridors and complementary facilities, while integrating smart and green bus systems**. This includes the procurement of electric buses, the development of sustainable energy infrastructure, and the installation of an Intelligent Transportation System (ITS).
4. **Recognizing the challenges posed by limited budgetary resources, the project seeks to mobilize additional funding from climate finance mechanisms and development partners**. By demonstrating a strong commitment to sustainable urban mobility and aligning with national and international climate goals, the project aims to attract investments and secure the necessary financial support.

3.1.3 Description of options and selected final concept design

The current project concept is centred around the deployment of electric buses (e-buses) as the primary decarbonization option for public transport in Greater Lomé. This choice reflects national climate ambitions, notably under Project 36 (Green Mobility Program) of the Togo 2025 Roadmap, the revised NDC (2021), and the Greater Lomé Sustainable Urban Mobility Plan. The electrification of the bus fleet is also a response to SOTRAL's operational challenges, including high fuel costs (40% of OPEX) and reliance on aging Euro 3 diesel buses.

However, the feasibility of full electric fleet deployment is subject to confirmation through dedicated studies (as envisaged under Activities 2.1.1 and 2.2.1) which will evaluate operational, energy, technical, and financial requirements. These will include assessments of depot capacity, energy supply reliability, grid infrastructure readiness, charging needs, and local maintenance capabilities.

3.2 Institutional and regulatory evaluation

The successful implementation of the LEUT project depends on a coherent institutional and regulatory framework that can enable integrated urban mobility reforms, low-carbon fleet deployment, and long-term sustainability of public transport services.

3.2.1 Alignment with national policies and plans

As mentioned in section 3.1, the LEUT project directly aligns with key policy frameworks such as the Green Mobility Program (Project 36 of the 2025 Government Roadmap), the 2021 NDC, and the forthcoming Gender-Sensitive Electric Mobility Strategy (2025–2029). The proposed activities also build on the Greater Lomé Sustainable Urban Mobility Plan (PMUD), which emphasizes the development of high-quality bus corridors and multimodal integration.

By supporting the adoption of electric buses, digital systems, and institutional reform, the project is designed to operationalize Togo national strategies.

It also leverages momentum generated by ongoing technical assistance under the STILTS programme, which aims to improve national and municipal capacities in urban mobility governance and climate-oriented transport planning.

3.2.2 Adequacy of the institutional framework

Despite a growing number of policies and pilot programmes, institutional fragmentation remains a core challenge. As noted in Chapter 2, mandates across national ministries (Transport, Environment, Energy, Finance), municipal bodies, and operators like SOTRAL remain poorly coordinated. There is no legally established urban mobility authority, which limits the integration of planning, funding, and service delivery functions.

LEUT project recognizes challenges in the Togo institutional framework and Component 3 of the LEUT project addresses a key institutional gap directly.

Output 3.2 proposes the creation of a dedicated “Autorité Organisatrice de la Mobilité” (AOM) for Greater Lomé, with a mandate to oversee planning, contracting, and regulation of urban transport. This structural reform is essential for the sustainability and scalability of urban transport investments.

3.2.3 Anticipated institutional impacts

The project will contribute to:

- Strengthening SOTRAL’s technical and operational capacity to manage a modern, low-emission fleet
- Enhancing interministerial coordination through the AOM
- Aligning energy and transport investments under a coherent planning framework
- Institutionalizing public service quality standards and gender-sensitive mobility planning

3.2.4 Risks and mitigation measures

The successful implementation of the LEUT project depends on addressing several institutional and behavioral risks that may hinder uptake, coordination, or long-term sustainability. These risks and corresponding mitigation measures are summarized in the table below.

Table 4 Planned reduction in GHG emissions in the revised NDC (2021 – 2025)

Institutional risk	Proposed mitigation measure
Resistance to reform from actors whose mandates may be restructured	Conduct inclusive consultations from early project stages to ensure ownership and clarify institutional roles; adopt a gradual, phased implementation strategy
Limited capacity at the municipal level to implement and manage new infrastructure	Include targeted capacity-building for municipal staff in the project design
Lack of technical capacities to operate electric mobility technologies and ITS systems	Provide specialized training programs and peer exchange visits to build technical expertise in e-mobility and digital systems operations

Institutional risk	Proposed mitigation measure
Insufficient interministerial coordination, particularly around infrastructure oversight	Establish an interministerial steering committee with clearly defined roles; consider assigning the Ministry of Public Works and Infrastructure a lead role in supervising BHLS works.
Resistance from local communities, including road users, informal vendors, and businesses affected by the works	Implement a proactive communication strategy, early community engagement, and grievance redress mechanisms to build trust and mitigate disruption
Slow modal shift towards public transport despite improved services	Deploy a change management campaign targeting user awareness, simplify and promote access to the new ITS tools and apps, and highlight benefits of electric mobility
User reluctance towards digital tools (apps, e-ticketing, ITS features)	Ensure intuitive user interface design, inclusive communication, and physical assistance at terminals during roll-out phases

3.3 Technical evaluation

3.3.1 Detailed project design

As mentioned is section 3.1.1, the LEUT project is structured around three main components with the objective of reducing emissions from the urban transport sector by improving the level (and quality) of service, enhancing intermodality, and addressing last-mile connectivity while minimizing the environmental impact of the five principal bus lines of the SOTRAL services in the Greater Lomé.

The LEUT program also aims to promote non-motorized transportation (NMT) and enhance access to public transit.

These combined objectives are intended to help reduce the rapid growth of greenhouse gas (GHG) emissions in the transport sector, while delivering important socio-economic benefits such as improved mobility and employment opportunities for vulnerable populations, better passenger information within the urban transport system, and a reduction in both noise pollution and harmful emissions. In addition, it seeks to mitigate the negative impacts of private vehicle use by encouraging a modal shift toward public transport.

The LEUT project components and outputs' structure is detailed below:

- **Component 1: Completion of the design and construction of high level of service bus corridors and complementary facilities**
  - Output 1.1: Construction of Bus with High Level of Service (BHLS)
  - Output 1.2: Construction of public transit depots and facilities
  - Output 1.3: Implementation of Non-Motorized Transport (NMT) networks
- **Component 2: Deployment and integration of smart and green bus systems**
  - Output 2.1: Procurement of low-carbon bus fleet
  - Output 2.2: Development of sustainable energy infrastructure
  - Output 2.3: Installation of an Intelligent Transportation System (ITS)

- **Component 3: Enabling environment for the effective management of public transport services**
  - Output 3.1: Policy and regulatory framework
  - Output 3.2: Institutional development and strengthening
  - Output 3.3: Capacity building
  - Output 3.4. Monitoring and evaluation system

Component 1: Completion of the design and construction of high level of service bus corridors and complementary facilities

Component 1 of the project focuses on the strategic development of a high-performance urban transport system in Greater Lomé through the construction of 5 Bus with High Level of Service (BHLS) corridors and the establishment of supporting infrastructure. The overarching objective is to improve the quality, speed, reliability, and environmental sustainability of public transportation services while promoting intermodality and accessibility for all users, including non-motorized transport (NMT) modes.

Output 1.1: Construction of Bus with High Level of Service (BHLS) corridors

The first output consists of the design and construction of BHLS corridors along the city's five priority bus lines currently operated by SOTRAL:

- L2 (Adétikopé – Rex),
- L7 (Kpogan – Bia),
- L1 (Zanguéra – Bia),
- L6 (Agoè Assiyéyé – Bia), and
- L12 (Entreprise de l'Union Limousine – Bia).

It consists of two activities as described bellow:

- **Activity 1.1.1** involves the completion of Preliminary and Detailed Design Studies and the preparation of Tender Documentation for the construction of the corridors. These studies include a comprehensive assessment of commercial bus speed and identification of operational bottlenecks such as intersections and congestion-prone areas. Specific technical solutions will be proposed to improve the efficiency of these lines, including the implementation of dedicated bus lanes on critical sections, the redesign of junctions to favor bus priority, and the optimization of traffic flow in central areas. The design of the BHLS corridors should not aim at a complete redesign of the routes but rather focus on critical sections in order to improve punctuality and commercial speed.

- **Activity 1.1.2** will implement these technical improvements through the construction of over 80 km of corridors, acknowledging that full-length intervention across all routes is not necessary. Instead, resources will be focused on high-impact segments with significant potential to improve service quality and reduce travel time. The corridors will be built using a phased approach to ensure minimal disruption to existing traffic and to allow the integration of lessons learned during early implementation phases.

Output 1.2: Construction of public transit depots and facilities

To support the operation and resilience of the BHLS network, this output focuses on the construction of essential facilities, including depots, terminals, and park-and-ride (P+R) systems. As P+R infrastructure is currently non-existent in Lomé, the Government has announced plans

to develop 10 multimodal hubs integrating informal shared transport, formal bus services, and pedestrian access. In alignment with these plans, the project will ensure that GCF-supported P+R interventions are fully complementary and do not duplicate government-led initiatives. It consists of four activities as described bellow:

- **Activity 1.2.1** involves the completion of Preliminary and Detailed Design Studies and the preparation of Tender Documentation for construction of the envisaged facilities. It consists of the design of two central bus station terminals, four bus depots and five park-and-ride infrastructures in peripheral neighborhoods. These facilities aim to optimize multimodal transfers, improve passenger convenience, and strengthen the logistical capacity of the bus system. Central terminals are the existing high-demand zones of Bia and Rex, while the bus depots and park-and-ride infrastructures in peripheral neighborhoods will focus on the peripherical parts of the city's five priority bus lines (2, 7, 1, 6, and 12). Activity 1.2.1 should serve as an intermediate milestone for readjusting SOTRAL's priorities.

- **Activity 1.2.2** will focus on the development of the two central bus terminals located in Bia and Rex, with the aim of improving passenger transfers and optimizing the operational efficiency of the BHLS network. These upgrades must address the spatial constraints of these dense urban areas while ensuring clear and safe organization of flows. This includes the design of secure pedestrian pathways, the classification and separation of different circulation flows (pedestrians, buses, and other vehicles), and improved visibility and legibility of the spaces. Planned interventions may include the redevelopment of sidewalks leading to the terminals, a review of the traffic circulation plan in the surrounding area, and the restructuring of bus stops to enhance accessibility and efficiency. The overall objective is to streamline passenger movements, reduce accident risks, and strengthen the regulation and performance of the BHLS system at these key urban nodes.

- **Activity 1.2.3** involves the construction of three strategically located bus depots in the western (Aflao Sagbado, Zanguéra, Vakpossito), northern (Adétikopé, Togblé, Agoènyivé), and eastern (Baguida, Bè Est) areas. These depots will be equipped to ensure safe storage, routine maintenance, and efficient dispatching of the bus fleet, thereby enhancing fleet availability and ensuring the long-term sustainability of the service. The objective is to minimize non-revenue "deadhead" mileage, optimize operational costs, and improve overall service efficiency. This will also allow SOTRAL staff to improve their working conditions and overall job satisfaction by being on average closer to their place of work. The depots will be designed and constructed in compliance with relevant technical and environmental standards.

- **Activity 1.2.4** will focus on the construction of five park-and-ride (P+R) facilities located at strategic access points along the priority bus corridors, with the objective of promoting a modal shift from private car use to public transport. The pre-selected sites include Adétikopé, Kpogan, Zanguéra, Agoè Assiyéyé, and Entreprise de l'Union Limousine. These infrastructures are intended to alleviate congestion on key arteries leading to the city center by offering multimodal transport solutions for users who cannot reach bus stops on foot. By facilitating seamless car-to-bus transfers, the P+R facilities will strengthen intermodality and extend the reach of the BHLS network. This activity is also designed to complement the interventions planned under Output 1.1, which focus on the construction of BHLS corridors and which may involve reallocating road space from private vehicles to bus operations. The proposed facilities will incorporate features that support integration with informal transport services (such as Zemidjans and taxis) and interurban connections. A special attention will be given to improving the safety and fluidity of pedestrian access around the stations served, to ensure comfortable and secure access for all users.

Output 1.3: Implementation of Non-Motorized Transport (NMT) networks

This output emphasizes the integration of active mobility solutions both into the urban transport ecosystem, and in inhabitants' habits. It consists of three activities as described bellow:

- **Activity 1.3.1** involves the planning and design of infrastructure for walking and cycling, focusing on accessibility, safety, and environmental integration. The aim is to promote a healthier urban lifestyle, reduce carbon emissions, and provide affordable mobility options by: (1) designing fitness and bicycle trails to encourage both walking and sports activities in Lomé; and (2) designing of safe pedestrian paths and green spaces to improve access to SOTRAL bus stops and enhance overall walkability. This work will comprise Preliminary and Detailed Design Studies as well as the preparation of Tender Documentation for activities 1.3.2 and 1.3.3.

- **Activity 1.3.2** includes the construction of 20 km of fitness and bicycle trails, with 10 km along the coastline and 10 km around the East and West lakes. These areas, which are of ecological and recreational importance, are surrounded by densely populated neighborhoods. The infrastructure will be designed to preserve the environmental integrity of these spaces while providing safe and attractive routes for walking and cycling. The objective of this activity is to offer secure spaces that allow residents to reconnect with their environment. It also aims to create urban cooling islands, foster a stronger connection between people and nature, and generally improve the image of cycling and walking in the city of Lomé. This non-motorized soft mobility link will connect key corridors served by public transport, which connect the northern and southern parts of the urban area (Boulevard du 30 Août, Avenue de la Victoire, RN1 - Rue de France, Avenue Augustino de Souza, Boulevard de l'Oti, and the Lomé bypass).

- **Activity 1.3.3** involves the development of approximately 50 km of pedestrian pathways and green spaces, primarily around the busiest bus stops or those with high potential for modal transfers. Safety and comfort features, such as barriers, pedestrian refuges, and shaded areas, will be integrated to encourage walking and improve last-mile connectivity between residential or employment areas and public transport services. These improvements aim primarily to promote and secure pedestrian movement, increase public transport usage, and foster a culture of soft and sustainable mobility. Beyond supporting the use of public transit, these interventions will also contribute to enhancing urban resilience and improving the quality of life in Lomé.

Component 2: Installation and commissioning of smart and green bus systems

Component 2 aims to complement the physical infrastructure developed under Component 1 with the procurement of low-carbon bus technologies, the development of supportive energy infrastructure, and the deployment of smart systems to enhance operational efficiency and user experience. The component is structured around three outputs that will enable the transition toward a cleaner, data-driven, and resilient public transport system in Greater Lomé.

Output 2.1: Procurement of low-carbon bus fleet

Output 2.1 focuses on the introduction of electric buses and the necessary charging infrastructure to initiate the decarbonization of the urban transport fleet.

- **Activity 2.1.1** involves a detailed technical study for the deployment of electric buses and the development of a low-emission fleet strategy. This includes evaluating bus and charging technologies (e.g., size and capacity of buses, overnight vs. opportunity charging), operational models (e.g., fully electric vs. mixed fleets), the bus routes and depots to be used, industrial approaches (e.g., local assembly and maintenance), and the procurement strategy (e.g., single or multiple procurement processes). The activity

will also examine contractual options for operations and maintenance, and assess the readiness of the SOTRAL operator and energy supply system prior to the procurement of the buses (activity 2.1.2).

- **Activity 2.1.2** involves the procurement of approximately 100 electric buses and their associated charging infrastructure. A competitive tender process will be launched to acquire the vehicles and equipment, in line with the technical specifications and strategic orientations developed under Activity 2.1.1. The procurement may be phased to align with infrastructure readiness, energy availability, and operational needs, ensuring full compatibility with local conditions and systems. This approach aims to optimize deployment efficiency and reduce implementation risks.

Output 2.2: Development of sustainable energy infrastructure

To support the electrification of the bus fleet, Output 2.2 focuses on securing and upgrading the energy supply system.

- **Activity 2.2.1** involves technical assistance for energy planning and coordination with CEET (the national electricity utility), including the exploration of PPP and PUP (Public Utility Partnership) models to support solar energy generation. Conducted in parallel with Activity 2.1.1, the outcomes and strategic directions of this activity will guide the implementation of Activities 2.2.2 and 2.2.3.

- **Activity 2.2.2** aims to modernize CEET's electrical equipment and distribution network in areas where electric bus charging stations will be installed, to ensure grid reliability and capacity. The objective is to guarantee that the depots and stations used for charging SOTRAL's electric vehicles have reliable and sufficient access to electricity, enabling the operator to run its fleet under optimal conditions without compromising service continuity or quality.

- **Activity 2.2.3** will involve the installation of one or more solar power facilities, including battery storage systems, to provide clean and stable energy for charging electric buses and reduce dependence on fossil-based electricity. The sites, exact capacities to be installed, and the contractual framework for the implementation, maintenance, and operation of these facilities (for example, through an independent power producer (IPP) model or a leasing mechanism) will be defined during Activity 2.2.1. These installations will be dedicated to SOTRAL services, enabling electric vehicle charging or providing clean power to certain depots. This activity is designed as a pilot initiative aimed at testing the deployment and management of medium-capacity solar stations through a partnership between one or more private operators and public services.

Strengthening electricity infrastructure for e-mobility

Togo's electrification rate reached 94.1% in urban areas in 2021, and recent investments – such as the Blitta solar plant (50 MW) and Kekeli thermal station (65 MW) - have boosted national capacity. However, challenges persist:

- Electricity supply to bus depots must be made reliable, especially overnight for charging electric buses
- Despite a growing share of renewables (nearly 19% of installed capacity), over 54% of electricity is still imported, primarily from Nigeria and Ghana[21]
- Mini-grids and off-grid solutions, supported by the Tinga Fund and projects like CIZO, are helping expand access but are not yet tailored for large-scale public transport use

Main options for electric bus charging at SOTRAL depots

1. **Direct Grid Connection**

SOTRAL does not generate its own electricity. Buses are charged directly from the national grid operated by CEET.

- This is the simplest short-term option but entails full dependency on CEET's supply.
- It requires the installation of appropriate electrical infrastructure (transformers, distribution panels, smart charging units). This infrastructure is required under all three options.

2. **On-site Solar PV Production (without storage)**

SOTRAL installs solar panels on depot rooftops to partially or fully produce its own electricity, depending on available surface and budget (approx. 1 hectare per MW). During daytime when buses are in circulation, excess energy can be injected into the CEET grid, and electricity from the grid is used for charging at night.

- Technical studies must confirm that sufficient space is available to meet charging needs.
- This option allows SOTRAL to support national climate goals by balancing energy consumption with local production.
- It could also reduce operating expenses (OPEX), as solar power is cheaper than electricity purchased from CEET. Self-production with grid injection is permitted under Article 19 of Law No. 2018-010 (August 8, 2018), subject to obtaining an authorization.

3. **Autonomous Solar production with storage**

SOTRAL produces solar power and stores it to charge buses and supply depot energy needs.

- This option requires a detailed analysis of battery storage costs, which are significant and must be justified through a robust financial assessment.
- Public transport usage patterns result in a time mismatch: buses operate during the day (when solar production peaks) and typically recharge in the evening. This temporal gap can lead to oversized battery systems.
- This solution also requires strong technical capacity for operations and maintenance (O&M).

Output 2.3: Installation of an Intelligent Transportation System (ITS)

This output focuses on enhancing the operation efficiency, coordination, and user accessibility of public transport services through digital tools.

- **Activity 2.3.1** involves designing and planning the integration of a modern Intelligent Transport System (ITS) for SOTRAL. This system includes geolocation tools that enable real-time tracking and reporting of bus positions, dynamic scheduling that adjusts operations based on traffic and demand, as well as smart ticketing that facilitates the purchase and access to tickets, fare integration with other modes (feeder services, park-and-ride), and simplified payment and subscription systems. Furthermore, it supports the deployment of open data, promoting transparency and innovation by making information accessible to the public and developers. This activity aims to improve transport efficiency, optimize resource management, and provide a better user experience while contributing to a more environmentally friendly and adaptable service.

- **Activity 2.3.2** includes the launch of a national competition to develop a geolocation and routing mobile application for bus passengers. The competition will be accompanied by public outreach and incentive mechanisms.

- **Activity 2.3.3** will procure and install ITS hardware and software, such as GPS units, servers, and control center systems. These will support real-time monitoring, improve service reliability, and enhance passenger information delivery.

Component 3: Enabling environment for the effective management of public transport services

Component 3 addresses the institutional, regulatory, and financial frameworks required to ensure the long-term sustainability and replicability of the investments made under Components 1 and 2. It also includes a capacity-building and monitoring system to track performance and strengthen stakeholder engagement.

Output 3.1: Policy and regulatory framework

This output focuses on strengthening the planning and governance of urban transport in Lomé.

- **Activity 3.1.1** will develop a long-term Green Mobility Plan for Greater Lomé. This strategic plan will build on existing urban mobility frameworks, further develop the Togolese Green Mobility Program and the Greater Lomé Sustainable Urban Mobility Plan, and propose a roadmap for the deployment of future electric bus lanes, integration of non-motorized transport, as well as sustainable urban logistics and private transport.

- **Activity 3.1.2** will establish quality standards for public transport services, including benchmarks and evaluation criteria regarding vehicle condition, safety, punctuality, accessibility, customer service, and environmental impact. These standards aim to improve and standardize the analysis and self-monitoring of public transport service quality in Lomé, and eventually at the national level. They will also help guide future improvement actions, procurement and investments for the Togolese public transport services.

- **Activity 3.1.3** aims to design and implement an innovative financial mechanism such as an Urban Transport Development Fund to ensure the long-term financial sustainability of urban transport investments. This mechanism will also serve to attract and leverage private sector co-financing, fostering public-private partnerships and enabling scalable

[21] Stratégie nationale de mobilité électrique sensible au genre, 2025-2029, Ministère de l'Environnement et des Ressources Forestières, PNUE, Décembre 2024

and impactful development of sustainable urban mobility solutions. The analysis will present international examples and propose solutions adapted to the Togolese context. The fund should provide a clear vision and help anticipate a well-organized procurement and fleet renewal process to support the growth and improvement of public transport services over the long term.

Output 3.2: Institutional development and strengthening

This output will support the establishment of a dedicated Urban Mobility Authority[22] ("*Autorité Organisatrice de la Mobilité*", AOM) for Greater Lomé, responsible for coordinating all public and non-motorized transport systems.

- **Activity 3.2.1** involves establishing the AOM as a legally recognized public entity with financial autonomy and a clear mandate to plan, regulate, finance, and manage urban mobility. It will unify prerogatives of key institutions at the national and metropolitan levels (MTRAF, DAGL, SOTRAL, etc.) under a single framework. The AOM will be empowered to collect revenues, sign funding and service contracts, and lead investments in transport infrastructure and services. Once a national legal framework is adopted, relevant authorities will delegate their competencies and associated resources to the AOM, which will act as the central coordinating body for urban mobility in Greater Lomé.

Output 3.3: Capacity building

To ensure effective implementation and management of the low-emission urban transport system, this output supports human resource development across key institutions such as SOTRAL, MTRAF, DAGL, MTP, MERF, MEM, and future AOM.

- **Activity 3.3.1** includes structured training program, designed and implemented to strengthen the skills of key stakeholders involved in public transport planning and operations. The program will target public agencies, SOTRAL staff, planners, and technicians. It will address essential topics such as eco-driving and road safety for drivers, fleet maintenance for both electric and conventional vehicles for mechanics, and the use of intelligent transport systems, including geolocation and passenger information tools. It will also cover service planning, performance monitoring, contract management, customer service, and inclusive mobility practices. The capacity-building initiative will include workshops and peer-learning activities to promote best practices and foster a culture of excellence among transport professionals. In addition, four study tours will be organized, including two regional and two international visits, for example to South Korea and Greece. Each tour will last three days and include five participants. These visits will provide hands-on exposure to recently implemented sustainable transport systems, encouraging practical learning and knowledge exchange.

- **Activity 3.3.2** targets capacity building for NMT planning and operation. It aims to build the capacities of stakeholders involved in urban planning in the development and design of infrastructure that promotes NMT, with a particular focus on inclusion and connectivity. This activity will provide comprehensive capacity building to improve non-motorized infrastructure in urban neighborhoods, ensuring these modes of transport are safe, accessible, and welcoming to all users, including women, children, the elderly, and persons with disabilities. Staff will be trained to measure and improve neighborhood walkability by assessing the quality and safety of pedestrian spaces, identifying barriers to walking and cycling, and designing solutions adapted to the local context that encourage active transport as well as integrating improved NMT infrastructure into the broader urban mobility system, with the goal of promoting and ensuring seamless

[22] Action n°8 of the Greater Lomé Sustainable Urban Mobility Plan "Integrated governance" D1 "Structuring mobility governance" and D2 "Creation an AOM"

connections between neighborhoods and other modes of transport. Through workshops, training sessions, and institutional strengthening, the activity will enable local agencies, planners, and operators to better understand the challenges of NMT mobility and to develop policies and interventions that foster inclusive mobility.

Output 3.4: Monitoring and evaluation system

This output will track the climate and development impacts of the project. It establishes a comprehensive monitoring and evaluation (M&E) framework designed to systematically track the climate and development impacts of the project. By providing timely and accurate data, the system will enable project managers, stakeholders, and policymakers to assess progress, identify challenges, and make informed decisions to optimize project outcomes. It ensures accountability and transparency in measuring how interventions contribute to greenhouse gas (GHG) emission reductions, modal shifts in transport, and overall service quality improvements

- **Activity 3.4.1** will develop focus on designing and deploying a robust GHG M&E system fully aligned with both national climate reporting obligations and international frameworks. It will collect and analyze data related to emissions reductions achieved through project interventions, monitor changes in transport modal shares to capture shifts toward sustainable modes, and evaluate improvements in service quality from the perspective of efficiency, reliability, and user satisfaction. By integrating cutting-edge data collection technologies and standardized methodologies, the system will ensure consistent, transparent, and verifiable reporting, thereby supporting the project's environmental goals and reinforcing stakeholder confidence.

- **Activity 3.4.2** focuses on implementing This activity is dedicated to mainstreaming Environmental and Social Safeguards (ESS) and gender-sensitive approaches throughout the project lifecycle. It involves the preparation and application of detailed Environmental and Social Management Plans (ESMPs) that identify potential environmental and social risks, propose mitigation measures, and set monitoring protocols to ensure compliance. It includes capacity building on ESS, and the mainstreaming of gender and inclusion in transport policies and infrastructure delivery.

3.3.2 Key changes to project outputs compared to the 2023 LEUT Design

In August 2023, the Ministry of Environment submitted a first version of the Concept Note entitled "Enabling Low-Emission Urban Transport (LEUT) in Greater Lomé." Following comments from the Green Climate Fund (GCF), as well as a field mission and stakeholder consultations in Lomé, the project structure was revised in 2025 to better reflect operational needs, stakeholders' guidance, local capacities, and the overall feasibility of project implementation.

The main changes compared to the first version of the Concept Note aimed to:

4. Shift toward a more feasible and context-appropriate transit model: A significant change concerns the transition from a BRT system built to Silver Standard to a more flexible and context-appropriate design focused on Bus Corridors with High Level of Service (BHLS). This adjustment reflects feasibility constraints (urban density, cost, and right-of-way limitations) and recommendations made by the Ministry of Road, Air, and Rail Transport (MTRAF) during the pre-feasibility mission. Rather than a 20 km segregated BRT infrastructure, the updated concept proposes improvements over approximately 80 km of priority corridors, with targeted infrastructure upgrades, focusing selectively on critical segments requiring improvements, to enhance commercial speeds and reliability.

5. Strengthen the energy infrastructure component: The 2025 version introduces a new Output 2.2: Development of sustainable energy infrastructure, which was not explicitly covered

in the 2023 Concept Note. This addition addresses critical concerns related to electricity supply and grid readiness for large-scale e-bus deployment. It includes planning with CEET, local grid reinforcement, and possible installation of solar infrastructure with battery storage to ensure stable and clean energy supply—responding to risks identified around energy availability and regulatory constraints in Togo's electricity sector.

6. Consolidate and refocus Non-Motorized Transport (NMT) interventions: NMT was present in the 2023 Concept Note, but it has been reorganized under Output 1.3 in the new structure. Rather than separating various infrastructure elements as in the original version, the updated design consolidates pedestrian and cycling infrastructure, green spaces, and safety improvements into a more coherent implementation-focused output. Some previously planned NMT last-mile services, such as bike-share schemes and e-bikes, were dropped due to feasibility concerns raised by stakeholders.

7. Clarify institutional and regulatory support mechanisms: Outputs on institutional reform, regulatory frameworks, and stakeholder capacity-building remain core to the project. However, they have been reorganized for clarity and operational focus under Component 3 in the 2025 Concept Note. Notably, several 2023 activities related to policy evaluation and procurement guidelines have been streamlined. Instead, the updated structure prioritizes the development of a green mobility plan, quality standards, and the establishment of an urban mobility authority – better aligned with current institutional ambitions and STILTS programme recommendations.

The main changes are described in the table below.

Table 5 Key changes to project outputs between the 2023 and the 2025 Concept Note

#	Output / Activity from previous concept note	Description of change
New elements introduced		
1.	Output 1.2: Construction of public transit depots and facilities	New infrastructure output which includes terminals, depots, and park-and-ride systems.
2.	Output 2.2: Development of sustainable energy infrastructure	New output to address the need for sustainable energy supply for low-carbon buses; not present in 2023 CN.
3.	Output 2.3: Installation of an Intelligent Transportation System (ITS)	New emphasis on ITS integration, including fleet management, ticketing, and data systems; not explicitly included in 2023 CN.
4.	Output 3.4: Monitoring and evaluation system	New output for robust climate M&E, including GHG tracking and ESS integration, which were not previously present.
Elements significantly revised		
5.	Output 1.1: Construction of BHLS corridors	Replaces the BRT Silver Standard with a context-appropriate high-level bus corridor system (BHLS), considering implementation feasibility and stakeholders' guidance. The objective is to cover a greater number of lines while minimizing disruption to the existing urban built environment.
6.	Output 2.1: Procurement of low-carbon bus fleet	Originally framed as the purchase of "low-emissions buses" without specifying the propulsion technology, this output now reflects a clear and deliberate shift toward fully electric buses. This strategic choice enables proper sizing of related project components – such as depot infrastructure, corridor upgrades, and grid reinforcement – and helps avoid interface issues across component.
7.	Output 1.3: Implementation of Non-Motorized Transport (NMT) networks	Consolidates pedestrian and cycling activities from 2023 under one streamlined output with a clearer implementation focus.

#	Output / Activity from previous concept note	Description of change
8.	Output 3.1: Policy and regulatory framework	Combines and simplifies multiple 2023 activities related to regulatory reforms and coordination mechanisms into one cohesive output.
9.	Output 3.2: Institutional development and strengthening	Regroups institutional support efforts including establishment of UTA and operationalisation into one consolidated output and in line with SILTS recommendations
10.	Output 3.3: Capacity building	Encompasses training, technical support, and eco-driving under one capacity-building umbrella to consolidate fragmented activities in the 2023 version.
Elements removed or integrated elsewhere		
11.	Activity 1.1.1.3: Design a concession agreement (in 2023 Concept Note)	Removed: concession-based operations were deprioritized in favor of institutional consolidation (AOM).
12.	Activity 1.4.1.5: Monitor and evaluate the new funding mechanism	Folded into the broader Output 3.4 on Monitoring and Evaluation.
13.	Activity 2.2.1.3: Monitor and evaluate BRT performance	BRT-specific performance evaluation removed as BRT concept was replaced by broader BHLS approach.

3.3.3 Expected project results

The LEUT project presents a multidimensional impact potential, with significant outcomes on environmental, social, economic, and institutional levels. The expected socio-economic, environmental, and institutional impacts are as follows:

1. **Socio-economic impacts:** The project contributes to socio-economic strengthening in the Greater Lomé area by creating and facilitating access to employment opportunities and reducing transportation costs for users, particularly the most vulnerable. It will generate both direct and indirect jobs, especially in the construction, operation, and maintenance of infrastructure and rolling stock. By reducing travel times and improving service quality, the project enhances citizen productivity and facilitates access to economic, educational, and healthcare opportunities, particularly for disadvantaged populations. The improvement of urban quality of life, notably through greening of public spaces and securing non-motorized travel, increases the city's attractiveness.

2. **Environmental impacts:** The project aims for a substantial reduction in greenhouse gas (GHG) emissions (see section 3.5), atmospheric and noise pollution at the urban level, and promotes a healthier and more sustainable urban environment. These goals will be achieved through the strengthening of high-capacity public transport, the introduction of low-emission (electric) buses into the public transport fleet, enhanced walkability within the metropolitan area, the promotion of active and non-motorized transport modes, and the possible installation of a 5 MW solar photovoltaic power plant to charge the electric fleet of buses.

3. **Institutional and governance impacts:** Through the establishment of a Mobility Organizing Authority (AOM) with a clear mandate for planning, regulation, and management of urban transport, along with capacity building for decision-makers, planners, and urban operators, the project anticipates a substantial improvement in the institutional and governance framework of the transport and urban mobility sector. Specialized training, international partnerships, and a rigorous system for monitoring and evaluating social, environmental, and operational impacts will ensure the project's transparency and adaptability.

3.3.4 Exit strategy and sustainability of impacts

To ensure long-term sustainability, the project will follow a clear exit strategy. Upon completion of the investment period, the institutional and operational responsibilities for infrastructure, rolling stock, ITS, and energy systems will be assumed by national and local stakeholders, primarily SOTRAL and the future Autorité Organisatrice de la Mobilité (AOM). The AOM will play a central role in overseeing the continued planning, regulation, and coordination of urban transport services.

The solar power infrastructure installed under Output 2.2 will be maintained under public-private partnerships or utility-led frameworks, ensuring long-term operations and asset management of the power asset.

Capacity-building activities (Component 3) will support skills transfer and knowledge retention within relevant institutions, enabling them to manage and scale the project's benefits independently. Financial mechanisms under Activity 3.1.3 are expected to support reinvestment and system expansion, and monitoring tools under Output 3.4 will allow continued evaluation of environmental and operational performance beyond the project's lifespan.

3.3.5 Project baseline, results and targets

The expected outcomes and quantified targets of the project are presented in the table below. At this stage, the objectives have been developed preliminarily based on existing studies. While some targets and performance indicators are already defined, further studies and measurements will be conducted during project implementation to refine and optimize these objectives as the project progresses.

Table 6 LEUT project baseline, results and target

Thematic Area	Objective	Performance Indicator	Baseline (2024)[23]	Target (2030-2035)
Ridership	Triple the average daily ridership on working days across the SOTRAL network	Passengers / working day	< 25,000	> 70,000
		Passenger-km on working days	<270,000	>810,000
Frequency	Increase peak-hour frequency on SOTRAL priority lines	Time between buses (min)	TBD	< 5 min
	Increase daily frequency on SOTRAL priority lines	Time between buses (min)	> 15 min	< 10 min
User Comfort	Reduce bus occupancy rate during peak hours	m²/passenger	TBD	> 0.7 m²/passenger
	Decrease average trip duration	% of users with trip < 30 min	< 30%	> 50%
	Increase user satisfaction	Satisfaction rate (%)	70%	90%
Operational Performance	Increase average vehicle load factor on working days on SOTRAL priority lines	Passengers per bus-km	< 2.7	> 4
	Increase commercial speed on SOTRAL priority lines	km/h	TBD	15–20 km/h
Operational Fleet	Number of buses fit for service	Number	> 90	> 185
	Average number of buses in operation	Number	> 70	> 150
	Number of electric buses operational	Number	0	> 95
Workforce Mobility	Average distance from home to work for SOTRAL staff	km	>10 km	< 5 km
	Average daily commute time reduction for SOTRAL staff	Minutes	TBD	< 30 min/day
Operating Costs	Decrease fuel share in operating costs	% of annual operating costs	> 40%	< 20%
	Increase profitability of SOTRAL priority lines	Revenue/Cost ratio (R/C)	< 0.9	> 1.5
	Reduce SOTRAL deadhead mileage in operating costs	% of annual operating costs	~ [7,8 to 15%] (~150-300 M FCFA)	< 5%
Modal Shift	Increase new users from each transport mode (from private vehicles, from taxis & zemidjans, from walking, and new users)	% breakdown of modal shift	~40% mototaxi ~40% taxi ~9% walking	> 10% per category (private vehicles, taxis & zemidjans, walking, new users)
	Increase use of NMT by providing access for the urban population to fitness and/or bicycle trails	Population living within 500 m from a trail	0	200,000

[23] SOTRAL User Surveys

Thematic Area	Objective	Performance Indicator	Baseline (2024)[23]	Target (2030-2035)
Environmental impact	Reduce SOTRAL CO_2 emissions per vehicle-km (TTW)	gCO_2/vehicle-km	141	80
	Share of renewable electricity sources in electric buses charge	% of e-bus fleet energy source (in kWh)	<25%	> 50%
Open Data	Availability of operational data	Real-time API access (location, ridership, travel times)	-	Available, public and free
Governance	Implementation of the *Autorité Organisatrice de la Mobilité*	AOM status	-	Fully operational
Capacity Building	SOTRAL and governmental staff training	% of trained personnel	-	To be defined

3.4 Environmental and social evaluation

3.4.1 Methodological approach

This environmental and social (E&S) evaluation is based on:

- A review of project design and implementation modalities
- Alignment with Togo's environmental legislation and social frameworks
- A preliminary assessment of potential E&S risks and benefits of the LEUT project
- Identification of measures to enhance climate resilience, gender inclusion, and environmental sustainability

Given the nature and scope of the LEUT project, the proposed activities are expected to have limited to moderate environmental and social risks, which are generally site-specific, reversible, and can be mitigated through appropriate measures. The project would likely fall under GCF ESS Category B[24], in line with the Revised Environmental and Social Policy (GCF/B.BM-2021/18).

3.4.2 Anticipated environmental and social impacts

Environmental and social impacts have been assessed based on the project's three core components:

- Component 1: Construction of high level of service bus corridors and complementary facilities
- Component 2: Deployment and integration of smart and green bus systems
- Component 3: Enabling environment for the effective management of public transport services

The impacts are categorized by project phase (construction, operation) and by type (positive, negative, co-benefit). A summary of key impacts is presented in the table below.

Table 7 LEUT project anticipated environmental and social impacts

Impact	Description	Construction Phase	Operations Phase
Environmental impacts			
GHG Emissions	Replacement of diesel buses with e-buses, reduction of private vehicle use, solar infrastructure	Negative: Embodied carbon from materials and civil works	Positive: Reduced operational emissions from e-buses and lower private vehicle use
Air quality	Reduced NOx, PM2.5, and SOx from fleet electrification and NMT infrastructure	Negative: Dust and machinery emissions from construction sites	Positive: Improved air quality along transport corridors
Land use	Depots, terminals, P+R facilities to be developed on government or urbanized land, minimizing	Minor land take; no significant resettlement expected	Neutral

[24] Category B. Activities with potential limited adverse environmental and/or social risks and impacts that individually or cumulatively, are few, generally site-specific, largely reversible, and readily addressed through mitigation measures;

Impact	Description	Construction Phase	Operations Phase
	resettlement risk. Green space and solar plant siting to be screened during detailed design		
Waste generation	EV batteries and solar panels will generate waste over time	Negative: Construction waste (standard materials and debris)	Neutral: EV battery/solar panel waste at end of operational life but EV waste is significantly less than fossil fuel waste
Climate adaptation co-benefits	Shaded walkways, permeable surfaces, urban greening integrated into pedestrian infrastructure to mitigate urban heat and flooding	Minimal	Positive: Reduced flood risk, improved urban climate resilience, urban cooling
Social impacts			
Community health & safety	Impacts on public safety, air quality, and transport safety	Negative: Increased exposure to dust, noise, traffic disruptions	Positive: Safer public transport system and improved air quality
Accessibility & inclusion	Universal design infrastructure improves equity of access	Not applicable	Positive: Safer, more accessible transport and pedestrian routes
Employment & livelihoods	Jobs created in e-bus operations and ITS management, but possible displacement of informal transport workers	Positive: Temporary employment in construction	Positive: New jobs in formal sector. Negative: Loss of income for some informal operators
Public perception & acceptance	Stakeholder consultations show strong public support for improved transport and ITS integration, with concerns around informal sector job losses	Mixed: Minor temporary disruption concerns	Mixed: General support for modernized transport; some concerns over job losses

Environmental impacts

- **GHG Emissions**: The LEUT project is expected to significantly reduce transport-related greenhouse gas emissions in Lomé through fleet electrification, non-motorized infrastructure and modal shift to ebuses thanks to improved operations. The replacement of diesel buses with approximately 100 electric buses will reduce tailpipe emissions and, if combined with renewable electricity (via solar charging infrastructure), lower the project's carbon intensity over its lifecycle. Emissions reductions will also result from decreased private vehicle usage due to improved public transit attractiveness and walkability.
- **Air Quality**: The shift from diesel to electric buses and the promotion of NMT will reduce emissions of local air pollutants such as NOx, PM2.5, and SOx. This will contribute to improved urban air quality, particularly in densely populated corridors, and reduce respiratory health risks for vulnerable populations, including children and the elderly.

- **Land Use**: The project is not expected to lead to significant land acquisition or involuntary resettlement. Infrastructure such as depots, terminals, and park-and-ride (P+R) facilities will be developed primarily on government-owned or already urbanized land. Nonetheless, environmental and social screening will be required during the detailed design phase to ensure land-use impacts are minimized, particularly for green space development and solar plant sitting.
- **Waste Management**: The construction phase will generate typical construction and demolition waste, which must be managed in compliance with national regulations. Over the longer term, the introduction of electric buses and solar installations will require the development of end-of-life management systems for batteries, photovoltaic panels, and electronic waste (e-waste) related to Intelligent Transport Systems (ITS). Waste management planning – including recycling or safe disposal mechanisms – should be integrated into procurement and operational guidelines.
- **Climate resilience and adaptation co-benefits**: By promoting a shift to sustainable public transport and NMT, the project contributes to long-term climate resilience in Lomé. The design of corridors and pedestrian facilities will incorporate adaptation best practices, including shaded walkways, permeable surfaces, and urban greening. These interventions enhance urban cooling, reduce flood risks, and promote ecosystem-based adaptation strategies consistent with GCF guidance on efficiency and effectiveness.

Social impacts

- **Accessibility and safety considerations**: Infrastructure design will prioritize universal accessibility and user safety. Bus terminals and pedestrian paths will incorporate ramps, tactile paving, adequate lighting, and pedestrian refuges. Traffic calming measures and improved junction designs will enhance safety at modal transfer points, particularly for children, women, and people with reduced mobility.
- **Equity, gender, and inclusion**: The LEUT project integrates gender-responsive and socially inclusive objectives, particularly through infrastructure improvements (e.g. safer pedestrian facilities, accessible terminals) and capacity-building components. In addition, the electrification of buses and ITS systems are expected to create new employment opportunities, which should be accessible to women and youth. To ensure that women and vulnerable groups benefit equitably from the project, it is recommended to develop a Gender and Social Inclusion Action Plan (GAP) at the next project stage.
- **Public perception and acceptance**: Stakeholder consultations held during the project design phase indicate strong public support for improvements to the current public transport system. The integration of ITS and mobile applications is seen as a modernizing step, but concerns around job losses in the informal transport sector will need to be addressed through targeted transition support measures and inclusive dialogue.

3.4.3 Key Risks and Mitigation Measures

Environmental and social risks have been identified based on the project's core components, anticipated activities during each phase of the project lifecycle, and the local context. Risks have been categorized by thematic area, assessed for their potential severity and likelihood (risk level), and paired with corresponding mitigation measures to avoid, reduce, or manage adverse impacts.

Table 8 Environment and social risks and mitigating measures

Risk Category	Description	Risk Level	Mitigation Measure
Environment - Land Use	Small-scale land acquisition for depots or P+R	Low to Moderate	Prioritize government-owned or degraded land; screen sites early

Risk Category	Description	Risk Level	Mitigation Measure
Environment - Waste Management	End-of-life disposal of EV batteries or solar panels	Moderate	Plan for battery recycling; comply with hazardous waste regulations
Social – Community Health & Safety	Increased traffic, dust, and noise during construction	Moderate	Site-specific ESMPs, traffic management, community notices
Social – Gender Inclusion	Unequal access to employment and transport benefits	Moderate	Develop a Gender Action Plan; conduct gender-sensitive outreach and recruitment
Social – Employment & Livelihoods	Loss of activity or income for workers in the informal transport sector	Moderate	Involve informal operators (service integration, retraining, etc.); develop transitional support programs (training, employment assistance, temporary subsidies)
Social – SEAH Risks[25]	Risk of sexual exploitation, abuse or harassment during implementation	Moderate	Integrate SEAH clauses in ToRs; contractor and staff training; gender-sensitive grievance mechanism
Institutional – Capacity Gaps	Limited experience in e-bus operation or ITS management	Moderate	Provide technical assistance and training; partner with experienced operators

3.4.4 Alignment with the SDGs

The project directly contributes to several Sustainable Development Goals (SDGs), including:

- **SDG 11 (Sustainable Cities and Communities)**: By improving the quality, reliability, and accessibility of public transport, the project promotes inclusive and sustainable urban mobility. Investments in bus corridors, pedestrian pathways, and cycling infrastructure enhance urban liveability and help reduce traffic congestion, pollution, and spatial inequality in Lomé.

- **SDG 13 (Climate Action)**: The electrification of the bus fleet, promotion of non-motorized transport, and installation of solar charging infrastructure contribute to significant reductions in greenhouse gas (GHG) emissions from the transport sector. The project is aligned with Togo's Nationally Determined Contributions (NDCs) and supports national efforts toward climate change mitigation and adaptation.

- **SDG 9 (Industry, Innovation and Infrastructure)**: The project supports the deployment of resilient and sustainable infrastructure, including modern depots, park-and-ride systems, and energy-efficient transport corridors. It also integrates innovative technologies such as Intelligent Transport Systems (ITS), contributing to the digital transformation and modernization of public services.

- **SDG 5 (Gender Equality)**: The project explicitly integrates gender-sensitive approaches across its design and implementation. Improvements to safety, lighting, accessibility, and affordability of public transport—combined with targeted capacity-building initiatives—

[25] In line with the GCF SEAH (Sexual Exploitation, Abuse and Harassment) Risk Assessment Guideline, the project is considered moderate-risk. Risks during community engagement or civil works will be mitigated by: i. Integrating SEAH clauses in all procurement documents and ToRs; ii. Establishing a gender-sensitive grievance mechanism; iii. Conducting awareness-raising and SEAH-prevention training for contractors and staff.

aim to enhance the mobility and economic participation of women and girls in urban areas.

- **SDG 3 (Good Health and Well-being)**: The transition from diesel to electric buses, alongside the promotion of walking and cycling, will significantly improve air quality in Lomé. This will help reduce the incidence of respiratory and cardiovascular diseases. In addition, enhanced road safety and access to health and education facilities through better transport services will improve overall well-being.

3.5 Economic and Financial Evaluation

Electric buses have important environmental and financial rationales that support their increasing implementation in urban networks. From the environmental perspective, electric buses replace fossil fuel use for a battery, which, depending on the energy source of the battery, can reduce emissions and other pollutants from bus operations. Though public buses are not typically a financially viable operation, electric buses can lower fuel imports for society which does constitute a financial rationale in favor of an electric bus programme.

The LEUT programme in the GL looks at multiple urban transport investments (listed in the table below) to optimize and reduce emissions of urban mobility in Lomé.

Table 9 Investment programme components

Physical investments	Non-physical investments
Construction of Bus lanes with High Level of Service (BHLS)	Policy and regulatory framework
Construction of public transit depots and facilities	Institutional development and strengthening
Implementation of Non-Motorized Transport (NMT) networks	Capacity building
Procurement of low-carbon bus fleet	Monitoring and evaluation system
Development of sustainable energy infrastructure	
Installation of an Intelligent Transportation System (ITS)	

These physical and non-physical investments provide an opportunity to optimize public transportation, increase bus ridership and NMT use, as well as reduce emissions.

Due to the early stages of this programme concept, the current mandate essentially consists of presenting the assumptions for the financial model and conducting impact analysis. The full financial evaluation will be carried out once the concept note has been validated and the funding proposal is required. Accordingly, we have conducted the following, which we present in this section of the report:

- **Impact analysis:** CO2 emissions analysis, number of people and women impacted by the project and fuel savings
- **Economic evaluation:** Qualitative description of the primary economic benefits from the programme
- **Financial evaluation:** Collection of financial assumptions for financial analysis at a later stage of project development

3.5.1 Assumption and inputs

The impact analysis and the financial modelling require a number of assumptions. We list in the following tables all of the impact analysis and financial assumptions used to generate the outputs in this report.

The project is evaluated for a 15-year period, in line with the useful life of an electric bus.

The following table explains how the traffic is framed conceptually, in the with and without project scenarios.

Table 10: Conceptual framework for traffic

	With project	Without project
Number of buses	We assume that SOTRAL will have 150 operational buses for the 20-year period. • 55 diesel buses • 95 electric buses	We assume that SOTRAL will have 70 diesel operational buses.
Bus km	We assume that in both scenarios a bus does the same distance.	
Bus passenger km	We assume that passenger km on SOTRAL network triples when the project is operational relative to 2024. After the project is online, growth increases with demographic growth.	We assume passenger km increase with demographic growth from 2024.
Deviated traffic		We assume that new bus passengers are deviated from the following modes: private vehicles, taxis, zemidjans, walking or new users.
Deadhead mileage	We assume that both diesel and electric buses will cut their deadhead mileage by 67% due to the new location of the bus depots.	We assume the buses keep the same deadhead mileage as currently experienced.
Last mile	We assume that bus passengers are more likely to do last mile transport to get to their destination than informal modes. Last mile transport increases relative to the without project scenario as there are more bus passengers.	We assume that last mile follows bus passenger growth.
SOTRAL workforce	We assume SOTRAL workforce increases with bus-km.	We assume SOTRAL workforce increases with bus-km, which is stagnant in this scenario.
Active transport	We assume the project will encourage people near the NMT corridors to use active transportation instead of taxis or zemidjans.	We assume that this population continues to use taxis or zemidjans.

The following table details the assumptions used for traffic and impact analysis.

Table 11 Assumptions for the emissions analysis

Assumption	Value	Source / comment
Traffic		
Number of km travelled by SOTRAL diesel buses in 2024	2 307 420 km	Rapport d'activité SOTRAL 2024
Number of diesel SOTRAL buses in operation in 2024	70 buses	Rapport d'activité SOTRAL 2024. The current SOTRAL fleet consists of 91 operational vehicles, with 72 actually in service due to the technical reserve.
Total number of SOTRAL buses during project	150 buses	CPCS assumption Combination of diesel and electric buses. The number of buses in service is expected to double in order to achieve the target of tripling ridership, through a combination of doubling the active fleet and increasing the average occupancy rate, particularly during off-peak hours.
Number of electric SOTRAL buses in operation during project	95 buses	CPCS assumption The number of e-buses to be procured is 100. SOTRAL's performance objective will be to operate 95% of this fleet.
Number in diesel SOTRAL buses in operation during project	55 buses	CPCS assumption We consider that a total of 150 buses will be sufficient to increase service capacity and meet the objective of tripling ridership. With 95 e-buses in operation, 55 of the existing diesel buses will be retained. Out of the current 70 diesel buses, 15 will be retired from the fleet.
Number of electric SOTRAL buses without project	0 buses	CPCS assumption.
Number of days to multiply daily traffic	244 working days	Rapport d'activité SOTRAL 2024
Passengers on SOTRAL network 2024	22 488 per working day	Calculated from SOTRAL data (Rapport d'activité SOTRAL 2024)
Passenger km on SOTRAL network 2024	270 000 pkm per working day	Calculated from SOTRAL data (Rapport d'activité SOTRAL 2024)
Passenger km on SOTRAL network 2029	810 000 pkm per working day	CPCS assumption The LEUT project objective is to triple the ridership on SOTRAL lines.
Deviated traffic to SOTRAL network Private vehicles	Private vehicles 20% Taxis 30% Zemidjans 30% Walking 10% New users 10%	CPCS assumption. Deviated traffic will be higher for taxis and zemidjans Assume that deviated traffic from taxi implies 25% more pkm since there is a driver. Similarly, we assume for zemidjans that a pkm is double given there is a driver and that zemidjans circulate without passengers (so pkm for zemidjans is 125% higher)
Last mile transport for bus users - % of additional pkm relative to bus pkm	5%	CPCS assumption Bus users travel an extra 5% for the last mile transport.
Population within 500 metres of NMT infrastructure in 2030	200 000 people	CPCS analysis

Assumption	Value	Source / comment
Daily average increase in active transportation of those living near NMT	0,5km	CPCS assumption
Reduction in taxi transportation from NMT	50%	CPCS assumption
Reduction in zemidjans transportation NMT	50%	CPCS assumption
SOTRAL workforce average daily distance travelled with project	5	CPCS assumption
SOTRAL workforce average daily distance travelled without project	10	CPCS assumption
Deadhead mileage		
Total SOTRAL fuel costs 2024	846 056 520 FCFA	Rapport d'activité SOTRAL 2024
Total kilometres driven excluding deadhead mileage	2 307 420 km	Rapport d'activité SOTRAL 2024
Reported cost of fuel for deadhead mileage	300 000 000 FCFA	SOTRAL
More conservative estimate cost of fuel for deadhead mileage	150 000 000 FCFA	CPCS SOTRAL estimate represents 35% of total fuel costs which seems high.
Fuel cost per km	302 FCFA/km	Calculation on above inputs
Price of diesel without VAT	685 FCFA/L	Global Petrol Prices
Deadhead mileage in 2024	497 248 km	Calculation on above inputs
Reduction in deadhead mileage	67%	CPCS assumption The objective is that the new terminals will be placed in a way that deadhead mileage will be reduced by 67%.
Energy intensity and emission factors		
Electric bus energy consumption	1,25 kWh/km	Assumption : FE = 125 kWh per 100 km - Etude comparative sur les différentes motorisations des autobus (Jun. 2024), CATP
Emissions from energy production grid	0,60 kg CO2e/kWh	CPCS analysis
Emissions from energy production solar	0,06 kg CO2e/kWh	CPCS analysis

Assumption	Value	Source / comment
Percentage of grid consumption feeding electric buses	50%	CPCS assumption
Percentage of solar consumption feeding electric buses	50%	CPCS assumption
Emissions from diesel bus	1.41 kg CO2e/kWh	Fuel efficiency 47 L/100km at 3 kgCO2e/L
Counterfactual Emissions from Private vehicles	0,33 kg CO2e/pkm	https://www.iea.org/data-and-statistics/charts/ghg-intensity-of-passenger-transport-modes-2019 Multiplied by below adjustment factor
Adjustment factor European vehicle to local vehicle condition	2	CPCS assumption Takes into account vehicle and network condition
Counterfactual Emissions from Taxis	0,33 kg CO2e/pkm	Assumes same factor as private vehicles
Counterfactual Emissions from Zemidjans	0,15 kg CO2e/pkm	CPCS analysis Multiplied by below adjustment factor
Adjustment factor European 2-wheeler to local 2-wheeler condition	2	CPCS assumption Takes into account vehicle and network condition
Counterfactual Emissions from Walking	0 kg CO2e/pkm	Assumes no emissions
Counterfactual Emissions from New users	0 kg CO2e/pkm	Assumes no emissions
Emissions reduction due to non-physical investments	10%	We assume that the non-physical investments will optimize urban mobility and reduce emissions from the project by 10%.

We present assumptions for the impact analysis, specifically for the gender and fuel analysis.

Table 12 Assumptions for the impact analysis

Assumption	Value	Source / comment
Gender		
Share of women in impacted population	50%	CPCS assumption Assumes women are 50% of bus ridership and NMT users.
Share of women as part of hiring for LEUT	50%	CPCS assumption Assumes women are 50% of new hiring in response to the programme.
Share of women working for SOTRAL in 2024	100	Rapport d'activité SOTRAL
Share of men working for SOTRAL in 2024	342	Rapport d'activité SOTRAL

Assumption	Value	Source / comment
Fuel		
Diesel bus consumption	0,47	Fuel efficiency 47 L/100km
Private vehicle petrol consumption	0,21	https://www.mdpi.com/1996-1073/12/6/1177
Private vehicle number of passengers	2	CPCS assumption
Taxi petrol consumption	0,21	Assumes same as private vehicle
Taxi number of passengers	3	CPCS assumption
Zemidjan petrol consumption	0,05	https://www.mdpi.com/1996-1073/12/6/1177
Price of petrol	680	https://www.globalpetrolprices.com/Togo/gasoline_prices/
Motor gasoline consumption of Togo in 2022	9 163 terajoule	IEA https://www.iea.org/countries/togo/oil
Diesel consumption of Togo in 2022	8 352 terajoule	IEA https://www.iea.org/countries/togo/oil
Conversion factor for 1 litre of petroleum product in TJ	0,000039	Statistics Canada https://www150.statcan.gc.ca/n1/pub/57-601-x/2010004/appendix-appendice1-fra.htm

Finally, we present financial assumptions that can be used to develop a financial model at the proposal phase.

Table 13 Assumptions for financial analysis

Assumption	Value	Source / comment
CAPEX		
Construction of Bus lanes with High Level of Service (BHLS)	66 500 000 USD	CPCS
Construction of public transit depots and facilities	31 800 000 USD	CPCS
Implementation of Non Motorized Transport (NMT) networks	6 190 000 USD	CPCS
Procurement of low-carbon bus fleet	30 200 000 USD	CPCS
Development of sustainable energy infrastructure	7 250 000 USD	CPCS
Installation of an Intelligent	2 345 000 USD	CPCS

Assumption	Value	Source / comment
Transportation System (ITS)		
Policy and regulatory framework	470 000 USD	CPCS
Institutional development and strengthening	500 000 USD	CPCS
Capacity building	400 000 USD	CPCS
Monitoring and evaluation system	500 000 USD	CPCS
OPEX		
Construction of Bus lanes with High Level of Service (BHLS)	5% du capex	CPCS assumption
Construction of public transit depots and facilities	5% du capex	CPCS assumption
Implementation of Non Motorized Transport (NMT) networks	5% du capex	CPCS assumption
Procurement of low-carbon bus fleet – Diesel buses	1.25 USD/km	Rapport d'activité SOTRAL 2024 • Fuel 846 056 520 USD per year • Salaries 675 798 054 USD per year • Maintenance 166 194 206 USD per year • Other expenses 330 988 072 USD per year
Procurement of low-carbon bus fleet – Electric buses	0.93 USD/km	CPCS assumption 50% reduction of fuel and maintenance costs
Development of sustainable energy infrastructure	5% du capex	CPCS assumption
Installation of an Intelligent Transportation System (ITS)	5% du capex	CPCS assumption
Revenues		
Electricity tariff	87 FCFA/kWh	CEET
Student	100 FCFA	Rapport d'activité SOTRAL 2024
Tranche 1	100 FCFA	Rapport d'activité SOTRAL 2024
Tranche 2	150 FCFA	Rapport d'activité SOTRAL 2024
Tranche 3	200 FCFA	Rapport d'activité SOTRAL 2024
Tranche 4	250 FCFA	Rapport d'activité SOTRAL 2024
Tranche 5	300 FCFA	Rapport d'activité SOTRAL 2024
Financial		
Exchange rate USD/FCFA	577	Xe.com
Tax rate	27%	Togo first

Assumption	Value	Source / comment
Bus life	15 years	Statistics Canada https://pub-saskatoon.escribemeetings.com/filestream.ashx?DocumentId=175837
Gearing	TBD[26]	
GCF loan term	TBD	
Interest rate	TBD	
Commitment fee	TBD	

3.5.2 Impact analysis model methodology

The impact analysis estimates:

1. **Emissions** avoided by the programme, including the cost of tonne avoided
2. Number of **passengers** impacted by the project
3. Number of **women** impacted by the project
4. **Fuel** savings in litres and USD

We consider two scenarios. Firstly, a project scenario where the investment programme is approved by GCF and is implemented. Secondly, a without project scenario where the investment programme is not approved by GCF and is not implemented.

We first estimate traffic for the different components of the project (number of buses, distance travelled by buses, deadhead mileage, last mile transport of bus users, active transportation along NMT infrastructure, workforce mobility). We differentiate between diesel and electric buses and also distinguish where deviated traffic comes from.

Using this traffic, we estimate in the Impact tab emissions firstly. We use all the emission factor assumptions from the Input tab to estimate line by line emissions from different activities in both with and without project scenarios.

The model then estimates a cost per tonne of CO2 avoided and a percentage of CO2 emissions decrease relative to the without project scenario.

Using the impact analysis assumptions, as well as traffic estimations, the Impact tab also presents the impact results for:

- Number of passengers impacted by the project
- Number of women impacted by the project
- Fuel savings in litres and USD

3.5.3 Impact assessment/Outputs:

The project is expected to generate a variety of positive economic benefits:

- Due to a greater number of buses fit for service, as well as the other investments to optimize the network, ridership may increase significantly on working days across the SOTRAL network.
- Greater public transit ridership could reduce congestion, as well as GHG emissions and other pollutants from other transport modes.

[26] To be determined based once Indicative Programme Financing assumptions are finalised with AE and GGGI

- Operating costs for SOTRAL buses will decrease with electric buses and the reduction in deadhead mileage from better placed terminals and depots.
- SOTRAL may run a more profitable business from lower operating costs and increased occupancy of its fleet.
- New infrastructure and management systems put in place are expecting to decrease average trip duration, which provide passengers time savings.
- It will encourage NMT, which reduces emissions and promotes a healthier mode of transport.
- User satisfaction is also expected to increase.

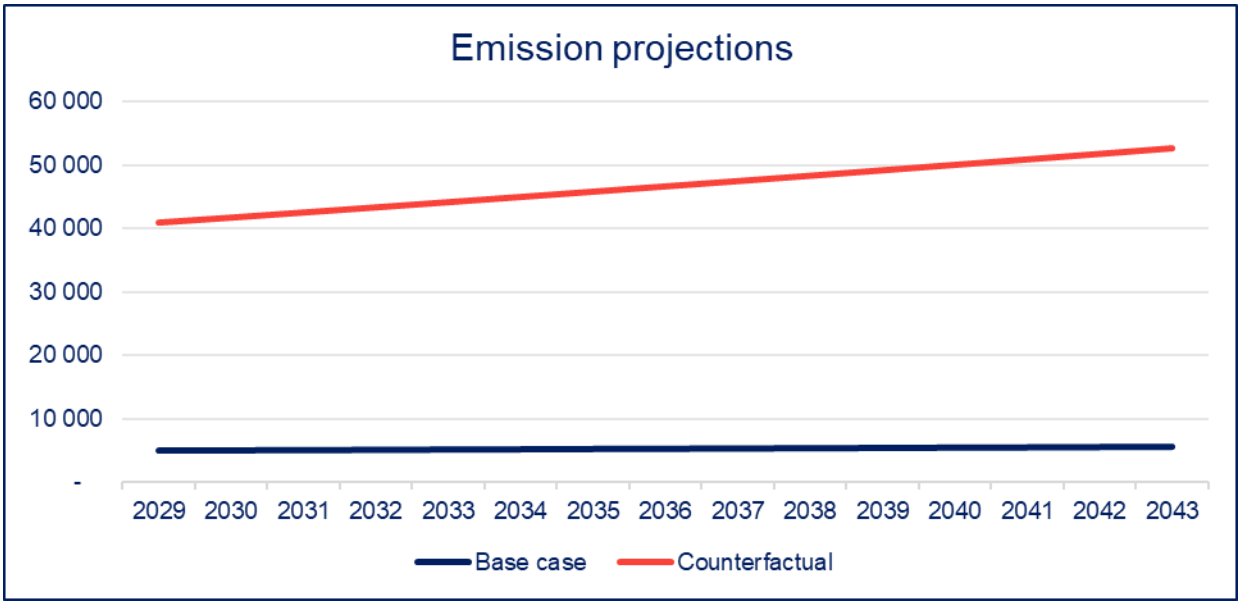
We quantify some of the potential socio-economic benefits below.

Emissions avoided by the programme, including the cost of tonne avoided

From a CO2 emissions perspective, the programme is estimated to avoid more than 41,000 tonnes of CO2 emission per year, over a 15-year period. This translates into more than a total of 620,000 tonnes of CO2 emissions avoided, or an 89% reduction in CO2 emissions relative to the counterfactual scenario.

It is estimated to cost 79 USD for a one tonne reduction of CO2. This could be lowered when the budget is optimized or detailed further at the proposal stage.

Figure 3-1 CO2 emissions with the project (base case) and without (counterfactual) project scenario (tonnes of CO2)



Source: CPCS analysis

In the optimistic and pessimistic scenario, it is estimated to cost 65 and 98 USD for a one tonne reduction of CO2 respectively.

Number of people impacted by the project

The project will impact bus passengers, future NMT users and SOTRAL workforce. The below table presents the total number impacted per population category and a yearly average based on the 15-year period. It should be noted that the bus passengers and NMT users do not

differentiate by unique individuals, i.e. one person may be counted as many times as they use the service in a given year.

Table 14 Passengers and users impacted by project

Users impacted	Unit	Over the total duration of the project	Yearly average
Bus passengers	passengers	585 247 357	39 016 490
NMT users	users	3 439 124	229 275
SOTRAL workforce	employees	14 207	947

Source: CPCS analysis

Number of women impacted by the project

Similarly, we present the number of women impacted by the project, within the categories of bus passengers, future NMT users and SOTRAL workforce. The below table presents the total number of women impacted per population category and a yearly average based on the 15-year period.

Table 15 Women impacted by project

Users impacted	Unit	Over the total duration of the project	Yearly average
Bus passengers	passengers	292 623 679	19 508 245
NMT users	users	1 719 562	114 637
SOTRAL workforce	employees	5 289	353

Source: CPCS analysis

Fuel savings in litres and USD

In terms of fuel savings, the project promises to reduce the need of imports. These savings are derived from two primary mechanisms:

- Diesel savings result directly from the electrification of the SOTRAL fleet, replacing conventional diesel-powered buses with electric vehicles.
- Petrol savings are primarily achieved through a modal shift from private cars (which largely use petrol) to public transport and non-motorized modes, made possible by improved BHLS services and better integration of the network.

We present the results in the table below.

Table 16 Passengers and users impacted by project

Users impacted	Unit	Over the total duration of the project	Yearly average
Diesel avoided litres	litres	6 073 320	404 888
Petrol avoided litres	litres	161 545 366	10 769 691
Diesel avoided cost	USD	7 210 094	480 673
Petrol avoided cost	USD	190 382 754	12 692 184

Source: CPCS analysis

For petrol avoided in 2029 (the year the project is operational), this represents 4% of the country's consumption of petrol in 2022 (4.8% in the optimistic scenario and 3.2% in the

pessimistic scenario). For diesel, this number is much smaller, representing 0.2% of the country's consumption of petrol in 2022 (more or less the same in the optimistic and pessimistic scenarios).

3.5.4 Budget and Financing

Table 17 Budget and Financing

Item	Spending start date	Spending duration (months)	Total cost USD
Physical investment			**144 285 000**
Output 1.1: Construction of Bus with High Level of Service (BHLS)	1-Jan-27	48	66 500 000
Output 1.2: Construction of public transit depots and facilities	1-Jan-27	48	31 800 000
Output 1.3: Implementation of Non-Motorized Transport (NMT) networks	1-Jan-27	48	6 190 000
Output 2.1: Procurement of low-carbon bus fleet	1-Jan-27	48	30 200 000
Output 2.2: Development of sustainable energy infrastructure	1-Jan-27	48	7 250 000
Output 2.3: Installation of an Intelligent Transportation System (ITS)	1-Jan-27	48	2 345 000
Non-physical investment			**1 870 000**
Output 3.1: Policy and regulatory framework	1-Jan-27	24	470 000
Output 3.2: Institutional development and strengthening	1-Jan-27	24	500 000
Output 3.3: Capacity building	1-Jan-27	24	400 000
Output 3.4: Monitoring and evaluation system	1-Jan-27	60	500 000
Total budget			**146 155 000**

3.5.5 Potential risks and mitigation

From a financial and economic perspectives, we detail some key risks.

Table 18 Environment and social risks and mitigating measures

Risk Category	Description	Risk Level	Mitigation Measure
Demand Risk	Traffic for buses and NMT infrastructure does not materialize	Moderate	Conduct comprehensive technical studies, including ridership studies; ensure design meets or surpasses established local and international standards
Limited access to construction materials as inputs for the infrastructure and buildings	Potential lack of availability, increase in the cost, or delay in the delivery timeline of key project inputs	Moderate	Benchmark pricing and delivery schedules; long term supply contracts
O&M Risk	The risk of bus operations falling below forecasts, increase in operational costs and/or occurrence of incidents that put in danger the safety of the employees or members of the public	Low to Moderate	Strengthen SOTRAL's capacity in operations and maintenance, and, if necessary, provide specialized external technical support to ensure service quality and operational safety
Unreliable energy for electric buses	Electric buses do not have access to a stable energy source	Moderate	Have an energy production component to the project

4 Financing Needs

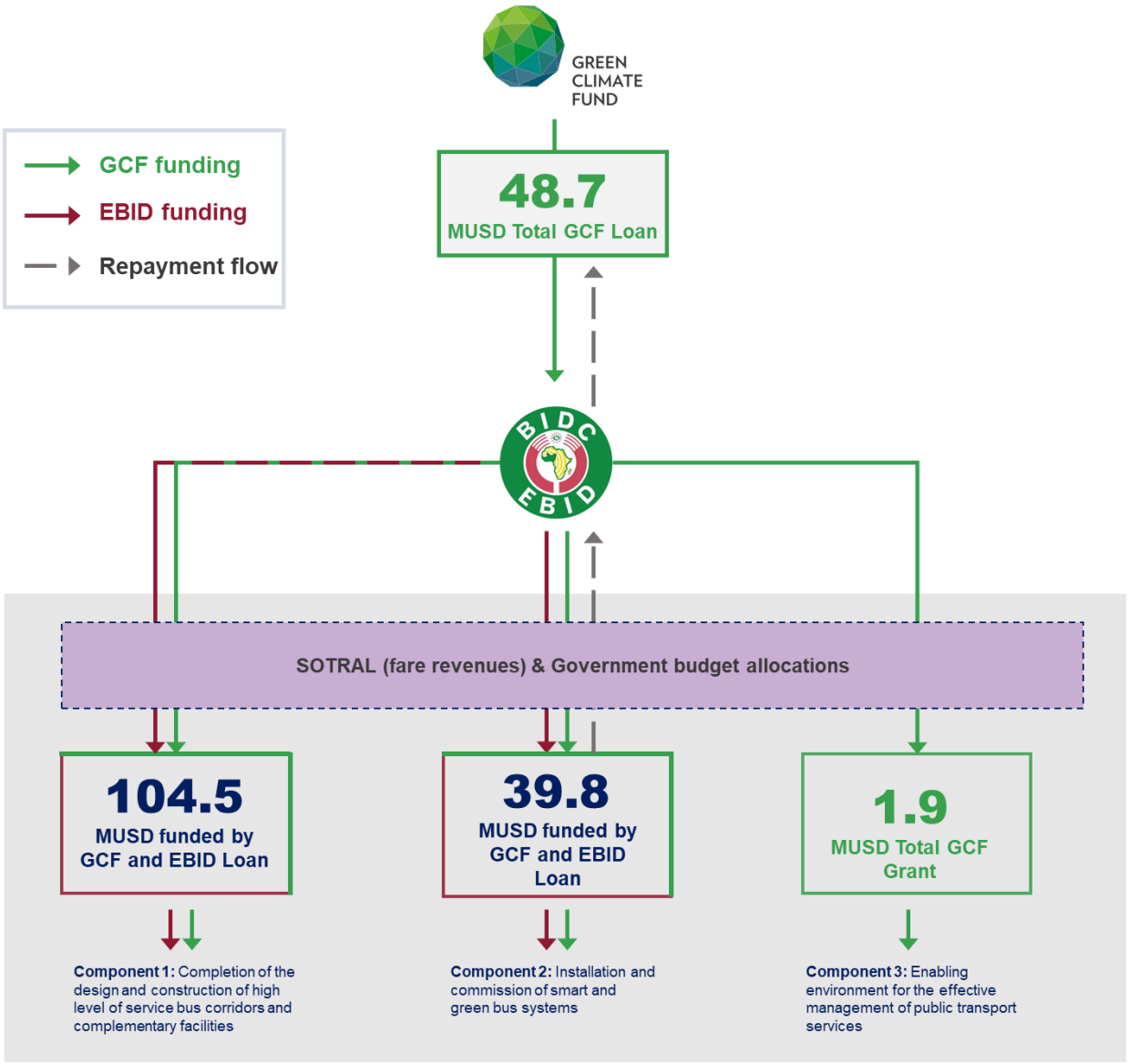
4.1 Indicative Programme Financing

The GCF funding for the Low Emission Urban Transport in Greater Lomé will consist of both grants and loans for the different components of the project. This financing will be divided between the Green Climate Fund (GCF) and the ECOWAS Bank for Investment and Development (EBID) – the accredited entity.

As shown in Figure 4-1, the illustrated flow of funds aligns with GCF benchmarks for similar low-emission urban transport programmes. It is a preliminary proposal, subject to further discussion and validation between GGGI, the Ministry of Transport, and the Accredited Entity (EBID).

The grant will primarily focus on capacity building, technical assistance, and policy development activities, while the loan facility will provide concessional financing for capital-intensive transport infrastructure investments.

Figure 4-1 Indicative Flow of funds LEUT project

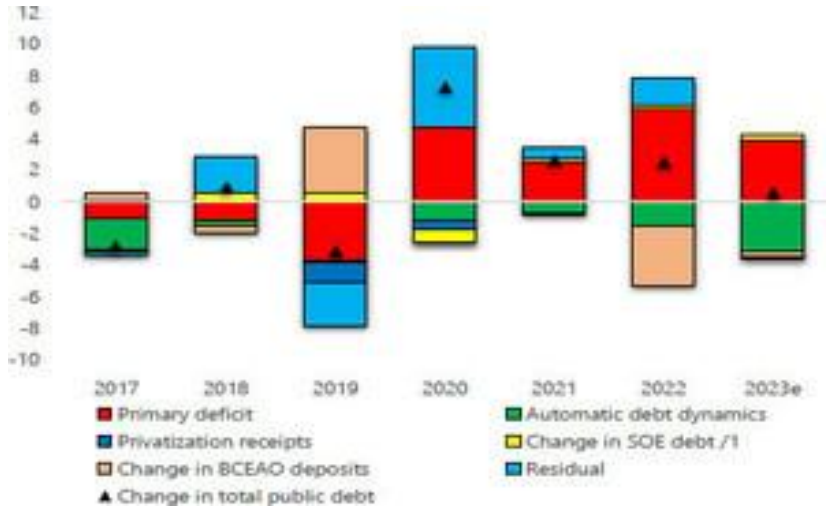


4.2 Need for concessional GCF financing

Fiscal challenges

Togo's updated NDC recognizes transport as a priority sector for both mitigation and adaption, with substantial potential to reduce emissions. While the government has made progress towards transport emissions reductions through a number of infrastructure projects, it remains financially constrained with key macro-economic indicators including fiscal deficit and debt levels restricting expenditure for large-scale transport infrastructure investments beyond basic NDC commitments. This financial burden on the government also increased significantly in light of the economic downturn during the Covid-19 pandemic, where healthcare spending and debt rose considerably.

Figure 4-2 Change in Total Public Debt Togo. 2017–23. (Percent of GDP)



Source: Togo: 2024 Article IV Consultation-Press Release; Staff Report; and Statement by the Executive Director for Togo

Barriers to accessing private capital locally

Local financial institutions and domestic banks lack the technical understanding and expertise to evaluate and finance innovative low-emission urban transport projects; the complexity of electric mobility systems, charging infrastructure requirements. This knowledge gap prevents local banks and private entities from developing appropriate financial products or risk assessment frameworks for low-emission transport investments. Risks perceived by local financing market remain a hurdle to the domestic financial sector, creating significant barriers to accessing private capital locally.

While electric mobility represents a priority technology for addressing urban mobility challenges and emissions reduction, large-scale deployment with adequate capacity building is new for Togo and requires concessional finance to demonstrate viability and build necessary expertise to scale up future private and public financing.

GCF additionality

The GCF funding is both strategic and essential for this project as it provides increased access to financing options and addresses the funding gap for Togo's transport emission reduction goals. As financial pressures on the government remain elevated due to competing development priorities and recent challenging economic years, bridging the financing gap for Togo's low-emission urban transport transition through GCF funding represents a critical contribution that can address the high upfront capital costs for electric bus deployment, charging infrastructure, and essential technical assistance, which cannot be fully covered through domestic resources alone. Without GCF support, the project's potential would be significantly compromised, limiting

deployment to small-scale pilots rather than the comprehensive system development required to demonstrate viability and attract further investment. The concessional financing for GCF would therefore address key barriers to additional financing, including limited financial literacy regarding new technologies, inadequate collateral for conventional lending, high commercial borrowing costs, and absence of appropriate financial instruments for electric mobility investments. Therefore, GCF grant funding for the project that can be scaled-up and sustained beyond the project life and continue to accrue emissions reductions, is justified.

5 Theory of change and alignment with GCF

5.1 Theory of Change

5.1.1 Theory of change goal statement

The Theory of Change is based on the premise that:

> **If** Greater Lomé is equipped with a modern, energy-efficient and inclusive public transport system, **then** Togo will be on a replicable and transformative path toward low-emission urban mobility, **because** these coordinated interventions remove systemic barriers, improve service delivery, and shift mobility behaviours toward cleaner and more inclusive modes.

5.1.2 Addressing barriers

Togo's current urban transport system is characterized by a high dependency on informal, inefficient, and polluting transport modes, lack of reliable public transport services, weak planning capacity, and inadequate infrastructure for pedestrians and cyclists. The proposed project directly addresses the following institutional, regulatory, financial, and technical barriers:

Table 19 Barriers addressed

Barrier category	Specific barriers	Addressed through
Social and Behavioral	Low public uptake of new services	Output 3.3: Awareness campaigns and eco-driving
	Resistance from informal operators	Output 3.4: M&E and climate co-benefit visibility
	Gender or social equity not effectively addressed	Output 3.1: Policy and regulatory framework; Output 3.3: Capacity building
Energy and operational Readiness	Weak grid capacity for e-bus charging	Output 2.2: Deployment of sustainable energy infrastructure with CEET and solar storage integration
Institutional and regulatory	Institutional delays in establishing AOM	Output 3.2: Establishment of an Urban Transport Authority (UTA), Output 3.1: Regulatory and policy reform
Technical capacity	Limited experience with ITS or EV maintenance	Output 3.3: Capacity building; Output 1.1 to 1.3: Infrastructure adapted to local context

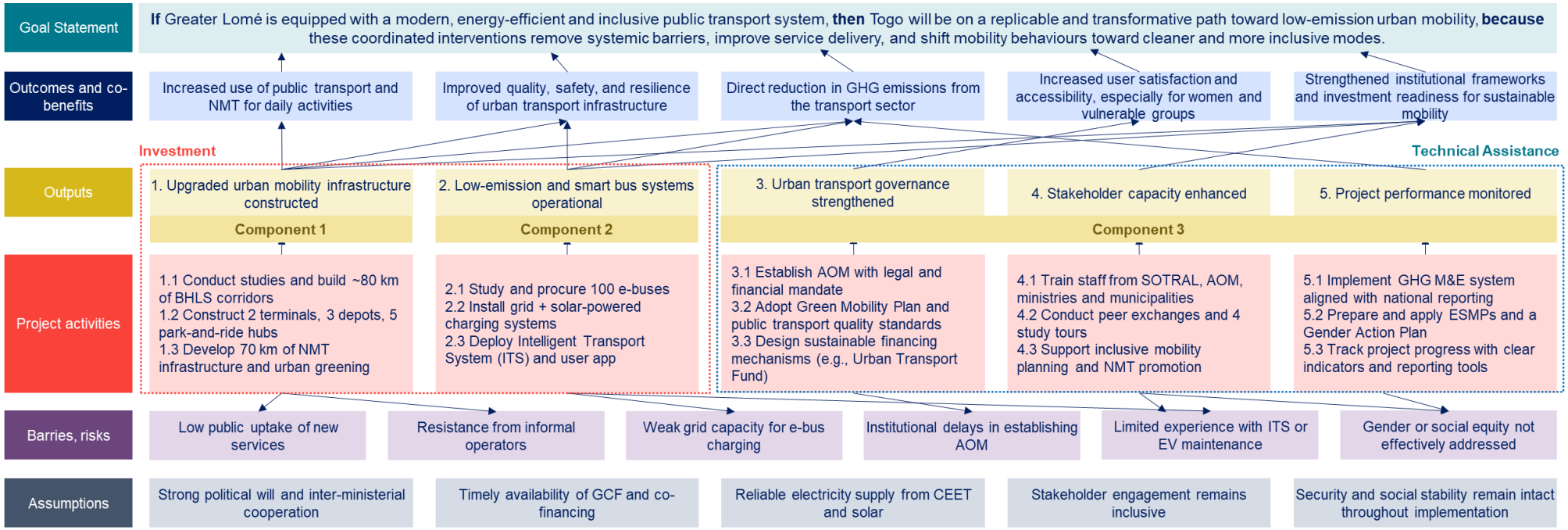
5.1.3 Theory of change diagram

The Theory of Change (ToC) presented in Figure 5-1 outlines the logical pathway through which the LEUT project in Greater Lomé is expected to achieve its climate and development objectives.

It is directly anchored in the project's goal statement, which sets out a replicable and transformative transition toward low-emission, inclusive urban mobility in Togo.

The ToC diagram links concrete project activities to a set of immediate outputs and intermediate outcomes, demonstrating how coordinated investments in infrastructure, electrification, governance, and capacity-building will drive both mitigation and adaptation benefits. The diagram also integrates the barriers, risks, and assumptions that may affect project success, providing a clear framework for managing uncertainties and enabling effective monitoring and evaluation.

Figure 5-1 LEUT project theory of change diagram



5.1.4 Mitigation and Adaptation potential

Mitigation

The LEUT project is expected to reduce GHG emissions by around 620,000 tCO_2 over a 15-year period, equivalent to a 20% reduction compared to a business-as-usual scenario. These reductions result from the combined effects of:

- A modal shift from informal and private transport to improved public transit
- The deployment of 100 electric buses replacing diesel vehicles on priority corridors
- Investments in non-motorized transport (NMT) infrastructure promoting walking and cycling

A dedicated GHG Monitoring, Reporting, and Verification (MRV) system will be deployed under Output 3.4 to track emission reductions throughout the project's implementation and operational lifespan.

Adaptation co-benefits

The project also contributes to urban climate resilience by integrating adaptation features into infrastructure and service design:

- Flood-resilient materials, green corridors, and improved drainage systems are embedded in BHLS and NMT works to mitigate flood and heat risks
- Shaded pedestrian paths and cycling trails improve thermal comfort and urban habitability in dense, exposed areas
- The project enhances mobility for vulnerable populations - including low-income commuters, women, and youth - by providing safer, more affordable, and reliable transport, reducing their exposure to climate-related disruptions.

These co-benefits strengthen the city's capacity to withstand climate shocks and ensure that adaptation and mitigation objectives are pursued in a mutually reinforcing manner.

5.2 Alignment with GCF funding criteria

Paradigm shift potential

The LEUT project is designed to catalyse a fundamental transformation in Greater Lome's urban mobility system, moving from fragmented, informal, and carbon-intensive transport modes to an integrated, inclusive, and low-emission public transport network. By introducing BHLS, deploying electric buses powered in part by solar energy, and creating a dedicated Urban Mobility Authority (AOM), the project establishes the institutional and infrastructural foundations for long-term, replicable change.

This paradigm shift is reinforced by:

- Integration of smart technologies (ITS, digital ticketing)
- Transition to clean energy systems for mobility
- Institutionalization of climate-aligned planning and regulation via the AOM
- Inclusive infrastructure benefiting vulnerable populations

The project also serves as a demonstration model for other secondary cities in Togo and West Africa, offering a scalable framework for climate-smart urban transport.

Impact potential

The project is expected to deliver significant impact, with estimated GHG reductions of 620,000 tCO_2 over a 15-year period, primarily through electrification of public transport and increased modal share of BHLS and NMT. The project's outputs - including 80 km of BHLS corridors, 100 e-buses, solar-powered charging infrastructure, and NMT facilities - are aligned with measurable indicators contributing directly to Togo's Nationally Determined Contributions (NDCs).

Sustainable development potential

Beyond climate objectives, the project delivers strong development co-benefits:

- Social: Increased access to affordable, safe, and inclusive transport services for low-income users, women, and youth
- Economic: Reduced congestion and travel time, enhanced productivity, and job creation during infrastructure development and operations
- Environmental: Reduced air and noise pollution in urban areas, protection of public health, and integration of nature-based solutions

The project supports the SDGs (notably 11, 13, and 9) and enhances Togo's resilience to environmental and socio-economic pressures.

Country ownership

The project is aligned with national strategies and climate commitments, including:

- Togo's NDCs, which prioritize transport electrification and modal shift
- The Urban Mobility Plan for Lomé (PMUD) and the Gender-Sensitive E-Mobility Strategy
- The Vision Togo 2030 and Low-Carbon Development Strategy

It was developed in close coordination with the Ministry of Transport, SOTRAL, Ministry of Environment, and other stakeholders. Stakeholder consultations were conducted during the prefeasibility phase, and further engagement is planned with civil society, local governments, and transport operators during implementation.

Needs of the recipient

Togo is highly vulnerable to climate change, with urban areas exposed to floods, extreme heat, and infrastructure stress. At the same time, the country faces:

- Severe investment gaps in urban transport infrastructure
- High upfront costs of electric buses and charging systems
- Limited institutional capacity to plan and regulate a modern mobility system

The project addresses these constraints by deploying concessional finance where commercial capital is currently unavailable or insufficient, and supporting long-term institutional strengthening through the AOM.

Efficiency and effectiveness

The project is structured for efficient delivery of climate outcomes and development co-benefits:

- High mitigation cost-effectiveness through concentrated interventions in one of Togo's most urbanized and emissions-intensive areas
- Use of blended finance to maximize the leverage of GCF contributions and crowd in additional public and private resources
- Strong value-for-money with multipurpose infrastructure (e.g. BHLS and NMT corridors that also serve as climate-resilient urban improvements)

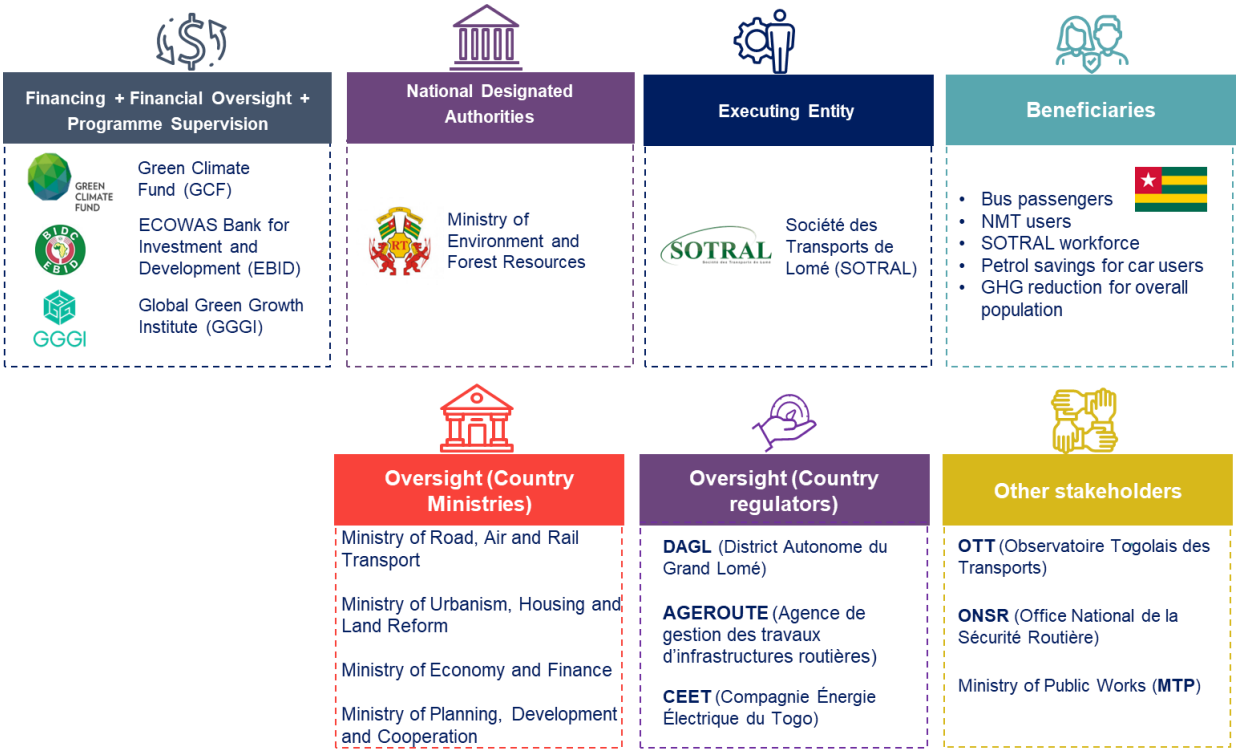
Clear performance indicators, a GHG M&E system ensure that climate and development results will be transparently tracked and verified throughout the project cycle.

5.3 Stakeholder and beneficiary mapping

The successful implementation of the LEUT project in Greater Lomé depends on the coordinated involvement of a wide range of stakeholders. These actors span across financing institutions, national authorities, implementing entities, oversight bodies, and beneficiaries. The figure below maps the institutional ecosystem supporting the project.

This mapping illustrates the diverse ecosystem of actors involved in the project, grouped according to their function in the delivery chain.

Figure 5-2 Stakeholder and beneficiary mapping



PRE-FEASIBILITY STUDY ➢ Developing the Green Climate Fund (GCF) Project: Enabling Low-emission Urban Transport (LEUT) in Greater Lomé, Togo

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