



**GREEN
CLIMATE
FUND**

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Provisional agenda item 10

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5 October 2026

Consideration of funding proposals – Addendum VIII

Funding proposal package for FP315

Summary

This addendum contains the following seven parts:

- a) A funding proposal titled "Bhutan Livable and Resilient Cities Project (LRCP)";
- b) No-objection letter issued by the national designated authority(ies) or focal point(s);
- c) Environmental and social report(s) disclosure;
- d) Secretariat's assessment;
- e) Independent Technical Advisory Panel's assessment;
- f) Response from the accredited entity to the independent Technical Advisory Panel's assessment; and
- g) Gender documentation.

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The documents are presented as submitted by the Accredited Entity.

Funding Proposal

Project/Programme title: Bhutan Livable and Resilient Cities Project (LRCP)

Country(ies): Bhutan

Accredited Entity: World Bank

Date of first submission: 2025-01-16

Date of current submission 2026-08-21

Version number V9



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Note to Accredited Entities on the use of the funding proposal template

- Accredited Entities should provide summary information in the proposal with cross-reference to annexes such as feasibility studies, gender action plan, term sheet, etc.
- Accredited Entities should ensure that annexes provided are consistent with the details provided in the funding proposal. Updates to the funding proposal and/or annexes must be reflected in all relevant documents.
- The total number of pages for the funding proposal (excluding annexes) **should not exceed 60**. Proposals exceeding the prescribed length will not be assessed within the usual service standard time.
- The recommended font is Arial, size 11.
- Under the [GCF Information Disclosure Policy](#), project and programme funding proposals will be disclosed on the GCF website, simultaneous with the submission to the Board, subject to the redaction of any information that may not be disclosed pursuant to the IDP. Accredited Entities are asked to fill out information on disclosure in section G.4.

Please submit the completed proposal to:

fundingproposal@gcfund.org

Please use the following name convention for the file name:

"FP-[Accredited Entity Short Name]-[Country/Region]-[YYYY/MM/DD]"

ACRONYMS:

ACRONYM	DEFINITION
ACREWAS	ADVANCING CLIMATE RESILIENCE OF THE WATER SECTOR IN BHUTAN
ADB	ASIAN DEVELOPMENT BANK
ADPC	ASIAN DISASTER PREPAREDNESS CENTER
AE	ACCREDITED ENTITY
AMA	ACCREDITATION MASTER AGREEMENT
AML/CFT	ANTI-MONEY LAUNDERING AND COUNTERING THE FINANCING OF TERRORISM
ARA	ADAPTATION RESULTS AREA
ASI	AVOID-SHIFT-IMPROVE
BAU	BUSINESS-AS-USUAL
BCR	BENEFIT-COST RATIO
BPL	BUS PRIORITY LANE
BTN	BHUTANESE NGULTRUM
BUR	BIENNIAL UPDATE REPORT
CBS	CITY BUS SERVICE
CCAP	CITY CORE ACTION PLAN
CCDR	BHUTAN COUNTRY CLIMATE AND DEVELOPMENT REPORT
CN	CONCEPT NOTE
CSO	CIVIL SOCIETY ORGANIZATION
DA	DESIGNATED ACCOUNT
DHS	DEPARTMENT OF HUMAN SETTLEMENT
DMA	DISTRICT METERED AREA
ECRUL	ENHANCING CLIMATE RESILIENCE OF THE URBAN LANDSCAPES AND COMMUNITIES IN THE THIMPHU–PARO REGION
EE	EXECUTING ENTITY
EFA	ECONOMIC AND FINANCIAL ANALYSIS
EIRR	ECONOMIC INTERNAL RATE OF RETURN
ENPV	ECONOMIC NET PRESENT VALUE
ESIA	ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT
ESMF	ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK
ESMP	ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN
ESS	ENVIRONMENTAL AND SOCIAL SAFEGUARDS
FAA	FUNDED ACTIVITY AGREEMENT
FM	FINANCIAL MANAGEMENT
FNPV	FINANCIAL NET PRESENT VALUE
FP	FUNDING PROPOSAL
FYP	FIVE-YEAR PLAN
GAP	GENDER ACTION PLAN
GCF	GREEN CLIMATE FUND
GDP	GROSS DOMESTIC PRODUCT
GHG	GREENHOUSE GAS
GLOF	GLACIAL LAKE OUTBURST FLOOD
GRM	GRIEVANCE REDRESS MECHANISM
IDA	INTERNATIONAL DEVELOPMENT ASSOCIATION
IDP	INFORMATION DISCLOSURE POLICY
IMF	INTERNATIONAL MONETARY FUND
IPPU	INDUSTRIAL PROCESSES AND PRODUCT USE
IRMF	INTEGRATED RESULTS MANAGEMENT FRAMEWORK
ITS	INTELLIGENT TRANSPORT SYSTEM
IUFRs	INTERIM UNAUDITED FINANCIAL REPORTS
JICA	JAPAN INTERNATIONAL COOPERATION AGENCY
KYC	KNOW YOUR CUSTOMER
LDC	LEAST DEVELOPED COUNTRY

LETMP	LOW EMISSION TRANSPORT MASTER PLAN
LMP	LABOR MANAGEMENT PROCEDURES
LRCP	BHUTAN LIVABLE AND RESILIENT CITIES PROJECT
LTS	BHUTAN'S LONG-TERM LOW GREENHOUSE GAS EMISSION AND CLIMATE RESILIENT DEVELOPMENT STRATEGY
M&E	MONITORING AND EVALUATION
MIS	MANAGEMENT INFORMATION SYSTEM
ML/TF	MONEY LAUNDERING / TERRORIST FINANCING
MLD	MILLION LITERS PER DAY
MoF	MINISTRY OF FINANCE
MoIT	MINISTRY OF INFRASTRUCTURE AND TRANSPORT
MoV	MEANS OF VERIFICATION
MRA	MITIGATION RESULTS AREA
NAP	NATIONAL ADAPTATION PLAN
NbS	NATURE-BASED SOLUTIONS
NDC	NATIONALLY DETERMINED CONTRIBUTION
NMT	NON-MOTORIZED TRANSPORT
NOL	NO OBJECTION LETTER
NPV	NET PRESENT VALUE
NRW	NON-REVENUE WATER
O&M	OPERATIONS AND MAINTENANCE
OHS	OCCUPATIONAL HEALTH AND SAFETY
PAVA	PROPERTY ASSESSMENT AND VALUATION DIVISION
PDO	PROJECT DEVELOPMENT OBJECTIVE
PIU	PROJECT IMPLEMENTATION UNIT
PMC	PROJECT MANAGEMENT CONSULTANT
PMU	PROJECT MANAGEMENT UNIT
PPF	PROJECT PREPARATION FACILITY
PSA	PUBLIC SERVICE AGREEMENT
PSC	PROJECT STEERING COMMITTEE
PWD	PERSONS WITH DISABILITIES
RAG	RED, AMBER, GREEN (RISK RATING)
RCP	REPRESENTATIVE CONCENTRATION PATHWAY
RGoB	ROYAL GOVERNMENT OF BHUTAN
RMA	ROYAL MONETARY AUTHORITY
SAARC	SOUTH ASIAN ASSOCIATION FOR REGIONAL COOPERATION
SCADA	SUPERVISORY CONTROL AND DATA ACQUISITION
SDG	SUSTAINABLE DEVELOPMENT GOAL
SEA/SH	SEXUAL EXPLOITATION AND ABUSE / SEXUAL HARASSMENT
SOE	STATE-OWNED ENTERPRISE
SPEI	STANDARDIZED PRECIPITATION EVAPOTRANSPIRATION INDEX
SSP	SHARED SOCIOECONOMIC PATHWAY
SuDS	SUSTAINABLE DRAINAGE SYSTEMS
SUTI	SUSTAINABLE URBAN TRANSPORT INDEX
TA	TECHNICAL ASSISTANCE
tCO ₂ EQ	TONNES OF CARBON DIOXIDE EQUIVALENT
ToC	THEORY OF CHANGE
TSP	THIMPHU STRUCTURE PLAN
TT	THIMPHU THROMDE
UNDP	UNITED NATIONS DEVELOPMENT PROGRAMME
UNDRR	UNITED NATIONS OFFICE FOR DISASTER RISK REDUCTION
UNFCCC	UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE
WFPSP	WATER FLAGSHIP PROGRAM SUPPORT PROJECT
WSD	WATER AND WASTEWATER SERVICES DIVISION
WSMP / TWSM	WATER SECTOR MASTER PLAN / THIMPHU WATER SERVICES MASTER PLAN
WTP	WATER TREATMENT PLANT

A.1. Project or programme	Project	A.2. Public or private sector	Public	
A.3. Request for Proposals (RFP)	Not applicable			
A.4. Result area(s)			GCF contribution	Co-financers' contribution¹
	Mitigation total			
	☐ Energy generation and access			
	☒ Low-emission transport		85%	28%
	☐ Buildings, cities, industries and appliances			
	☐ Forestry and land use			
	Adaptation total			
	☐ Most vulnerable people and communities			
	☒ Health and well-being, and food and water security		0%	44%
	☒ Infrastructure and built environment		15%	28%
	☐ Ecosystems and ecosystem services			
A.5. Expected mitigation outcome <i>(Core indicator 1: GHG emissions reduced, avoided or removed / sequestered)</i>	69,519 tCO ₂ eq (over 20 years)	A.6. Expected adaptation outcome <i>(Core indicator 2: direct and indirect beneficiaries reached)</i>	Direct: 104,162 (50,519 female)	Indirect: 271,871 (134,857 female)
A.7. Total financing (GCF + co-finance²)	USD 48 million	A.9. Project size	Small	
A.8. Total GCF funding requested	USD <u>28 million</u>			
A.10. Financial instrument(s) requested for the GCF funding	☒ Grant \$22.4m ☒ Loan \$5.6m ☐ Guarantee	☐ Equity ☐ Results-based payment		
A.11. Implementation period	Five years January 2027 – December 2031	A.12. Total lifespan	20 years for the infrastructure before capital maintenance. Approximately 10 years for implementing complementary strategies from Low Emission Transport Master Plan (LETMP), with rolling programme of bus replacement every 10-12 years. The water sector interventions have an economic lifespan of 20 years.	
A.13. Expected date of AE internal approval	10/1/2026	A.14. ESS category	B	
A.15. Has this FP been submitted as a CN before?	Yes ☒ No ☐	A.16. Has Readiness or PPF support been used to prepare this FP?	Yes ☒ No ☐	
A.17. Is this FP included in the entity work programme?	Yes ☒ No ☐	A.18. Is this FP included in the country programme?	Yes ☒ No ☐	

A.19. Complementarity and coherence	Yes ☒ No ☐
A.20. Executing Entity information	The Government of the Royal Kingdom of Bhutan, represented by its Ministry of Finance (MoF) and acting through its Ministry of Infrastructure and Transport (MoIT)
A.21. Executive summary (max. 750 words, approximately 1.5 pages)	
1. The Livable and Resilient Cities Project (LRCP) supports Bhutan's response to two emerging climate challenges in its urban areas: rising greenhouse gas emissions from transport and growing climate risks to water systems and urban transport infrastructure. Focusing on Thimphu, Bhutan's capital and largest city, the project combines low-emission resilient urban mobility investments with measures to strengthen the resilience of critical water infrastructure and services. These interventions will reduce emissions from urban transport while addressing the increasing risks of flooding, landslides, drought, and heat affecting the capital. By piloting integrated mitigation and adaptation solutions, LRCP establishes a scalable model for climate-resilient urban development in Bhutan. 2. Bhutan remains carbon negative, but gross emissions are rising rapidly with economic growth³. National greenhouse gas emissions reached 2,723.28 GgCO₂e in 2020, about 600 percent above 1994 levels, and are projected to rise to 8,217.42 GgCO₂e by 2050 under a business-as-usual pathway⁴. Transport represents the main urban mitigation challenge, with road transport accounting for about 20 percent of national energy demand and relying almost entirely on fossil fuels. In Thimphu, increasing car ownership and congestion are contributing to rising fuel consumption and urban emissions, reinforcing the need for a shift toward low-emission public transport. 3. Bhutan also faces acute and growing climate vulnerability driven by climate change. Climate projections for Bhutan indicate increasing rainfall intensity, more frequent extreme precipitation events, higher peak temperatures, and greater seasonal variability in water availability. These trends are already affecting the capital. Around 20 percent of settlements are located in high-risk flood zones; the city's flood-prone built-up area nearly tripled between 1985 and 2015; and modelling suggests that an event currently classified as a 1-in-100-year pluvial flood could recur as often as once every five years by the 2060s⁵. The city also faces rainfall-triggered landslides, surface temperatures exceeding 40°C in summer, and growing dry-season water stress⁶. Climate change and rapid urbanization therefore reinforce one another, increasing the exposure of infrastructure and communities to flooding, landslides, drought, and heat. 4. These climate risks are compounded by institutional and technical barriers that limit the city's capacity to respond effectively. In transport, Thimphu's constrained road network and declining service quality have reinforced a shift toward private vehicles: nearly 50 percent of commuters travel by private car, compared with about 10 percent by city bus and 22 percent by walking or other non-motorized transport. Additionally, Thimphu's road network is highly exposed to flooding, inadequate drainage, and climate-induced disruptions resulting in recurrent transport interruptions, increased congestion, higher vehicle operating costs, and significant economic and business disruption. In the water sector,	

¹ Co-financer's contribution means the financial resources required, whether Public Finance or Private Finance, in addition to the GCF contribution (i.e. GCF financial resources requested by the Accredited Entity) to implement the project or programme described in the funding proposal.

² Refer to the [Policy of Co-financing](#) of the GCF.

³ Department of Environment and Climate Change, Royal Government of Bhutan. (2023). *Bhutan's long-term low greenhouse gas emission and climate resilient development strategy (LTS)*. Retrieved from https://unfccc.int/sites/default/files/resource/LTS%20Report_final%20print_copy.pdf

⁴ United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP). (n.d.). *Sustainable Urban Transport Index (SUTI) report for Thimphu City*. Retrieved from <https://www.unescap.org/sites/default/files/Thimphu.pdf>

⁵ Adhikari, K., et al. (2023). *Assessing flood risk in Thimphu: Analyzing contributing factors through urban flood modeling*. International Journal of Scientific Research in Engineering and Management. Retrieved from <https://ijsrem.com/download/assessing-flood-risk-in-thimphu-analyzing-contributing-factors-through-urban-flood-modeling/>

⁶ Asian Disaster Preparedness Center (ADPC) & United Nations Office for Disaster Risk Reduction (UNDRR). (2020). *Disaster risk reduction in Bhutan: Status report 2020*. Retrieved from <https://www.adpc.net/lgo/category/ID1664/doc/2021-dhx3BO-ADPC-Disaster-Risk-Reduction-in-Bhutan-Status-Report-2020.pdf>

climate variability is affecting an aging distribution network where non-revenue water exceeds 50 percent and supply in some neighborhoods is limited to 3–9 hours per day. Institutional arrangements for urban service delivery remain fragmented, and utilities lack the digital systems, operational autonomy, and performance management tools needed to manage climate risks proactively.

5. LRCP addresses these barriers through an integrated package of climate-focused investments and institutional reforms. On mitigation, the project will establish the backbone of Bhutan's first low-emission urban bus system through an 18.9 km bus priority corridor with dedicated bus lanes, a fleet of 50 electric buses, two passenger terminals and an upgraded bus depot, 75 bus shelters, signalized pedestrian crossings, and digital systems for fleet management, passenger information, and ticketing. These interventions are designed to improve the speed, reliability, and attractiveness of public transport while reducing dependence on private vehicles. The expected result is a reduction of 69,519 tCO₂eq by 2048 relative to the BAU scenario. This also has significant resilience co-benefits as investments will enhance the robustness of the urban mobility system by reducing disruption from flooding and extreme rainfall, improving network redundancy and continuity of service during climate shocks.
6. On adaptation, the project will climate-proof priority water infrastructure and improve water security in areas exposed to drought, flooding, and landslide disruption. Investments include upgrading raw water intake structures so they can operate under both low-flow and high-flow conditions; stabilizing slopes and pipeline corridors exposed to rainfall-induced landslides; rehabilitating deteriorated distribution mains in core district-metered areas; and installing SCADA systems, bulk meters, flow meters, and pressure valves to enable real-time monitoring and faster leak detection. These measures address the climate risks of drought variability, flood damage, and landslide disruption to water infrastructure while helping reduce non-revenue water and improving the reliability of urban water supply.
7. Institutionally, LRCP will create the conditions for sustained climate action. In transport, the City Bus Service will be strengthened as an autonomous state-owned enterprise able to operate and expand low-carbon public transport under Public Service Agreements. In the water sector, LRCP will support a ring-fenced water services unit within Thimphu Thromde, enabling clearer budgeting, revenue management, staffing, and performance monitoring arrangements. Day-to-day management of the water network will be strengthened through embedded international specialists working alongside Water Services Division staff, building the operational and technical capacity needed to manage the system on a resilient and financially sustainable basis. The project will also enable technology transfer, introducing ITS/MIS, real-time passenger information, and digital ticketing for transport as well as SCADA systems for utility operations. The institutional changes supported by LRCP are designed from the outset to drive a paradigm shift in urban service delivery, building the capacity within implementing institutions to lead future scale-up. They provide transferable governance and operational blueprints, supported by protocols, data systems, and management tools that other Bhutanese cities can adopt as they face similar urbanisation and climate pressures.
8. GCF will provide US\$28 million, including US\$22.4 million in grant financing and US\$5.6 million in concessional loan financing, alongside US\$20 million from IDA. Concessional climate finance is critical to support the upfront costs of low-emission transport systems, climate-resilient infrastructure, and institutional reforms that would otherwise be difficult to finance through domestic resources alone. The Royal Government of Bhutan, represented by the Ministry of Finance and acting through the Ministry of Infrastructure and Transport, will implement the project with support from Thimphu Thromde and the City Bus Service under a Project Steering Committee and a dedicated project management unit.
9. LRCP is closely aligned with Bhutan's climate and development strategies, including the National Adaptation Plan (NAP), the Low-Emission Transport Master Plan, the Thimphu Water Services Master Plan, and the priorities of the 13th Five-Year Plan. It also directly contributes to Bhutan's Nationally Determined Contributions (NDCs) under the Paris Agreement. By integrating low-emission mobility, climate-resilient water systems, and institutional reforms, LRCP demonstrates a scalable model for

climate-resilient urban development in Bhutan and supports a long-term paradigm shift toward low-carbon, climate-resilient urban infrastructure. LRCP uses Thimphu as a demonstration city for systemic transformation in urban service delivery, with lessons and models designed for replication across Bhutan. . The two primary transferable models are the CBS transition to a State-Owned Enterprise operating under a Public Service Agreement and the ring-fenced Water and Wastewater Services Division, both of which provide replicable institutional and governance blueprints for other Bhutanese cities. Bhutan's 13th Five-Year Plan has already committed to 45 additional electric buses for secondary cities, reflecting national intent to scale the approach. Policy workshops will disseminate operational lessons to other Thromdes, while ITS and SCADA data will inform investment planning and climate adaptation decisions nationally. Together, these institutional reforms and the infrastructure investments that underpin them establish a nationally replicable model for low-carbon, climate-resilient urban service delivery consistent with Bhutan's carbon neutrality commitment.

PROJECT/PROGRAMME INFORMATION

B.1. Climate context (max. 1000 words, approximately 2 pages)

10. Bhutan is a small country on the southern slopes of the Himalayas with ambitious commitments to climate change mitigation and resilience. The country is lower-middle-income, with a population of 0.78 million and a GDP per capita of US\$3,700⁷. Urbanization has accelerated in recent decades, with 45 percent of the population now living in urban areas. Thimphu, the capital and largest city, is home to 15 percent of the national population and functions as the country's primary administrative and economic center.

Climate change problem

11. Bhutan remains carbon-negative, primarily due to its extensive forests and reliance on hydropower. However, economic growth is increasing emissions, particularly in the energy and industrial sectors. Simultaneously, Bhutan faces severe climate risks such as shifting rainfall patterns and heatwaves, especially in urban centers like Thimphu. These climate hazards exacerbate infrastructure and water management challenges.

Mitigation needs

12. Bhutan occupies a unique position globally as a carbon-negative country. Total greenhouse gas (GHG) emissions in 2020 amounted to 2,723.28 Gg CO₂e. Carbon sequestration from Bhutan's extensive forest cover was estimated at 9,513.50 Gg CO₂e in the same year⁸. Bhutan has therefore significantly exceeded its net-zero commitments and has pledged since 2009 to maintain carbon neutrality in perpetuity, a commitment reaffirmed in its second Nationally Determined Contribution (NDC) in 2021.
13. Emissions arising from economic activity have nevertheless increased steadily over recent decades, registering a 600 percent increase between 1994 and 2020⁹. Bhutan's graduation from Least Developed Country (LDC) status in 2023 marks an important milestone in its development trajectory but continued economic expansion is expected to place additional upward pressure on emissions. National GHG emissions are projected increase to 8,217.42 Gg CO₂e by 2050 under current development trends, primarily driven by increases in the energy sector and Industrial Processes and Product Use (IPPU)¹⁰.
14. Within the energy sector, emissions are dominated by transport. Bhutan's power sector remains largely decarbonized due to its reliance on run-of-the-river hydropower systems. However, road transport, which accounts for approximately 20 percent of total energy demand, depends almost entirely on fossil fuels. Bhutan relies heavily on road-based mobility to sustain economic activity and connectivity as a landlocked country. Demand for passenger transport is projected to double by 2050 under BAU conditions, while freight demand is projected to triple. As a result, the transport sector is expected to account for an increasing share of total emissions over time.
15. These projected increases in transport demand and emissions are closely linked to changing urban mobility patterns. Population growth in Thimphu has been rapid over the past two decades, with the city's population increasing from 79,185 in 2005 to 114,551 in 2017, reflecting sustained rural-urban migration and economic expansion¹¹. Travel distances have lengthened as the city has

⁷ World Bank, *World Development Indicators – Bhutan*, 2024. Retrieved from <https://data.worldbank.org/country/bhutan>

⁸ Royal Government of Bhutan, *First Biennial Update Report of the Kingdom of Bhutan to the UNFCCC*, 2022. National Environment Commission. Retrieved from <https://unfccc.int/sites/default/files/resource/BhutanBURreport.pdf>

⁹ Ibid

¹⁰ Department of Environment and Climate Change, Royal Government of Bhutan. (2023). *Bhutan's Long-Term Low Greenhouse Gas Emission and Climate Resilient Development Strategy*. Retrieved from <https://unfccc.int/documents/631824>

¹¹ Office of the Census Commissioner, Royal Government of Bhutan. (2005). *Population and Housing Census of Bhutan 2005*. Retrieved from <https://unstats.un.org/unsd/demographic/sources/census/quest/BTN2005en.pdf>; National Statistics Bureau, Royal Government of Bhutan. (2018). *2017 Population and Housing Census of Bhutan: National Report*. Retrieved from https://www.nsb.gov.bt/wp-content/uploads/dlm_uploads/2020/07/PHCB2017_national_report.pdf

expanded along the valley corridor, reducing the feasibility of walking and increasing reliance on motorized transport. Rising household incomes and improvements in road infrastructure have further contributed to steady increases in vehicle ownership, with the number of registered motor vehicles in Bhutan increasing from 3,600 in 1985 to more than 112,000 by 2020¹². The growth of Thimphu has not been matched by a comparable expansion of public transport services, further reinforcing dependence on private vehicles. As a result, nearly 50 percent of commuters travel by private car, compared to approximately 10 percent using the city bus service and around 20 percent using taxis. Non-Motorized Transport (NMT), primarily walking, still accounts for approximately 22 percent of trips but its share has declined significantly from 48 percent in 2009, reflecting a broader shift towards motorized mobility.

16. Transport-related emissions are also influenced by congestion patterns and declining travel efficiency. Urban growth has occurred within a spatially constrained valley setting, intensifying traffic flows along a limited road network. Traffic volumes along the main corridor are projected to increase as urbanization continues. Modeled travel times for general vehicles increase from about 107 seconds per kilometer in 2023 to roughly 116 seconds per kilometer by 2047 under the BAU scenario, while bus travel times increase from around 179 to 188 seconds per kilometer, indicating worsening congestion conditions along the corridor¹³. Even moderate increases in peak-hour car traffic are expected to intensify congestion, increase vehicle idling time, lengthen travel durations, and raise fuel consumption, further increasing transport-related emissions.

Adaptation needs

Climate impacts

17. Bhutan has experienced significant warming since the 1960s. Minimum temperatures have risen faster than maximum temperatures and average annual temperatures in Thimphu have increased from 5.2°C in 1979 to 7.0°C in 2024. Urban areas are already experiencing high surface temperatures, with land surface temperatures in Thimphu reaching up to 43°C during summer months due to the combined effects of regional warming and urban heat accumulation. Climate models project further warming of 1.0–2.5°C by 2040-2059. Bhutan will experience slightly more global warming than the global average with projections indicating a consistent increase in temperature under both RCP 4.5 (+0.8°C - 2.8°C) and RCP 8.5 (+3.2°C - 5.6°C)¹⁴. Rising temperatures are also expected to intensify heat extremes, with the probability of heatwaves projected to increase from about 2 percent today to between 20 and 36 percent by 2100¹⁵.

¹² Ministry of Information and Communications, Royal Government of Bhutan, *Low Emission Development Strategy for Surface Transport*, 2021. Retrieved from https://www.moit.gov.bt/wp-content/uploads/2023/10/LEDS_Surface-Transport.pdf

¹³ See Annex 22: Assessment of GHG emissions reductions and MRV

¹⁴ World Bank Group, *Climate Risk Country Profile: Bhutan*, 2021. Retrieved from

https://climateknowledgeportal.worldbank.org/sites/default/files/country-profiles/15874-WB_Bhutan%20Country%20Profile-WEB.pdf

¹⁵ Ibid

Table 1: Projected anomaly (changes °C) for maximum, minimum, and average daily temperatures in Bhutan for 2040–2059 and 2080–2099, from the reference period of 1986–2005 for all RCPs.¹⁶

Scenario	Average Daily Maximum Temperature		Average Daily Temperature		Average Daily Minimum Temperature	
	2040–2059	2080–2099	2040–2059	2080–2099	2040–2059	2080–2099
RCP2.6	1.3 (–0.6, 3.5)	1.3 (–0.6, 3.4)	1.3 (–0.1, 2.8)	1.2 (0.0, 2.9)	1.2 (–0.3, 3.2)	1.3 (–0.4, 3.2)
RCP4.5	1.7 (–0.3, 3.7)	2.5 (0.3, 4.8)	1.6 (0.2, 3.0)	2.4 (0.8, 4.0)	1.7 (0.0, 3.6)	2.3 (0.8, 4.5)
RCP6.0	1.5 (–0.6, 3.6)	2.8 (0.6, 5.2)	1.5 (0.1, 3.0)	2.8 (1.3, 4.5)	1.6 (–0.2, 3.4)	2.9 (1.2, 5.0)
RCP8.5	2.3 (0.2, 4.2)	4.7 (2.4, 7.0)	2.2 (0.8, 3.6)	4.5 (2.8, 6.5)	2.2 (0.7, 4.0)	4.6 (2.8, 7.1)

18. Bhutan's precipitation patterns are also changing. The country receives more than 70 percent of its annual rainfall during the Southwest Monsoon between June and September, but monsoon patterns have become increasingly irregular and are characterized by heavier rainfall events and greater variability. Extreme precipitation events are projected to become 1.3 to 1.5 times more frequent by mid-century. Thimphu is projected to experience more frequent and intense rainfall events under both SSP2-4.5 and SSP3-7.0 scenarios, with the number of days receiving more than 20mm of precipitation expected to increase by approximately 40–100% by mid-century as compared to the 1995–2014 baseline. These shifts are expected to intensify both pluvial and fluvial flooding across the country: intense monsoon rainfall can rapidly increase surface runoff and river discharge, while glacial melt and glacial lake dynamics further amplify riverine flood risks. A 100-year flood could occur every five years by the 2060s¹⁷.
19. Bhutan is simultaneously increasingly exposed to drought conditions due to rising temperatures and increasing rainfall variability. Observed hydrological trends indicate increasing water stress. World Bank analysis of Total Water Storage Anomaly (TWSA) data since 2011 shows a declining trend across Bhutan's major cities, suggesting growing pressure on water resources. Longer dry spells are projected, with consecutive dry days in Thimphu expected to reach between 140 and 160 days per year¹⁸.

Exposure

20. Bhutan's cities are highly exposed to these climate hazards due to their geographic location and patterns of urban development. Rapid urbanization has increased exposure to climate hazards like pluvial and fluvial flooding, landslides, droughts, and heat. About a fifth of all settlements are in zones with high flood risks. Infrastructure is mostly located along drainage basins, which are vulnerable to heavy monsoon rains and glacial lake outburst floods¹⁹.
21. Thimphu illustrates these exposure dynamics particularly clearly. The city has the largest built-up areas exposed to pluvial flooding of all urban areas in Bhutan. Its exposed built-up areas increased from approximately 0.6 sq km to 1.7 sq km over the 31-year period between 1985 and 2015, outstripping all other major towns. The high rate of growth of exposed areas is combined with disjointed pluvial flood zones: flood zones are distributed across built-up areas in both older and newer settlements. Figure 1 shows rainwater flood probability across neighborhoods²⁰.

¹⁶ Ibid. Note that the table is showing the median of the CCKP model ensemble and the 10–90th percentiles in brackets

¹⁷ World Bank Group, *Climate Risk Country Profile: Bhutan*, 2021. Retrieved from

https://climateknowledgeportal.worldbank.org/sites/default/files/country-profiles/15874-WB_Bhutan%20Country%20Profile-WEB.pdf

¹⁸ World Bank Group, *Bhutan Country Climate and Development Report (CCDR)*, 2025

¹⁹ World Bank Group, *Bhutan Urban Climate Risk Analysis*, 2024

²⁰ Ibid

22. Similarly, Thimphu is highly exposed to riverine flooding caused by heavy monsoon rains and glacial melt. The Wang Chhu River flows through the city center, joined by seven tributaries which amplify flood risk. Urban expansion has increased the number of residential areas, commercial zones, and infrastructure assets located within river floodplains, heightening exposure to riverine flooding during extreme rainfall events. The city has experienced at least five major flood events over the last quarter century, resulting in 74 deaths and millions of dollars in damages²¹.
23. Rainfall-triggered landslide hazards are a significant corresponding threat. Thimphu is vulnerable to landslides due to its location and heavy seasonal rainfall. Urban expansion into surrounding hillsides and the clearing of vegetation for roads and housing have increased exposure by destabilizing slopes and placing new development in areas susceptible to rainfall-triggered landslides. Figure 2 shows how rainfall-triggered landslide risk is spread across the city²².
24. Thimphu also stands out as one of the warmest urban areas in Bhutan. Figure 3 shows average summer surface temperatures from 2013 to 2022. Rapid growth in dense built-up areas, paved surfaces, and reduced vegetation cover has intensified urban heat island effects, increasing the exposure of residents and infrastructure to extreme urban temperatures. Extreme exacerbates water scarcity and evaporation and contributes to the drying up of natural water sources²³.

Figure 1: Built-up area in rainwater flood risk zone

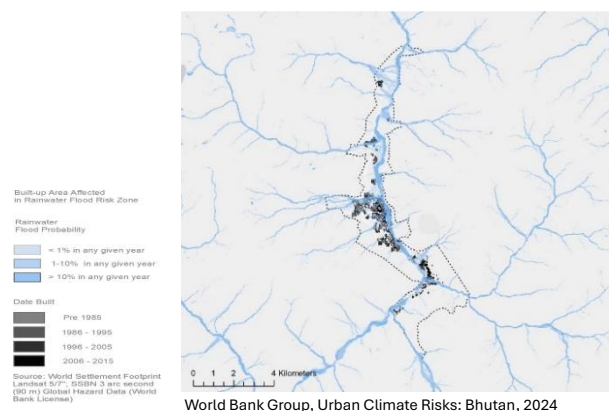
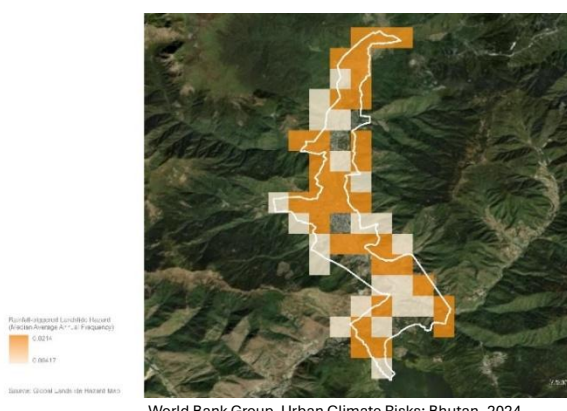


Figure 2: Rainfall-triggered landslide hazard



25. Finally, Thimphu is increasingly at risk of drought. Predominantly dry conditions prevailed from 2011 to 2020, as measured through precipitation and groundwater storage. The Standardized Precipitation Evapotranspiration Index (SPEI) for June 2019, for instance, provides an example of a broader trend where Thimphu experienced drier than normal years. Figure 4 indicates increasingly dry conditions, as measured by the TWSA. Population growth and rising urban water demand increase the city's exposure to these drought conditions²⁴.

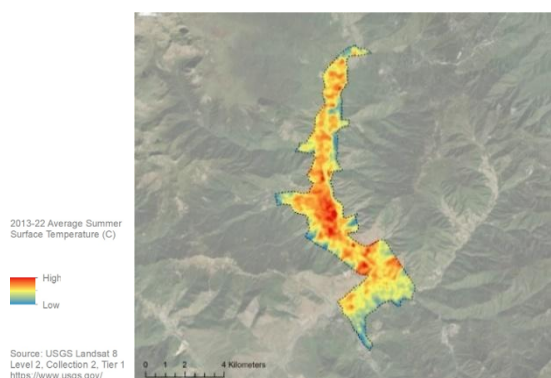
²¹ World Bank Group, *Climate Risk Country Profile: Bhutan*, 2021. Retrieved from https://climateknowledgeportal.worldbank.org/sites/default/files/country-profiles/15874-WB_Bhutan%20Country%20Profile-WEB.pdf; Department of Disaster Management, Royal Government of Bhutan, *National Disaster Risk Management Strategy*, 2019. Retrieved from https://www.preventionweb.net/files/74873_finalndrmsndmabhutan.pdf; National Environment Commission Secretariat, Royal Government of Bhutan, *National Adaptation Plan of the Kingdom of Bhutan*, 2023. Retrieved from <https://unfccc.int/sites/default/files/resource/NAP-Bhutan-2023.pdf>

²² World Bank Group, *Bhutan Country Climate and Development Report (CCDR)*, 2025

²³ Ibid

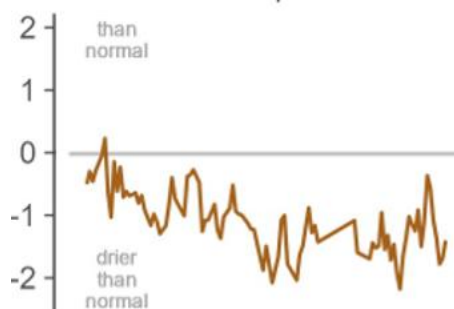
²⁴ World Bank Group, *Bhutan Urban Climate Risk Analysis*, 2024

Figure 3: Average summer surface temperature



World Bank Group, Urban Climate Risks: Bhutan, 2024

Figure 4: Thimphu TWS anomaly, 2011 - 2020



World Bank Group, Urban Climate Risks: Bhutan, 2024

Vulnerability

26. Bhutan's urban systems face additional vulnerabilities that amplify the impacts of climate change. Rapid urban growth has often outpaced infrastructure development and planning capacity, resulting in uneven service provision and increasing pressure on critical urban systems. Among the most critical are urban transport and water supply systems, which are essential for economic activity, service delivery, and public health but are increasingly exposed to climate hazards.
27. Urban transport in Bhutan is largely road-based, with cities relying on a limited network of arterial corridors to connect residential areas, commercial centers, and public services. In Thimphu, much of this network follows the narrow valley floor and adjacent hillsides, making it particularly sensitive to climate hazards. Intense monsoon rainfall can trigger landslides, debris flows, and localized flooding that block roads, damage drainage systems, and disrupt mobility across the city. Fathom-Global 3.0 data indicates that flood depths in the core urban areas typically range from approximately 0.2 to 1.2 meters under low to high emissions scenarios respectively. Damage to road linkages extends beyond infrastructure costs — projected flood depths observed in exposed areas are sufficient to impair vehicle movement, reduce road passability, and in some cases render key corridors temporarily unusable, leading to increased congestion, travel delays, and higher vehicle operating costs for users.
28. Thimphu's water supply system relies primarily on surface water sources conveyed through gravity-fed transmission networks to treatment plants and distribution systems serving the city's growing population. These sources are sensitive to seasonal rainfall variability and changing hydrological conditions, leading to periodic supply shortages during the dry season when river flows and groundwater recharge decline. Operational assessments indicate that these seasonal shortages periodically require emergency water rationing and temporary supply measures to maintain minimum service levels. The city has experienced recurrent water supply disruptions in recent years, with households in some areas receiving piped water only intermittently during dry periods (see Annex 2, Sections 4.3–4.4).
29. At the same time, Thimphu's water transmission infrastructure is highly exposed to climate hazards. Transmission pipelines are located along steep hillsides where heavy rainfall can trigger landslides and slope failures. During intense monsoon events, pipelines can become dislodged or damaged as unstable slopes shift or debris impacts buried infrastructure. Repairs are often delayed due to difficult terrain and adverse weather conditions, resulting in prolonged service interruptions in affected neighborhoods.
30. These climate risks are compounded by structural weaknesses within the water supply system. While the core city's treatment plants and boreholes have a combined maximum production capacity of approximately 28 MLD, operational output is closer to 19 MLD due to source variability and operational constraints. System efficiency also remains low: non-revenue water losses exceed

50 percent, reflecting leaks, unauthorized connections, and limited monitoring of flows and pressure within the distribution network (Annex 2, Sections 4.3–4.4).

31. In addition, pedestrian pathways are also exposed to the climate risks outlined above. Landslides and flooding risk damage pedestrian infrastructure, making parts of the city inaccessible on foot. High temperatures also create disincentives to travel on foot unless pedestrian infrastructure is both climate resilient and convenient. Sidewalk coverage at 55.2 percent of routes and the near-complete absence of dedicated cycling facilities mean that non-motorized transport remains unsafe and impractical for most residents, particularly during heavy rainfall and extreme weather conditions. These risks in turn can push the population to use fossil fuel-based transportation or to cut them off from mobility entirely. Similarly, roads that bus lines depend on are at risk of flooding. Bus shelter coverage stands at just 6.3 percent of stops and bus bay coverage at 8.3 percent, leaving passengers without weather protection. Thimphu's bridges, including the Kamji, Pamtsho, and Dechencholing bridges, are largely built to 20- or 25-year design standards that are already being exceeded with increasing frequency as extreme weather intensifies. These crossings are exposed to scour, flood damage, and landslide-driven embankment failure, and their loss severs the connectivity that public transport depends on. Road drainage infrastructure is inadequate, with intense rainfall regularly overwhelming drainage capacity along key corridors, flooding road surfaces, and causing sewer overflow onto major routes, which further constrains pedestrian movement and access to public transport during extreme events. The urban heat island effect, intensified by Thimphu's valley topography and growing built-up surface area, accelerates the deterioration of asphalt and structural materials, increasing maintenance burdens and shortening infrastructure lifespans. These physical vulnerabilities are compounded by the fragility of the bus fleet and maintenance system; when roads are damaged or flooded, an aging fleet with no protected priority corridors has no means of maintaining service continuity.

32. These trends are summarized in table 2.

Table 2: Climate Risk Assessment summary

Impacts	Exposure	Vulnerability
Rising temperatures and heatwaves Average annual temperatures in Thimphu increased from 5.2°C in 1979 to 7.0°C in 2024, with land surface temperatures reaching up to 43°C in summer. The probability of heatwaves is projected to increase from about 2% today to 20–36% by 2100.	Dense built-up areas, paved surfaces, and reduced vegetation cover intensify urban heat island effects, increasing exposure of residents and infrastructure to extreme temperatures.	Extreme heat exacerbates water scarcity and contributes to the drying up of natural water sources. The urban heat island effect accelerates deterioration of roads and structural materials, and deters walking
Intense rainfall and flooding Extreme precipitation events are projected to be 1.3–1.5 times more frequent by mid-century. A 100-year flood event could occur every five years by the 2060s.	Thimphu's exposed built-up area grew from 0.6 to 1.7 sq km between 1985 and 2015. The Wang Chhu River and seven tributaries run through the city centre, with urban expansion placing residential and commercial areas within floodplains.	Roads, drainage systems, and bus infrastructure are at risk. Bus shelter coverage stands at just 6.3% of stops, leaving passengers unprotected. The city has experienced five major floods in 25 years, resulting in 74 deaths.
Landslides Heavy seasonal rainfall combined with hillside urban expansion and vegetation clearance destabilizes slopes across the city.	Water transmission pipelines are located along steep hillsides. Roads, bridges, and pedestrian paths sit on or adjacent to unstable slopes.	Pipeline damage causes prolonged service interruptions, with repairs delayed by difficult terrain. Key bridges, including Kamji, Pamtsho, and Dechencholing, face scour and embankment failure risk, severing public transport connectivity
Drought and water stress Total Water Storage Anomaly data show a declining trend across Bhutan's major cities since 2011. Consecutive dry days in Thimphu	Water supply relies on surface sources that are sensitive to seasonal variability and changing hydrological conditions. Rising urban population and demand compound this exposure.	Core city treatment plant output (19 MLD) falls below combined capacity (28 MLD). Non-revenue water losses exceed 50%. Some households receive water only intermittently during dry periods,

are projected to reach 140–160 per year.

and seasonal shortages periodically require emergency rationing.

LRCP and complementary projects

33. LRCP addresses these two emerging climate challenges in Bhutan's urban areas, tackling transport emissions and growing climate risks to water systems and urban infrastructure. The project combines low-emission urban mobility investments with measures to strengthen the resilience and efficiency of critical water infrastructure in Thimphu.
34. Several complementary initiatives are underway in Bhutan's urban resilience and water sectors (see Feasibility Study, Chapter 9, Section 9.9, Table 9-1.) The UNDP *Enhancing Climate Resilience of the Urban Landscapes and Communities in the Thimphu–Paro Region (ECRUL)* project supports climate-informed urban planning and nature-based solutions to reduce flood and landslide risks across the wider metropolitan region. The ADB's *Water Flagship Program Support Project (WFPSP)* is expanding climate-resilient drinking water and irrigation services in Thimphu Valley and several other districts, with investments located primarily in upstream areas of the valley. The UNDP *Advancing Climate Resilience of the Water Sector in Bhutan (ACREWAS)* project complements these efforts by strengthening basin-level water management and watershed restoration to improve long-term water availability. The Livable and Resilient Cities Project (LRCP) complements these initiatives by focusing on climate-resilient urban infrastructure and service delivery within the core of Thimphu. LRCP complements these initiatives in two distinct ways. First, it fills a geographic gap by focusing on the city core while partner projects operate at the basin level, on the urban periphery, or in upstream valley areas. Second, where partner projects build capacity primarily through workshops and training, LRCP goes further by embedding international specialists directly within the Water Services Division and City Bus Service, providing sustained, hands-on technical support that drives institutional change.

B.2 (a). Theory of change narrative and diagram (max. 1500 words, approximately 3 pages plus diagram)

35. LRCP's Project Development Objective (PDO) is to enhance livability and climate resilience in the project area by improving targeted urban infrastructure and service delivery. The Theory of Change is anchored in the goal: IF climate resilient water management, urban pedestrian, and low-emission transportation systems are implemented and client capacity is improved, THEN the local population will have greater resilience capacity against climate shocks, access to safe and reliable water, and more resilient and sustainable urban mobility, BECAUSE water, urban pedestrian, and transport infrastructure will be less vulnerable to riverine floods, landslides, drought, and urban heat island effects AND a modal shift toward non-motorized and public transport will reduce GHG emissions from the city's transport system. To achieve this overarching goal, the project will generate several core outcomes. First, urban water services in the project area will become more reliable and more resilient to climate hazards, especially drought, flooding, and rainfall-triggered landslides²⁵. Second, climate-resilient urban mobility infrastructure in the project area will encourage a modal shift from private vehicle use toward walking and non-motorized transport. Third, climate-resilient and low-emission urban passenger transport in Thimphu encourages a shift from private car use toward electric public transport, maintains reliable mobility under climate stress, and reduces GHG emissions from the transport sector. Fourth, the institutions responsible for water and public transport will have enhanced capacity to operate, maintain, finance, and replicate climate-resilient and low-emission urban systems. In addition, there will be co-benefits addressing improved access to jobs and income; improved household hygiene and health; and improved air quality and reduced pollution²⁶.

²⁵ The project is addressing climate risks outlined in section B.1III for all relevant sectors.

²⁶ More information on the improvements to the enabling environment and policy frameworks are found in section D.2.

36. The project's outputs are organized across six major corresponding areas:

1.1.a) Climate-resilient water supply infrastructure and distribution networks will be established and operational. This will be achieved through project activities such as improving raw water intake structures, stabilizing landslide-prone slopes, NRW reduction, reorganizing Water Treatment Plants (WTPs) and treated water transmission lines, and enhancing the water distribution network with smart meters. Together, these activities will reduce system losses, improve the reliability and coverage of water supply, and harden the network against climate-related disruptions, collectively contributing to a climate-resilient water supply and distribution network. These improvements will yield climate resilience benefits for household end users who will have access to a more reliable water supply system that is better able to adjust to climate shocks, as these upstream improvements are required for the water system to operate properly and reliably within a climate-vulnerable environment to deliver water to household connections. Such improvements will help increase the number of hours per day household have reliable water access.

1.1.b) Climate-informed decision-making systems and operational control mechanisms will be established and functioning. Water supply operations will be informed through the project's installation of Supervisory Control and Data Acquisition (SCADA) systems, which will be integrated into improved decision-making and management processes (see area 2.1). By enabling real-time monitoring of network performance and early detection of faults and stress events, the SCADA system will allow operators to respond proactively to climate-related disruptions, improving the resilience and reliability of day-to-day water service delivery. By improving real-time data collection, the utility will be able to more efficiently and coordinate between the water treatment plants, storage systems, and distribution networks, improving water service access and reliability which will ultimately benefit the end users. Such systems will better allow the utility to match water supply and local household/neighborhood demand in real time, including during climate shocks, to better serve local residents, while also improving the ability of the utility to make forward-looking, data-driven decisions that will benefit household users. Combined with the physical infrastructure improvements mentioned above, the SCADA system will help increase the number of hours households have reliable water access.

1.2) Climate-resilient pedestrian access and public realm infrastructure will be established. The project will carry out urban pedestrian interventions, improving the safety and convenience of sidewalks, footpaths, and passageways to facilitate pedestrian movement along the bus priority corridor and in the downtown core, that is, Norzin Lam. It will remove high kerbs and hazards on footpaths, upgrade sidewalks and connecting paths, install communication cable ducts under sidewalks, implement a comprehensive traffic circulation and management plan, and improve roadside drainage. Taken together, these interventions create a safer, more accessible, and more climate-resilient pedestrian environment, reducing the attractiveness of private vehicle use and supporting the broader modal shift toward walking, non-motorized transport, and public transit.

1.3) A climate-resilient and low-emission public transport system will be established and operational. The project will develop an 18.9 km bus priority corridor (BPC) with dedicated bus lanes, bus bays, and 75 bus shelters, deploy a fleet of 50 electric buses, construct two new bus terminals and upgrade the existing city bus depot, all equipped with fast charging infrastructure for e-bus operations, roll out Intelligent Transport Systems (ITS) and Management Information Systems (MIS) to provide live service information and improve operational flexibility, and install 23 signalized pedestrian crossings to enhance safety and first- and last-mile connectivity. Together, these investments create the physical and operational conditions for a competitive, zero-emission public transport system. The BPC improves journey times and service reliability, the expanded e-bus fleet eliminates direct emissions from public transport operations while enabling the frequency and quality of service necessary to realize the BPC's benefits, the charging infrastructure enables the sustained operation and future expansion of the electric fleet, and the ITS/MIS and pedestrian crossings make public transport a more attractive and accessible alternative to private vehicle use. By integrating infrastructure, vehicles, technology, and first- and last-mile access, these

investments drive the modal shift that underpins the project's mitigation outcomes while ensuring that mobility is maintained under climate stress.

2.1) Water and urban sector institutional systems, tools, and capacities will be strengthened to independently and sustainably deliver climate-resilient water services and plan future investments. The institutional setup, level of technical capacity, and financial profile of the sector in Thimphu is inadequate to ensure forward-looking climate resilience capacity and an ability to be proactive in addressing and financing climate needs. The project aims to shift this dynamic through a series of targeted institutional, technical, and financial interventions that together contribute to a broader paradigm shift toward more climate-resilient water service provision. The project will establish a ring-fenced municipal water and wastewater division, strengthen day-to-day management through digital monitoring, improve billing and tariff systems, develop disaster and emergency response processes, and deliver institutional strengthening and policy support, underpinned by a targeted communications strategy²⁷. Such improvements to utility performance will improve the utility's capacity to specifically address poorer resident's water needs with regard to future planning, tariff-setting, and billing. The project will also support the development and implementation of the Bhutan Land Information System (BLIS), a unified platform integrating land registration, cadastre, public land management, and valuation data that will improve disaster risk identification, strengthen natural resource management, and enable more informed government decision-making on the economic risks of climate shocks to infrastructure and land assets.

2.2) The City Bus Service will be capacitated to transition to an independent SOE with a national mandate to sustainably operate low-carbon public transport and support its expansion to other cities, facilitating the replication of the model elsewhere in the country. CBS currently operates as a service without the institutional structure, operational expertise, or financial sustainability needed to lead Bhutan's transition to low-emission public transport. The project addresses this by delivering a series of targeted governance, operational, and capacity-building interventions that together contribute to a broader paradigm shift toward a self-sustaining, low-carbon public transport provider. The project will strengthen CBS's day-to-day operations through embedded bus operations consultants, support its transition to delivering services under Public Service Agreements (PSAs) with other Thromdes, help diversify non-fare revenue sources such as retail franchises, advertising, and bus leasing, build the capacity of the broader transport network, and analyze the potential for operators to provide dedicated services such as school buses to reduce peak-hour demand. It will develop national standards for ITS and smartcard payments, and provide policy and institutional support to implement national frameworks including the Low Emission Transport Master Plan and National Adaptation Plan, underpinned by a targeted communications and awareness campaign to drive behavioral change among Thimphu commuters.

37. The project recognizes several barriers and risks. As documented in the Feasibility Study, the barriers in the water and transport sector in Bhutan are categorized by type to support diagnostic clarity. For the purpose of project design, these barriers are synthesized into a set of integrated, sector-level constraints (e.g., fragmented service delivery, infrastructure vulnerability, and weak public transport competitiveness) that directly inform the project's Theory of Change. The current major barriers are summarized in Table 3 below:

Table 3: Identified barriers and project response

Barrier type and name	Description	Project response
Fragmented and weak water service delivery	High non-revenue water losses, aging and undersized distribution	Ring-fenced utility-style water service management; SCADA installation and

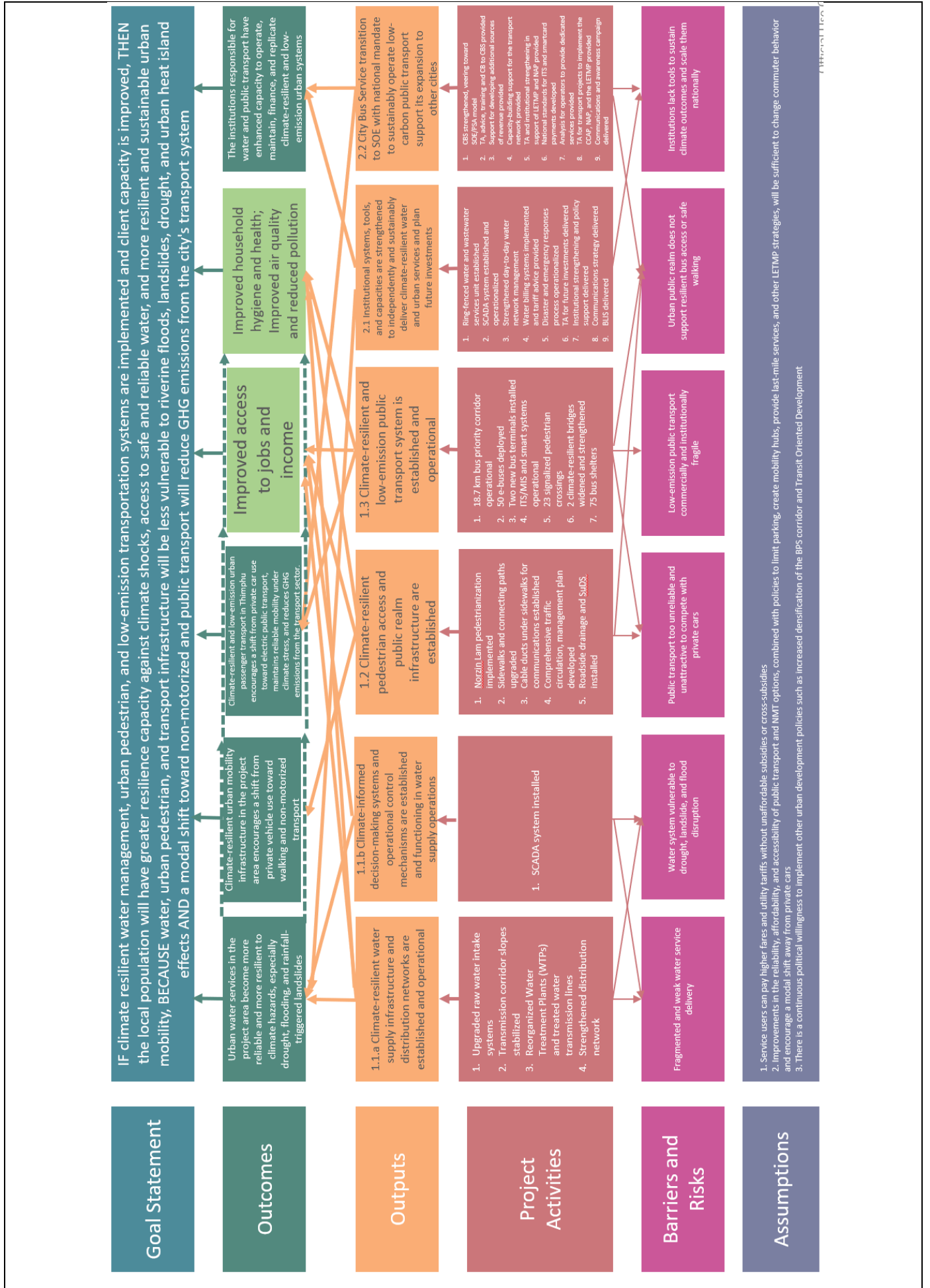
²⁷ By project closing, the client will regularly prepare and apply maintenance strategies, emergency protocols, business plans, and budgets to guide climate-resilient water service management. All relevant municipal staff will be trained in SCADA use, climate-resilient planning, and emergency response. These improvements aim to increase supply hours from 3-9 hours/day in the baseline up to 15 hours/day at closing. Households receiving at least 12 hours/day of water is expected to rise from zero percent up to 50 percent at closing.

	networks, and limited storage capacity undermine reliable service delivery	operationalization; water supply network rehabilitation and NRW reduction
Water system vulnerable to drought, landslide, and flood disruption	Vulnerable intake and transmission infrastructure, combined with increasing climate-driven variability in water availability, expose the system to frequent disruption	Climate-proofed raw water intakes; stabilization of landslide-prone transmission corridors; improved distribution monitoring and control
Public transport too unreliable and unattractive to compete with private cars	Buses compete with private vehicles for congested road space; bus shelter coverage is 6.3% and bus bay coverage 8.3%; much of the CBS fleet is beyond its operational lifespan; service frequency is low outside peak periods; the Olakha maintenance facility lacks equipment to support a modernizing fleet	Bus priority corridor (18.9 km); procurement of 50 e-buses; two new bus terminals; ITS/MIS for real-time service information; 75 bus shelters; 23 signalized pedestrian crossings
Low-emission public transport commercially and institutionally fragile	CBS lacks the institutional structure, financial sustainability, and operational expertise to lead Bhutan's transition to low-emission public transport	CBS capacitated to become independent SOE under Public Service Agreements with other Thromdes; embedded bus operations support; business planning; revenue diversification through non-fare sources such as advertising, retail franchises
Urban public realm does not support resilient bus access or safe walking	Inadequate sidewalks, footpaths, and drainage infrastructure reduce the safety and attractiveness of walking and non-motorized transport along the corridor	Upgraded sidewalks and connecting paths; Norzin Lam pedestrianization; roadside drainage improvements; NbS/SuDS installation; traffic circulation and management plan
Institutions lack tools to sustain climate outcomes and scale them nationally	Fragmented mandates, limited coordination, and constrained technical capacity across water and transport agencies weaken integrated, climate-resilient urban service delivery	Technical assistance across water and transport sectors; climate-resilient infrastructure design standards; planning tools and maintenance systems; policy support including parking restrictions and freight policies; M&E framework to track outcomes and support replication

38. Finally, the Theory of Change rests on several key assumptions regarding external factors:

- Service users can pay higher fares and utility tariffs without unaffordable subsidies or cross-subsidies;
- Improvements in the reliability, affordability, and accessibility of public transport and NMT options, combined with policies to limit parking, create mobility hubs, provide last-mile services, and other LETMP strategies, will be sufficient to change commuter behavior and encourage a modal shift away from private cars; and
- There is continued political willingness to implement other urban development policies such as increased densification of the BPS corridor and Transit Oriented Development.
- During implementation, care will be taken to work with the client in a timely and flexible manner to address any of these external factors if they become relevant. In addition, relevant internal risks to the project include whether the project will have sufficient capacity to effectively procure civil works, equipment, and technical systems and that relevant

agencies and development partners will coordinate effectively with each other and local stakeholders. The project activities to improve client capacity will work with the client to directly address these institutional capacity concerns through training and providing technical support.



Direct Beneficiaries

39. Approximately 104,162 direct beneficiaries (of whom 50,519 female) are expected by project close. An estimated 52,046 core city residents will benefit from improved water supply reliability and resilience. Access to treated water will increase from 3-9 hours per day to at least 15 hours per day (12 hours/day in the dry season). Non-revenue water will be reduced from over 50% to 25% in the city core, and 100% of the distribution network will be covered by real-time SCADA monitoring (E.5, Outcome 1). The city residents will directly benefit from improved household-level services, which include a more reliable and continuous supply of clean water. Connections will be rationalized to reduce network interruptions and leakages, and support will be provided to ensure that household connections are accessible and affordable. This will result in an increased number of households having access to better quality and affordable water services, while improved utility operational and financial performance will increase the utility's capacity to directly address the water needs of the poorest users. The World Bank Group is committed to improving water security for 400 million people by 2030 under the Water Forward program and the associated Water Strategy Implementation Plan, which requires taking a people-centric approach to ensuring that household end users receive improved water sector services, including through LCRP. These improvements will reduce exposure to drought-related water stress and climate-related service interruptions. A further 72,448 residents will benefit from climate-resilient urban mobility and transport infrastructure. Improved drainage, flood-resilient bridges and bus shelters, and safer pedestrian crossings along the Bus Priority corridor are expected to support a substantial modal shift from private vehicles to public and non-motorized transport, increasing the share of trips taken by bus from roughly 8% to 25% (E.5, Outcomes 2 and 3 and Core Indicator 2 in E.3). Detailed calculations are provided in the Adaptation Beneficiaries Analysis.

Indirect Beneficiaries

40. Approximately 271,871 indirect beneficiaries (of whom 134,857 female) are expected by project close. For water, 123,988 users outside the core area will benefit from city-wide NRW reductions and improved resilience of the water supply system to drought- and landslide-related disruptions. For urban mobility and transport, 112,802 residents who do not primarily use public transport or NMT will indirectly benefit from enhanced pedestrian access, urban greening, and reduced transport-related air pollution associated with the transition to electric buses. Approximately 200,000 annual tourists are expected to benefit from both sets of improvements. Detailed calculations are provided in the Adaptation Beneficiaries Analysis.

Avoiding Double-Counting

41. Water supply and transport beneficiaries are tracked separately and mapped to different ARAs. For ex-ante estimation, core city residents benefiting from water supply improvements are assumed to use public transport and NMT at the same rate as the city as a whole. The overlapping share (beneficiaries of both water and transport activities) is counted only once, in the total figure, and excluded from "unique" beneficiary estimates for each.²⁸ Baseline surveys will confirm this approach during implementation. Detailed calculations are provided in the Adaptation Beneficiaries Analysis.

B.2 (b). Outcome mapping to GCF results areas and co-benefit categorization

²⁸ This means that *unique* water and *unique* transport beneficiary figures do not sum to "total beneficiaries", with the difference representing beneficiaries of *both* improvement types (counted only once in total).

Outcome number	GCF Mitigation Results Area (MRA 1-4)				GCF Adaptation Results Area (ARA 1-4)			
	MRA 1 Energy generation and access	MRA 2 Low-emission transport	MRA 3 Building, cities, industries, appliances	MRA 4 Forestry and land use	ARA 1 Most vulnerable people and communities	ARA 2 Health, well-being, food and water security	ARA 3 Infrastructure and built environment	ARA 4 Ecosystems and ecosystem services
Outcome 1 Urban water services in the project area become more reliable and more resilient to climate hazards, especially drought, flooding, and rainfall-triggered landslides	☐	☐	☐	☐	☐	☒	☒	☐
Outcome 2 Climate-resilient urban mobility infrastructure in the project area encourages a shift from private vehicle use toward walking and non-motorized transport	☐	☒	☐	☐	☐	☐	☒	☐
Outcome 3 Climate-resilient and low-emission urban passenger transport in Thimphu encourages a shift from private car use toward electric public transport, maintains reliable mobility under climate stress, and reduces GHG emissions from the transport sector	☐	☒	☐	☐	☐	☐	☒	☐
Outcome 4 The institutions responsible for water and public transport have enhanced capacity to operate, maintain, finance, and replicate climate-resilient and low-emissions urban systems	☐	☒	☐	☐	☐	☒	☒	☐

Co-benefit number	Co-benefit					
	Environmental	Social	Economic	Gender	Adaptation	Mitigation
Co-benefit 1 Improved access to jobs and income	☐	☒	☒	☒	☐	☐
Co-benefit 2 Improved household hygiene and health; Improved air quality and reduced pollution	☒	☒	☒	☒	☐	☐

B.3. Project/programme description (max. 2500 words, approximately 5 pages)

COMPONENT 1: RESILIENT AND LOW-CARBON SERVICE DELIVERY

42. Component 1 finances the core physical investments that will improve the resilience and sustainability of urban services in Thimphu. The city is facing the combined pressures of rapid urbanization, rising vehicle ownership, and increasing climate stress. More intense rainfall is increasing the risk of erosion, landslides, pluvial flooding, and river scour, while longer and more variable dry seasons are worsening seasonal water shortages. These pressures threaten the reliability of two systems that are critical to urban productivity and livability: the water supply network and the transport network. They also impose growing costs through service disruption, emergency repairs, congestion, and deteriorating public space.

43. The purpose of this component is therefore to improve climate-resilient service delivery while also shifting the city toward lower-carbon mobility. The component combines investments in resilient water infrastructure, pedestrian-oriented public realm improvements, and the first phase of a low-emission public transport system built around bus priority infrastructure and electric buses. These investments strengthen adaptation by reducing climate-related service interruptions and support mitigation by enabling a modal shift away from private vehicles and toward non-motorized and electric public transport. Over the longer term, Component 1 contributes to a paradigm shift by demonstrating how climate-resilient water infrastructure, street design, and low-emission mobility can be planned and delivered as one integrated urban system.

Sub-component 1.1: Strengthening water supply systems to support resilient water services

44. Sub-component 1.1 addresses the physical and operational weaknesses that currently limit the resilience of Thimphu's water supply system. Water abstraction points are vulnerable to extreme hydrological conditions; transmission lines are exposed to landslides and erosion; and non-revenue water losses in the city core exceeding 50% constrain the efficient use of scarce resources. The sub-component combines infrastructure rehabilitation, digital monitoring, and operational improvements to support more reliable and equitable water service delivery, targeting an increase in average daily supply hours from 3–9 hours to 15 hours (12 hours during the dry season) by project close. Implementation responsibility rests with Thimphu Thromde through the PIU, with technical coordination and oversight from the MoIT PMU. The activities under sub-component 1.1 will directly benefit households by improving water access during climate shocks, increasing hours of water supply availability, improving pressure management, and increasing access for currently unconnected households. Improvements to data collection and monitoring will enable the utility to more efficiently link and manage the infrastructure as an integrated system. It also supports risk management and helps the utility to prepare ahead of time for a range of potential climate risks; and to identify local areas in need of new and improved local connections, including identifying local needs for managing hours without water service. These improvements will yield climate resilience benefits for household end users who will have access to a more reliable water supply system that is better able to adjust to climate shocks, as these upstream improvements are required for the water system to operate properly and reliably within a climate-vulnerable environment to deliver water to household connections. Both installing the SCADA system under activity (1.1.a) and the physical infrastructure improvements under activities (1.1.b-e) are necessary to work together to increase the number of hours households have access to reliable water supply.
45. Under activity (1.1.a), the project will install a Supervisory Control and Data Acquisition (SCADA) system to monitor the performance of water and wastewater treatment plants and key components of the distribution network. The system will be integrated into the District Metered Areas (DMAs) across the city core, including zones around Norzin Lam and the transport corridor, and will include bulk water meters, flow meters, and pressure control equipment. This will allow real-time monitoring of flows, pressure conditions, and actual demand, while also enabling hydraulic analysis and demand forecasting under extreme climate conditions. The deliverable will be an operational SCADA system across the core city's DMAs enabling real-time performance monitoring, leak detection, and data-driven network planning. By improving real-time data collection, the utility will be able to more efficiently and coordinate between the water treatment plants, storage systems, and distribution networks, improving water service access and reliability which will ultimately benefit the performance for end users. Such systems will better allow the utility to match water supply and local household/neighborhood demand in real time, including during climate shocks, to better serve local residents, while also improving the ability of the utility to make forward-looking, data-driven decisions that will benefit household users.
46. Under activity (1.1.b), the project will upgrade 2 raw water intake systems so that they can function more reliably during both flood and drought conditions, with structural improvements to

sediment handling and flow control. The deliverable will be climate-resilient intake infrastructure at key stream sources supplying the city, reducing the risk of service failure during extreme hydrological events.

47. Under activity (1.1.c), the project will protect vulnerable raw and clear water transmission corridors through slope stabilization and related erosion-control measures, reducing the risk that high-rainfall events trigger landslides that damage transmission lines and interrupt service. The deliverable will be stabilized transmission corridors protecting key water supply routes. This work will focus on 1 length of the raw water transmission corridor and 3 lengths of the treated water transmission corridors, with improvements occurring at 37 points along these lengths. Along these four lengths, this work will include improvements to 12 retaining walls sites, 8 slope stabilization sites, 15 pipe anchoring sites, 1 drainage work site, along with pipe replacement at 1 site. These 37 sites are located along 297 m of raw water transmission lines and 3.6 km of treated water transmission lines.
48. Under activity (1.1.d), the project will reorganize water treatment plant operations and transmission routing using SCADA data to optimize storage and distribution across the city's DMAs, improving the equity and continuity of supply including during prolonged droughts. The deliverable will be improved distribution management supporting more consistent and equitable service delivery.
49. Under activity (1.1.e), the project will upgrade the distribution network along Norzin Lam and the transport corridor to reduce non-revenue water losses through replacement of deteriorated water mains and active leakage control, coordinated with the street and sidewalk works under Sub-component 1.2. The deliverable will be an upgraded distribution network in the project area, contributing to the project's target of reducing NRW from 50% to 25%.

Sub-component 1.2: Improving the resilience and convenience of sidewalks, footpaths, and passageways to encourage non-motorized transport

50. Sub-component 1.2 focuses on the public realm improvements needed to make walking and public transport access safer, more convenient, and more resilient to climate impacts. Norzin Lam is the city's main commercial spine, yet it currently experiences congestion, limited pedestrian space, poor accessibility, and localized drainage problems. Sidewalks along the proposed bus priority corridor do not yet provide a high-quality walking environment or strong first- and last-mile links to public transport. This sub-component improves the street environment in ways that directly support the transport investments under Sub-component 1.3 while also reducing flood risk and improving the quality of public space. Implementation responsibility rests with Thimphu Thromde through the PIU, with technical coordination and oversight from the MoIT PMU.
51. Under activity (1.2.a), the project will make public realm improvements to Norzin Lam, with works including removal of high kerbs and obstructions, improved surfacing, and installation of street furniture, amenities, and accessible features. The deliverable will be a completed 1.3 kilometer scheme for Norzin Lam supporting walking, urban placemaking, and climate-resilient city-centre mobility.
52. Under activity (1.2.b), sidewalks and connecting paths along the bus priority corridor will be upgraded to universal access standards, with improvements to surface quality, continuity, and pedestrian amenity, coordinated with pedestrian crossing and bus stop installation under Sub-component 1.3. The deliverable will be upgraded, climate-resilient sidewalks and connecting paths along the corridor.
53. Under activity (1.2.c), continuous cable ducts will be installed under sidewalks and power connections provided to bus stops to support passenger information systems and corridor

lighting, integrated into sidewalk construction to avoid repeated trenching. The deliverable will be continuous ducting along corridor sidewalks with power connections at all bus stops.

54. Under activity (1.2.d), a traffic circulation and management plan will be developed and implemented for central Thimphu to allow emergency and service vehicle access while prioritizing pedestrians and supporting bus priority operations. The deliverable will be an implemented Traffic Circulation and Management Plan for central Thimphu.
55. Under activity (1.2.e), roadside drainage will be upgraded and linked to Sustainable Drainage Systems (SuDS) to improve runoff management and reduce pluvial flood risk, delivered as part of the Norzin Lam and sidewalk works, and will include sewer improvements to address pluvial flood risk in the city core. The deliverable will be improved roadside drainage and functioning SuDS installations along the corridor and Norzin Lam.

Sub-component 1.3: Investments toward a modal shift to resilient low-emission public transport

56. Sub-component 1.3 supports the physical transition toward a cleaner and more reliable public transport system in Thimphu that is more resilient to floods. Rising car use has contributed to congestion, longer travel times, and increasing emissions, while the existing bus system lacks the speed, reliability, and passenger amenities needed to attract a larger share of trips. This sub-component finances the core transport assets required for a step change in service quality: bus priority infrastructure, fleet expansion with electric buses, charging and depot facilities, and digital systems for operations and passenger information. These investments are central to the mitigation ambition of the project and, through road and bridge resilience improvements and pedestrian access works, also contribute to adaptation. The MoIT PMU leads procurement and implementation. CBS assumes operational responsibility once assets are commissioned.
57. Under activity (1.3.a), the project will construct an 18.9-kilometre bus priority corridor along the main road corridor, with dedicated bus priority lanes in both directions, bus bays, 75 bus shelters, road and bridge widening, and bridge protection works including scour measures to improve climate resilience. The deliverable will be a continuous bus priority corridor with shelters and resilient corridor infrastructure improving service speed, reliability, and climate robustness²⁹.
58. Under activity (1.3.b), a tranche of 50 electric buses will be procured to support higher-frequency trunk and feeder services and replace diesel buses in the fleet. The deliverable will be a fleet of 50 electric buses ready for service on the corridor.
59. Under activity (1.3.c), two new terminals will be constructed at the northern and southern ends of the corridor and the city-centre bus depot upgraded with charging and maintenance facilities for electric buses, climate-proofed against a 1.5-meter flood depth. The deliverables will be two new climate-resilient bus terminals and an improved central depot with physical flood defenses, high-capacity drainage, and off-grid solar/battery autonomy at the central depot for uninterrupted e-bus operations.
60. Under activity (1.3.d), Intelligent Transport Systems (ITS) and a Management Information System (MIS) will be procured and installed to provide live service information, integrated e-ticketing, and improved operational monitoring through the CBS control room. The deliverable will be an operational ITS/MIS system improving service reliability and passenger information.
61. Under activity (1.3.e), 23 signalized pedestrian crossings will be installed near bus stops to improve safety, accessibility and convenience for passengers and pedestrians, forming an essential complement to the upgraded sidewalks and bus shelters along the corridor.

²⁹ LRCP finances the northern segment (CSI Junction to Dechencholing), including bus shelters and pedestrian crossings along the full corridor. The southern segment (Ngabiphu to CSI Junction) is being independently financed by the Royal Government of Bhutan at a cost of USD 4,700,000.

COMPONENT 2: URBAN MANAGEMENT, PLANNING, AND CAPACITY BUILDING FOR IMPROVED CLIMATE RESILIENCE

62. Component 2 strengthens the institutions, systems, and management arrangements needed to sustain and scale the investments financed under Component 1. Without stronger service delivery institutions, better planning systems, and clearer operational responsibilities, the benefits of the physical investments would be difficult to maintain over time. The component therefore focuses on water and transport sector institutions, project management systems, and the technical assistance required to translate the infrastructure investments into durable improvements in service quality and climate resilience.
63. The purpose of this component is to create the enabling environment for long-term climate-resilient urban service delivery. It will do so by strengthening utility-style water management within Thimphu Thromde, supporting the transition of CBS into a more autonomous and professionally managed transport operator, and providing targeted technical assistance to MoIT on water and transport sector development. These outcomes contribute directly to adaptation by improving the capacity of agencies to plan for and respond to floods, droughts, and other climate shocks, and they reinforce mitigation by institutionalizing the systems needed for low-emission public transport. Over the longer term, Component 2 supports a paradigm shift by embedding climate resilience and low-carbon service standards into the way Bhutan plans, finances, and manages urban services.
64. Component 2 is delivered through several mechanisms. The first is a team of embedded international consultants appointed by the TT PIU to work within the new Water and Wastewater Services Division (WSD), building its operational capacity from the inside. The second is a team of embedded bus operations specialists appointed to work within CBS during the transition to SOE operations. The third is a structured call-down arrangement managed by the PMU to engage specialist consultants for targeted water- and transport-sector assignments. The fourth is a Project Management Consultant (PMC), engaged by the MoIT PMU to provide resident project management expertise, coordinate implementation across both sectors, and procure and oversee specialized technical inputs. The final mechanism are a team of engineering consultants, engaged by the TT PIU to support the procurement and supervision of construction works.

Sub-component 2.1: Capacity building and institutional strengthening for resilient and sustainable water service delivery

65. Sub-component 2.1 complements the water infrastructure investments under Sub-component 1.1 by building the institutional and operational capacity needed to manage the system on a more resilient and financially sustainable basis. Sub-activities (a) through (e) are delivered by the embedded WSD consultants working within Thimphu Thromde. Sub-activities (f) through (h) draw on the call-down arrangement. By improving the performance of the ring-fenced utility to deliver water service needs across the service area, the activities under subcomponent 2.1 will benefit households by allowing the utility to be better-informed about local residential needs in the water sector, providing a better understanding of local residences' ability to pay and potential subsidy needs, improving information available to the utility on unconnected households and the potential for establishing such connections, as well as better planning for facing climate risks. Such improvements to utility performance will improve the utility's capacity to specifically address poorer resident's water needs with regard to future planning, tariff-setting, and billing.
66. Under activity (2.1.a), embedded WSD consultants will establish a ring-fenced Water and Wastewater Services Division within Thimphu Thromde, with a defined organizational structure, staffing plan, budget framework, and accountability arrangements that allow water and wastewater services to progressively align with international service standards. The first annual business plan and financial accounts will be prepared, key WSD staff will be recruited and trained in utility-style operating procedures, and management responsibilities will be progressively transferred to WSD counterparts. The deliverables are a formally established WSD with

approved governance structure; the first annual business plan and financial accounts endorsed by TT management; and documented training records for WSD staff.

67. Under activity (2.1.b), the embedded WSD consultants will design, procure, install, and commission the SCADA system across the city core's DMAs. The hydraulic model will be calibrated to reflect actual network conditions, and the system will be configured for real-time leak detection and pressure monitoring. WSD operators will be trained to interpret SCADA data and apply it to day-to-day network management, maintenance scheduling, and capital investment prioritization. Baseline performance data from the ADB-supported system will be collected to determine the requirements for new SCADA system integration. The TORs for the SCADA systems will include technical requirements to be able to be integrated with the ADB-supported SCADA systems, while taking care to avoid single source procurement issues, along with direct engagement with the operators of these SCADA systems to test integration of each system. Procured equipment will be tested to be complementary with the ABD-supported SCADA system. A point person in the PIU will be identified to oversee system integration, with the ADB requirements and current performance defining the floor of the expected performance of the new SCADA systems. The deliverables are a commissioned and operational SCADA system integrated across the city core's DMAs; a calibrated hydraulic model; and documented evidence that WSD operators are trained and using the system in daily network management.
68. Under activity (2.1.c), the embedded WSD consultants will establish pressure zone management across the distribution network, with DMAs delineated and configured for performance monitoring. A structured preventative maintenance program will be designed with defined inspection cycles and trigger thresholds. SCADA-generated flow and pressure data will be used to identify priority investments and prepare annual maintenance and capital investment plans for WSD and Steering Committee approval. Deliverables are at least one annual maintenance and capital investment plan prepared and approved and documented pressure zone management procedures adopted by the WSD.
69. Under activity (2.1.d), the embedded WSD consultants will assess existing billing practices and revenue collection, and design and deploy a digital billing system covering the WSD's customer base. A tariff review will be conducted analyzing cost-recovery options and affordability thresholds, leading to a tariff reform report with phased implementation recommendations. Deliverables are an operational digital billing system covering the WSD's customer base; and a tariff review report submitted to TT and RGoB.
70. Under activity (2.1.e), the embedded WSD consultants will map climate-related risks to each segment of the water supply chain and develop standardized emergency response procedures for floods, glacial lake outburst floods, pipe bursts, and blockages. Roles, communication protocols, and escalation procedures will be defined, a business continuity plan covering service restoration priorities will be prepared, and at least one full simulation exercise will be conducted to test and refine the procedures. The deliverable will be a documented and tested emergency response and business continuity plan, formally adopted by TT.
71. Under activity (2.1.f), international specialists engaged through the call-down arrangement will assess the feasibility and institutional requirements for introducing private sector participation in water service delivery in smaller Thromdes, analyze options for nationally consistent climate-resilient regulatory frameworks and service standards, and prepare policy options papers with implementation recommendations. Technical inputs will be provided to MoIT on the prioritization and structuring of future water investments consistent with LRCP outcomes. This activity will also involve two policy-focused workshops bringing together water sector specialists from other Thromdes and MoIT officials to discuss emerging policies, regulations, and investment priorities.
72. Under activity (2.1.g), local consultants will develop and begin implementing a water conservation and customer engagement communications strategy for the WSD, covering demand management messaging and efforts to shift household attitudes towards more sustainable water consumption practices. The strategy will include the production of materials for

distribution through community channels and targeted outreach to residential and commercial water users, targeting a reduction in per capita consumption to 100 litres per capita per day in line with the Water Sector Master Plan. Deliverables are an approved communications strategy and documented evidence of rollout including produced materials and outreach.

Sub-component 2.2: Capacity building and institutional strengthening for resilient and sustainable transport and urban service delivery

73. Sub-component 2.2 complements the transport investments under Sub-component 1.3 by strengthening the institutions and management systems needed to operate and expand low-emission public transport. Its central objective is to support the transition of CBS into a professionally managed State-Owned Enterprise (SOE) with the governance, staffing, commercial strategy, and technical systems required to deliver reliable e-bus services under a Public Service Agreement (PSA). Sub-activities (a) through (c), (f) are delivered through the PMC, which procures and oversees a team of embedded bus operations specialists working within CBS. Sub-activities (d), (e), and (g) are delivered through the call-down arrangement. Implementation is led by MoIT, with CBS assuming progressively greater operational responsibility as the project proceeds.
74. Under activity (2.2.a), the embedded bus operations specialists procured by the PMC will draft the legal instruments required to establish CBS as a State-Owned Enterprise under Bhutanese corporate and public sector law, including the SOE charter, governance framework, and national mandate for urban and inter-urban transport. The Public Service Agreement between CBS and Thimphu Thromde will be prepared, defining service standards, route obligations, performance indicators, fare-setting mechanisms, and financial reporting requirements. The first CBS annual business plan and financial accounts will be prepared under the new governance structure. Deliverables are legal instruments establishing CBS as an SOE; a signed PSA between CBS and TT; and the first CBS annual business plan and financial accounts prepared under the new governance structure.
75. Under activity (2.2.b), the embedded bus operations specialists procured by the PMC will provide design and deliver training programs for CBS drivers in e-bus operation, mechanics in electric vehicle maintenance and diagnostics, and customer service staff in passenger management and accessibility. A comprehensive CBS operations manual will be developed covering fleet scheduling, depot management, fare collection, incident response, and reporting. A period of shadow operations will be conducted during which CBS will run services under PSA conditions to test service standards, ticketing systems, and staff readiness before full rollout. Deliverables are CBS staff trained in e-bus operations, maintenance, and customer care; a documented readiness assessment completed following shadow operations; and CBS operating scheduled e-bus services on the corridor under the PSA.
76. Under activity (2.2.c), the embedded bus operations specialists procured by the PMC will support CBS in developing a commercial assessment of non-fare revenue opportunities, including business cases for retail franchises at the Dangrina and Ngabiphu terminals, an advertising framework for bus stops and on-bus placements, and an assessment of demand for bus leasing arrangements. A phased implementation roadmap with revenue projections will be prepared. The measurable deliverable will be a revenue diversification strategy and associated implementation roadmap for CBS, endorsed by CBS management.
77. Under activity (2.2.d), international specialists engaged through the call-down arrangement will prepare capital investment, asset management, and maintenance plans for the BPS corridor infrastructure, bus fleet, and terminal facilities, drawing on traffic and ridership data and aligned with projected climate risks. The plans will set out maintenance schedules, investment priorities, and handover arrangements to guide MoIT's stewardship of the assets after project closure. The deliverable will be an approved set of capital investment and asset management plans for the gradual introduction of bus services and infrastructure.

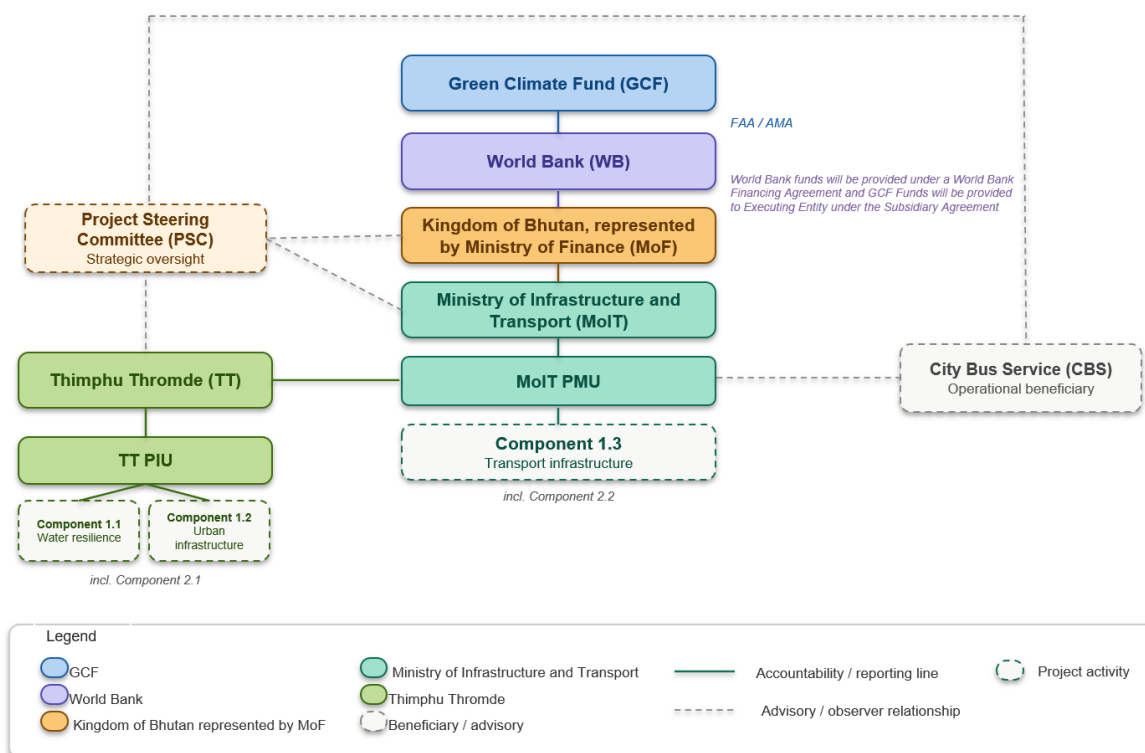
78. Under activity (2.2.e), international specialists engaged through the call-down arrangement will support MoIT in prioritizing and implementing policies, strategies, and regulations under the Low-Emission Transport Master Plan and National Adaptation Plan, including parking demand management, freight policies, and fare-setting frameworks. The technical assistance to support the implementation of national plans such as the LETMP (which includes policies such as parking rationalization in the city centre, corridor-specific pedestrian improvements, improvements to public transport supporting TOD, and design of mobility hubs) which will drive the uptake of public transport. Deliverables are policy briefs and draft regulations for priority LETMP measures, submitted to MoIT.
79. Under activity (2.2.f), the embedded bus operations specialists procured by the PMC will finalize the ITS and MIS procurement specification, provide technical evaluation support during tendering, and support CBS through the installation, integration, testing, and commissioning of the system across the control room and bus fleet. CBS staff will be trained in system operation and the use of smartcard and scheduling data for service planning, and national standards for ITS interoperability and smartcard payments will be developed for adoption by MoIT. Deliverables are a commissioned and operational ITS/MIS system with CBS staff trained in its use and published national ITS interoperability and smartcard payment standards.
80. Under activity (2.2.g), international specialists engaged through the call-down arrangement will collect and analyze ridership data, school travel patterns, and employer commuting profiles to assess demand for dedicated services such as school buses and employer-sponsored transport. The impact of these services on peak-hour demand will be modelled, and the commercial viability of inter-urban e-bus deployment to secondary cities will be evaluated. Deliverables are a demand analysis report and policy options for integrating such services with the CBS network, submitted to MoIT.
81. Under activity (2.2.h), local consultants will develop and implement a communications and awareness campaign to inform residents of the benefits of public transport and non-motorized transport and to build support for the broader mobility reforms. The campaign will be based on a baseline assessment of commuter attitudes and travel behavior and will include the production of materials covering the environmental, health, and cost benefits of switching from private vehicles to public and non-motorized transport, with targeted outreach. Deliverables are an approved communications strategy endorsed by MoIT and CBS and a documented record of outreach activities including produced materials and evidence of public engagement.
82. Under Activity 2.2(i), international and local consultants will prepare the conceptual design, functional specifications, and quality control framework for the Bhutan Land Information System (BLIS). A private sector firm will develop and deploy the core software. The system will integrate modules for land registration, cadastre, mortgages, leases, public land management, dispute management, and e-services into a single platform, upgrade the existing land registry system (eSakor), incorporate the Land Bank Management System (LBMS), implement an e-services portal, and ensure interoperability with the Department of Human Settlement's building records, the land valuation rates of PAVA, and Bhutan's National Spatial Data Infrastructure. Training and capacity building will be delivered to end users. BLIS will improve the disaster risk identification of land and buildings, enhance the management and protection of Bhutan's natural resources, increase public land and building asset use efficiency and revenues, and direct public lands toward their highest and best environmental and economic use. The deliverable will be a fully functional BLIS solution.

B.4. Implementation arrangements (max. 1500 words, approximately 3 pages plus diagrams)

Overview

83. The World Bank will serve as the Accredited Entity (AE) to the GCF and will administer GCF resources in accordance with the Accreditation Master Agreement (AMA) and the Funded Activity Agreement (FAA). The World Bank contractually requires that the Executing Entity to follow its policies and procedures relating to procurement, financial management, environmental and social standards, integrity, and monitoring and evaluation. The World Bank will supervise project implementation and report progress to the GCF in accordance with the reporting requirements established under the FAA. World Bank resources will be provided to the Kingdom of Bhutan through a Financing Agreement between the World Bank and MoF, consistent with standard IDA procedures.
84. The Executing Entity (EE) for LRCP is the Kingdom of Bhutan, represented by its Ministry of Finance and acting through its Ministry of Infrastructure and Transport (MoIT). Implementation of project activities will be coordinated by MoIT, which will host the Project Management Unit responsible for overall project coordination. Implementation responsibilities for specific project components will be carried out in collaboration with Thimphu Thromde (TT)'s Project Implementation Unit.
85. Figure 5 illustrates the overall institutional arrangements of LRCP, including the governance structure, the relationships between the Accredited Entity and the Executing Entity, and the roles of the implementing agency and operational beneficiary.

Figure 5: Institutional arrangements



Governance Arrangements

86. Strategic oversight of LRCP will be provided by a Project Steering Committee (PSC), which will be established by the Kingdom of Bhutan at the beginning of the project implementation period. The PSC will serve as the project's high-level decision-making and coordination body. Its role will be to

provide strategic guidance, ensure alignment with national policies and development priorities, facilitate coordination among implementing agencies, and review overall project performance.

87. The PSC will be chaired by the Secretary of MoIT and will include representatives from the Ministry of Finance, Thimphu Thromde, the City Bus Service, and the Bhutan Construction and Transportation Authority.
88. The PSC will meet at least twice per year and will review project progress, approve Annual Work Plans of the PMU and PIU, and provide guidance on major policy or implementation issues that may arise during implementation.

Project Management Arrangements

89. Day-to-day project coordination and management will be carried out by a Project Management Unit (PMU) established within the Department of Human Settlement (DHS) of the Ministry of Infrastructure and Transport. The PMU will be responsible for overall project management, including coordination across implementing entities, procurement oversight, financial management coordination, monitoring and evaluation, safeguards compliance, and reporting to the World Bank. The PMU will consolidate progress information from its own oversight activities and from TT. It will report to the World Bank which will in turn report to GCF. The PMU will also provide administrative and technical support to the Project Steering Committee.
90. The PMU will be led by a Project Director appointed by the Government and will include specialists responsible for procurement, financial management, environmental and social safeguards, monitoring and evaluation, gender, and legal matters. These specialists will be drawn from existing MoIT staff.
91. To strengthen implementation capacity, the PMU will be supported by a Project Management Consultant (PMC). The PMC will provide technical and operational support to the PMU, including assistance with procurement processes, engineering review, contract administration, and coordination of technical consultancies. The PMC will support the PMU in fulfilling its management responsibilities.
92. The PMU will develop the Operations Manual prior to the procurement of buses, establishing the operational and institutional framework required for the delivery of scheduled e-bus services. The Operations Manual will be prepared in close coordination with CBS management and MoIT, and will include, among others: technical standards and specifications for buses and the ITS; bus fleet management, operations, and maintenance procedures; route planning and management; service frequencies and scheduling; operational performance standards and monitoring arrangements; and other relevant operational and institutional requirements.

Project Implementation Arrangements

93. Implementation responsibilities for infrastructure investments will be carried out by the relevant sector institutions through dedicated implementation units. Responsibilities are organized by project component.

Ministry of Infrastructure and Transport (MoIT)

94. Through the PMU, MoIT will manage procurement and supervision of construction contracts under Component 1.3. These investments include bus priority lanes, bus stops and shelters, terminals, depots, charging infrastructure, and intelligent transport systems (see C1.3, activities a – e). MoIT will also coordinate institutional strengthening activities under Component 2.2. These activities support public transport governance reforms and the operational transition of the City Bus Service (see C2.2, activities a-i). Procurement responsibilities under the project will be shared between MoIT and Thimphu Thromde (TT), both of which have relevant institutional experience implementing infrastructure activities and managing procurement under government and development partner-

financed projects. Given the complexity of the proposed investments, additional dedicated procurement capacity and strengthened coordination arrangements will be established within the PMU/PIU, with a detailed procurement capacity and risk assessment to be reflected in the Project Procurement Strategy for Development (PPSD). Further details are provided in the Feasibility Study (see Section 9.4.1).

95. A Financial Management (FM) assessment of the implementing ministry has been carried out in accordance with World Bank policy. The assessment determined that acceptable financial management arrangements are in place to ensure that: (i) project funds will be used for the intended purposes in an efficient and economical manner; (ii) financial reports will be prepared in an accurate and timely manner; and (iii) project assets and resources will be adequately safeguarded. Further details are provided in the Feasibility Study (see Section 9.4.1). Both MoIT and TT will be allocated/transferred funds by MoF to separate Fund Identification Code based on the Annual Work Plan (AWP) approved by PSC. PIU TT and PMU will prepare AWP for their respective activities allocated under the project, and PMU will consolidate AWP and present to PSC for approval.

Thimphu Thromde (TT)

96. Through the PIU, Thimphu Thromde will manage procurement and supervision of construction contracts under Components 1.1 and 1.2. These investments include water system resilience measures such as SCADA systems, raw water intake upgrades, transmission protection works, and leakage reduction programs. They also include pedestrianization, sidewalk improvements, drainage upgrades, and improvements to public spaces and connectivity (see C1.1, activities a-e and C1.2, activities a-e). Thimphu Thromde will also coordinate institutional strengthening activities under Component 2.1. These activities support the establishment and strengthening of water service delivery systems (see C2.1, activities a-g).
97. A capacity assessment of Thimphu Thromde has been conducted in accordance with World Bank procedures. The assessment confirmed that the municipality has adequate institutional arrangements, including Financial Management, to implement infrastructure investments with the support of dedicated project management and technical consultants. Further details are provided in the Feasibility Study (see Section 9.4.2).

City Bus Service (CBS)

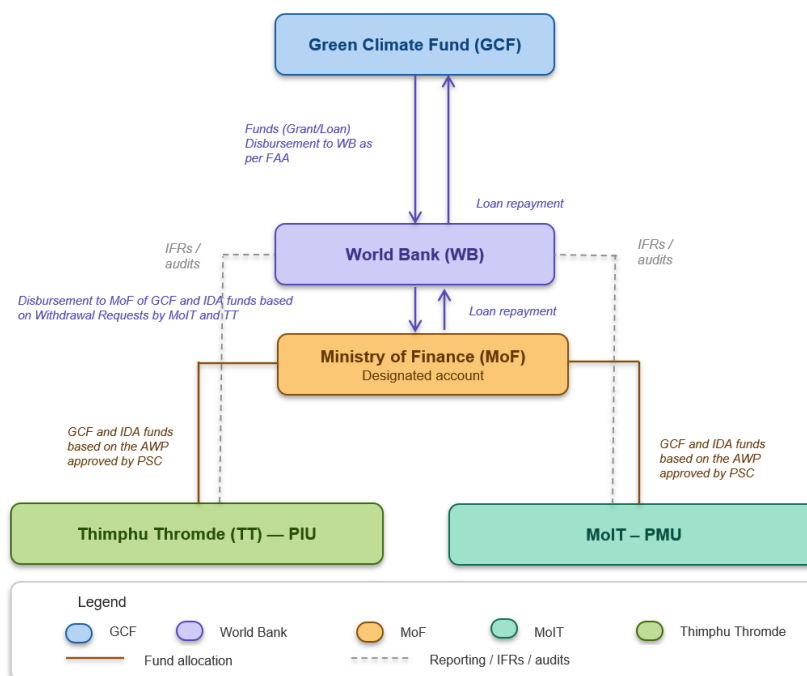
98. CBS will not have a direct role in project management or procurement during project implementation. Instead, CBS will serve as the operational beneficiary of public transport infrastructure financed under Component 1.3 (see C1.3, activities a – e). CBS will also benefit from institutional strengthening activities under Component 2.2 that support its transition into an independently managed state-owned enterprise (see C2.2, activities a – i). Following completion of infrastructure investments, CBS will assume responsibility for operation and maintenance of the electric bus fleet, bus terminals, depots, and intelligent transport systems. The legal and contractual arrangements for the transfer of assets to CBS will be formalized prior to project close. E-buses, terminals, and charging infrastructure procured under Component 1.3 will be transferred to CBS under an asset transfer agreement between MoIT and CBS, consistent with CBS's transition to an SOE and the terms of the Public Service Agreement with Thimphu Thromde.

Financial Management and Flow of Funds

99. GCF financing will be administered by the World Bank as the Accredited Entity. Following signature and effectiveness of the Funded Activity Agreement, IDA will enter into a Financing Agreement (Subsidiary Agreement) with the Kingdom of Bhutan. GCF funds will be disbursed to the Kingdom of Bhutan through the Ministry of Finance, which will manage the project's Designated Account.

From the Ministry of Finance, funds will be allocated to the MoIT and TT based on Annual Work Plans consolidated by the PMU and approved through the PSC. Both MoIT and TT will be responsible for financial management reporting and ensure compliance with World Bank fiduciary requirements for the funds allocated/transferred. Financial flows and contractual arrangements between the AE, the EE, and implementing entities are illustrated in Figure 6.

Figure 6: Flow of Funds



Experience and Track Record of Implementing Institutions

100. The World Bank has extensive experience supporting infrastructure and climate resilience projects in Bhutan and has implemented numerous operations in the water, transport, and urban sectors. The Bank has worked closely with the Ministry of Infrastructure and Transport, the Ministry of Finance, and Thimphu Thromde for several decades. The Ministry of Infrastructure and Transport has a strong track record of implementing infrastructure investments and managing donor-financed projects. The Ministry has led national transport and urban development initiatives and has experience coordinating multi-agency infrastructure programs. Thimphu Thromde is responsible for municipal administration and service delivery in Bhutan's capital city and has implemented several urban infrastructure projects, including water supply improvements and public space upgrades. Together, these institutions provide the institutional capacity required to implement the LRCP and sustain the project's investments beyond the implementation period.

B.5. Justification for GCF funding request (max. 1000 words, approximately 2 pages)

Rationale

101. Bhutan's climate financing needs are estimated at \$7.7–14 billion by 2030, with adaptation needs alone at approximately \$3.2 billion³⁰. These needs far exceed available domestic resources. Public debt stands at approximately 118% of GDP in FY2024/25 and is projected to rise to 141% of GDP by FY2028/29, driven largely by hydropower contingent liabilities³¹. The fiscal deficit stood at

³⁰ World Bank Group, *Bhutan Country Climate and Development Report (CCDR)*, 2025

³¹ International Monetary Fund, Asia and Pacific Department, *Bhutan: 2025 Article IV Consultation — Press Release and Staff Report*, IMF Staff Country Reports No. 26/19, January 2026

2.9% of GDP in FY2025/26. Bhutan's financing envelope is also set to narrow following LDC graduation, as concessional and grant resources, historically over 22% of public resources, gradually taper off. ADB, JICA, UNDP, and SAARC have each allocated their Bhutan financing to other projects, leaving no viable alternative international source for LRCP. Commercial financing is not available on viable terms: at a representative domestic rate of 13.5% over 7 years, the BRT project produces a financial net present value of negative \$13.25 million, confirming that private debt cannot close the financing gap (EFA, Annex 3). In a small, landlocked economy like Bhutan where domestic capital markets remain at an early stage of development and commercial financing for first-of-kind clean mobility infrastructure carries risk profiles that the private sector is not yet positioned to absorb, GCF's concessional support plays an indispensable catalytic role creating the conditions under which a sustainable, scalable, and ultimately self-financing public transport system can take root. Bhutan's domestic capital markets are shallow, credit systems are weak, financial instruments are limited, and there is no established private sector appetite for climate infrastructure investment in water or transport. Underpriced public tariffs, limited foreign currency access, and political constraints on tariff reform further deter private participation.

102. Three market failures justify GCF financing: non-internalized climate externalities, whereby the full social value of avoided emissions and improved climate resilience accrues to society but is not captured in revenues; first-mover risk on technology and institutional reform; and the public-good characteristics of adaptation investments such as flood-resilient drainage and pedestrian pathways, which cannot generate cost recovery. Consequently, there are no BRT or other rapid urban transit systems in Bhutan (the project system will be first-of-its-kind in the country; see Annex 22 for additionality demonstration under CDM AM0031), and – despite the RGoB's commitment to low-carbon transport – such systems are unlikely to be developed without GCF financing, considering these barriers.

Coherence of Financial Instruments

103. In the water sector, physical infrastructure investments are financed entirely by IDA (\$4.39M grant and \$1.32M loan). These investments generate an economic NPV of \$3.06M at an EIRR of 19.1% but do not produce revenues sufficient to service commercial debt. IDA grant financing of \$3.04M supports water sector institutional strengthening. SCADA systems and capacity building are not revenue-generating in any timeframe and are only viable through grant financing. Water tariffs are aligned with local affordability and there is limited political space for increases sufficient to finance capital or system improvements. Water revenues currently barely cover operational and maintenance costs. Thimphu Thromde has limited financial autonomy and no commercial borrowing capacity. IDA grant financing ensures that water infrastructure improvements reach end users without tariff increases.
104. In the transport sector, GCF provides a grant of \$18.43M and a concessional loan of \$5.6M, alongside an IDA grant (\$1.58M) and IDA loan (\$8.68M) for co-financing transport infrastructure. The grant covers the non-revenue-generating works, such as pedestrian access works and the ITS system. The concessional loan applies to components where financial performance improves as modal shift deepens, that is, the first tranche of 50 e-buses and associated charging and ancillary infrastructure. Bus fares have been set through consultations with users and the City Bus Service and are aligned with local affordability. At approximately Nu. 12.50 per trip (\$0.134), fares represent less than 2.5% of monthly per capita income. Concessional fares are available for schoolchildren and the elderly. These fare levels are essential for achieving the modal shift that underpins the project's mitigation ambitions, but they mean that farebox revenue cannot finance capital investment. The positive externalities of public transport, including emissions reductions, congestion relief, and improved air quality, reinforce the case for concessional financing. These benefits accrue broadly to society but cannot be captured in farebox revenues.
105. The concessionalities requested is the minimum required to ensure viability. Even at the most concessional all-loan terms available, the project's equity returns remain below the 12% cost of

capital (MIRR of 6.1%, equity FNPV of –\$13.25 million), leaving it unable to attract or retain private equity. The grant component is calibrated to close precisely this gap — lifting equity FNPV to +\$0.41 million and MIRR to 13.0% — without generating windfall returns for investors. The blended structure therefore represents the minimum required to convert a sub-hurdle, value-eroding proposition into a bankable project. Bhutan's structural constraints, including public debt projected at 141% of GDP by FY2028/29, shallow domestic capital markets, an absence of private climate infrastructure investors, limited foreign currency reserves, and declining preferential aid, mean that even moderate increases in financing cost significantly impair project viability. The risk-sharing structure reflects each instrument's role. GCF and IDA grant financing is reserved for infrastructure that is not revenue-generating, including pedestrian and public realm investments under Sub-component 1.2 and the institutional reforms under Component 2 that are not viable on any commercial basis. The bus priority corridor infrastructure under Sub-component 1.3 is financed through a blend of GCF grants and IDA grants and loans, reflecting its role as enabling infrastructure for the revenue-generating bus system. The e-buses themselves and the associated charging infrastructure is financed entirely through GCF and IDA loans, where the financial position improves progressively as modal shift deepens and CBS transitions to SOE operations, making a reimbursable instrument appropriate over the medium term while remaining well below commercial rates.

B.6. Exit strategy (max. 500 words, approximately 1 page)

106. LRCP operationalizes the “avoid, shift, improve” framework across water and transport systems. In water, it avoids climate impacts through resilient infrastructure, shifts toward more efficient and equitable distribution, and improves performance through SCADA-enabled management. In transport, it avoids motorized travel, shifts travel to public and non-motorized modes by enhancing walkability and creating a high-quality transit corridor, and improves performance through electric buses, reduced travel time for bus users, and intelligent transport systems.
107. The project is designed to ensure that these improvements continue beyond the implementation period without reliance on concessional financing. The exit strategy is structured around clear asset ownership arrangements, defined operation and maintenance responsibilities, institutional ownership, and financial sustainability mechanisms.
108. At the system level, LRCP combines infrastructure investments under Component 1 with institutional strengthening under Component 2 to establish durable service delivery arrangements. In the water sector, Thimphu Thromde will operate a strengthened Water and Wastewater Services Division, supported by SCADA-enabled monitoring, improved asset management, and enhanced billing systems, enabling reliable service under increasing climate variability. In the transport sector, CBS will serve as the long-term operator of public transport services, with project-supported activities under Sub-component 2.2 enabling its transition toward a professionally managed State-Owned Enterprise. Activities under Sub-component 2.2 will also support the definition of service standards, performance obligations, and institutional responsibilities for transport service delivery.
109. Asset ownership and operation and maintenance responsibilities after project completion are defined as follows. Thimphu Thromde will own and be responsible for operation and maintenance of pedestrian infrastructure, including sidewalks, footpaths, urban realm improvements, and associated non-motorized transport facilities. Bus terminals and e-bus infrastructure (including electric buses, charging systems, and depot facilities) will be owned and operated by CBS. Bus stops and associated passenger access infrastructure will be subject to final allocation under the SOE framework, which will define whether ownership and maintenance responsibilities rest with CBS or Thimphu Thromde, based on operational efficiency and institutional capacity considerations.
110. All infrastructure financed under the project will be supported by operation and maintenance plans that define lifecycle requirements, responsibilities, and budget allocations. In the water sector, Thimphu Thromde will manage water infrastructure, including treatment systems, transmission networks, and distribution systems, supported by preventive maintenance, monitoring, and

emergency response procedures. In the transport sector, CBS will operate and maintain electric buses, charging systems, terminals, depots, and intelligent transport systems, supported by supplier-backed service agreements and technical training. Battery lifecycle management will include warranties and end-of-life arrangements such as take-back or certified recycling.

111. Financial sustainability will be reinforced through improved cost recovery and operational efficiency. In the water sector, improved billing systems, tariff adjustments, and reduced non-revenue water will enhance revenue generation and enable reinvestment in maintenance and future expansion. In the transport sector, CBS will strengthen financial performance through increased ridership and diversified revenue streams, including fare revenues and ancillary income. The project is designed to create a financially sustainable ecosystem for future expansion. The positive Modified Internal Rate of Return (MIRR) of 13% achieved with GCF support demonstrates that the operational model can generate sufficient cash flows to be attractive for potential future financing.
112. The sustainability of Component 2 activities will be ensured through institutionalization within implementing agencies rather than continuation as project-based functions. Capacity building, operational systems, and planning tools introduced under the project will be embedded within the staffing structures, budget processes, and routine functions of Thimphu Thromde, MoIT, and CBS. This ensures that asset management, service planning, system monitoring, and policy implementation continue as core government responsibilities after project completion.
113. Finally, LRCP contributes to a long-term paradigm shift by demonstrating how climate-resilient water systems, pedestrian friendly public realm improvements, and low-emission transport can be delivered as an integrated urban system. These approaches will be embedded within national and municipal practices, enabling replication in other cities and supporting the transition toward climate-resilient and low-carbon urban service delivery.

FINANCING INFORMATION							
C.1. Total financing							
(a) Requested GCF funding (i + ii + iii + iv + v + vi + vii)	Total amount			Currency (USD)			
	28			million USD (\$)			
GCF financial instrument	Amount	Tenor		Grace period	Pricing		
(i) Senior loans	5.6	20		5	<u>0.75%</u>		
(ii) Subordinated loans							
(iii) Equity							
(iv) Guarantees							
(v) Reimbursabl e grants							
(vi) Grants	22.4						
(vii) Results- based payments							
(b) Co- financing information	Total amount			Currency			
	20			million USD (\$)			
Name of institution	Financial instrument	Amount	Currency	Tenor & grace	Pricing	Seniorit y	
<u>World Bank</u>	<u>Senior Loans</u>	<u>10</u>	<u>million USD\$</u>	<u>40 years</u>	<u>2%</u>	<u>Options</u>	
<u>World Bank</u>	<u>Grant</u>	<u>10</u>	<u>million USD\$</u>				
(c) Total World Bank IDA (d) financin g (c) = (a)+(b)	Amount			Currency			
	<u>48</u>			<u>million USD (\$)</u>			
(d) Other financing arrangement s and contribution s							
C.2. Financing by component							
Component	Subcomponent/ac tivity	Indicative cost million USD (\$)	GCF financing		Co-financing		
			Amount million USD (\$)	Financial Instrument	Amount million USD (\$)	Financial Instrument	Name of Institutions
<u>Component 1.1</u>	Strengthening water supply systems to support	<u>5.71</u>			<u>4.39</u> <u>1.32</u>	<u>Grants</u> <u>Loan</u>	World Bank

	resilient water services						
<u>Component 1.2</u>	Improving the safety and convenience of sidewalks, footpaths, and passageways to encourage non-motorized transport	<u>6.7</u>	<u>6.7</u>	<u>Grants</u>			
<u>Component 1.3</u>	Investments toward a modal shift to low-emission public transport	<u>27.59</u>	<u>11.73</u>	<u>Grants</u>	<u>1.58</u>	<u>Grant</u>	<u>World Bank</u>
			<u>5.6</u>	<u>Loan</u>	<u>8.68</u>	<u>Loan</u>	<u>World Bank</u>
<u>Component 2.1</u>	Capacity building and institutional strengthening for resilient and sustainable water service delivery	<u>3.04</u>			<u>3.04</u>	<u>Grants</u>	<u>World Bank</u>
<u>Component 2.2</u>	Capacity building and institutional strengthening for resilient and sustainable transport service delivery	<u>2.59</u>	<u>2.59</u>	<u>Grants</u>			
<u>Project Management</u>	Project management and implementation units	<u>2.20</u>	<u>1.28</u>	<u>Grants</u>	<u>0.92</u>	<u>Grants</u>	<u>World Bank</u>
	M&E	<u>0.18</u>	<u>0.11</u>	<u>Grants</u>	<u>0.08</u>	<u>Grants</u>	<u>World Bank</u>
Indicative total cost (USD)		<u>48</u>	<u>28</u>		<u>20</u>		

C.3 Capacity building and technology development/transfer (max. 250 words, approximately 0.5 page)

C.3.1 Does GCF funding finance capacity building activities?

Yes ☒ No ☐

C.3.2. Does GCF funding finance technology development/transfer?

Yes ☒ No ☐

114. LRCP includes \$2.59 million in GCF grant funding dedicated to capacity building and technology development across the urban transport sector. These investments are essential to institutionalizing climate-resilient service delivery and enabling long-term systems transformation and institutional reform.
115. Capacity-building activities will support the establishment of a ring-fenced water division in Thimphu Thromde and the transition of CBS into an independent SOE with a national mandate. This includes technical assistance for developing business plans, HR policies, budgeting, regulatory support, tariff reforms, and disaster response planning. Institutional strengthening will also support the MoIT in implementing the LETMP, NAP, and CCAP.
116. Finally, the project will finance the design, procurement, installation, testing, and maintenance of key digital systems to improve operational efficiency and climate responsiveness. This includes a SCADA system for real-time monitoring and leakage control in Thimphu's water network WTPs, and an ITS and MIS to support route scheduling, real-time passenger information, digital ticketing, incident response, and fleet optimization.

CTED PERFORMANCE AGAINST INVESTMENT CRITERIA

D.1. Impact potential (max. 500 words, approximately 1 page)

Impact Potential of the LRCP

117. LRCP is designed to deliver transformational mitigation and adaptation impacts by enabling a paradigm shift in the provision of urban services in Thimphu. The project directly addresses the GCF's Mitigation Result Areas (MRAs) and Adaptation Result Areas (ARAs) through a comprehensive, integrated approach.

Mitigation Impact: Contribution to Low-Emission Sustainable Development Pathways

118. LRCP will significantly contribute to MRA 2: Low-emission transport through system-wide interventions:
119. *Low-Carbon Mobility Transformation:* The introduction of 50 electric buses, a bus priority corridor with dedicated lanes, and complementary transport policies will support a modal shift of 30% from private vehicle use to public transport along the proposed corridor by 2048, avoiding roughly 34 million vehicle-km of private car travel annually. These figures are supported by detailed traffic modelling along the proposed corridor. This transition is expected to result in the reduction of approximately 69,519 tonnes of CO₂eq over 20 years, conservatively estimated against a business-as-usual (BAU) scenario. Emissions savings will be driven by avoided private vehicle trips, reduced traffic congestion (avg. travel time reduced by appx. 20% by 2048), and the decarbonization of the public transport fleet, powered by Bhutan's 100% renewable hydropower. For the broader city, these investments are projected to increase the share of trips made by bus by 17 percentage points, from 8% to 25%, compared to BAU. These measures are key to Bhutan's low-emission development pathway: while Bhutan is a net carbon sink for now, its LTS notes that a BAU trajectory would put its carbon-neutral status at risk by 2047–2048, as rising emissions and declining forest sink capacity converge. The transport sector is the primary source of energy-related GHG emissions (60%), and expected to increase in a BAU scenario due to continued uptake of private vehicle use. Therefore, the LTS identifies the development of NMT infrastructure and deployment of electric Bus Rapid Transit (with 100% of bus sales to be electric by 2045) – both key elements of the project – as priorities.
120. *Operational Efficiency for Urban Services:* LRCP's water sector investments will increase energy efficiency through the installation of SCADA systems, rehabilitation of transmission lines, and reduction of non-revenue water (NRW). Improved system reliability and leak detection will reduce the energy intensity of water supply operations. Given the low carbon intensity of Bhutan's hydropower-dominated electric grid and its largely gravity-based water supply, energy savings (roughly 65 MWh over 20 years) and associated GHG reduction are relatively small.³² Nonetheless, they support the country's low-emissions and resilient pathway: as climate change poses increasing risks to hydropower generation³³, and electricity demand continues to rise (including to accommodate increasing vehicle electrification), efficient use of electricity helps avoid incentives to invest in higher-emissions supplementary energy sources. In addition, Bhutan exports a substantial amount of surplus hydropower to India, particularly during monsoon season (May-October), and also sometimes imports energy from India during the dry season (November-April) when hydropower is unable to meet peak demand.³⁴ Enhancing efficient use of electricity therefore increases the amount of clean energy available for export, displacing generation at the prevailing regional grid emission factor,.

Adaptation Impact: Contribution to Climate-Resilient Sustainable Development

³² LRCP EFA

³³ Bhutan 21st Century Economic Roadmap, <https://pmo.gov.bt/wp-content/uploads/2026/02/document-1753155904040.pdf>

³⁴ "Central Electricity Authority (CEA), Government of India, Ministry of Power, *CO2 Baseline Database for the Indian Power Sector, User Guide*, Version 22.0, August 2026. https://cea.nic.in/wp-content/uploads/baseline/2026/09/User_Guide_Version_22.0.pdf

121. LRCP will strengthen resilience in alignment with ARA 2 (health, well-being, food and water security) and ARA 3 (infrastructure and built environment) through the following mechanisms:
122. *Resilient and Equitable Urban Mobility:* Transport interventions will enhance adaptive capacity for road users, particularly public and non-motor transport users. Improvements include climate resilient road and bridge upgrades, safer sidewalks, ramps, bus shelters, and well-lit access routes. Heat-resilient, air-conditioned e-buses and robust first- and last-mile connectivity will reduce heat stress and exposure to extreme weather. Bus-based mobility will also improve the city's capacity for evacuation during disasters, while climate-resilient drainage and roadside infrastructure will mitigate flooding-induced disruptions. Approximately 72,448 direct beneficiaries³⁵ (users of public transit and NMT), of which 48.5% female, are expected to benefit from more climate-resilient public and non-motor transport systems by the end of implementation.
123. *Water Security and Public Health:* LRCP will ensure continuous and equitable access to safe water, including during periods of climate change-exacerbated drought, by improving water supply resilience, reducing NRW, and enhancing operational autonomy. Key adaptation results of the water component include: Improved availability of safe water (increasing the proportion of core city residents with at least 15 hours per day (12 hours during the dry season) of treated water supply from ~17% to 100%) and increased resilience of water supply via reduced losses (NRW reduced from >50% to 25% in city core.) Water supply improvements are expected to serve 52,046 direct beneficiaries³⁶ by project end, of which 48.5% female. These measures directly contribute to ARA 2 by improving water security, building resilience to climate shocks including droughts and flooding, reducing the risk of waterborne disease outbreaks, and enhancing public health. Upgraded drainage systems—integrated with Sustainable urban Drainage Systems (SuDS)—will also mitigate contamination of downstream water sources, supporting urban water security and environmental protection.
124. *Digital Systems for Faster Response and Adaptive Management:* SCADA-enabled water operations and real-time mobility data will improve the city's ability to anticipate, monitor, and respond to climate-related disruptions. Enhanced asset management, leak detection, and performance monitoring will allow for more agile and climate-responsive service delivery across sectors.
125. The total value of resilience improvements to water and transport infrastructure, under ARA 3, is approximately US \$45.5 million, while the incremental cost of climate resilience is approximately US \$1.61 million, based on project budget estimates and engineering studies (see Annex 3 – EFA for detailed calculations).

Conclusion

126. LRCP offers strong impact potential by directly advancing Bhutan's Nationally Determined Contributions (NDCs) and National Adaptation Plan (NAP) objectives. Its contributions to both mitigation and adaptation result areas demonstrate the project's potential to drive climate-resilient, low-emission urban transformation. The integrated focus on behavioral shifts, demand management, and service efficiency positions LRCP as a replicable model for sustainable development in Bhutan and other mountainous, rapidly urbanizing countries.

D.2. Paradigm shift potential (max. 500 words, approximately 1 page)

127. LRCP uses Thimphu as a demonstration city to catalyze systemic transformation in urban service delivery in Bhutan. By simultaneously addressing infrastructure deficits and institutional weaknesses across transport and water, it establishes a replicable model for climate-resilient, low-emission urban development with direct applicability to other mountainous, rapidly urbanizing areas.

Potential for Scaling Up and Replication

³⁵ Of which 52,117 unique (not also direct beneficiaries of water activities) -- see Adaptation Beneficiary Analysis.

³⁶ Of which 31,715 unique (not also direct beneficiaries of transport/public space activities).

128. Bhutan's secondary cities face transport and water challenges that closely mirror Thimphu's at an earlier stage of growth: rising private vehicle dependence, inadequate public transport, deteriorating pedestrian infrastructure, and water systems characterized by high non-revenue losses and weak operational governance. For example, Phuentsholing suffers from chronic traffic congestion while Samdrup Jongkhar and Sarpang experience intermittent water supply, inadequate sewerage, and regular flooding. LRCP responds through two transferable institutional and governance models, each combining strong institutional design with the infrastructure needed to make it work. In transport, the primary transferable model is the CBS transition to a State-Owned Enterprise operating under a Public Service Agreement, a governance framework establishing clear mandates, accountability structures, and a basis for long-term financial planning applicable in any Bhutanese city. The whole-of-system infrastructure package (electric buses, NMT improvements, unified ticketing, and bus priority lanes) is integral to this model, providing the operational foundation on which it is built and demonstrated at scale. Bhutan's 13th Five-Year Plan already commits to 45 additional electric buses for other cities, reflecting national intent to replicate the approach. In water, the primary transferable model is the ring-fenced Water and Wastewater Services Division, a governance and operational structure with independent accounting, SCADA-informed asset management, and performance-based private sector engagement that provides a replicable blueprint for other Thromdes. Together, the governance model and the infrastructure investments it oversees demonstrate what climate-resilient service delivery can achieve at scale. Both models also offer lessons for other mountainous, rapidly urbanizing areas facing similar terrain constraints and institutional challenges.

Potential for Knowledge Sharing and Learning

129. ITS and SCADA data will go beyond immediate operations: transport performance data will support network benchmarking and investment planning by MoIT and other Thromdes, while SCADA-generated reporting will inform tariff-setting, capital prioritization, and climate adaptation decisions nationally. In transport, international advisors supporting the CBS SOE transition will train local staff in fleet management, ITS operations, and financial planning. In water, embedded consultants within the Water and Wastewater Services Division will deliver structured training in SCADA operations, climate-resilient network management, and emergency response, building institutional knowledge that persists after the project closes. Two policy workshops will bring operational staff together to discuss emerging policies, regulations, and investment priorities, supporting replication across Bhutan.

Contribution to the Creation of an Enabling Environment

130. Component 2 creates the enabling environment for sustained, scaled climate-resilient service delivery through institutional reforms. In transport, the CBS transition to an SOE under a Public Service Agreement establishes clearer mandates, accountability structures, and a basis for financial planning. Though public service contributions will remain necessary over the long term, the PSA framework progressively reduces dependence on ad hoc government support. In water, the ring-fenced Water and Wastewater Services Division with SCADA-informed asset management, independent accounting, and performance-based private sector engagement provides a replicable governance model for other Thromdes, with cost-recovery tariff reform progressively improving financial sustainability as the system matures. By institutionalizing these reforms within national agencies, LRCP ensures the enabling environment outlasts the project and supports scale-up elsewhere.

Contribution to the Regulatory Framework and Policies

131. LRCP operationalizes a suite of national and local policy frameworks. In transport, it implements key elements of the Low Emission Transport Master Plan (LETMP) and the 2021 Low Emission Development Strategy, with technical assistance also developing complementary instruments including parking demand management, freight policies, and fare-setting frameworks. In water, it operationalizes the Water Sector Master Plan, the Thimphu Structure Plan, and the City Core Action Plan. Component 2 institutional reforms are the mechanisms through which these strategies achieve durable effect. LRCP operationalizes commitments the Government of Bhutan has already made, reducing implementation risk and strengthening prospects for scale-up.

Contribution to Climate-Resilient Development Pathways

132. LRCP is aligned with Bhutan's 2021 NDCs, which prioritize transport decarbonization and climate-resilient water services, and with the 2023 NAP, which calls for strengthening urban infrastructure against climate hazards and reducing water system losses. The long-term structural change LRCP contributes to these goals is grounded in institutional reform and policy change, working in concert with targeted infrastructure investment. On mitigation, the CBS SOE model, with its PSA accountability framework, performance incentives, and financial planning capacity, is what embeds low-emission transport as the default service delivery model for the long term. The projected reduction of 69,519 tonnes CO₂eq over 20 years is made possible by this institutional model operating the electrified public transport fleet running on Bhutan's 100% renewable hydropower. On adaptation, the ring-fenced Water and Wastewater Services Division, with SCADA-informed network management, climate-aware capital planning, and tested emergency response procedures, is what ensures durable resilience outcomes are sustained beyond the project period. The infrastructure investments are the operational foundation on which these institutional models are built and through which they deliver results. These governance reforms operationalize the sectoral strategies underpinning the NDCs and NAP: the LETMP and Low Emission Development Strategy in transport; the Water Sector Master Plan and City Core Action Plan in water. Taken together, they establish a nationally replicable model for climate-resilient urban service delivery, consistent with Bhutan's carbon neutrality commitment.

D.3. Sustainable development (max. 500 words, approximately 1 page)

133. LRCP generates measurable co-benefits across environmental, social, economic, and gender dimensions, aligned with SDGs 3, 6, 7, 9, 11, and 13, and directly reflected in the project's Theory of Change:

Environmental co-benefits

134. Beyond its key climate mitigation benefits, the shift to public and non-motor transport will improve air quality and public health: reductions in diesel and petrol consumption, estimated at 13,276 and 42,999 thousand litres respectively over 20 years, will lower local concentrations of PM_{2.5}, NO_x, and SO₂, with clean air benefits valued at a net present value of \$2.2 million (12% discount rate, EFA). In the water sector, reducing NRW from over 50% to 25% will recover approximately one quarter of all treated water currently lost to leakage and unauthorized connections, making that volume available to additional households without increasing abstraction from climate-stressed sources.

Social co-benefits

135. Increasing water supply from 3–9 hours per day to 15 hours per day, beyond the key adaptation benefits described in section D.1, will reduce the risk of waterborne disease outbreaks and enhance public health, with particular gains for the more than 77% of households currently reliant on portable water during dry periods, reducing the time and health burden borne disproportionately by women and girls. Provision and improved separation of pedestrian infrastructure (sidewalks and crossings) will improve safety and reduce road traffic accidents. Upgraded bus infrastructure with lighting, real-time information displays, and priority seating will improve safety and accessibility for women, people with disabilities, and the elderly. Passenger surveys confirm that most CBS users are in the bottom 40% income bracket, meaning improved public transport disproportionately benefits the urban poor. Average bus fares of approximately Nu. 12.50 per trip represent less than 2.5% of monthly per capita income, keeping public transport affordable for low-income households. The project's beneficiary analysis estimates 104,162 direct beneficiaries by project close (with double counting removed).

Economic co-benefits

136. The EFA estimates a Net Present Value (NPV) of \$23.9 million for the pedestrian and transport investments (excluding GHG benefits), rising to \$25.9 million at mid-range carbon pricing. The Bus Priority Corridor is projected to reduce bus travel times by over 20% once operational. This efficiency generates significant economic benefits, with travel time savings from all users growing from \$2.37 million per year upon opening of the Bus Priority Corridor to \$3.87 million per year by 2048 as modal shift deepens. Vehicle operating cost savings generate an NPV of \$8.46 million over the project period, with avoided

road accident costs contributing a further \$3.12 million. Improved access to efficient public transport helps connect residents to jobs and economic opportunity. Reduced congestion and improved pedestrian facilities also support over 200,000 annual tourists who visit Thimphu's commercial centre, further benefiting local businesses. The water investment generates an ENPV of \$3.06 million (EIRR 19.1%).

Gender-sensitive development

137. Women in Thimphu have a labour force participation rate of 31.9% and earn on average 25% less than men, while relying more heavily on public transport. 44% report that the current bus system requires better security. LRCP addresses these gaps through improved lighting, real-time passenger information, and anti-harassment measures. Increased water supply reliability directly reduces the burden of water collection borne primarily by women. The Gender Action Plan (Annex 8) ensures women participate meaningfully in project planning and feedback.

D.4. Needs of recipient (max. 500 words, approximately 1 page)

Vulnerability of the Country

138. Thimphu faces multiple interacting climate hazards: flooding, landslides, urban heat stress, and drought. Between 1985 and 2015, the built-up area exposed to pluvial flooding nearly tripled to 1.7 km²; a current 100-year flood event is projected to recur every five years by the 2060s. Flooding damages water intake structures and transport bridges built to design standards already being exceeded. Drought compounds these pressures: over 77.5% of households resort to portable water during dry periods, and the water network, largely installed over 40 years ago, suffers non-revenue water losses exceeding 50% and average supply of only 3–9 hours per day. Urban heat island hotspots reach 43°C in summer, exacerbating water scarcity and infrastructure deterioration (see Section B.1).

Vulnerable Groups and Gender Aspects

139. Women, low-income households, youth, persons with disabilities, and the elderly are disproportionately affected. As documented in Annex 8, women in Thimphu have a labour force participation rate of just 31.9%, earn on average 25% less than men, and rely more heavily on public transport. 44% of women report that public transport requires better security, and younger women frequently avoid buses due to harassment concerns. Women also bear the primary burden of water collection, and unreliable supply imposes disproportionate time and health costs that intensify during floods when damaged infrastructure limits their mobility and access to services. Women entrepreneurs on Norzin Lam face additional livelihood risks from construction disruption, and female persons with disabilities receive less assistance than male counterparts. Youth unemployment among women (21.2%) is nearly 50% higher than among men (14.5%). LRCP responds through inclusive infrastructure, concessionary fares, bus safety measures, SEA/SH safeguards, and a Gender Action Plan with dedicated gender expertise in the PMU.

Economic and Social Development Level

140. Despite graduating from LDC status in 2023, Bhutan faces severe fiscal constraints. Total public debt stood at 118% of GDP in FY2024/25, driven by hydropower contingent liabilities, and is projected to reach approximately 141% of GDP by FY2028/29. The fiscal deficit is widening to 2.9% of GDP in FY2025/26 and 4.1% in FY2026/27, while the current account deficit stands at 19% of GDP in FY2024/25³⁷. Bhutan's financing envelope is also set to narrow following LDC graduation, as concessional and grant resources, historically over 22% of public resources, gradually taper off. Bhutan imports all its fossil fuels, and continued vehicle growth will further undermine fiscal and energy resilience.

³⁷ 37

International Monetary Fund, Asia and Pacific Department, *Bhutan: 2025 Article IV Consultation — Press Release and Staff Report*, IMF Staff Country Reports No. 26/19, January 2026

Absence of Alternative Sources of Financing

141. Bhutan's climate financing needs are estimated at US\$7.7–14 billion by 2030, against adaptation needs of approximately US\$3.2 billion, far exceeding available funding (Section B.5). Capital markets are shallow, Thimphu Thromde lacks borrowing capacity, farebox revenues cannot finance capital investment, and water revenues barely cover operational costs. Commercial financing at around 13.5% over 7 years produces an FNPV of negative \$13.25 million for the BRT, confirming it is not viable without concessional support (Section B.5). Other potential sources, including ADB, JICA, UNDP, and SAARC, have allocated their financing for Bhutan to other projects. Without GCF support, the transport fleet defaults to diesel, climate-resilient water infrastructure remains unfinanced, and pedestrian investments would not proceed.

Need for Strengthening Institutions and Implementation Capacity

142. Institutional weaknesses compound physical vulnerability. Water services lack utility-style management and data infrastructure for climate-informed operations, and CBS lacks the structure to plan and finance fleet renewal. Neither sector systematically integrates gender, disability, or climate risk into service design (Feasibility Study, Chapter 5). Component 2 addresses these gaps through CBS's SOE transition, a ring-fenced Water and Wastewater Services Division with SCADA-based management, and embedded technical assistance, building capacity to sustain and replicate climate-resilient service delivery.

D.5. Country ownership (max. 500 words, approximately 1 page)

Alignment with National Climate Strategy and Existing Policies

143. LRCP is fully aligned with Bhutan's 2021 NDCs, which identify surface transport decarbonization as one of four priority focus areas and climate-resilient water services as a key investment priority, and with the 2023 NAP, which calls for reducing water system losses, ensuring reliable service delivery, and enhancing infrastructure resilience. LRCP operationalizes these commitments through a suite of national and local instruments, including the Low Emission Transport Master Plan (LETMP), the 2021 Low Emission Development Strategy for Transport, the Water Sector Master Plan (WSMP), the Thimphu Structure Plan, and the City Core Action Plan. All project activities are embedded within Bhutan's 13th Five-Year Plan (2024–2029).

Local Asset Ownership and Institutional Capacity

144. All project assets will be owned by local entities with public service mandates. Water infrastructure will vest in Thimphu Thromde (TT), responsible for municipal water and wastewater delivery, while the electric bus fleet, terminals, depots, and intelligent transport systems will transfer to the City Bus Service (CBS), which holds the mandate for low-emission public transport in Thimphu.
145. Component 2 builds the capacity of TT and CBS to sustain and scale these investments. For TT, this means establishing a ring-fenced Water and Wastewater Services Division with SCADA-based asset management, capacity support through embedded consultants, and cost-recovery tariff reform. For CBS, it means supporting the transition to a State-Owned Enterprise under a Public Service Agreement framework with embedded operational support and financial planning capacity. Both reforms are designed to enable TT and CBS to independently deliver climate-resilient services after project completion and provide replicable models for other Thromdes and urban centres (see Section B.4). A January 2024 bus priority corridor pilot demonstrates early government commitment to de-risking implementation, and a Project Steering Committee (PSC) chaired by MoIT with representation from MoF, TT, CBS, and the Bhutan Construction and Transportation Authority provides high-level governance (see Section B.4).

Role of the National Designated Authority

146. Bhutan's NDA to the GCF is the Ministry of Finance (MoF). The NDA serves as the primary interface between the RGoB and the GCF, communicating national climate priorities, providing strategic direction to GCF programming and planning, and endorsing projects for submission to the Fund. For

LRCP, the NDA has issued the No Objection Letter (NOL) confirming that LRCP is consistent with Bhutan's national climate strategies and country-driven priorities.

Engagement with Civil Society and Relevant Stakeholders

147. Stakeholder engagement has been central to LRCP's design and will remain integral throughout implementation, encompassing urban residents, transport users, water-stressed communities, women, youth, persons with disabilities, civil society organizations, and private sector actors. The engagement approach is formalized in the Stakeholder Engagement Plan (Annex 7) and Environmental and Social Management Plan (ESMP). Gender-responsive participation is governed by the Gender Assessment and Action Plan (Annex 8, Sections 2 and 3), covering inclusive engagement of women and marginalized groups across planning, implementation, and monitoring. A project-specific Grievance Redress Mechanism will ensure transparent recourse for all affected persons, and the SEA/SH Prevention and Response Action Plan (Annex 8, Section 7) addresses gender-based violence and harassment risks.

D.6. Efficiency and effectiveness (max. 500 words, approximately 1 page)

Alignment with GCF's Efficiency and Effectiveness Criteria

148. The LRCP is designed to deliver high-impact outcomes in transport decarbonization, resilient and low-emission urban infrastructure, and urban water resilience through a cost-effective and financially sustainable investment approach. The proposal demonstrates strong economic returns, strategic use of concessional finance, and operational efficiency in both capital and non-financial terms.

Cost-Effectiveness and Economic Efficiency

149. The economic and financial modelling for LRCP underscores its cost-effectiveness and strong value for money: Transport investments demonstrate an ENPV of US\$26.5 million and an EIRR of 22.9% (with high GHG Benefits). Water sector investments also show strong viability with an EIRR of 19.07% and an NPV of economic benefits of US\$3.06 million.
150. The project avoids damages of about \$64.14 million from flood impacts by reducing exposure of residential, non-residential, and infrastructure assets within the settlement zone. In addition, the transition from private cars to electric buses shields beneficiaries from oil price volatility while generating clean air co-benefits valued at \$2.2 million, reflecting avoided health and environmental costs associated with reduced vehicle emissions.
151. GCF support is critical for project viability. For component 1.3 – Modal shift investments to low emission transport, the Financial NPV (FNPV) is US\$0.41 million with GCF funding, but would be US\$-13.25 million without GCF funding, clearly demonstrating the financial feasibility gap addressed by concessionality. This outcome is particularly significant in a resource-constrained context like Bhutan.

Financial Sustainability and Revenue Generation

152. The financial modelling confirms that the urban transport system—specifically the City Bus Service—can achieve long-term financial sustainability: annual farebox revenue for the "With project" scenario is estimated to significantly increase to US\$5.03 million by 2050, supporting future capital expenditures without additional government or donor financing.
153. In the water sector, efficiency gains from reducing leakages and improving asset management will reduce operational costs and defer capital-intensive expansion, with the project aiming to reduce Non-Revenue Water (NRW) from over 50% to 25%.

Appropriateness of Concessionality and GCF Role

154. GCF concessional finance plays a catalytic role. Without it, the City Bus Service would likely revert to diesel-powered fleet replacements and bus mode share would remain low, undermining Bhutan's NDC targets. The total GHG emission reduction over 2029 to 2048 is estimated at 69,519 tCO₂eq. It should be

noted that this is a very conservative estimate; actual emissions reduction will be closely monitored and is likely to be higher.³⁸

155. The total, undiscounted cost of carbon abatement through the public transport activities (Subcomponent 1.2c, 1.2e, 1.3, and 2.2a-h which have a total GCF cost of USD 21 million) is estimated at USD 301.93/tonne CO₂, based on GHG reductions of 69,519 tCO₂ between 2029 and 2048. This is on the higher end compared to similar BRT projects, reflecting Thimphu's relatively small population (virtually all comparable projects have been undertaken in cities at least 20x more populous), which inherently limits the potential scale of absolute GHG emissions reduction, even with a large modal shift, and means a higher cost of infrastructure per passenger. The marginal cost of abatement, based on NPV of net costs (accounting for benefits such as travel time savings, reduced vehicle operating costs, and improved safety), is US\$ -119/tCO₂, reflecting the project's considerable benefits beyond GHG emissions reduction.

156. The structure of concessionality (GCF grants: US\$22.4 million, concessional loans: US\$5.6 million) is appropriate. Grants are allocated to investments with significant public-good and adaptation benefits (e.g., Component 1.2 "Improved pedestrian infrastructure" receives US\$6.7 million in GCF Grants). Concessional loans support components with partial cost-recovery potential, such as electric buses (e.g., Component 1.3 receives US\$5.6 million in GCF Loans). This reflects the minimum blend required to achieve feasibility and affordability.

Use of Non-Financial Best Practices and Operational Efficiency

157. The project incorporates global best practices, drawing on international case studies for urban and transport design. In water, it focuses on smart optimization of existing assets, including SCADA systems for real-time monitoring and targeted upgrades. Behavioral change is also promoted, with strategies to reduce household water use from 135 to 100 liters per person/day.

Conclusion

158. LRCP represents a highly efficient and effective investment, delivering strong economic returns, leveraging GCF concessionality to crowd in co-finance, and maximizing impact through operational excellence and global best practices.

³⁸ See Annex 22: Assessment of GHG Emissions Reduction & MRV for more detail, including a sensitivity range under different assumptions. This central estimate uses conservative parameters on mode shift, bus occupancy and diesel bus efficiency.

LOGICAL FRAMEWORK

This section refers to the project/programme's logical framework in accordance with the GCF's Integrated Results Management Framework to which the project/programme contributes as a whole, including in respect of any co-financing.

E.1. Project/Programme Focus

Please indicate whether this proposal is for a mitigation or adaptation project/programme. For cross-cutting proposals, select both.

- ☒ Reduced emissions (mitigation)
- ☒ Increased resilience (adaptation)

E.2. GCF Impact level: Paradigm shift potential (max 600 words, approximately 1-2 pages)

Assessment Dimension	Current state (baseline)		Potential target scenario (Description)	How the project/programme will contribute (Description)
	Description	Rating		
Scale	Thimphu's public transport system is almost entirely fossil-fuel-dependent. Moreover, the unreliability of the bus system, combined with safety concerns and limited accessibility means that private cars are increasingly favoured by the population to travel into the city, exacerbating emissions from the transport sector.	Low	Paradigm shift lies at the core of the project transport objective which seeks to encourage a modal shift from private vehicles to public and non-motorised transport in Bhutan. This will be reinforced by an evidence-based approach to planning and managing the development of Bhutan's cities and public transport system towards long-term benefits, climate resilience, and economic development, while also mobilising investment for low-emission transport and associated infrastructure.	The LETMP sets out eleven strategies for implementing a low-emission transport system for Thimphu, which will be incorporated into the Thimphu Structure Plan, but which are all relevant to the development of transport networks in other cities in Bhutan. The project will use a combination of push and pull factors that will incentivise the use of low-emission public transport modes.
	Thimphu's water supply system is fragmented, with aging infrastructure, high levels of NRW, and limited resilience to climate impacts such as landslides, droughts, and flooding. Water availability is uneven across the city and many neighborhoods experience only intermittent supply. Digital monitoring and adaptive management systems are largely absent.		Under the Water Master Plan, Thimphu aims to achieve universal climate-resilient water services which are continuous and optimize the use of treated water.	LRCP will enhance the climate resilience of the entire water supply chain – from intake to distribution – by upgrading infrastructure, reducing NRW, installing SCADA systems, and enhancing institutional capacity. These actions will ensure reliable 24/7 supply even under extreme climate conditions and enhance equity across neighborhoods.

				Capacity building will also ensure that investments fully mainstream climate resilience, such that road, public transport, NMT and water infrastructure are resilient to changing climate hazards.
Replicability	Low-emission alternatives for public transport and halting the rapid emissions growth in the transport sector have not yet been implemented for Thimphu, nor indeed Bhutan as a whole. Water services have developed in an ad hoc manner, using inconsistent technologies and facing severe service gaps. There is no structured model for modern, climate-resilient water utilities in Bhutan. Institutional structures lack autonomy and dedicated financing.	<u>Low</u>	There is potential for replication of the LRCP model to other areas of Bhutan, as well as other countries in the region. Many of the challenges to improving bus services and non-motorized transport in Thimphu are common throughout the South Asia region – such as the combined need for increased physical capacity on the bus network, institutional reforms, stronger service delivery approaches, and infrastructure development. The proposed project therefore offers opportunities for both demonstration impact and potential replication in a region where emissions from urban transport are a globally significant issue. Most notably, Thimphu's scale offers the potential to demonstrate a transformational step change in urban transport in an environment where cause and effect are readily identifiable and governance risks to the program are relatively low. LRCP will establish a model structure with ring-fenced budgeting, performance-based contracts, and digital monitoring. This will form a replicable institutional and operational model for other Bhutanese cities. Improved data systems and the use of SCADA will generate insights for replication.	The technical assistance provided through the project will support the process of planning and scaling a similar approach in other cities, and LRCP will result in the City Bus Service becoming an efficient transport operator that is fully accountable for the services it provides under Public Service Agreements with other <i>thromdes</i>. Similarly, the performance contract for private sector maintenance of the systems and plants is replicable in other urban areas. The project will institutionalize planning and budgeting processes for climate-resilient services, including the creation of a municipal water and wastewater division. The introduction of private sector expertise and digital platforms will provide proof of concept for other urban areas. The project will also support inter-municipal learning and capacity-building to support scale-up.

Sustainability	Efforts towards the modal shift are embedded in multiple policies that have been developed to ensure that Bhutan's development pathway is responsive to changing demands in the transport sector to prevent the proliferation of unsustainable transport modalities and maladaptation to climate change that would prevent the country from achieving its net-zero ambitions. Thimphu's water supply system suffers from weak institutional capacity, with water services managed by an under-resourced municipal unit lacking structured mandates and modern tools. Maintenance is reactive and there is limited capacity to manage shocks or disruptions caused by climate variability.	<u>Medium</u>	The increase in fare box revenues from the higher passenger numbers without an unaffordable increase in bus fares or government subsidies, means that CBS will be able to finance the continued increase in bus capacity and to replace the remaining diesel bus fleet at the end of its economic life, without long-term dependence on GCF concessionary finance. The city will have a dedicated municipal water and wastewater division with improved technical expertise, clear operational mandates, and the ability to manage climate-related risks. Infrastructure will be climate-resilient, minimizing downtime during extreme weather events.	The project will elicit a modal shift in transport demand in favour of public transport and NMT options in Thimphu and, eventually, other cities in Bhutan. The project also provides an opportunity to introduce zero emission buses to these services which can then be applied nationally, taking advantage of Bhutan's surplus of electricity from renewable sources. The project also allows RGoB to fulfil its commitment to protect the natural environment by reducing air and waterborne pollution. The project will create a durable shift in how urban water systems are managed - moving from reactive, ad hoc responses to a structured, climate-resilient, and technology-enabled service model. These improvements will ensure that water systems remain reliable and adaptive long after the project ends, embedding sustainability in both institutions and infrastructure.
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E.3. GCF Outcome level: Reduced emissions and increased resilience (IRMF core indicators 1-4, quantitative indicators)						
GCF Result Area	IRMF Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions / Note
				Mid-term	Final ³⁹	
MRA2 Low-emission transport	Core 1: GHG emissions reduced, avoided or removed/sequestered	Ex-ante and ex-post periodic analyses (conducted by a third-party contractor)	0 tCO ₂ eq	3,818 tCO ₂ eq	11,339 tCO ₂ eq (by project end) 69,519tCO ₂ eq (over 20 years)	The energy supply for bus charging infrastructure remains dominated by renewable sources. Push policies are introduced to reinforce the target modal shift.
ARA3 Infrastructure and built environment	Core 2: Direct and indirect beneficiaries reached [Transport & Public Space interventions – Comp. 1.2-1.3]	CBS's smartcard data on bus users Periodic surveys Project M&E reports	0	Direct: 61,652 (52,956 unique) Female: 48.5% Indirect: 315,600 Female: 156,066	Direct: 72,448 (52,117 unique) Female: 48.5% Indirect: 313,013 Female: 155,522	NMT/road infrastructure is well-maintained and remains accessible Bus fares remain affordable for the majority of citizens Notes: Direct beneficiaries are city bus and NMT users; tourists/visitors to Thimphu will indirectly benefit. For Core 2, overlap exists between beneficiaries of transport and water adaptation interventions. Both non-unique and unique direct beneficiary targets are presented here. See attached Adaptation Beneficiary analysis for detailed approach to avoiding double counting.

³⁹ The final target means the target at the end of project/programme implementation period. However, for core indicator 1 (GHG emission reduction), please also provide the target value at the end of the total lifespan period which is defined as the maximum number of years over which the impacts of the investment are expected to be effective.

<u>ARA2 Health, well-being, food and water security</u>	<u>Core 2: Direct and indirect beneficiaries reached</u> <u>[Water supply interventions – Comp. 1.1]</u>	SCADA system data on supply hours and pressure Survey data	0	Direct: 25,001 (16,305 unique) Female: 48.5% Indirect: 318,232 Female: 157,342	Direct: 52,046 (31,715 unique) Female: 48.5% Indirect: 323,988 Female: 160,134	Beneficiaries are currently underserved core city residents gaining access to treated piped water for at least 12 hours/day throughout the dry season and 15 hours/day otherwise (see Adaptation Beneficiaries analysis for calculations); measures resilience to climate change-exacerbated water scarcity. Assumptions: successful SCADA rollout, improved infrastructure resilience, adequate staffing of the new water division; water charges remain affordable for poorer households and unauthorised connections are eliminated For Core 2, overlap exists between beneficiaries of transport and water adaptation interventions. Both non-unique and unique direct beneficiary targets are presented here. See attached Adaptation Beneficiary analysis for detailed approach to avoiding double counting.
<u>ARA3 Infrastructure and built environment</u>	<u>Core 3: Value of physical assets made more resilient to the effects of climate change and/or more able to reduce GHG emissions</u>	Economic and Financial Analysis Engineering design and construction documentation	US \$0	Value of physical assets made resilient: US\$ 25.73 million	Value of physical assets made resilient: US\$ 45.45 million	Please see Flood risk assessment in Annex 3 for a detailed breakdown of this calculation. Incremental cost of resilience is based on detailed engineering studies that provide estimates of typical cost factors for resilience measures and project budget estimates.

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E.4. GCF Outcome level: Enabling environment (IRMF core indicators 5-8 as applicable)					
Core Indicator	Baseline context (description)	Rating for current state (baseline)	Target scenario (description)	How the project will contribute	Coverage
Core Indicator 5: Degree to which GCF investments contribute to strengthening institutional and regulatory frameworks for low emission climate-resilient development pathways in a country-driven manner	RGoB has developed a range of policy frameworks and environmental commitments in the transport and water sectors with the support of DFIs but will need to adopt regulatory, fiscal, institutional and enforcement measures to monitor and implement them. It will also need to plan an effective communications strategy to change behaviours.	<i>medium</i>	CBS, MoIT, and TT have the necessary capacity and skills to procure investments in the built environment and to develop low-emission transport systems in Bhutan that are responsive to needs and operate in line with nationally accepted standards. MoIT and TT have strengthened institutional and regulatory frameworks to ensure climate-resilient water supply systems in Thimphu. The Thromde demonstrates enhanced capacity for planning, budgeting, and implementing climate-resilient infrastructure aligned with national strategies like the CCAP and NAP, fostering sustainable urban service delivery and development.	The project will establish CBS as an efficient state-owned enterprise and provide the necessary training to build institutional capacity. MoIT will facilitate agreements for the extension of CBS services to other Thromde and develop national standards for ITS smartcard payment systems, and transit-oriented development. TT will introduce private sector operators under performance contracts to the management and operation of water services. The project will strengthen Thimphu Thromde's service delivery through capacity development for climate-resilient planning, and stakeholder communication strategies.	<i>National level (one country)</i>

Core Indicator 6: Degree to which GCF investments contribute to technology deployment, dissemination, development or transfer and innovation	The project presents an opportunity to utilise state-of-the-art technology to improve the user experience of public transport and for the operators to manage water services reliably and efficiently. Current bus services use ICE vehicles and inadequate maintenance facilities with a poor record of reliability. Although improving, the use of smartcards and the provision of online information is basic. Digital monitoring and adaptive management systems are largely absent, contributing to the haphazard management of water services.	<i>low</i>	Bus services in Bhutan will transition to the use of e-buses, supported by digital solutions for scheduling, monitoring, ticketing, and customer information, with robust charging infrastructure in place. Services will be scheduled to meet customer demand and be cleaner, safer, and more reliable. Thimphu will establish an integrated SCADA system covering the municipal water network in the core city. This system will enable real-time monitoring of leaks, water pressure, and consumption patterns, allowing for timely operational responses, improved water conservation, and resilience to climate-induced shocks. Response to disasters will be improved through better risk assessment and data collection, and training.	The project will result in effective systems for e-bus operations in Thimphu, providing charging infrastructure, ITS and MIS systems that will improve the efficiency and reliability of bus services. The project will directly finance the deployment of a SCADA system across the water distribution network. Capacity-building programs will ensure municipal staff and private contractors are trained in the use, maintenance, and interpretation of the data. The project also supports performance-based contracts with private sector operators that incentivize the use of smart technology for operational efficiency.	<i>Single sub-national area within a country</i>

E.5. Project/programme specific indicators (project outcomes and outputs)

Project/programme results			Baseline	Target	
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<i>(outcomes/ outputs)</i>	<i>Project/programme specific Indicator</i>	<i>Means of Verification (MoV)</i>		<i>Mid-term</i>	<i>Final</i>	<i>Assumptions/note</i>
Outcome 1: Urban water services in the project area will become more reliable and more resilient to climate hazards, especially drought, flooding, and rainfall-triggered landslides	Reduced water losses in city core distribution network, reflecting reduced vulnerability to climate-driven resource and infrastructure stress	Reports generated from SCADA monitoring system	Over 50% water losses	Down to 35% water losses in city core	Down to 25% water losses in city core	This indicator measures reduced vulnerability to, among others, drought-induced scarcity and flood- or landslide-related pipe damage.
Output 1.1a: Climate-resilient water and supply infrastructure and distribution networks are established and operational	Increased supply hours, maintained consistently across seasons including during the dry season and other climate stress periods	Reports generated from SCADA	3-9 hours/day in city core	Minimum 10 hours/day throughout year	15 hours/day (with a minimum of 12 hours/day maintained throughout the dry season)	Measures reduced vulnerability to climate change-exacerbated drought/water scarcity. Dry season is December through February.
Output 1.1b: Climate-informed decision-making systems and operational control mechanisms are established and functioning in water supply operations	Percentage of distribution network covered by real-time SCADA monitoring, enabling automated detection of leakage and anomalous pressure or flow conditions caused by floods, landslides, or drought-related stress demands	Reports generated from SCADA	0%	75%	100%	This will support reduced hours of infrastructure downtime (non-performance or underperformance) during shocks.
Outcome 2: Climate-resilient urban mobility infrastructure in the project area encourages a shift from private vehicle use	Percentage peak-period modal shift from private vehicles to public	CBS smartcard data Pedestrian and traffic surveys	2023 traffic survey by technical consultants and	Bus mode share increase to 15%	Bus mode share increase to 20% by 2031 (25% by 2047)	Assumptions: Improvements to services and infrastructure, including the introduction of priority bus lanes and improved accessibility, will serve as

toward walking and non-motorized transport	and non-motorised transport ⁴⁰		analysis of smartcard data Private vehicles accounted for 48.8% of commuter mode share, and walking 22%, in 2019; bus accounted for roughly 8% in 2023 ⁴¹	Walk mode share maintained	Walk mode share maintained	sufficient pull factors towards public and non-motorised transport, while complementary policies such as restrictions on parking create sufficient push factor to discourage private vehicle use. Modal share targets are for city as a whole.
Output 1.2: Climate-resilient pedestrian access and public realm infrastructure are established	Length of improved urban placemaking and NMT infrastructure, with SuDS and roadside drainage installed and verified as operational by site inspection	Construction reports Site Surveys; site inspection reports; post-rain site assessments conducted by PIU engineers	0 km	6 km	12 km	This includes investments in Norzin Lam as well as improvements along the Bus Priority Corridor.
Outcome 3: Climate-resilient and low-emission urban passenger transport in Thimphu encourages a shift from private car use toward electric public transport, maintains reliable mobility under climate stress, and reduces GHG emissions from the transport sector.	GHG emissions reduced, avoided or removed/sequestered through modal shift to public transport	Ex-ante and ex-post periodic analyses conducted by a third-party contractor)	0 tCO ₂ eq	3,818 tCO ₂ eq	11,339 tCO ₂ eq (69,519 tCO ₂ eq by 2048)	Bus Priority corridor operation expected to begin 2029 (midterm year)
	Average number of flood or landslide-related closure or restriction days on the Bus Priority Corridor per year	Thimphu Thromde and/or CBS records	TBD ⁴² (days)	25% reduction from baseline	50% reduction from baseline	BPC civil works including climate resilience measures expected completion by midterm

⁴⁰ This indicator contributes to both Outcomes 2 and 3. It is measured under Outcome 2 to ensure that the matrix remains easy to follow.

⁴¹ Baseline will be updated at project inception.

⁴² Baseline to be established at project inception.

Output 1.3 Climate-resilient and low-emission public transport system is established and operational	Direct users that benefit from improved access to low-emission, climate-resilient transport infrastructure and services	CBS smartcard data; passenger surveys	0	61,652	72,448	Includes bus and NMT users.
Outcome 4: the institutions responsible for water and public transport will have enhanced capacity to operate, maintain, finance, and replicate climate-resilient and low-emission urban systems	Thimphu Thromde demonstrates improved water service management	Annual maintenance plans Documented disaster and emergency response protocols tested at least annually Annual business plans and budget submissions Consultant progress reports	No formal maintenance strategies, emergency response protocols, or integrated technical and financial planning processes in place	Division prepares maintenance strategy and business plan with embedded expert support; begins implementation of emergency response protocols and budgeting processes	Division regularly prepares and applies maintenance strategies, emergency protocols, business plans, and budgets to guide climate-resilient water service management with reduced external support	
	City Bus Service (CBS) is equipped with internal systems and staff capacity to support State-Owned Enterprise (SOE) operations	CBS annual business plans Internal financial reports and accounting records Documented Standard Operating Procedures (SOPs) for service delivery Consultant progress reports	CBS lacks internal business planning, financial reporting, and appropriate service operations procedures	CBS has developed and piloted at least two core internal systems — such as an annual business plan and internal financial reporting tools — with support from embedded consultants, and has begun applying them in	CBS independently prepares and uses annual business plans, financial reports, and operating procedures to manage service delivery	

				day-to-day service planning and management		
Output 2.1: Institutional systems, tools, and capacities are strengthened to independently and sustainably deliver climate-resilient water services and plan future investments	Number of municipal staff trained in SCADA use, climate-resilient planning, and emergency response	Training reports; Attendance records; Staff feedback	No structured training program	All staff trained across operations and management	Continuous training with refreshers	
Output 2.2: City Bus Service is in a position to operate as an SOE with national mandate to sustainably operate low-carbon public transport supports its expansion to other cities	Non-fare revenue as a share of CBS operating costs	CBS financial reports	<5%	5%	≥10%	Political support for SOE model continues and PSA accountability is maintained Advertising, leasing, and retail partnerships are successfully implemented Further e-bus services funded under 13FYP and services introduced in other urban areas and for some inter-urban routes
Co-benefit: Improved household hygiene and health	Percentage of households in target areas experiencing reliable daily access to piped water supply (≥15 hours/day; ≥12 hours/day during dry season), contributing to improved household hygiene and health	Household survey (baseline and endline) Thimphu Thromde water supply performance reports SCADA system logs (if disaggregated data available)	Appx. 17% ⁴³	Increase of 42 percentage points from baseline	Increase of 83 percentage points from baseline	

⁴³ Estimated based on data in Water Supply Masterplan (2023) – see Adaptation Beneficiaries analysis. To be confirmed at project inception

Co-benefit: Improved air quality and reduced pollution	Concentration of PM2.5, NOX, and SO2 in Thimphu	Permanent roadside monitoring stations	TBD ⁴⁴	Baseline minus 6%	Baseline minus 16%	A modal shift to public transport will decrease the number of vehicles per passenger-km travelled, which – along with electrification of bus fleet – will reduce emissions and noise pollution.
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E.6. Project/programme activities and deliverables

Activities	Description	Sub-activities	Deliverables
1.1: Strengthening water supply systems to support resilient water services	These activities strengthen the resilience of Thimphu's water supply system against the increasing climate risks of drought, flooding, and rainfall-triggered landslides. Raw water intake infrastructure at key stream sources will be upgraded to function reliably under both flood and drought conditions, reducing the risk of service failure during extreme hydrological events. Vulnerable hill slopes and transmission line corridors will be stabilized against erosion and landslide risk, protecting supply continuity during high-rainfall events. Water treatment plant operations and transmission routing will be reorganized to optimize storage and distribution across DMAs, improving supply equity and continuity including during prolonged droughts. Non-revenue water losses along Norzin Lam and the transport corridor will be reduced through replacement of deteriorated mains, active leakage control, and installation of smart meters, advanced pressure valves, bulk water meters, and flow meters, conserving scarce resources and improving service reliability under increasing climate stress. The SCADA system will be installed to monitor the performance of water and wastewater treatment plants. It will also be integrated into the DMAs (District Metered Areas) around Norzin Lam and the transport corridor, including components like bulk meters and pressure relief valves. This system will enable accurate monitoring of capacity utilization and actual demand, and help Thromde forecast future demand for planning upgrades.	a) Installation of SCADA system to monitor the performance of water and wastewater treatment plants and key components of the distribution network across the city core DMAs, enabling real-time monitoring, leak detection, and hydraulic analysis b) Improve 2 raw water intake systems to function effectively under extreme climatic conditions, with structural improvements to sediment handling and flow control c) Slope stabilization and erosion-control measures along 4 vulnerable transmission corridors (1 raw water and 3 treated water), covering 297 m of raw water transmission lines and 3.6 km of treated water transmission lines, with improvements at 37 points including 12 retaining wall sites, 8 slope stabilization sites, 15 pipe anchoring sites, 1 drainage work site, and pipe replacement at 1 site, to reduce the risk of landslide-related service interruptions d) Reorganize WTP operations and transmission routing to optimize storage and distribution across DMAs, improving the equity and continuity of supply including during prolonged droughts	Operational SCADA system across the city's DMAs enabling real-time performance monitoring, leak detection, data-driven network planning, and changes in system downtime Climate-resilient intake infrastructure at 2 key stream sources supplying the city, reducing the risk of service failure during hydrological events Stabilized transmission corridors at 37 improvement points along 4 corridor lengths (297 m raw water; 3.6 km treated water), protecting key water supply routes Improved distribution management supporting more consistent and equitable service delivery

⁴⁴ Baseline to be established at project inception following installation of monitoring equipment.

		e) Upgrade the distribution network along Norzin Lam and the transport corridor to reduce NRW through replacement of deteriorated water mains, active leakage control, and installation of approximately 7,900 smart meters (residential and commercial), coordinated with the street and sidewalk works under Sub-component 1.2	Upgraded distribution network in the project area with smart metering, contributing to the project's target of reducing NRW from over 50% toward 25%
1.2: Improving the resilience and convenience of sidewalks, footpaths, and passageways to encourage non-motorized transport	Improvements to connecting building alleys and footpaths in Norzin Lam and upgraded sidewalks along the bus priority corridor will together improve pedestrian safety, accessibility, and first- and last-mile connectivity to public transport, directly supporting the modal shift away from private vehicles that underpins the project's mitigation ambition. Continuous cable ducts installed beneath sidewalks will support real-time passenger information displays and lighting at bus stops, enhancing the reliability and attractiveness of public transport under all weather conditions. A traffic circulation and management plan for central Thimphu will prioritize pedestrians and public transport while enabling emergency and delivery access. Roadside drainage will be improved and linked to Sustainable Drainage Systems to enhance stormwater management and reduce the risk of flooding.	a) Removal of high kerbs, obstructions, and hazards on footpaths and improvements to the amenity of the area with improved street furniture b) Improvements to sidewalks and connecting paths along the bus priority corridor, constructed to universal access standards c) Provision of continuous cable ducts under the sidewalks for connecting the display boards at bus stops, including spare ducts for any subsequent communications cabling. Provision of electrical power to each bus stop for lighting and information displays d) Implementation of a comprehensive traffic circulation and management plan for the central area, which allows for access by emergency services and for deliveries but prioritizes pedestrians e) Improving roadside drainage along the bus priority corridor and Norzin Lam and connecting the stormwater drains to Sustainable Drainage Systems (SuDS) to	Completed 1.3 kilometre pedestrianization scheme for Norzin Lam supporting walking, urban placemaking, and climate-resilient city-centre mobility Upgraded, climate-resilient sidewalks and connecting paths along the bus priority corridor, constructed to universal access standards Continuous cable ducting installed along corridor sidewalks with power connections established at all 75 bus stops Traffic Circulation and Management Plan for the central area implemented Improved roadside drainage and functioning SuDS installations along the corridor and Norzin Lam

		slow run-off and filter stormwater before discharge	
1.3: Investments toward a modal shift to low-emission public transport	The project will deliver an 18.9 kilometre bus priority corridor with dedicated bus priority lanes in both directions, two new bus terminals, upgrades to the city centre depot with electric bus charging infrastructure, junction improvements, and installation of 75 new bus bays and shelters, together creating the infrastructure conditions for a sustained modal shift from private vehicles to public transport. An initial tranche of 50 electric buses will replace the oldest diesel vehicles in the fleet, reducing transport emissions. An enhanced Intelligent Transport System with real-time journey planning, integrated e-ticketing, and a Management Information System will improve service reliability and passenger experience, reinforcing the attractiveness of low-emission public transport as the default mode of travel. Two bridges will be widened to accommodate the bus lanes and strengthened with scour protection and pier and abutment works to maintain corridor operability during flood and river erosion events. Finally, 23 signalized pedestrian crossings will be installed near bus stops to improve safety and support active travel.	a) Provision of an 18.9 km bus priority corridor with dedicated bus priority lanes in both directions, bus bays, and 75 bus shelters, widening of two bridges to provide for the bus lanes, and the construction of pier and abutment protection in the rivers to prevent bridge scour and provide greater resilience to extreme climate events b) Purchase an initial tranche of 50 e-buses to provide additional capacity for higher-frequency trunk services as the first stage to a zero-emission public transport system c) Construction of two new bus terminals (at the northern and southern ends of the corridor) and upgrading of the central bus depot, all equipped with charging infrastructure for e-bus operations (20 charger units across the three sites) d) Procure ITS and MIS for live information on bus services and for service reliability, including a control room, passenger information screens at 75 bus shelters, in-bus terminals, and a pre-payment system e) Installation of 23 signalized pedestrian crossings near bus stops for the safety and convenience of pedestrians and bus passengers	Continuous 18.9 km bus priority corridor with dedicated lanes, 75 shelters, and resilient corridor infrastructure improving service speed, reliability, and climate robustness Fleet of 50 electric buses ready for service on the corridor Two new bus terminals and an improved central depot with 20 DC fast chargers and the infrastructure needed for e-bus operations Operational ITS/MIS system improving service reliability and passenger information 23 signalized pedestrian crossings installed near bus stops along the corridor
2.1: Capacity building and institutional strengthening for resilient and sustainable water and urban service delivery	This activity builds the institutional capacity needed to manage Thimphu's water system on a resilient and financially sustainable basis, ensuring that the infrastructure investments under Sub-component 1.1 translate into durable improvements in service reliability under increasing climate stress. A ring-fenced Water and Wastewater Services Division will be established within Thimphu	a) Establish a ring-fenced water and wastewater services division within Thimphu Thromde	Functional, ring-fenced water and wastewater services division established within Thimphu Thromde; first annual business plan and financial accounts endorsed by TT

	Thromde with its own budget, staff, and accountability mechanisms. Embedded international consultants will introduce SCADA-informed network management, prepare climate-resilient annual maintenance and capital investment plans, and build internal WSD capacity to operate and maintain the system under drought, flood, and landslide conditions. Digital billing systems and cost-reflective tariffs will strengthen the financial sustainability needed to fund ongoing climate adaptation investments. Emergency response procedures for floods, GLOFs, and drought-related disruptions will be developed and tested, ensuring the WSD can maintain or rapidly restore service continuity following climate-related shocks. Technical assistance to MoIT will support the prioritization of climate-resilient water investments and the development of nationally consistent service standards. A communications strategy will promote water conservation in line with the Water Sector Master Plan target of 100 litres per capita per day. The project will also support the development and implementation of the Bhutan Land Information System (BLIS).	b) Commission and integrate the SCADA system into day-to-day WSD operations, calibrate the hydraulic model, and train WSD staff to use the system for network monitoring, leak detection, maintenance planning, and capital investment decisions c) Introduce utility-style network management practices including pressure zone management and a structured preventative maintenance programme, and prepare annual maintenance and capital investment plans for WSD and Steering Committee approval d) Support the introduction of billing systems and provide advice on tariffs that allow greater cost recovery for water supply and wastewater treatment to enable financial sustainability e) Establish processes for disaster and emergency responses to burst pipes, blockages, floods, and GLOFs f) Provide policy and technical support to MoIT on climate-resilient water investment priorities, private sector participation options in smaller Thromdes, and regulatory frameworks for nationally consistent service standards, including two policy-focused workshops with water sector specialists from other Thromdes and MoIT officials g) Develop and implement a water conservation and customer engagement communications strategy for the WSD,	management; documented training records for WSD staff Commissioned and operational SCADA system integrated across the city's DMAs; calibrated hydraulic model; documented evidence that WSD operators are trained and using the system in daily network management At least one annual maintenance and capital investment plan prepared and approved; documented pressure zone management procedures adopted by the WSD Operational digital billing system covering the WSD's customer base; tariff review report submitted to TT and RGoB Documented and tested emergency response and business continuity plan, formally adopted by TT Policy briefs and technical reports on water sector investment priorities and reform options delivered to MoIT; two policy-focused workshops with water sector specialists from other Thromdes and MoIT officials, held and documented Approved communications strategy; documented evidence of rollout including produced materials and outreach activities
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2.2: Capacity building and institutional strengthening for resilient and sustainable transport service delivery	CBS will be established as a State-Owned Enterprise with a national mandate for urban and inter-urban transport, operating under Public Service Agreements with local Thromdes, providing the governance framework needed to embed low-emission public transport as the default mode of travel in Bhutan's cities. CBS will receive technical assistance to build the operational capacity, staff skills, and protocols required to manage an electric bus fleet reliably and efficiently, maximizing the GHG reduction potential of the e-bus investment. It will develop commercial strategies to diversify revenue streams and reduce dependence on public subsidy, strengthening the long-term financial viability of low-emission service delivery. Support will be provided for CBS and MoIT to formulate long-term, climate-resilient investment and maintenance plans aligned with the LETMP, ensuring the corridor infrastructure and fleet are maintained to a standard that sustains modal shift over time. A scalable ITS and integrated payment system will be designed, with national standards for ITS interoperability and smartcard payments developed, improving service reliability and passenger experience to reinforce public transport as a competitive alternative to private vehicles. The project will assess dedicated services and the commercial viability of inter-urban e-bus deployment to secondary cities to reduce peak congestion. A communications strategy will promote awareness of the environmental and health benefits of the new public transport system, supporting behavior change in favor of low-emission mobility.	a) Support CBS in its establishment as an SOE with a national mandate to develop low-emission public transport under PSAs with other Thromdes b) Provide technical support, advice, training and capacity building to CBS in the transition to the new bus services, and the introduction to service of the new e-buses, including training for drivers and customer service c) Support CBS in developing additional sources of revenue such as retail franchises at mobility hubs, advertising at bus stops and on buses, and bus leasing for private or commercial use d) Provide capacity-building support for the preparation of climate-resilient capital, financing, and maintenance plans for the transport network e) Providing technical assistance and institutional strengthening for prioritizing and implementing policies, strategies, and regulations in the LETMP and NAP (including parking restrictions and freight policies that will reinforce the modal shift) f) Develop national standards for ITS and smartcard payments. Finalize the specification of the ITS system upgrade and assist CBS with its installation, testing, and operation, and the use of survey and smartcard data to plan and improve services as appropriate	Legal instruments establishing CBS as an SOE; signed; first CBS annual business plan and financial accounts prepared under the new governance structure CBS staff trained in e-bus operations, maintenance, and customer care; documented readiness assessment completed following shadow operations; CBS operating scheduled e-bus services on the corridor under the PSA Revenue diversification strategy and associated implementation roadmap for CBS, Approved set of capital investment and asset management plans for the corridor infrastructure, bus fleet, and terminal facilities, endorsed by MoIT and the Project Steering Committee Policy briefs and draft regulations for priority LETMP measures, submitted to MoIT Commissioned and operational ITS/MIS system with CBS staff trained in its use; published national ITS interoperability and smartcard payment standards

		g) Analyze the potential for operators to provide dedicated services such as school buses to reduce peak hour demand for the scheduled services as part of the wider rationalization of services set out in Bhutan's LETMP and based on demand data, and evaluate the commercial viability of inter-urban e-bus deployment to secondary cities h) Develop a communications and awareness campaign to inform Thimphu residents of the benefits of using public transport and NMT i) Develop and deploy the Bhutan Land Information System (BLIS), a unified platform integrating land registration, cadastre, public land management, and valuation data to improve disaster risk identification, strengthen natural resource management, and enable more informed government decision-making	Demand analysis report and policy options for integrating dedicated services with the CBS network, including assessment of inter-urban e-bus deployment options, submitted to MoIT Approved communications strategy endorsed by MoIT and CBS; documented record of outreach activities including produced materials and evidence of public engagement Conceptual design of BLIS; procurement specifications for BLIS development; Developer Inception Report; BLIS Implementation Plan; BLIS quality report; Developer Final Report; and the fully functional BLIS deployed at the National Land Commission Secretariat (NLCS) / GovTech data center
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E.7. Monitoring, reporting and evaluation arrangements (max. 500 words, approximately 1 page)

159. **The management and oversight arrangements for the implementation of the project will also be used to provide monitoring, evaluation, and reporting of the project against the expected outputs and outcomes, using the indicators described in the logframe.** A Monitoring and Evaluation officer will be appointed within the PMU in MoIT to define and coordinate the baseline data and periodic review and measurement of the indicators and site inspections defined in Section E5. The surveys, audits, reviews and site inspections will be carried out by independent third-party contractors as required by World Bank and GCF policies and procedures.
160. **The PMU in MoIT will produce consolidated quarterly interim financial reports summarizing activities and deliverables completed in the previous quarter, and any variance against the approved work plans and budgets, for the World Bank as AE.** This will include all public communications and consultation activities. The quarterly reports will also contain summaries of any surveys, inspections, or reviews that were due

under the M&E Plan in the previous quarter plus the summary reports from smartcard data on passengers carried and the permanent environmental monitoring to provide a time series of relevant data. A project risk register will be created and updated using a RAG rating.

161. **The Annual Workplan and Budget will report against the outturn of the previous year's workplan and budget, and progress against the Deliverables set out in the Workplan, the Logframe Indicators in this Funding Proposal, and the Environmental, Social, and Gender Management Frameworks.** The Annual Workplan will also include the most recent audited financial statements of CBS and the outturn against the Key Performance Indicators set out in the Public Service Agreement. There will be an annual audit of all expenditures against the GCF grant and IDA financing. All other RGoB expenditure will be subject to internal audit and CBS financial statements will be subject to the financial reporting standards that apply to SOEs in Bhutan.
162. **Within six months of the completion of the Works for Component 1, in addition to the quarterly summary reports, an Interim Report will evaluate the effectiveness of the procurement and implementation challenges for both suppliers and contractors.** The Interim Report will also cover the work to date on the institutional strengthening and capacity building activities. The report will assess the project's contribution to a paradigm shift in travel behaviours and water supply management in Thimphu and also plans to extend this nationally by creating the enabling environment in terms of policies and projects for both public transport and water service delivery. This section of the report will follow GCF's three-point scale rating and will include any additional evaluation and assessment activities. A Final Evaluation and Project Completion Report will be submitted to the AE at the end of the project.
163. **Evaluation Plan:** The project will undergo independent mid-term and final evaluations to assess performance, inform decision-making, and ensure accountability and to assess the project's effectiveness, impact, and sustainability in achieving its climate mitigation and adaptation outcomes. The scope covers all physical investments and institutional reforms across the transport and water sectors. The evaluations will assess the project's success in reducing GHG emissions, strengthening the climate resilience of infrastructure and beneficiaries, and institutionalizing a paradigm shift in urban service delivery. The evaluations will use a mixed-methods approach grounded in the project's M&E framework (Annex 11). This includes quantitative analysis of data from SCADA systems, smartcards, and traffic counts, alongside qualitative methods such as institutional capacity assessments, household surveys, and stakeholder interviews. Performance will be measured against the indicators in the project's logical framework and the GCF Integrated Results Management Framework (IRMF). A project-wide baseline will be established in Year 1. A mid-term evaluation will be conducted in Year 3 to allow for adaptive management, and a final evaluation will be completed at the end of the project to assess overall achievement of objectives. The Project Management Unit (PMU) will commission and oversee the independent evaluators. The final evaluation reports will be submitted to the Project Steering Committee, the World Bank, and the GCF.

ASSESSMENT AND MANAGEMENT

F.1. Risk factors and mitigations measures (max. 3 pages)

Please describe financial, technical, operational, macroeconomic/political, money laundering/terrorist financing (ML/TF), sanctions, prohibited practices, and other risks that might prevent the project/programme objectives from being achieved. Also describe the proposed risk mitigation measures. Insert additional rows if necessary.

For probability: High has significant probability, Medium has moderate probability, Low has negligible probability

For impact: High has significant impact, Medium has moderate impact, Low has negligible impact

Prohibited practices include abuse, conflict of interest, corruption, retaliation against whistleblowers or witnesses, as well as fraudulent, coercive, collusive, and obstructive practices

Selected Risk Factor 1

Category	Probability	Impact
<u>Governance</u>	<u>Low</u>	<u>Medium</u>

Description

- Failure or delay to establishing CBS as an SOE with powers to enter PSAs with thomde and for the MoIT PMU to procure buses and IT systems, and with governance arrangements for the preparation of annual business plans, budgets, and accounts.
- Poor coordination and project management between parties in implementing LRCP results in unforeseen delays in meeting the critical path deliverables and delays full implementation of the services

Mitigation Measure(s)

- Utilise project management planning and best practices, maintain risk registers and provide effective oversight of the process under project management support (discussed under Implementation Arrangements)
- Provide TA from Component 2.2(a) in the preparation of the legal documentation and preparation of a PSA.

Selected Risk Factor 2

Category	Probability	Impact
<u>Technical and operational</u>	<u>Low</u>	<u>Medium</u>

Description

- CBS lacks the resources and experience to prepare procurement documents for the e-buses and ITS and to manage the procurement process. CBS is not able to prepare for the implementation of LRCP services in recruiting and training drivers, mechanics, and administrative staff in time to deliver the additional services because of a lack of resources, budgets, or experienced managers
- Lack of interest from suppliers and contractors results in an ineffective procurement process or poor value for money

Mitigation Measure(s)

- Provide support to the procurement unit in MoIT, and if needed MoF, and TA under project management support
- Provide support from the institutional strengthening budget in Component 2.2 Recruit or second experienced staff to CBS
- Ensure effective marketing of the opportunity through technical and trade channels, and provide potential bidders with good information and sufficient notice of the bidding timetable and process

Selected Risk Factor 3

Category	Probability	Impact
<u>Technical and operational</u>	<u>Medium</u>	<u>Medium</u>

Description

CBS lacks experienced data analysts to plan bus routes, schedules, and dedicated services from surveys, transport plans, and smartcard data to optimise the use of resources and meet demand and reliability targets		
Mitigation Measure(s)		
- Provide support from the institutional strengthening budget in Component 2.2(b) - Second or recruit additional staff and provide short-term budget cover		
Selected Risk Factor 4		
Category	Probability	Impact
<u>Technical and operational</u>	<u>Medium</u>	<u>Medium</u>
Description		
- Failure to retain staff with detailed knowledge of the technical design of the new PIU - TT is not able to recruit or retain experienced staff for the supervision of the range of construction activities and approval of detailed designs		
Mitigation Measure(s)		
- Senior management should prioritise staff retention in critical areas such as human resource planning and promotions - Provide support from the institutional strengthening budget in Component 2.1 and Component 2.2; second or recruit additional staff and provide short-term budget cover - Embedded consultant contracts will include knowledge transfer and documentation protocols to ensure institutional knowledge is captured and not lost with staff turnover		
Selected Risk Factor 5		
Category	Probability	Impact
<u>Technical and operational</u>	<u>Low</u>	<u>Medium</u>
Description		
Design standards for NMT infrastructure and legislation on maintaining Rights of Way are not completed in time for the procurement process		
Mitigation Measure(s)		
- Provide support from the policy strengthening budget in Component 2.2(e) and 2.2(f) - Sequence procurement to accommodate potential regulatory delays, ensuring that works not dependent on finalized standards can proceed in parallel		
Selected Risk Factor 6		
Category	Probability	Impact
<u>Governance</u>	<u>Medium</u>	<u>Medium</u>
Description		
- If parking restrictions, bus-lane compliance, and other demand-management measures are not enforced, the project may not achieve the intended modal shift - This would reduce expected GHG reductions and limit the broader paradigm shift		
Mitigation Measure(s)		
- Implement traffic circulation and management measures under Component 1.2(d) - Support policy implementation and enforcement under Component 2.2(e) - Strengthen behaviour change and public awareness under Component 2.2(i) - Reinforce inter-agency coordination under project management support		
Selected Risk Factor 7		
Category	Probability	Impact
<u>Legal</u>	<u>Medium</u>	<u>Medium</u>

Description		
· Delays in completing enabling standards and regulations (e.g., NMT standards, Rights-of-Way requirements) can slow procurement and implementation, pushing back impact delivery		
Mitigation Measure(s)		
• Accelerate preparation of standards and regulations under Component 2.2(e) and 2.2(f) • Strengthen coordination and approval processes under project management support • Sequence procurement in line with regulatory readiness under project management support		
Selected Risk Factor 8		
Category	Probability	Impact
<u>Forex</u>	<u>Medium</u>	<u>Medium</u>
Description		
· Inflation, foreign exchange pressures, and import restrictions can raise costs or delay procurement of imported equipment (e-buses, chargers, ITS/SCADA), affecting schedule and scope · The need to import e-buses creates additional exposure, and any barriers to imports could hamper implementation		
Mitigation Measure(s)		
• Undertake early procurement planning and packaging under project management support • Prioritize procurement of long-lead imported equipment under Component 1.3(b–d) • Include contingencies and flexible procurement strategies under project management support • GCF financing is denominated in USD, providing structural protection against BTN depreciation for the procurement of imported equipment • Contract for the procurement of e-buses, ITS, and SCADA equipment in hard currency where permissible under RGoB procurement rules		
Selected Risk Factor 9		
Category	Probability	Impact
<u>Other</u>	<u>Medium</u>	<u>Medium</u>
Description		
· Increasing floods, landslides, and extreme rainfall can disrupt construction and damage works-in-progress, delaying commissioning and early benefits		
Mitigation Measure(s)		
• Integrate climate-resilient design across water and transport investments under Component 1 • Strengthen supervision and contingency planning under project management support • Schedule construction of the most exposed works (intake structures, slope stabilization, and bridge works) outside of the peak monsoon season where feasible		
Selected Risk Factor 10		
Category	Probability	Impact
<u>Reputational</u>	<u>Medium</u>	<u>Medium</u>
Description		
· Even with improved services, travellers may not shift from private vehicles if service quality or demand-management measures are insufficient · This weakens mitigation outcomes and risks underachievement of GHG reduction targets		
Mitigation Measure(s)		
• Deliver high-quality and reliable public transport services under Component 1.3 • Implement complementary demand-management measures under Component 2.2(e) • Support behaviour change and user engagement under Component 2.2(i) • Monitor performance through ITS/MIS systems under Component 1.3(d)		

Selected Risk Factor 11		
Category	Probability	Impact
<u>Legal</u>	<u>Medium</u>	<u>Medium</u>
Description		
· If CBS's SOE/PSA governance and legal powers are delayed, service rollout and long-term sustainability could be compromised		
Mitigation Measure(s)		
- Support CBS establishment as an SOE and PSA development under Component 2.2(a) - Define governance, financial, and reporting frameworks under Component 2.2(a) - Align service rollout with institutional readiness under Component 1.3 and 2.2		
Selected Risk Factor 12		
Category	Probability	Impact
<u>Technical and operational</u>	<u>Medium</u>	<u>Medium</u>
Description		
· Shortfalls in recruiting and training drivers, mechanics, managers, or data analysts can reduce service reliability and frequency, weakening modal shift and GHG reduction delivery		
Mitigation Measure(s)		
- Provide training and capacity building under Component 2.2(b) - Support operational readiness and transition to e-bus systems under Component 2.2(b) - A structured shadow operations period is built into the project design, during which CBS will run services under PSA conditions before full rollout, ensuring staff readiness is verified and any gaps addressed before commitment to full service delivery		
Selected Risk Factor 13		
Category	Probability	Impact
<u>Governance</u>	<u>Medium</u>	<u>Medium</u>
Description		
· Weak coordination between MoIT PMU, Thimphu Thromde PIU, and CBS can cause critical-path delays and interface failures across civil works, utilities, and ITS deployment		
Mitigation Measure(s)		
- Strengthen coordination, planning, and oversight under project management support - Maintain integrated implementation schedules and reporting systems under project management support		
Selected Risk Factor 14		
Category	Probability	Impact
<u>Technical and operational</u>	<u>Medium</u>	<u>Medium</u>
Description		
· System integration failures, vendor dependence, or inadequate budgeting for upgrades (ITS/MIS + SCADA) can reduce operational performance and weaken M&E evidence of impact		
Mitigation Measure(s)		
- Implement ITS/MIS systems under Component 1.3(d) - Develop technical standards and integration frameworks under Component 2.2(f)		

- Support system integration, testing, and operation under Component 2.2(f)
- Procurement contracts for ITS and SCADA systems will require open-architecture design, source code access, and operator manuals to reduce vendor lock-in and support long-term adaptability and expansion

Selected Risk Factor 15

Category	Probability	Impact
<u>Technical and operational</u>	<u>Medium</u>	<u>Medium</u>
Description		
· Charger downtime, spare parts and maintenance challenges, or weak battery end-of-life arrangements can lower fleet availability and reduce service quality and mitigation impact		
Mitigation Measure(s)		
• Develop charging and depot infrastructure under Component 1.3(c) • Strengthen operations and maintenance capacity under Component 2.2(b) • Support asset management and maintenance planning under Component 2.2(d)		

Selected Risk Factor 16

Category	Probability	Impact
<u>Governance</u>	<u>Medium</u>	<u>Medium</u>
Description		
· If future FYP budgets or tariff reforms do not materialize as expected, O&M and medium-term resilience improvements (especially in water) may plateau		
Mitigation Measure(s)		
• Support revenue diversification and financial sustainability strategies under Component 2.2(c) • Strengthen financial planning and asset management under Component 2.2(d) • Improve billing and tariff systems under Component 2.1(d) • The PSA framework creates a contractual basis for service funding that reduces dependency on discretionary FYP allocations; the non-farebox revenue strategy under Component 2.2(c) targets progressive reduction of subsidy dependence		

Selected Risk Factor 17

Category	Probability	Impact
<u>Reputational</u>	<u>Medium</u>	<u>Medium</u>
Description		
· Construction-phase CHS/OHS and SEA/SH risks can cause delays and reputational harm if mitigation measures and GRMs are not effectively implemented and used		
Mitigation Measure(s)		
• Implement environmental and social management measures under project management support • Establish and operationalize grievance redress mechanisms under project management support • Strengthen contractor supervision and compliance under project management support		

Selected Risk Factor 18

Category	Probability	Impact
<u>Prohibited practices</u>	<u>Medium</u>	<u>Medium</u>
Description		
· Multi-package procurement increases exposure to prohibited practices and fiduciary failures, which could delay disbursement and implementation if controls are weak		
Mitigation Measure(s)		

- Apply robust procurement and financial management systems under project management support
- Strengthen oversight, audit, and reporting mechanisms under project management support
- Ensure transparency and accountability across procurement processes

POLICIES AND STANDARDS

G.1. Environmental and social risk assessment (max. 750 words, approximately 1.5 pages)

164. On the transport side, the proposed project is designed to provide a safer, zero-emission public transport system, encouraging the use of non-motorised transport. This will contribute to Bhutan's Low Emission Development Strategy, which is one of several strategies aimed at ensuring that the country remains carbon neutral. Adverse environmental and social impacts are likely to only arise during the construction phase and as such will be short-lived and temporary. While certain impacts will be more significant than others, the project has made attempts to reduce the severity of impacts as far as possible, for instance by reducing the project footprint, shifting alignment to reduce impact on private properties during the construction phase, phasing construction activities to reduce disruptions to road users and businesses and ensuring that compensation will be paid to directly affected landowners. The contractors will also be required to produce various management plans to which they will be held accountable, in addition to the ESMP, for aspects such as waste management, traffic management, emergency procedures, and labor management procedures. A Stakeholder Engagement Plan will also be adhered to throughout the project to ensure that the public and interested parties are consulted on risks and options and kept informed. The operational phase will see overarching positive benefits from reduced GHG emissions, leading to improved air quality, an enhanced public transport system that is safer and more reliable with improved mobility and links to other non-motorised transport facilities, universal and equitable access, as well as improved future opportunities for business.
165. The proposed mitigation measures will see impacts reduced to within acceptable limits during the construction phase, while the operational phase is likely to only see significant positive environmental and social impacts. As such, this project should be supported from an environmental and social perspective, assuming all mitigation measures are adhered to. The project was screened in terms of its environmental and social risks, based on the preferred option. In determining the appropriate category, the GCF's Sustainability Guidance Note: *Screening and Categorising GCF-financed activities* was used to ensure alignment with the risk rating. The proposed project involves linear civil works undertaken through the city of Thimphu including road widening, bus fleet, shelters, terminal and depot, and targeted urban upgrading of alleyways, public spaces, and water supply systems. The project will result in a range of impacts, with varying significance levels. The majority of the adverse impacts identified are temporary and occurring during the construction phase. On environmental aspects, the project will have a limited adverse impact, due to the location of the project within an existing urban environment. However, the project is likely to generate significant social impacts during the construction phase, including temporary economic displacement linked to disruptions to road users and pedestrians, business owners, landowners and apartment dwellers resulting from roadworks. It is unlikely that any buildings will need to be relocated but direct temporary restrictions on access will be experienced and some structures will require compensation along with minor land parcel readjustment. Adverse impacts on land use and business have been minimized through project design by reducing the project footprint and shifting alignment to reduce impact on private properties to the extent feasible. Alternative access to businesses and dwellings from back streets is also possible in many areas. Other construction phase risks involve traffic safety and community and worker health and safety due to proximity of civil works to surrounding public facilities (including schools). Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH) risk is rated as moderate using World Bank's screening tool and additional assessment as the construction activities take place in urban settings and close to schools. Phased construction activities will further reduce disruptions to road users and businesses.

166. Water component activities are designed to avoid and minimize civil works. Activities include enhancing existing selected intake structures, water supply mains and transmission lines, as well as enhancing existing treatment plants to meet drinking water standards. These activities are not expected to require land acquisition or result in economic displacement. They are expected to result in positive environmental impacts by upgrading storm water drainage systems to prevent untreated wastewater from contaminating the river water resources. Communications outreach to communities and key stakeholders will foster a better understanding and garner public support for efficient use of water at the household level. The initiative aims to reduce daily consumption of water from 135 litres per person to 100 litres, leading to significant water savings.
167. As such, the project is assessed to be a Category B. To accurately assess the potential impacts, a comprehensive Environmental and Social Impact Assessment (ESIA), incorporating an Environmental and Social Management Plan (ESMP) has been developed for the transport component and an ESMP prepared for the water component. The ESMPs include mitigation measures to effectively avoid, minimize, and mitigate impacts during the construction and operation phases of the project, as well as implementation arrangements, including institutional capacity building and budget estimates.
168. In addition to this, a detailed Stakeholder Engagement Plan and Resettlement Action Plan have also been developed (see Appendices 1 and 2). The project has been screened and rated moderate for gender-based violence risk and prevention and management measures included in a Gender Action plan.
169. A project-specific grievance redress mechanism (GRM) will be established to receive, evaluate, and facilitate the resolution of affected persons concerns, complaints, and grievances about the social and environmental performance at the level of the project. The GRM will aim to provide a time-bound and transparent mechanism to voice and resolve social and environmental concerns linked to the project. The project will adopt a three-tier GRM in implementing the project. The GRM will include referral measures to address SEA/SH complaints associated with interactions between project workers and community. A public awareness campaign will be conducted to ensure that awareness of the project and its grievance redress procedures are shared with affected persons and other stakeholders. The campaign will ensure that the vulnerable groups are made aware of the need for and process in availing the GRM.
170. Labor Management Procedures (LMP) will address worker health and safety and conduct. Contractors will be supervised to prepare and implement management plans to address the range of environmental and social risks. Provisions will also be included for monitoring and evaluation, and further training and capacity building for environmental and social performance. SEA/SH Prevention and Response Action Plan has been developed to manage such risks.

G.2. Gender assessment and action plan (max. 500 words, approximately 1 page)

171. A Gender Assessment and a Gender Action Plan (GAP) were developed for LRCP following both the GCF's Gender Policy and its Gender Assessment and Action Plan Templates. These outputs were informed by a review of existing literature and secondary databases, analysis of primary data (collected through a dedicated project survey in 2022 and 2023), stakeholder consultations and expert input. In conducting the gender assessment, guidance was also sought from the World Bank's operational guidelines on mainstreaming gender in road transport and its toolkit for enabling gender-responsive urban mobility.
172. The assessment identified project opportunities for women and men, as well as other vulnerable groups like people with disability (PWD) to contribute to inclusive resilience building. These opportunities are translated into gendered actions that promote gender equality and reduce disparities in the sector, which are captured in a dedicated, project-specific GAP.
173. The Gender Assessment's national analysis on gender equality in Bhutan (context, instruments and stakeholders) highlighted that, despite Bhutan making significant progress in closing gender inequality gaps in recent decades through gender-sensitive legislation, policies and plans, inequalities persist due to deeply rooted traditional gender norms and values. As a result, the

transport and water sectors in Bhutan are not gender neutral. For instance, women typically have inferior access to public transport (compared to men) and this access is further influenced by their economic, social and livelihood status. Pedestrianization is also a critical form of mobility that has historically been overlooked from a gender-needs perspective in both Bhutan's urban and rural contexts. The safety of women and girls in Bhutan's public spaces, both as passengers on public transport (and related infrastructure, like at stations) and pedestrians, thus requires particular attention and must be tackled through a multipronged approach that considers infrastructural, operational, regulatory and outreach elements.

174. The impacts of climate change also affect women more than men (for example, by increasing their workload – which is often unpaid) and can trigger shifts in settlement patterns with the migration of men to urban centres. This has implications on urban dynamics – in terms of population increases and composition, economic activity and skills, poverty levels, and urban sprawl – which in turn influence mobility patterns and needs in cities, like Thimphu where the LRCP is located.
175. The intersection of these mobility and climate considerations was explored in-depth through a project-specific gender assessment that used primary and secondary data to understand differences in existing patterns, needs, preferences, perceptions and barriers to use of public transport and pedestrianized areas for women, men and PWD. For example, personal safety and security are crucial factors for women when using public transport and pedestrianized areas, and the poor condition of bus shelters and lack of seating are key factors that disproportionately affect women with children, elderly people, and PWD.
176. These findings informed a series of activities, indicators and targets captured in the GAP. These are broadly focussed on (1) Developing gender-sensitive and disability-inclusive transport and pedestrian infrastructure; (2) Improving city bus services for women and persons with special needs through standardized operational efficiency and effective management; (3) Promoting sensitization and community engagement to prevent sexual harassment and advocate for the rights of PWD to bring positive behaviour changes in public spaces and transport.
177. The project also aims to address the concerns of women and children, who are disproportionately impacted by poor water services. By focusing on water quality, supply hours, reliability, and improved resilience, the project seeks to alleviate these issues.
178. To ensure inclusive decision-making, the project will actively involve women's groups and marginalized communities, understanding their specific needs and concerns. Infrastructure designs will consider the unique requirements of women, aiming to reduce drudgery and save time. Additionally, the project will promote the participation of women in the implementation and service delivery processes. For example, the Thimphu Thromde water division will be encouraged to maintain a considerable number of women within their workforce, ensuring that female perspectives and expertise are integrated into water management and service strategies.

G.3. Financial management and procurement (max. 500 words, approximately 1 page)

179. GCF grant disbursements will be held in a separate Trust Fund by the World Bank. GCF funds will be channeled to Royal Government of Bhutan in a segregated Designated Account maintained in Royal Monetary Authority (RMA) by Ministry of Finance (MoF). To receive GCF funds from the World Bank, disbursements will be made to the Designated Account (DA) maintained by Ministry of Finance in RMA based on Interim Unaudited Financial Reports (IUFRs) that includes forecasts for the next two quarters and report expenditures for the previous two quarters. The fund flow will take place through a government Budget Fund Account (BFA), where funds disbursed by the World Bank into DA of the MoF will be released to the EEs based on funds requirement in Annual Work Plan submitted to the World Bank by EEs. All use of funds under the Project, including grant and loan proceeds, and disbursements to implementing agencies will be subject to an annual independent audit, and the procurement of goods and services under the project will also follow the World Bank's fiduciary requirements, including the Procurement Regulations.
180. Procurement will be carried out in accordance with the World Bank Procurement Regulations for IPF Borrowers, Sixth Edition, February 2025 ("Procurement Regulations") and the provisions

stipulated in the Project Procurement Strategy for Development (PPSD) and the procurement plan that may be updated from time to time with the World Bank's approval. The project will be subject to the World Bank's Anticorruption Guidelines, dated October 15, 2006, and revised in January 2011 and July 2016. The project will use the World Bank's Systematic Tracking of Exchanges in Procurement (STEP) to plan, record, and track procurement transactions. Procurement activities will be undertaken by the PMU to be set up under DHS, MoIT and PIU under Thimphu Thromde. The risks identified during the assessment will be mitigated through capacity building and TA, deployment of experienced procurement officers, hiring additional procurement consultants, submission of quarterly procurement progress monitoring reports by the PMU. The procurement officers will complete relevant procurement training. The World Bank will also provide training in procurement and STEP. The World Bank's procurement supervision will include prior and post review of the contracts. Procurement post review by the World Bank will be conducted on an annual basis or more frequently as needed.

G.4. Disclosure of funding proposal

Note: The Information Disclosure Policy (IDP) provides that the GCF will apply a presumption in favour of disclosure for all information and documents relating to the GCF and its funding activities. Under the IDP, project and programme funding proposals will be disclosed on the GCF website, simultaneous with the submission to the Board, subject to the redaction of any information that may not be disclosed pursuant to the IDP. Information provided in confidence is one of the exceptions, but this exception should not be applied broadly to an entire document if the document contains specific, segregable portions that can be disclosed without prejudice or harm. Indicate below whether or not the funding proposal includes confidential information.

☐ No confidential information: The accredited entity confirms that the funding proposal, including its annexes, may be disclosed in full by the GCF, as no information is being provided in confidence.

☒ With confidential information: The accredited entity declares that the funding proposal, including its annexes, may not be disclosed in full by the GCF, as certain information is being provided in confidence. Accordingly, the accredited entity is providing to the Secretariat the following two copies of the funding proposal, including all annexes:

- full copy for internal use of the GCF in which the confidential portions are marked accordingly, together with an explanatory note regarding the said portions and the corresponding reason for confidentiality under the accredited entity's disclosure policy, and
- redacted copy for disclosure on the GCF website.

The funding proposal can only be processed upon receipt of the two copies above if containing confidential information.

ANNEXES

H.1. Mandatory annexes

- ☒ Annex 1 NDA no-objection letter(s) ([template provided](#))
- ☒ Annex 2 Feasibility study - and a market study, if applicable
- ☒ Annex 3 Economic and/or financial analyses in spreadsheet format
- ☒ Annex 4 Detailed budget plan ([template provided](#))
- ☒ Annex 5 Implementation timetable including key project/programme milestones ([template provided](#))
- ☒ Annex 6 E&S document corresponding to the E&S category (A, B or C; or I1, I2 or I3):
[\(ESS disclosure form provided\)](#)
 - ☒ Environmental and Social Impact Assessment (ESIA) or
 - ☒ Environmental and Social Management Plan (ESMP) or
 - ☐ Environmental and Social Management System (ESMS)
 - ☐ Others (please specify – e.g. Resettlement Action Plan, Resettlement Policy Framework, Indigenous People's Plan, Land Acquisition Plan, etc.)
- ☒ Annex 7 Summary of consultations and stakeholder engagement plan
- ☒ Annex 8 Gender assessment and project/programme-level action plan ([template provided](#))
- ☒ Annex 9 Legal due diligence (regulation, taxation and insurance)
- ☒ Annex 10 Procurement plan ([template provided](#))
- ☒ Annex 11 Monitoring and evaluation plan ([template provided](#))

H.2. Other annexes as applicable

- ☒ Annex 12 AE fee request ([template provided](#))
- ☒ Annex 13 Co-financing commitment letter, if applicable ([template provided](#))
- ☒ Annex 14 Term sheet including a detailed disbursement schedule and, if applicable, repayment schedule
- ☐ Annex 15 Evidence of internal approval ([template provided](#))
- ☒ Annex 16 Map(s) indicating the location of proposed interventions
- ☐ Annex 17 Multi-country project/programme information ([template provided](#))
- ☐ Annex 18 Appraisal, due diligence or evaluation report for proposals based on up-scaling or replicating a pilot project
- ☐ Annex 19 Procedures for controlling procurement by third parties or executing entities undertaking projects financed by the entity
- ☐ Annex 20 First level AML/CFT (KYC) assessment
- ☒ Annex 21 Operations manual (Operations and maintenance)
- ☒ Annex 22 Assessment of GHG emission reductions and their monitoring and reporting (for mitigation and cross cutting-projects)⁴⁵
- ☒ Other references

⁴⁵ Annex 22 is mandatory for mitigation and cross-cutting projects.

** Please note that a funding proposal will be considered complete only upon receipt of all the applicable supporting documents.*



དངུལ་ཅིན་ལྷན་ཁག།
Department of Macro-fiscal and Development Finance
Ministry of Finance
Royal Government of Bhutan

BHUTAN
Believe

MoF/DMDf/DCDMD/GCF_NDA/WB/2024-2025/2110

March 4, 2025

To: The Green Climate Fund (“GCF”)

Re: Funding proposal for the GCF by World Bank Group regarding Bhutan Livable and Resilient Cities Project

Dear Madam/Sir,

We refer to the project titled *Bhutan Livable and Resilient Cities Project* in the Kingdom of Bhutan as included in the funding proposal submitted by the World Bank Group to us on 16 January 2025.

The undersigned is the duly authorized representative of **the Department of Macro-fiscal and Development Finance of the Ministry of Finance**, the National Designated Authority of the Kingdom of Bhutan.

Pursuant to GCF decision B.08/10, the content of which we acknowledge to have reviewed, we hereby communicate our no-objection to the project as included in the funding proposal.

By communicating our no-objection, it is implied that:

- (a) The government of the Kingdom of Bhutan has no-objection to the project as included in the funding proposal;
- (b) The project as included in the funding proposal is in conformity with the national priorities, strategies and plans of the Kingdom of Bhutan;
- (c) In accordance with the GCF’s environmental and social safeguards, the project as included in the funding proposal is in conformity with relevant national laws and regulations.

We also confirm that our national process for ascertaining no-objection to the project as included in the funding proposal has been duly followed.

We acknowledge that this letter will be made publicly available on the GCF website.

Kind regards,

Tshering Dorji (Mr.)

Director

**Department of Macro-fiscal and Development Finance, Ministry of Finance
Bhutan**

Environmental and Social Safeguards (ESS) Report Disclosure Form

Basic project or programme information	
Project or programme title	Bhutan Livable and Resilient Cities Project (LRCP)
Potential sub-project(s) anticipated after GCF Board approval	No
Sector (public or private)	Public
Accredited entity/Project-specific Assessment Approach (PSAA) applicant	International Bank for Reconstruction and Development and International Development Association (World Bank)
Environmental and social safeguards (ESS) category	Category B
Location – specific location(s) of project or target country or location(s) of programme	The Project will be implemented in Thimphu City in Bhutan.
Safeguard Documents: Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plans (ESMPs), Environmental and Social Management System (ESMS), Environmental and Social Management Framework (ESMF), Environmental and Social Due-Diligence (ESDD) report, Land Acquisition and/or Resettlement Action Plan (LARAP), Indigenous Peoples Plan (IPP), Indigenous Peoples Planning Framework (IPPF), Resettlement Action Plan (RAP), Resettlement Policy Framework (RPF) etc. (as applicable)	
Date of disclosure on entity's website	Sunday, September 20, 2026
Language(s) of disclosure	English
Explanation on language	English is the working language for E&S documentation in Bhutan. Bhutan's environmental assessment legislation, the Environmental Assessment Act of 2000, does not specify the language in which ESIA's must be prepared. ESIA's for both domestic and international projects are prepared in English rather than in Dzongkha, the national language. For public disclosure, the executive summaries of technical environmental and social safeguard documents are translated into Dzongkha, while the full documents are made available in English. Dzongkha lacks the necessary technical vocabulary and glossaries, particularly in modern engineering and environmental sciences. Therefore, the ESIA and ESMP are in English.
Link(s) to disclosure	Environmental and Social Impact Assessment (ESIA) for Public Transport and Public Space Improvement Components English: https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099092026211592736 Translated language(s): English with Executive Summary translated into Dzongkha Environmental and Social Management Plan (ESMP) for Water Supply Component

	English: https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099092026211511104 Translated language(s): English with Executive Summary translated into Dzongkha
Other link(s)	https://moit.gov.bt/public-disclosure-of-environmental-and-social-impact-assessment-esia/
Remarks on compliance with GCF policies	ESS reports consistent with the requirements for a Category B project are contained in the documents above.
Disclosure in locations convenient to affected peoples (stakeholders)	
Date(s)	Tuesday, September 22, 2026
Place(s)	Ministry of Infrastructure and Transport (MoIT): 194 Chang LAM, SE, Thimphu City Bus Service (CBS): 220 Gongdzin Lam SE, Thimphu Thimphu Thromde (TT): 196 Chang Lam SE, Thimphu.
Date of Board meeting in which the FP is intended to be considered	
Date of entity's Board meeting	N/A
Date of GCF's Board meeting	Monday, October 26, 2026

* Subsequent to the disclosure of the form on 24 September 2026, the following update has been made: Minor updates have been made to maps in Environmental and Social Impact Assessment (ESIA).

Note: This form was prepared by the entity stated above.

Secretariat's assessment of FP315

Proposal name:	Bhutan Livable and Resilient Cities Project (LRCP)
Accredited entity:	International Bank for Reconstruction and Development and International Development Association (World Bank)
Country/(ies):	Bhutan
Project/programme size:	Small

I. Overall assessment of the Secretariat

- The funding proposal is presented to the Board for consideration with the following remarks:

Strengths	Points of caution
Climate-resilient urban development at scale: the project directly addresses rising climate vulnerability in Bhutan by integrating flood-resilient water infrastructure with low-emission public transport in Thimphu, strengthening urban resilience for a population highly exposed to glacial lake outburst floods and intensifying monsoon variability, while simultaneously reducing transport-sector emissions in a country where transport energy demand is almost entirely fossil-fuel based.	Long-term financial sustainability and transition to public transport requires continued policy enforcement, institutional reforms and strengthening, and gradual strengthening of cost-recovery mechanisms.
Paradigm-shifting modal shift: by establishing first bus priority system corridor in Bhutan with 50 battery electric buses, dedicated lanes, and non-motorized transport infrastructure, the project introduces a replicable low-emission urban mobility model. Beyond physical infrastructure investments, the project establishes new service-delivery models through the transformation of the City Bus Service into an autonomous state-owned enterprise operating under a public service agreement framework and the creation of a ring-fenced Water and Wastewater Services Division. These reforms create durable institutional arrangements that can sustain	Achievement of projected mitigation outcomes depends on sustained modal shift from private vehicles to public transport and successful implementation of complementary transport measures. Climate and financial benefits are sensitive to ridership growth and realization of projected service-quality improvements.

and scale climate investments beyond the project lifecycle.	
Strong cross-cutting climate rationale: the project delivers outcomes in both mitigation results area 2 and adaptation results areas 2 and 3, with an estimated 69,519 tonnes of carbon dioxide equivalent reduced over 20 years, over 104,000 direct beneficiaries with improved climate resilience, and a combined economic net present value of approximately USD 27 to 30 million across transport and water components.	

2. The Board may wish to consider approving this funding proposal in accordance with the term sheet agreed between the Secretariat and the accredited entity (AE) and, if considered appropriate, subject to the conditions set out in annex II to document GCF/B.46/02.

II. Summary of the Secretariat's assessment

2.1 Project background

3. While Bhutan remains carbon-negative due to forest sinks, structural emissions are rising rapidly – having increased nearly 600 per cent since 1994, with projections indicating a tripling by 2050 under business as usual. Urban transport is the key driver, accounting for ~20 per cent of national energy demand and heavily reliant on imported fossil fuels. Urban mobility is becoming increasingly carbon-intensive, with over 50 per cent of trips by private vehicles and limited uptake of public transport (<15 per cent ridership), risking long-term lock-in of high-emission and inefficient urban forms.

4. The country's climate risk profile is intensifying and is already constraining urban service delivery and economic resilience. Warming rates (~0.5 °C per decade) are accelerating glacial retreat and altering hydrological regimes, resulting in more frequent floods, landslides and seasonal water stress. In Thimphu, flood exposure has expanded significantly, with extreme flood events expected to become much more frequent, while the city's water system is highly inefficient (non-revenue water (NRW) >50 per cent) and unreliable (3–9 hours/day supply).

5. The Bhutan Livable and Resilient Cities Project (LRCP) is a cross-cutting climate investment designed to target the dual challenge of rising climate vulnerability and rapidly growing transport-sector emissions by combining mitigation (modal shift, electrification) with adaptation (resilient urban water and public transport systems) in the capital city of Thimphu, aligned with the nationally determined contribution (NDC) of Bhutan and long-term climate resilience objectives.

6. The LRCP addresses these challenges through a programmatic approach that combines climate-resilient infrastructure investment with institutional transformation. Component 1 (investment) will finance climate-resilient water supply infrastructure – including monitoring by Supervisory Control and Data Acquisition (SCADA), enhancement of water intake structures, slope stabilization, transmission mains and distribution network upgrades to reduce NRW losses – alongside the first bus priority system (BPS) corridor in Bhutan. The BPS comprises 18.9 kilometres of climate-resilient dedicated bus lanes, a fleet of 50 battery electric buses, 2 terminals, 75 bus shelters with real-time passenger information systems, pedestrian

infrastructure including the pedestrianization of Norzin Lam and 23 signalized crossings, and intelligent transport systems for real-time fleet management. Component 2 (institutional strengthening and project management) will build regulatory, institutional and technical capacity, including the transformation of the City Bus Service (CBS) into a state-owned enterprise operating under a public service agreement, and a ring-fenced Water and Wastewater Services Division within the Thimphu Thromde.

7. The financing structure reflects the constrained fiscal position of Bhutan and the presence of structural market failures. The project requests USD 28 million in GCF financing, structured as USD 22.4 million in grant and USD 5.6 million in concessional loan (20-year tenor, 5-year grace period, 0.75 per cent interest rate), alongside USD 20 million in [International Development Association](#) (IDA) co-financing (USD 10 million grant, USD 10 million concessional loan at 40-year tenor, 2 per cent interest rate). The total project cost is USD 48 million. Implementation will span five years from January 2027 to December 2031, with infrastructure designed for a 20-year service life. GCF categorizes the project as Category B for its environmental and social safeguards.

2.2 Component-by-component analysis

8. The project is structured into two main components and a project management subcomponent as set out below.

Component 1: Resilient and low-carbon service delivery (total cost: USD 40.00 million; GCF cost: USD 24.03 million)

9. Component 1 aims to strengthen the reliability, efficiency and climate resilience of essential urban services while enabling a transition towards low-emission mobility in Thimphu. The component integrates climate resilient water supply improvements, non-motorized and pedestrian infrastructure, and a BPS to deliver coordinated mitigation and adaptation outcomes

10. Subcomponent 1.1: Climate resilient water supply (total cost: USD 5.71 million; IDA grant: USD 4.39 million, IDA loan: USD 1.32 million) focuses on strengthening the reliability, efficiency and climate resilience of Thimphu's water supply system through targeted infrastructure and system upgrades. The subcomponent includes climate-resilient intake improvements at five critical intake points including Dodena, designed to withstand extreme hydrological events, alongside slope stabilization measures to protect critical infrastructure from landslides and erosion. Investments also cover rehabilitation and upgrading of transmission and distribution networks, including installation of durable ductile iron pipelines, as well as improvements in water treatment systems (filtration and chlorination) to ensure safe and continuous supply.

11. These interventions are complemented by the deployment of SCADA-enabled monitoring and control systems enabling real-time system management, pressure regulation and leak detection to improve operational efficiency. These investments are expected to reduce NRW losses from over 50 per cent towards a target of 25 per cent and ensure year-round, climate-resilient water access for approximately 52,046 residents.

12. Subcomponent 1.2: Non-motorized transport and pedestrian infrastructure (total cost: USD 6.70 million; GCF grant: USD 6.70 million) supports the development of safe, accessible and climate-resilient public spaces and non-motorized transport networks in Thimphu. This subcomponent will finance the pedestrianization of approximately 1.3 kilometres of Norzin Lam, Thimphu's main commercial street, alongside upgrades to sidewalks, pedestrian crossings, and connecting residential areas to BPS bus stops. It also incorporates sustainable urban drainage systems and climate-resilient design features to enhance drainage, reduce flood risk, and improve urban environmental quality along key corridors. These interventions are

designed to complement the BPS investment by enabling modal shift towards public transport and walking, improving accessibility and connectivity while reducing reliance on private vehicles. At the same time, it enhances safety for women, children, the elderly, and persons with disabilities, through improved lighting, safer crossings, and pedestrian-friendly design.

13. Subcomponent 1.3: Low-emission transport – bus priority system (total cost: USD 27.59 million; GCF grant: USD 11.73 million; GCF loan: USD 5.6 million; IDA grant: USD 1.58 million; IDA loan: USD 8.68 million). This subcomponent represents the core mitigation investment and is designed to enable a structural shift in Thimphu's urban mobility system. It will finance the first BPS in Bhutan – an 18.9-kilometre route connecting Babesa in the south to Dechencholing in the north – served by a fleet of 50 battery electric buses. Key investments include dedicated bus lanes with priority signalling, bridge widening at Lungtenzampa, 2 bus terminals, 75 bus shelters with intelligent transport systems and real-time passenger information, a bus depot with charging infrastructure, 23 signalized pedestrian crossings, management information systems, and associated public realm and non-motorized transport improvements to enhance accessibility and safety. The BPS is projected to drive a significant modal shift from private to public transport, improving service reliability and travel times while reducing congestion. This shift underpins the projected avoided emissions. By integrating infrastructure, operations and digital systems, the subcomponent provides a scalable and replicable model for low-emission urban transport in Bhutan, while avoiding long-term carbon lock-in in a rapidly urbanizing context.

Component 2: Urban management, planning and capacity-building for improved climate resilience (total cost: USD 5.62 million; GCF cost: USD 2.59 million)

14. Component 2 focuses on strengthening the institutional, regulatory and technical foundations required to sustain and scale climate-resilient and low-emission urban service delivery systems. The component complements infrastructure investments under Component 1 by enhancing governance, operational capacity and enabling frameworks across the water and transport sectors.

15. Subcomponent 2.1: Water institutional strengthening (total cost: USD 3.04 million; IDA grant: USD 3.04 million). This subcomponent supports transition towards a more autonomous, accountable and performance-oriented water utility model within Thimphu Thromde. It will establish a ring-fenced Water and Wastewater Services Division with enhanced financial and operational autonomy, supported by strengthened asset management, business planning, billing and revenue collection systems, and improved service delivery standards. It will also support capacity-building for SCADA operations and maintenance capacity, enabling real-time monitoring, leak detection and improved system efficiency, alongside development of emergency preparedness and response protocols to address climate-induced service disruptions.

16. Subcomponent 2.2: Transport institutional strengthening (total cost: USD 2.59 million; GCF grant: USD 2.59 million). This subcomponent supports the transition of urban public transport in Thimphu towards a commercially oriented, performance-based and low-emission service model. It will finance the organizational transformation of CBS into a state-owned autonomous entity operating under a public service agreement framework, introducing clear performance obligations, service standards and financial accountability. It also supports development of operational standards, fare setting regulatory frameworks, operations and management standards for service monitoring and optimization using Innovating for Transport and Energy Systems, and capacity-building for electric bus operations and maintenance. The subcomponent also supports the development of the Bhutan Land Information System to strengthen disaster risk identification, climate resilience planning and climate-informed public land management.

III. Assessment against investment criteria

17. The project consistently scores medium to high against the GCF investment criteria. A detailed assessment is provided below.

3.1 Impact potential

Scale: N/A

18. The LRCP demonstrates a strong impact potential in contributing to GCF mitigation and adaptation results areas, with a well-defined pathway towards low-emission and climate-resilient urban development in Bhutan, one of the world's most climate-vulnerable countries. The project is projected to reduce greenhouse gas (GHG) emissions by approximately 69,519 tonnes of carbon dioxide equivalent (t CO₂ eq) over the 20-year lifetime (2029–2048), estimated on a conservative mode-shift-only basis under Clean Development Mechanism approved methodology 0031, contributing directly to the country's NDC and reducing reliance on imported fossil fuels. These reductions are primarily attributable to the modal shift from private fossil-fuel vehicles to battery electric buses powered by near-100-per-cent hydroelectric grid of Bhutan. The intervention also avoids long-term carbon lock-in in a rapidly urbanizing context, shifting the city towards a lower-emission mobility pathway.

19. On adaptation, the project contributes to increased climate-resilient development by addressing systemic vulnerabilities in Thimphu's urban water and transport systems, which are highly exposed to flooding, landslides and seasonal water scarcity. The project targets both infrastructure and service-level resilience. The project will directly benefit approximately 104,162 people (50,519 female), comprising residents gaining access to improved climate-resilient water supply and commuters benefiting from affordable low-emission transport. Approximately 271,871 people (134,857 female) will benefit indirectly through reduced air pollution, improved road safety, reduced flooding and enhanced connectivity. The flood resilience benefits are valued at approximately USD 64 million in present value terms. Additional health co-benefits include reduced particulate and nitrogen oxide emissions in a narrow valley where temperature inversions concentrate pollutants.

3.2 Paradigm shift potential

Scale: N/A

20. The paradigm shift potential of the LRCP lies in infrastructure investment along with enabling environment reforms to transition Thimphu's urban systems towards low-emission and climate-resilient service delivery as a model for Bhutan and the broader South Asian region. It enables system-level changes, including establishment of operational and technical standards for public transport and water services, deployment of digital systems (intelligent transport system and SCADA) for real-time performance management, and institutional restructuring through a public service agreement-based model for CBS and a ring-fenced Water and Wastewater Services Division. These elements shift service provision from fragmented, input-based delivery towards performance-based, data-driven and financially disciplined models, directly aligned with the NDC, national adaptation plan, Low Emissions Transport Master Plan, and Watershed Management Plan. The introduction of the first BPS with battery electric buses in Bhutan demonstrates the feasibility of low-emission public transport in a small, mountainous developing country. The thirteenth Five-Year Plan for Bhutan already commits to deploying electric buses for secondary cities, directly building on the LRCP model. The institutional framework – including the CBS state-owned enterprise, the public service agreement, and intelligent transport system standards – provides a replicable template for other cities in the country and comparable Himalayan urban contexts. These reforms create durable institutional arrangements that can sustain and scale climate investments beyond the project lifecycle.

21. The project incorporates knowledge generation and dissemination mechanisms, including structured training programmes and policy-focused workshops, which are expected to facilitate learning and reduce implementation risks for future investments. In parallel, it contributes to strengthening the enabling environment through development and application of technical standards, regulatory measures (for example, parking management, fare setting, cost-recovery frameworks), and planning tools, creating conditions for sustained sector transformation and market development in low-emission transport and resilient water systems. However, scalability is somewhat constrained by Thimphu's small population. Replication potential is stronger regionally, where the approach to integrating climate-resilient infrastructure with electric bus transport in mountainous contexts could inform interventions across the Hindu Kush–Himalayan region.

22. The extent of paradigm shift will depend on continued enforcement of policy measures, institutional capacity to sustain reforms, and gradual improvement in financial sustainability, particularly in relation to cost recovery and public transport operations. Overall, paradigm shift potential is assessed as medium to high, with moderate risk linked to post-project institutionalization and scaling of reforms.

3.3 Sustainable development potential

Scale: N/A

23. The LRCP supports progress on multiple Sustainable Development Goals (SDGs), particularly SDG 6 (Clean Water and Sanitation), SDG 11 (Sustainable Cities and Communities), SDG 13 (Climate Action), SDG 3 (Good Health and Well-being), SDG 5 (Gender Equality), and SDG 9 (Industry, Innovation and Infrastructure). Social co-benefits include improved pedestrian safety through 23 signalized crossings; affordable public transport for lower-income residents; road safety; improved water quality and reliability benefiting women who bear primary responsibility for household water management. Environmental co-benefits include reduced emissions, clean air benefits valued at net present value (NPV) of USD 2.2 million and noise reduction from the transport sector, sustainable urban drainage systems integration, and preservation of the carbon-negative status of Bhutan.

24. The economic benefits include foreign currency savings from imported fuels, resilient infrastructure, reduced travel times and improved labour mobility. The gender action plan ensures 48.5 per cent female direct beneficiaries. Gender-responsive design includes well-lit bus stops responsive to the 44 per cent of women reporting security concerns; accessible pedestrian infrastructure; employment opportunities for women in bus operations; and sex-disaggregated monitoring and evaluation.

3.4 Needs of the recipient

Scale: N/A

25. The LRCP presents a strong case for GCF support given the convergence of high climate vulnerability, constrained development conditions, and limited financing capacity in Bhutan. The country remains highly exposed to floods, landslides and water stress, with impacts concentrated in Thimphu where unreliable water supply and inadequate urban mobility disproportionately affect vulnerable groups, including low-income households, women and persons with disabilities.

26. The vulnerability of Bhutan is compounded by geographic isolation as a landlocked Himalayan country, a narrow economic base, limited technical capacity, and high dependence on hydropower revenues that are themselves threatened by glacial melt and changing monsoon patterns. The project directly responds to the country's NDC and priorities of the national adaptation plan by strengthening climate-resilient water systems and enabling a shift to low-

emission and inclusive urban transport, thereby addressing both adaptation and mitigation needs while improving access, safety and service reliability for vulnerable populations.

27. Bhutan graduated from least developed country status in December 2023 but faces severe fiscal constraints. Public debt stands at approximately 118 per cent of gross domestic product (GDP) in the financial year 2024/25, projected to rise to approximately 141 per cent of GDP by financial year 2028/29, with a fiscal deficit of 2.9 per cent of GDP in financial year 2025/26. Climate financing needs are estimated at USD 7.7 to 14 billion by 2030, substantially exceeding available domestic resources. The financial analysis confirms that without GCF concessional support, the project is not viable, demonstrating that the financial NPV of the low-emission transport investment shifts from +USD 0.41 million with GCF support to –USD 13.25 million without it. This reflects structural market failures driven by low, affordability-based tariffs and lack of cost recovery. In this context, GCF financing is essential to bridge the viability gap while supporting institutional strengthening and system modernization.

3.5 Country ownership

Scale: N/A

28. A no-objection letter was issued on 4 March 2025 by the Ministry of Finance. The project is fully aligned with NDC 3.0 (2025) of Bhutan, the thirteenth Five-Year Plan (2024–2029), the LETMP, the NAP (2023), the WSMP, and the Thimphu Structure Plan, which collectively commit the country to maintaining carbon neutrality while strengthening resilience across sectors. The recently adopted NAP (2023) further institutionalizes medium- and long-term adaptation priorities across key sectors, including water, urban settlements and infrastructure, and emphasizes integration of climate resilience into national development planning. The executing entities – Ministry of Finance and Ministry of Infrastructure and Transport (MoIT) – are established ministries with past World Bank project experience. Extensive consultations were conducted with government agencies, community groups, women's groups, transport operators, and civil society.

3.6 Efficiency and effectiveness

Scale: N/A

29. The economic and financial analysis (EFA) adopts a comprehensive economic valuation framework that quantifies multiple benefit streams in line with the established methodologies commonly used in urban transport and water supply economic appraisals. From an economic perspective, the overall project generates an economic internal rate of return (IRR) of 21.4 per cent to 22.3 per cent, with the investments under the water sector component (Component 1.1) generating an economic IRR of 19.1 per cent and an economic NPV of USD 3.06 million, and the low-carbon and climate-resilient mobility investments under Components 1.2 and 1.3 generating an economic IRR of 21.8 per cent to 22.9 per cent and an economic NPV of USD 23.90 million excluding GHG benefits, rising to USD 26.53 million at the high shadow price of carbon. These results indicate that the project generates economic benefits significantly in excess of costs, with economic IRRs above the typical social discount rate of 7–8 per cent for such investments. The economic benefits of the water sector investments are primarily adaptation benefits and driven by reductions in NRW, improved water availability and reliability, enhanced asset life, operational efficiencies and savings associated with reduced water resource fees. The mobility investments predominantly supported by GCF funding generate system-wide economic benefits (both adaptation and mitigation benefits) through increased public transport ridership, reduced congestion, travel time savings, lower fuel consumption, improved road safety, GHG emission reductions, reduced dependence on imported fossil fuels, and enhanced climate resilience.

30. The financing package for GCF fundings has been structured to match the risk profile and revenue-generating potential of individual investments, with GCF grant financing directed towards public-good infrastructure and climate-related investments such as bus priority corridors, pedestrianization measures, intelligent transport systems and enabling infrastructure, while concessional debt (GCF and IDA) supports revenue-generating assets such as electric buses and chargers. The overall grant-loan mix for electric buses and ancillary infrastructure has been calibrated to maintain debt affordability of CBS (adequate debt service coverage ratio of at least 1.5x) and ensuring adequate equity returns for supporting future expansion of electric buses. The blended financing approach enables the project to address both market and public-sector financing gaps while ensuring affordability and long-term sustainability against the risks.

31. The EFA clearly highlights that the project, as well as GCF concessional funding, is crucial from a financial sustainability and affordability perspective. Under the 'no-project scenario', CBS experiences progressively worsening operating deficits, while under the 'with-project scenario', the operation returns to positive operating cash flow by 2029 and maintains operating surpluses throughout the analysis period, indicating that the project and GCF support materially improve the financial sustainability and credit profile of the operating entity for future electric buses expansion. The additionality of GCF funding and the adequacy of financing mix is further underscored by the investments (electric buses, charging stations and other ancillary infrastructure - Component 1.3) for CBS in Bhutan as summarized below.

32. Under a 'no-GCF/commercial financing' scenario for CBS, the project generates a financial NPV of USD -13.25 million and a modified IRR of 6.1 per cent against the market benchmark of 12 per cent, highlighting that commercial financing is not viable for CBS for this phase of electric bus expansion funded under the project due to high early-stage debt service obligations and long ridership ramp-up periods. With GCF concessional financing under the 'with GCF financing' scenario for CBS, the project achieves a positive financial NPV of approximately USD 0.41 million and a modified IRR of 13.0 per cent, representing GCF additionality of USD 13.66 million (or 6.9 per cent increase in IRR). The initial electric bus fleet and ancillary infrastructure supported under the project improve service quality, increase ridership, strengthen farebox revenues, and can create the financial conditions (adequate cash flows) necessary for future fleet expansion using commercial financing. This improvement demonstrates the effectiveness of the proposed GCF funding in addressing identified financing barriers as well as in transitioning CBS on a credible pathway towards long-term sustainability. However, the sensitivity analysis highlights that the sustainability of CBS's future commercial financing strategy for future electric bus expansion is also dependent on the realization of projected electric vehicle cost reductions and ridership growth assumptions.

33. The GCF cost per direct beneficiary is approximately USD 269, and the cost per t CO₂ eq abated is USD 301.93 over 20 years. While the abatement cost exceeds the portfolio average, this reflects the small transport system scale and high per-unit electric bus procurement costs for a landlocked mountainous country. The abatement metric does not capture the approximately USD 64 million in flood resilience benefits. The co-financing ratio of 1:0.71 reflects the fiscal constraints of a recently graduated least developed country. IDA co-financing of USD 20 million is committed, confirmed in a letter dated 2 May 2025.

IV. Assessment of consistency with GCF safeguards and policies

4.1 Environmental and social safeguards

34. **Project overview.** The Bhutan LRCP aims to enhance liveability and climate resilience in Thimphu through improved urban infrastructure and service delivery. The project will support resilient water services, resilient urban public spaces and low-emission mobility, low-emission public transport, and institutional strengthening for water and transport service delivery. The main physical investments include rehabilitation and modernization of Thimphu's water supply system, installation of SCADA systems, strengthening of raw water intake and transmission systems, reduction of non-revenue water, urban placemaking and pedestrian improvements along Norzin Lam and connecting alleyways, development of an approximately 18.9-kilometre bus priority corridor, construction of 75 bus shelters and bays, installation of 23 signalized pedestrian crossings, procurement of 50 electric buses, construction of 2 bus terminals, depot and charging infrastructure upgrades, and deployment of intelligent transport and management information systems. The expected environmental and social co-benefits include improved reliability of water supply, reduced exposure of urban infrastructure to floods and landslides, improved pedestrian safety and accessibility, improved public transport reliability, reduced local air pollution and GHG emissions, enhanced inclusion of women and persons with disabilities in urban mobility, and strengthened institutional capacity for climate-resilient urban services.

35. **Environmental and social (E&S) risk category and safeguard instruments.** The project is classified as Category B, consistent with the accreditation level of the AE. The Secretariat notes that the project is rated 'Substantial' under the World Bank Environmental and Social Framework, reflecting the complexity of dense urban civil works, temporary and potentially permanent economic displacement, proximity to sensitive receptors, biodiversity and cultural heritage interfaces, and implementation-capacity constraints. This classification is understood as broadly corresponding to a high-complexity Category B operation under the GCF risk categorization approach, as the anticipated adverse impacts are expected to be largely site-specific, mostly construction-phase, and manageable through the proposed mitigation and monitoring measures. The AE has prepared a site-specific environmental and social impact assessment (ESIA) and environmental and social management plan (ESMP) for the transport and urban public-space components, a separate ESMP for the water supply component, a draft Resettlement Action Plan, a Stakeholder Engagement Plan, and associated project instruments including gender and sexual exploitation, abuse and harassment (SEAH)-related measures. These instruments provide the basis for consideration by the Board and for subsequent implementation supervision by the AE.

36. **Compliance with GCF environmental and social safeguards (ESS) standards.** The following paragraphs describe how the project complies with the relevant GCF ESS standards.

37. **ESS 1: Assessment and management of environmental and social risks and impacts.** The ESIA for the transport and urban public-space components establishes the environmental and social (E&S) baseline, assesses impacts and risks, identifies sensitive receptors, presents alternatives analysis, and sets out an ESMP with mitigation, monitoring, institutional responsibilities, training and budget provisions. The ESIA identifies the most significant adverse impacts to be: construction-phase disruption to traffic, access, businesses and community safety; occupational health and safety risks; dust, noise and vibration; temporary livelihood impacts; biodiversity impacts from tree removal and in-stream works; and potential impacts on cultural heritage sites. It also identifies significant long-term benefits from cleaner mobility, improved safety and accessibility, reduced local air pollutants and enhanced climate resilience.

38. The water supply component has been assessed through a separate ESMP, reflecting its distinct risk profile and the generally rehabilitation-oriented nature of the proposed works. The ESMP for the water component covers works at the Dodeyna intake, raw water transmission-line stabilization, pipeline rehabilitation, SCADA installation, water-service disruption, environmental flow, water quality, public health and operation and maintenance arrangements.

The ESMP for the water activities records that no land acquisition, physical displacement or economic displacement is currently expected for this component, while maintaining a contingency approach for unforeseen land, asset, access or livelihood impacts that may arise during detailed design or implementation. This is an appropriate fit-for-purpose approach for the current stage, provided that any such unforeseen impacts are screened and addressed through the RAP or an appropriate RAP addendum before the related works proceed.

39. The project applies the mitigation hierarchy through route and design modifications, use of existing rights-of-way and existing water infrastructure, co-location of water and transport works to reduce repeated disruption, land readjustment to avoid or minimize acquisition, phased implementation of Norzin Lam improvements, and requirements for contractor environmental and social management plans (C-ESMPs) and subplans before works. The ESMP requirements will be integrated into procurement and contract documents, including requirements for contractors to prepare site-specific C-ESMPs, occupational health and safety (OHS) plans, traffic management plans, pollution prevention plans, community health and safety measures, cultural heritage measures and other subplans commensurate with the works.

40. **ESS 2: Labour and working conditions.** The project will involve direct workers, contracted workers and consultants. Civil works will be undertaken for transport, public-space and water investments, and the ESIA anticipates an average workforce of approximately 200 workers per day during construction, with a potentially significant proportion of foreign workers. Labour risks include occupational health and safety risks from works near live traffic, bridge works, trenching, confined spaces, heavy machinery, electrical systems, hazardous materials and construction camps; worker accommodation risks; labour influx; risk of discrimination; and risks of child labour, forced labour and SEAH.

41. The safeguards instruments provide for Labour Management Procedures, written employment contracts, prohibition of child and forced labour, worker induction and training, a worker grievance redress mechanism (GRM), a Code of Conduct, safe worker accommodation, contractor E&S and OHS staffing, OHS plans, emergency preparedness and response procedures, and compliance with Bhutanese labour and OHS requirements and World Bank Group Environmental, Health, and Safety Guidelines. These provisions are broadly aligned with [International Finance Corporation](#) (IFC) Performance Standard 2. During implementation, the AE is expected to verify that contractor labour management arrangements, worker GRM, accommodation standards, OHS controls, incident reporting and worker training are operational before physical works commence in each work package.

42. **ESS 3: Resource efficiency and pollution prevention.** Construction activities may generate dust, noise, vibration, spoil, construction waste, hazardous waste, wastewater, erosion, sedimentation and accidental spills. Risks are most relevant along the BPS corridor, Norzin Lam, bridge works, construction yards, water-pipeline trenching and water-intake or transmission-line locations. The ESIA identifies construction-material requirements and indicates that quarry materials will be sourced from government-approved or licensed suppliers and that no new quarry sites will be developed. Mitigation measures include dust suppression, equipment maintenance, work-hour controls, sediment and erosion controls, spoil management, waste segregation, hazardous waste management, spill prevention and response, and use of approved disposal sites.

43. During operation, the project is expected to generate positive climate and air-quality benefits through deployment of electric buses and modal shift from private vehicles to public transport and non-motorized transport. The ESIA includes provisions for battery take-back through electric bus procurement, terminal and depot waste management, hazardous waste handling, used oil management and wastewater controls. The water-related ESMP also supports resource efficiency through reduction of non-revenue water and SCADA-enabled system management, and requires maintenance of mandated environmental flow at Dodeyna intake.

The Secretariat expects these resource-efficiency and pollution-prevention measures to be carried forward into procurement documents, operation and maintenance procedures and operational monitoring.

44. **ESS 4: Community health, safety and security.** Community health and safety risks are material given the project's location in dense urban corridors with schools, hospitals, businesses, residential areas, cultural heritage sites, pedestrians and road users in close proximity to works. The transport ESIA identifies sensitive receptors including schools, special education needs schools, the National Referral Hospital (JDWNRH), Kidu Medical Center, the National Memorial Chorten, Hejo Chorten, Dechencholing Palace, Dolma Lhakhang/Pangrizampa, commercial areas, public offices, markets, rivers, streams, forest areas and landslide-prone sections.

45. The ESMPs provide for traffic management plans, advance public notification, signage, detours, trained flag personnel, hard fencing of work zones, safe pedestrian access, universal access principles, emergency vehicle access, work-hour controls near sensitive receptors, public awareness campaigns and community GRM arrangements. The project design also includes 23 signalized pedestrian crossings, improved lighting, low-floor buses, wheelchair spaces, tactile paving, ramps and safer pedestrian infrastructure. These measures are broadly aligned with IFC Performance Standard 4. The community-interface risks will be managed through site-specific contractor plans, corridor-level coordination and continued consultation, particularly where water, road and public-space works overlap.

46. **ESS 5: Land acquisition and involuntary resettlement.** A draft RAP was prepared during appraisal. The draft RAP is the principal instrument for managing land, asset and livelihood impacts. The draft RAP records that the project requires approximately 96.18 acres of land, mostly public land, with limited private land impacts. It also records that the project has used route alternatives, design modifications, realignment and land readjustment to avoid and minimize private land acquisition. The main resettlement-related risk is economic displacement and temporary livelihood disruption. The draft RAP identifies 130 project-affected households along the BPS route and 539 project-affected households in the Norzin Lam area as potentially affected by livelihood impacts, including business operators, building owners and parking fee collectors.

47. The draft RAP establishes a cut-off date and provides for compensation at replacement cost, land-for-land or land readjustment where feasible, assistance for non-title-holders, shifting allowances, livelihood restoration, support for vulnerable households, grievance redress, internal monitoring, external monitoring and completion audit. This is directionally aligned with IFC Performance Standard 5 and GCF requirements. The Secretariat supports the AE's commitment to finalize and implement the RAP before relevant works, including further refinement of land accounting, affected structures, land readjustment, physical displacement, economic displacement, business relocation or closure risk, employee impacts, parking-fee collector impacts, informal users and vulnerable households as the detailed design and consultations are completed.

48. The draft RAP acknowledges that income verification for affected businesses can be challenging because some businesses reported outliers or negative net revenue. The draft RAP therefore includes compensation approaches based on net revenue and alternative calculations where income cannot be verified. The Secretariat notes that transparent communication with Project Affected Households, clear documentation of the valuation method, and accessible grievance channels will be important for effective RAP implementation, particularly in Norzin Lam and BPS road-widening sections where businesses may experience access, parking and customer-flow disruptions. The final RAP will be disclosed at least 30 days prior to commencement of the relevant civil works, and compensation and applicable resettlement assistance will be provided before possession of affected land and assets is taken.

49. **ESS 6: Biodiversity conservation and sustainable management of living natural resources.** Biodiversity risks are moderate and site-specific. The transport ESIA identifies removal of 309 trees, potential impacts on fauna, in-stream works at bridge locations, erosion and sedimentation risks, and potential disturbance near forested areas. It also records that a 0.8 kilometre section of the BPS route passes through state-reserved forest land, while the Thimphu Wetlands Key Biodiversity Area is located west of the Wang Chhu River and is not physically encroached by the BPS route. Mitigation measures include a Biodiversity Management Plan, pre-clearing fauna checks, prohibition of hunting, low-flow-season in-stream works, sediment controls, compensatory planting of native trees at a ratio exceeding 3:1, and monitoring of plantation survival.
50. For the water component, the most sensitive location is the existing Dodeyna intake within the Multiple Use Zone of Jigme Dorji National Park. The water-related ESMP indicates that works at the intake will be minor and limited to SCADA sensors, small secure chambers and security fencing, with no major civil works, rehabilitation or expansion of the intake. It provides for a Jigme Dorji National Park Works Protocol, park clearance, strict footprint control, contractor conduct protocols, and pack-in/pack-out waste management. This is an appropriate risk-based approach for managing the protected-area interface. The Secretariat expects detailed design to confirm the final footprint, transmission-line stabilization locations, vegetation clearance and site-specific biodiversity controls before works in sensitive areas commence.
51. **ESS 7 / IFC Performance Standard 7: Indigenous Peoples.** The AE has conducted a screening to assess the presence of Indigenous Peoples and confirmed that the project area does not contain any Indigenous Peoples, nor will they be affected by the project's activities.
52. **ESS 8: Cultural heritage.** The project will be implemented in areas with significant cultural and religious heritage. The ESIA identifies nearby cultural heritage sites including the National Memorial Chorten, Hejo Chorten, Dechencholing Palace, Dolma Lhakhang/Pangrizampa and other religious and cultural sites along the BPS route and Norzin Lam. Potential risks include vibration, dust, noise, access disruption, disruption of religious practices and chance finds during excavation. The ESMP includes chance-find procedures, consultation with relevant authorities, vibration monitoring, pre-construction condition surveys, dust and noise control, and cultural heritage management measures. The site-specific cultural heritage management measures will be finalized before works are begun near sensitive sites, including vibration thresholds, monitoring locations, access-maintenance arrangements, consultation with caretakers or Lams, and scheduling controls for religious events.
53. **Implementation arrangements and capacity.** The project will be implemented through a project management unit (PMU) housed in the Department of Human Settlement within the MoIT and a project implementation unit (PIU) housed in Thimphu Thromde, with CBS as the operational beneficiary for transport assets. A Project Steering Committee will provide strategic oversight, while the PMU and PIU will be supported by a Project Management and Supervision Consultant with dedicated E&S specialists. Contractors will be required to appoint qualified Environmental, Social and OHS officers and prepare C-ESMPs and subplans. The water-related ESMP assigns direct responsibility for water-component implementation to Thimphu Thromde PIU, with PMU oversight and Project Management and Supervision Consultant's technical supervision. This provides a workable implementation structure for a high-complexity Category B project, provided that staffing, training, contractor supervision and reporting remain commensurate with the scale and sequencing of works.
54. The Secretariat notes that implementation capacity is a key residual risk because the project involves dense urban construction, multiple contractors, overlapping works, sensitive receptors, livelihood impacts and operational transition of CBS. The project instruments provide for safeguards staffing, consultant support, training, contractor obligations and readiness measures. During implementation, the AE is expected to monitor timely mobilization of

required personnel, delivery of planned training, Project Management and Supervision Consultant supervision, contractor compliance with ESMPs and C-ESMPs, RAP implementation and corrective actions.

55. **Stakeholder engagement.** The SEP identifies affected parties, other interested parties and disadvantaged or vulnerable groups across the water, public-space and transport components. Stakeholders include affected landowners, businesses, tenants, road users, bus users, informal vendors, parking fee collectors, residents near terminals and road-widening sections, schools, hospitals, water users, utilities, government agencies, civil society organizations, women's organizations, persons with disabilities, flood-affected households and cultural heritage caretakers. Consultations have been undertaken over several rounds from 2022 to 2025 using public meetings, focus group discussions, key informant interviews and targeted consultations. Key issues raised include business disruption, parking loss, access restrictions, compensation, Norzin Lam pedestrianization, women's safety, accessibility for persons with disability, school safety, traffic congestion, bus reliability, water supply reliability, water quality, sewer overflows, electric vehicle battery disposal and GRM access.

56. The Stakeholder Engagement Plan and ESIA indicate that stakeholder feedback has informed project design, including phased implementation of Norzin Lam improvements, universal access features, RAP updates, gender-responsive design elements and continued engagement during implementation. This is broadly aligned with GCF expectations for meaningful, ongoing and inclusive stakeholder engagement. Consultations will continue during detailed design and implementation, including water-component consultations covering service disruption, advance notification, alternative water supply arrangements, water quality concerns, emergency or shortage communication, GRM awareness, and the needs of vulnerable users, schools, hospitals and water-dependent businesses.

57. **Grievance redress mechanism.** The project establishes a project-level GRM with multiple uptake channels, including contractor offices, thromde and MoIT offices, social media, email, thromde complaint system, toll-free number, Thuemis (Thimphu Thromde Local Area Plan Representatives), project focal officers and online submissions. It identifies grievance categories covering construction impacts, SEAH, operations-related grievances and RAP-related grievances. The project will also have a worker GRM under labour management arrangements and a dedicated SEAH pathway. The GRM provides for acknowledgement, registration, investigation, escalation, monitoring, reporting and appeals. The Secretariat considers the proposed GRM architecture broadly adequate, but recommends that consolidated standard operating procedures (SOP) for the GRM be prepared before RAP implementation and civil works, harmonizing the project GRM, RAP grievance process, worker GRM, contractor-level mechanisms, operational complaints and SEAH pathway.

58. **Sexual exploitation, abuse and harassment.** In accordance with the GCF Environmental and Social Policy, the AE has recognized SEAH as a relevant safeguard issue for this project, given the civil works, workforce-community interface, potential use of non-local and male-dominated labour, temporary worker accommodation, proximity of worksites to residential areas, schools and community spaces, and the project's passenger-facing public transport operations. The project identifies SEAH risk as moderate and considers risks to women, adolescent girls, persons with disabilities, public transport users, women workers and other vulnerable groups. The SEAH Prevention and Response Action Plan includes mitigation measures across construction and operations, including mandatory Codes of Conduct, worker and contractor training, community awareness, worker accommodation controls, confidential reporting channels, contractor monitoring, referral pathways, lighting, CCTV, emergency features, driver identification, passenger-facing complaint information and a CBS operational GRM/SOP to be developed before electric bus operations commence. The proposal also sets out a differentiated SEAH grievance pathway, whereby complaints may enter through broader project GRM channels or specialized service providers and are then routed confidentially to a

SEAH-specific pathway supported by the Gender/Gender-based Violence (GBV) Specialist, GBV Service Provider and SEAH GRM Committee. The Committee's role is framed around project accountability, fact-finding and corrective or disciplinary action, while survivor services, legal decisions, medical care and case management remain survivor-led and supported through external referral actors, including the Royal Bhutan Police Women and Child Protection Unit, hospitals, the Respect, Educate, Nurture and Empower Women organization, National Commission for Women and Children, PEMA Secretariat for mental health and child protection, District Women and Child Focal Persons and Community-based Support System volunteers. The approach is broadly consistent with GCF SEAH expectations on early risk identification, survivor-centred response, confidential grievance handling, referral mapping, contractor obligations and monitoring. During implementation, continued attention should be given to ensuring that the CBS operational GRM/SOP and related SEAH prevention measures are reflected in the final CBS Operations Manual and relevant operational instruments, including human resources, driver Code of Conduct and operator agreement documents, and that prevention and response measures adequately cover women CBS workers, including female drivers, terminal staff and customer-facing personnel.

59. The Secretariat notes that the full ESIA and ESMPs were disclosed in English, with Executive Summaries in Dzongkha, reflecting a project-specific language arrangement differing from the Secretariat's usual translation approach. This was considered in light of the AE's explanation that English is widely used and taught in Bhutan and MoIT's confirmation that the arrangement reflects prevailing national practice and supports public access to key E&S information through Dzongkha summaries.

4.2 Gender policy

60. The funding proposal demonstrates broad alignment with the requirements of the GCF Gender Policy through a project-specific gender assessment and a gender action plan tailored to the urban transport, public space, water resilience and institutional-strengthening dimensions of the Bhutan Livable and Resilient Cities Project. The proposal integrates women, persons with disabilities and vulnerable groups across the project design, with attention to women's participation in transport sector employment and leadership, women entrepreneurs and parking fee collectors affected by Norzin Lam redevelopment, women and users of public transport who have disabilities, and households and businesses affected by water shortages, planned shutdowns, flood risks and service disruptions related to water, sanitation and hygiene (WASH).

61. The gender assessment identifies gender-differentiated barriers and opportunities across the project's main intervention areas. It notes that women are underrepresented in decision-making and technical roles in the Department of Human Settlements/Ministry of Infrastructure and Transport, Thimphu Thromde and CBS, despite women's broader participation in some institutional workforces. Women remain concentrated in support and labour roles, with limited representation in technical, managerial and leadership positions. The assessment also identifies constraints linked to gender stereotypes, limited access to technical training and mentorship, childcare and eldercare responsibilities, and weak institutional gender-mainstreaming capacity.

62. The assessment also identifies project-specific livelihood risks for women entrepreneurs and parking fee collectors affected by the Norzin Lam redevelopment. It recognizes that women-owned and women-operated micro and small businesses may face temporary displacement, reduced foot traffic, access restrictions, construction-related dust and noise, disruption of supply chains, income loss, rental pressure and uncertainty over post-construction access to upgraded commercial spaces.

63. The assessment further identifies safety and accessibility concerns for women and persons with disabilities in public transport and related infrastructure. It notes that women users, particularly younger women and students, face heightened risk of harassment, discomfort and insecurity linked to overcrowding, poor lighting, limited driver accountability and weak reporting mechanisms. Persons with disabilities face barriers related to high bus steps, inadequate seating and grab bars, lack of tactile markers, braille signage and audio announcements, and limited assistance.

64. The gender assessment also addresses gendered WASH risks, including women's unpaid care and household water-management burden, the impacts of water shortages and service interruptions on hygiene and menstrual health, and the need for inclusive communication and alternative access arrangements during planned shutdowns, disruptions and flood-related emergencies. It positions women and vulnerable groups as direct beneficiaries of improved water reliability and continuity, not only as recipients of awareness activities.

65. Key challenges identified include:

- (a) limited representation of women in decision-making, technical and operational roles across the Department of Human Settlement /MoIT, Thimphu Thromde and CBS;
- (b) construction-related income disruption and post-construction recovery risks for women entrepreneurs and parking fee collectors affected by Norzin Lam redevelopment;
- (c) safety, accessibility and comfort barriers for women and persons with disabilities using public transport and related infrastructure;
- (d) gendered WASH burdens arising from water shortages, service disruptions and flood-related emergencies; and
- (e) the need to strengthen institutional capacity, monitoring and accountability for gender-responsive implementation.

66. The gender action plan builds on the gender assessment to address both structural and operational barriers. Activities include inclusive CBS recruitment, internships and apprenticeships for women in operational and technical roles, leadership development for women engineers, a gender-responsive CBS human resources manual, establishment of a crèche at a bus terminal, livelihood restoration and transition support for affected women entrepreneurs and parking fee collectors, inclusive bus and public-space design, gender-responsive water shutdown communication and emergency WASH measures, and capacity strengthening through a Gender Expert, staff sensitization, gender-responsive workplace infrastructure and gender-disaggregated monitoring. The plan incorporates measurable targets, including increasing the share of female CBS employees in technical, operational and managerial roles from 21 per cent to 30 per cent, supporting income recovery for affected entrepreneurs, improving women users' reported safety, accessibility and comfort in public transport, ensuring gender-disaggregated consultation before planned water shutdowns, and improving women's knowledge of flood-warning channels and emergency water points.

67. The gender action plan embeds an inclusion-oriented approach by addressing women, persons with disabilities, female-headed households, women-owned businesses, low-income residents, parking fee collectors, youth and other vulnerable groups. It links gender-responsive measures to project design and operations, including transport service management, bus and stop design, Norzin Lam public-space redevelopment, water-service continuity, emergency preparedness and institutional capacity. Indicative budget estimates are included for most activities in the gender action plan, and several are linked to project implementation arrangements, including PMU leadership, support from the Gender Expert, and implementation roles for Thimphu Thromde, CBS, civil society organizations, local consultants and contractors.

68. The gender action plan will be led by the PMU within the Department of Human Settlement, supported by a Gender Expert, with implementation roles for Thimphu Thromde and CBS. This is consistent with GCF requirements that AEs dedicate appropriate financial, human and institutional resources to support implementation of the project-level gender action plan.

4.3 Risks

4.3.1. Accredited entity/executing entity capability to execute the current project (medium risk)

69. The World Bank will serve as the AE, and the executing entity will be the Kingdom of Bhutan through its MoIT and the city government. The AE will be responsible for supervising project implementation and report to GCF while the executing entity will be responsible for overall project coordination with the project implementation unit. The World Bank has extensive experience working in development projects in Bhutan including projects for the water, transport and urban sectors. The MoIT is the lead agency in implementing infrastructure investments including those from donor-financed projects and has experience coordinating multi-agency infrastructure programmes. The city government will be responsible for municipal administration and service delivery in Thimphu.

4.3.2. Project-specific execution risks (medium risk)

70. **Natural hazard risk:** The country's capital, Thimphu, is exposed to flooding, rainfall and other extreme events that could disrupt works and/or damage project assets leading to delays in completion.

71. **Counterparty risk:** The AE (World Bank - IBRD/IDA) is a top-tier multilateral rated AAA/Stable/1-1+ by S&P (Apr 2026). Its credit profile is characterised by a unique combination of near-sovereign backing, exceptional governance, and strong financial buffer. While leverage is a point of focus, its shareholder support structure, market access, and prudent risk management frameworks make it a resilient AE. GCF credit risk on the AE is therefore negligible

72. **Sovereign credit risk:** Bhutan is not rated by external credit rating agencies. Based on internal assessment, GCF credit exposure to Bhutan is comparable to other medium rated sovereign credit that are below investment grade. Bhutan has a small, concentrated economy which is highly dependent on hydropower exports to India. Its total public debt is approximately 118% of GDP (FY2024/25) and is projected to rise to 145% by FY 2028/29, driven by hydropower contingent liabilities. Following Bhutan's graduation from the LDC category in 2023, preferential aid is declining.

73. **Foreign currency risk.** The GCF loan will be denominated in USD and future currency volatility will be absorbed by the sovereign borrower's credit.

4.3.3. Compliance risk (medium risk)

74. The project presents heightened inherent compliance risk due to the nature of the proposed activities, particularly urban infrastructure, civil works, information and communication technology systems, consulting services, and operation and maintenance-related activities. These activities increase exposure to potential procurement, contractor and consultant management, fraud, corruption, collusion, misprocurement, and use-of-proceeds risks. Institutional strengthening and project management activities present comparatively lower inherent money-laundering, financing of terrorism and prohibited practices risk.

75. These risks are mitigated to some extent by the AE's established fiduciary, procurement, anti-money-laundering and countering the financing of terrorism, sanctions, and integrity control framework. GCF proceeds will be held in a separate Trust Fund and administered in accordance with World Bank procedures, with project expenditures and disbursements subject to annual independent audit. Procurement will follow World Bank requirements, including screening, due diligence, contract-level risk assessment, prior and post review, supervision and escalation mechanisms. Additional mitigants include beneficial ownership disclosure for relevant procurement, contractual integrity provisions, independent review of civil works and recruitment processes, and established channels for fraud and corruption allegations, including potential referral to the World Bank Integrity Vice Presidency.

76. Residual risk remains, due to the scale of infrastructure and construction activities, the number of counterparties, procurement and contract management complexity, and the practical limitations of post-delivery end-use monitoring. However, taking into account the AE's institutional control framework and project-level monitoring, audit, screening, supervision and escalation arrangements, the overall compliance risk is assessed as medium.

4.3.4. GCF portfolio concentration risk

77. In case of approval, the impact of this proposal on the GCF concentration risk will remain within the monitoring thresholds of the risk appetite statement in terms of results areas, single proposal or AE concentration.

78. It is recommended that the Board consider the above factors in its decision.

Summary risk assessment	
Overall project/programme	Medium
Accredited entity/executing entity capability	Medium
Project/programme-specific execution	Medium
Compliance	Medium
GCF portfolio concentration	Within the monitoring thresholds

4.4 Fiduciary

79. As the AE, the World Bank will be responsible for the management and administration of GCF resources, in accordance with its policies, procedures and practices, as well as the relevant provisions of the funded activity agreement and the accreditation master agreement (AMA). The World Bank will enter into agreements with the executing entities – the Ministry of Finance and the Ministry of Infrastructure and Transport (MoIT) of the Royal Government of Bhutan – to make available GCF and IDA financing for eligible project activities, consistent with the provisions of the funded activity agreement.

80. A PMU will be established within MoIT, staffed with dedicated project management, financial management, procurement, E&S safeguards, and monitoring and evaluation specialists. A PIU within the Thimphu Thromde will implement the water supply subcomponent. A Project Steering Committee chaired by the Secretary of MoIT will provide strategic oversight. Financial management and procurement will be carried out in accordance with the World Bank Procurement Regulations for Investment Project Financing borrowers. The project will ensure robust external audit arrangements consistent with World Bank and GCF requirements.

4.5 Results monitoring and reporting

81. This cross-cutting project contributes to GCF mitigation results area 2 (low-emission transport) and adaptation results areas (ARA) 2 and 3 (water security; infrastructure and built environment), with additional contributions to Integrated Results Management Framework Core Indicators 3, 5 and 6. It targets GHG reductions of 3,818 t CO₂ eq by mid-term, 11,339 t CO₂ eq by project completion (2031), and 69,519 t CO₂ eq over the 20-year lifetime (2029–2048). Direct beneficiaries are estimated at 104,162 (50,519 women; 48.5 per cent), comprising 52,046 water-supply beneficiaries (ARA 2) and 72,448 transport beneficiaries (ARA 3) with overlap removed. Indirect beneficiaries total 271,871 (134,857 women; 48.5 per cent).

82. Annex 22 sets out GHG calculations using Clean Development Mechanism approved methodology 0031 v8.0 (bus rapid transit), with transparent assumptions on ridership growth (7.9 per cent bus mode share in 2023 rising to 25 per cent by 2048), the hydropower-based grid factor, and inputs from the Sunjin Traffic Demand Management. The monitoring and evaluation plan (annex 11 of the funding proposal package) anchors monitoring in quarterly interim unaudited financial reports, annual performance reports, an interim report at Component 1 completion, a year-3 mid-term evaluation, and a final independent evaluation submitted to GCF. Data sources include SCADA, CBS smartcard and intelligent transport system, household and traffic surveys (USD 155,000), gender-based safety surveys (USD 20,000), permanent air-quality monitoring (USD 5,000), capacity assessments, and third-party GHG verification using the same ex-ante methodology. Project-wide baselines and climate-resilience proxy indicators (corridor flood/landslide closure days; dry-season supply hours) will be confirmed at inception.

83. The theory of change, logical framework, Integrated Results Management Framework indicators, and adaptation beneficiaries analysis were iteratively strengthened across multiple rounds of review, with supplementary indicators (corridor closure days, dry-season supply hours, SCADA coverage, household water access, non-fare revenue share), and materially reinforced the adaptation framing. The indicative monitoring budget outlined in annex 11 is internally consistent with subcomponent 2.3(c) of the detailed budget (annex 04 of the funding proposal package), and roles for data collection and reporting across the PMU, Thimphu Thromde PIU, CBS, and third-party firms are clearly assigned. The Secretariat is satisfied that the results framework is robust and aligned with the Integrated Results Management Framework.

4.6 Legal assessment

84. The legal arrangements for the project will be based on the accreditation master agreement between GCF and the Accredited Entity which has been signed and is effective (the “**AMA**”). Consequently, they will consist of a project-specific funded activity agreement which incorporates the AMA.

85. The Accredited Entity has not provided a legal opinion/certificate confirming that it has obtained all internal approvals and it has the capacity and authority to implement the project.

86. The proposed project will be implemented in the Kingdom of Bhutan (the “**Host Country**”). GCF has been granted privileges and immunities in the Host Country.

87. GCF does not hold industrial property protection for its combined logo (sphere with the words “Green Climate Fund”) in the Host Country. This means that, while industrial property protection is pending, (i) GCF’s combined logo could be used by other entities or individuals (including those seeking to impersonate GCF) and (ii) there could be legal claims by entities or individuals asserting their protected trademark, opposing GCF using its combined logo in the country. In both cases, this may lead to reputational risk.

88. To address the matters raised in this section and to facilitate prompt implementation of the project, it is recommended that any approval by the Board is made subject to the following conditions:

- (a) Submission by the Accredited Entity to GCF of a certificate or legal opinion, in form and substance satisfactory to the GCF Secretariat, within 120 days after Board approval, confirming that the Accredited Entity has obtained all final internal approvals needed by it and has the capacity and authority to implement the proposed project;
- (b) Signature of the funded activity agreement in a form and substance satisfactory to the GCF Secretariat within 180 days from the date of Board approval, or the date the Accredited Entity has provided a certificate or legal opinion confirming that it has obtained all final internal approvals, whichever is later; and
- (c) Completion of the legal due diligence to the satisfaction of the GCF Secretariat prior to the signature of the funded activity agreement.

Independent Technical Advisory Panel's assessment of FP315

Proposal name:	Bhutan Livable and Resilient Cities Project (LRCP)
Accredited entity:	International Bank for Reconstruction and Development and International Development Association (World Bank)
Country/(ies):	Bhutan
Project/programme size:	Small

I. Assessment of the independent Technical Advisory Panel

1.1 Overview

1. Transport emissions are a major greenhouse gas (GHG) emission source in Bhutan: in 2023 around 25 per cent of GHG emissions excluding land use, land-use change, and forestry were from the transport sector.¹ Bhutan has experienced an average annual growth rate of transport emissions of more than 8 per cent over the last 15 years – only being interrupted by the coronavirus disease 2019 but resurging again since 2021/2022. The project intervention focuses on reducing road-based passenger transport emissions in Thimphu.
2. Bhutan faces growing climate risks, with floods and landslides threatening all kinds of urban infrastructure. Climate projections indicate increasing rainfall intensity and more frequent extreme events, but also higher peak temperatures and greater seasonal variability in water availability, including recurrent droughts. The climate risks are compounded by institutional barriers that limit response capacity. In the water sector, ageing distribution networks with high levels of leakage result in limited water services to the population. The project promotes operational autonomy and performance management tools needed to manage climate risks proactively, along with upgrading and climate-proofing of infrastructure.
3. The project combines low-emission resilient urban public transport investments with measures to strengthen the resilience of critical water infrastructure and services in Thimphu, the capital and largest city of Bhutan. Transport and water have been identified by Bhutan as climate priority areas. The project's justification for combining the two areas is based on being entry points for achieving integrated urban climate resilience. The project design, however, shows limited interactions between the two areas. Also, the two components are not integrated into broader urban planning or related to cross-sectoral resilience measures.
4. The viewpoint of the independent Technical Advisory Panel (iTAP) is that it would have been more effective and offered larger potential to achieve a high transformational impact if the project had focused either (a) solely on the transport sector combining supply and demand interventions, measures for (urban) freight and passenger transport, comprehensive initiatives to establish an ecosystem to accelerate the transition to e-mobility, and actions to increase the climate resilience of urban mobility; or (b) have integrated urban resilience measures across all sectors in Thimphu. The proposed project is a limited intervention addressing two identified problems that have limited interaction. The merits of intending to solve these two problems is not questioned; however, a project design focusing on one area but in a more comprehensive

¹ ClimateWatch data.

manner could have gone beyond standard investment project interventions towards a transformational approach.

5. Component 1 of the project (83 per cent of the total investment) finances a low-carbon and resilient public transport service built around a bus priority infrastructure while strengthening water supply systems. Subcomponent 1.1. strengthens water supply systems combining infrastructure rehabilitation, digital monitoring and operational improvements. This subcomponent accounts for 12 per cent of the total project investment and is 49 per cent grant and 51 per cent loan financed by the World Bank. Subcomponent 1.2 improves the convenience and resilience of sidewalks to encourage increased walking combined with public transport. This subcomponent accounts for 14 per cent of the total project investment and is fully grant financed by GCF. Subcomponent 1.3 focuses on the establishment of a bus-based public transport system including a 19-kilometre bus priority corridor operated by 50 electric buses, an intelligent transport system including e-ticketing, upgraded bus stations and terminals. This subcomponent accounts for 57 per cent of the total project investment and is grant and loan financed by GCF and the World Bank. Component 2 of the project (17 per cent of total investment) includes project management (5 per cent of total investment) grant financed by the GCF and the World Bank and measures for capacity-building and institutional strengthening in the water and the transport sector (12% of total investment) grant financed by the World Bank (water sector) and by GCF (transport sector). Transport capacity-building is focused on strengthening the state-owned bus operator. USD 500,000 or 1 per cent of funds (activities 2.2.e and 2.2.h) are reserved for promoting non-motorized transport and assessing other low-carbon transport measures such as parking demand management.

6. The small amount of funds assigned to transport measures which are not related to the establishment of a bus priority system, as well as the lack of concrete implementation targets, clearly indicate the limited scope of the project – with a concentration on improving public transport supply without integrating transport demand measures beyond study reports. A more appropriate title for the transport component of the project would be the establishment of a low-carbon and resilient bus priority system.

7. The project is public sector with the accredited entity (AE) being the World Bank and the executing entity being the Government of the Royal Kingdom of Bhutan, represented by its Ministry of Finance and acting through its Ministry of Infrastructure and Transport. The total investment volume is USD 48 million, of which USD 28 million is GCF-funded. GCF funding includes USD 22.4 million grants and USD 5.6 million concessional loans. The implementation period is five years.

1.2 Impact potential

Scale: N/A

8. The project has an expected mitigation outcome of reducing around 70,000 tonnes of carbon dioxide (t CO₂) over the lifespan of 20 years and an expected adaptation outcome affecting around 104,000 direct beneficiaries and 270,000 indirect beneficiaries. Direct beneficiaries represent 13 per cent of the population of Bhutan.

9. The mitigation impact is achieved by the transport intervention. The transport investment results in reduced GHG emissions through a technology shift from fossil-fuel powered buses to electric units and through a modal shift from conventional modes of transport, including the existing bus service, taxis and ride-hailing services, passenger cars, motorcycles and non-motorized transport, towards a new public transport system which is faster and more convenient as well as having lower emissions per passenger-kilometre. The project has separated the two impacts – quantifying the impacts from the technology shift separately from those related to the modal shift. The iTAP considers this as important to have a

better understanding of the GHG emissions reductions as well as air quality impacts of different measures and their cost-effectiveness. Methodologically, a separation of impacts can be done using the approved United Nations Framework Convention on Climate Change (UNFCCC) Clean Development Mechanism methodology for a shift to electric vehicles² to determine the technology impact and the approved UNFCCC methodology for bus rapid transit (BRT) systems³ or the UNFCCC approved methodology for mass transit systems⁴ for determination of the modal-shift impact. To avoid double counting, the modal-shift impact is calculated as if new fossil fuel buses would be used to run the new mass transit system.

10. The technology impact is calculated based on using electric buses in the with-project scenario, instead of diesel units in the scenario without the project. Bhutan, at the moment, has only a very limited usage of electric buses and recent entries of the buses have been supported by grants from the Indian government. Therefore, it is reasonable to assume a baseline of diesel-powered buses. Electricity is produced in Bhutan to 100 per cent by renewables (almost entirely hydropower) with a grid factor of zero. Emission reductions are due to the difference between GHG emissions using same size new diesel buses versus electric units. The resultant calculations show expected annual emission reductions of 3,200 t CO₂ for the 50 nine-metre long buses or 64,000 t CO₂ cumulatively reduced over a 20-year period (assuming bus renewal after 10–12 years). A life-cycle approach including up- and downstream GHG emissions for bus manufacturing and disposal (including battery manufacturing for electric buses) would result in higher emission reductions, as significant GHG baseline emissions from fossil fuel extraction, refinery and transport are not accounted for in the baseline.⁵ The calculation performed by the project is in accordance with the cited UNFCCC methodology and uses conservative parameters.

11. The modal-shift impact is due to having a modern, convenient and attractive public transport system which can attract passengers from other modes of transport in the with-project scenario. It can be expected that the share of the public transit mode increases from a relatively low base level of 15 per cent. The new public transport system largely replaces the currently operating system while expanding its coverage and improving its performance. Many users of the new system will thus be current public transport users, while additional passengers from high-emission modes such as passenger cars and taxis are also attracted. The stand-alone emission reduction impact through modal shift is cumulative over a 20-year period only around 5,000 t CO₂. The stand-alone impact is calculated based on using diesel buses for the new system, resulting in approximatively 30 grams CO₂ per passenger-kilometre, which is higher than the emissions per passenger-kilometre of the current buses operated by the City Bus Service (CBS). CBS currently operates smaller and less convenient buses than those planned in the new system with less convenience for clients. Compared to passenger cars and taxis, the new bus system, even if operated by diesel units, has emission advantages. Based on the usage of -buses, the emission reductions are cumulative to 69,000 t CO₂. However, 65,000 of the 69,000 t CO₂ reduction is due to the technology shift towards electric buses. Calculations performed by the AE are based on the UNFCCC methodology AM0031 with conservatively assumed values for the different data parameters.

² UNFCCC, AMS-III.C Emission reductions by electric and hybrid vehicles;

<https://cdm.unfccc.int/UserManagement/FileStorage/074L1U9KACQDM3RVPZIE0FHW8I2NTR>

³ UNFCCC, AM0031, Bus rapid transit projects:

<https://cdm.unfccc.int/UserManagement/FileStorage/ODC84B1TWGMFUI3XR9V7AZ52E06HKY>

⁴ UNFCCC, ACM0016, Mass rapid transit projects;

<https://cdm.unfccc.int/UserManagement/FileStorage/AGIYJ9LB47D8M61O5FWCQ0ZVENUXST>

⁵ Estimates of the iTAP indicate that embedded battery emissions are recovered within three months of operations of an electric bus in Thimphu (based on battery sets of 200 kilowatt-hour (kWh) for a nine-metre bus, usage of lithium iron phosphate batteries with battery manufacturing emissions of 70 kilogram/kWh, and annual emission reductions per bus of 64 t CO₂). Batteries have a guaranteed lifespan of 8 years at 80 per cent state of health with an expected commercial lifespan of 10 years.

12. The combined GHG mitigation impact is estimated at a cumulative 69,000 t CO₂. This value is considered by the iTAP to be materially correct, in line with internationally recognized and peer reviewed methodologies, and conservative.
13. The adaptation impact in terms of direct and indirect beneficiaries is calculated separately for the transport and the water sector interventions. The sum of direct and indirect beneficiaries for both the transport and water sectors is adjusted to avoid double counting resulting in 104,000 direct beneficiaries (58 per cent from the transport sector and 42 per cent from the water sector) and 270,000 indirect beneficiaries (59 per cent from the transport area and 51 per cent from the water area).
14. In the transport sector, the project invests in improved stormwater drainage, climate resilient road and bridge upgrades, and urban greening in public spaces. These measures are expected to reduce vulnerability to flooding and related disruptions along the bus corridor, as well as exposure to extreme heat. Direct beneficiaries are residents who use the improved public transit and non-motorized transport infrastructure, with an estimated 72,000 residents expected to benefit directly by project completion. Indirect beneficiaries include Thimphu residents who occasionally use the city's main north-south corridor and core urban public spaces, as well as tourists who use these areas. This amounts to approximately 310,000 indirect beneficiaries, excluding direct beneficiaries to avoid double counting.
15. In the water sector, the project's key direct adaptation benefits are improved access to treated water for core city residents and enhanced resilience of water supply to landslide erosion and drought. The resilience of the city's water supply system to climate hazards is improved, resulting in adaptation benefits for all users of the city water supply system. Direct beneficiaries are core area residents with improved safe water availability estimated at 52,000 people. Indirect beneficiaries are residents outside the core area and tourists and visitors adding up to 320,000 indirect beneficiaries.
16. The iTAP considers the calculations of the adaptation impact to be materially correct and conservative. The mitigation impact can be considered relatively limited compared to the project investment. However, this is related to the small size of the city which makes interventions in the transport sector per passenger transported more expensive. Around 13 per cent of the country's population are direct beneficiaries, which is considered a high impact.
17. Overall, the iTAP considers the impact potential as medium to high – achieving potentially significant adaptation benefits as well as a mitigation benefit, albeit limited.

1.3 Paradigm shift potential

Scale: N/A

18. The project intends to make urban water services more reliable and more resilient to climate hazards. In the transport sector the project intends to make urban mobility more climate resilient and less reliant on passenger cars. In both areas institutional strengthening is a core aspect to make changes sustained and to create the framework for ongoing improvements.
19. The proposed priority bus lane public transport system is a first for Bhutan. This is, however, also related to the relatively small size of Thimphu (around 120,000 residents); cities of this size mostly do not have and do not require BRT systems which cater for higher passenger demand. Outside Thimphu, cities in Bhutan are smaller and therefore the replicability potential of the bus system within the country is considered as marginal.
20. Electrifying the bus fleet is an important step towards decarbonization. However, Bhutan had already introduced a similar number of electric buses earlier in 2026 under an Indian-backed green mobility project. While the GCF intervention is important, its electrification component is therefore not innovative. The project states that it is embedded in and contributes

to the country's "Long-Term Low Greenhouse Gas Emission and Climate Resilient Development Strategy" (LTS). The LTS targets 100 per cent electric bus sales – not vehicle stock – by 2045. It would be commendable if the project helped create conditions for a more ambitious LTS. A target of 100 per cent electric bus sales by 2045 can be considered business as usual, since comparable countries have set goals of 100 per cent electric urban bus sales by 2030 or 2035. Targets could instead distinguish between urban and intercity bus operations. Beyond establishing the low-carbon bus system in Thimphu, the project currently includes no mechanisms or activities that would point to a paradigm shift in the rising transport emissions in Bhutan. Achieving such a shift would require a more comprehensive low-carbon mobility approach for Thimphu, together with concrete actions to scale these activities beyond the city. As currently designed, the project is basically a well-designed stand-alone intervention to improve Thimphu's public transport system.

21. The project intends that the transition from CBS to a state-owned enterprise operating under a public service agreement with clear mandates and accountability structures can be replicated in other cities. This will require, however, extensive capacity-building and training efforts. The project currently has one budget line which represents an investment in scaling and replicating efforts beyond Thimphu: "2.2.a Support to CBS in its establishment as a SOE [state-owned enterprise] with a national mandate to develop public transport nationally under public service agreements with other thromdes (urban local government entity)" with a budget of USD 60,000. This limited budget will not be sufficient to transform structures in other cities. While the "blueprint" is a first step, it will not result in replication without the creation of the required enabling conditions.

22. In the water sector it is intended to scale up through replication of the governance and operational structure which will provide a replicable blueprint for other cities and areas in Bhutan. In contrast to the transport sector, the project has a budget and activity line which concretely address replication and scaling process: "1(f) Provision of institutional strengthening and policy support for the prioritization, structuring and development of technical specifications for further water projects, policies and regulations including option to increase private sector involvement in water service delivery in smaller thromdes", including workshops and trainings with a budget of around USD 500,000. The project's important focus on reducing non-revenue water and going from intermittent towards continuous supply is strategically combined with increased operational autonomy.

23. In most developing country settings the proposed project could be considered as business as usual and non-additional. In the majority of countries, especially those with a BRT system, electric buses have a lower total cost of ownership than fossil fuel buses and urban electric-bus deployment is occurring in dozens of countries. BRT systems have also been a standard public transport solution for several decades, implemented by multiple cities to upgrade public transport systems and reduce congestion. A modern BRT infrastructure design also incorporates general resilience measures related especially to flooding and heatwaves to preserve the investment realized. GCF investments should go beyond these business-as-usual practices. This would imply, for example, investments in projects which include a comprehensive approach to shift from a car-oriented city towards a people-oriented one, with measures to achieve low-carbon urban mobility encompassing all modes of transport, including passenger and freight transport, and monitoring measures which take account of city-wide CO₂ emissions. Innovative approaches which have the potential to result in a paradigm shift go beyond isolated investments to improve the public transport supply. It is recognized that the Bhutan project also includes measures to increase the quality of walkways. Other measures are, however, limited to studies and reports with a very small budget and no targets or implementation activities. The iTAP recommends that future urban transport projects considered by GCF be more ambitious and innovative and that they go beyond conventional and

widely implemented measures to warrant the concessionality of GCF funds, especially of grants, thereby ensuring the additionality of measures and the targeted paradigm shift.

24. Based on the above points, the iTAP considers the paradigm shift potential of the project to be low to medium.

1.4 Sustainable development potential

Scale: N/A

25. The project has positive impacts in the environmental, social and economic field and is aligned with several Sustainable Development Goals (SDGs): SDG 3 (ensure healthy lives and promote well-being for all at all ages), SDG 6 (ensure availability and sustainable management of water and sanitation for all), SDG 7 (ensure access to affordable, reliable, sustainable and modern energy for all), SDG 9 (build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation), SDG 11 (make cities and human settlements inclusive, safe, resilient and sustainable), and SDG 13 (take urgent action to combat climate change and its impacts).

26. In the environmental area the major positive impact is on improved air quality due to reducing emissions primarily of nitrogen oxides and fine particulate matter. Emissions are reduced through usage of zero-combustion emission electric buses and through a modal shift from high-emission modes of transport to low-emission ones. The project also saves energy as electric engines have a factor 3 lower energy usage for traction than fossil fuel engines. In addition, mode switch results in a shift from high-energy usage passenger cars and ride-hailing vehicles to buses. Electric buses and a mobility system based on public transport also result in reduced noise levels.

27. In the social area, the transport element of the project improves quality of life by creating a city which is less focused on private means of mobility, thus increasing the liveability of the city as well as reducing the number of accidents. The improved air quality also reduces respiratory diseases affecting mainly children, elderly and more vulnerable people. In the water sector, significantly increasing the available daily water supply reduces the risk of water-related disease outbreaks and enhances public health. It also reduces the time and health burden for more vulnerable households that have to carry water to their homes. This burden is met disproportionately by women and girls and is exacerbated during dry periods.

28. The project improves economic well-being directly through reduced time spent on travel, reduced accident rates, reduced spending for vehicle maintenance and operations and reduced health costs from diseases related to air pollution. In the long term, people's quality of life and happiness improve with a people-centred mobility structure, which enhances the attractiveness of the city and improves tourists' and travellers' experience in Thimphu. Usage of electric buses and increased usage of public and non-motorized transport also result in reduced fossil fuel imports and thus positively affect the balance of payments of Bhutan. Bhutan produces electricity purely with renewable means and has surplus electricity generation which is exported to India. New power projects will increase this surplus even during the dry season. Bhutan can thus reduce its dependency on imports and exposure to external price fluctuations in the fossil fuel market.

29. Women rely more heavily on public transport than men in Thimphu. Improving the public transport system and its security thus directly benefit women. Increased water supply reliability also directly reduces the burden of water collection borne primarily by women.

30. Overall, the project's sustainable development potential is considered by the iTAP to be high.

1.5 Needs of the recipient

Scale: N/A

31. Bhutan is a lower-middle-income country, with a population of 0.8 million of which 45 per cent are living in urban areas with Thimphu, the capital and largest city, having around 120,000 residents.
32. Bhutan faces acute and growing climate vulnerability driven by climate change. Increased rainfall intensity, higher peak temperatures, and greater seasonal variability in water availability affect the capital. Thimphu's road network is highly exposed to flooding, inadequate drainage and climate-induced disruptions. Infrastructure is mostly located along drainage basins, which are vulnerable to heavy monsoon rains and glacial lake outburst floods. Thimphu is also vulnerable to landslides due to its location and heavy seasonal rainfall. In the water sector, climate variability is affecting an ageing distribution network. Thimphu's water supply system relies primarily on surface water sources sensitive to seasonal rainfall variability, leading to periodic supply shortages during the dry season. The water transmission pipelines are exposed to landslides and slope failures, especially during monsoon events. The climate hazards experienced by Thimphu exacerbate infrastructure and water management challenges.
33. Transport emissions are one of the major GHG emission sources of the country and have grown rapidly in the last two decades, driven by economic growth and a rapidly expanding private car fleet.
34. The institutional capacity and limited availability of well-trained and experienced staff to manage urban services aggravate the underlying problem. In the water sector non-revenue water losses exceed 50 per cent due to leaks and unauthorized connections, highlighting system inefficiencies and structural weaknesses.
35. The fiscal deficit of Bhutan is high, and the available concessional financing envelope is more limited since Bhutan graduated from a least developed country in 2023. With commercial finance, the two public sector interventions (BRT and water interventions) would each produce a negative financial internal rate of return.
36. Based on the above aspects, the iTAP considers the needs of the recipient to be high.

1.6 Country ownership

Scale: N/A

37. The no-objection letter of the Government of Bhutan has been provided.
38. The AE held various stakeholder meetings prior to presenting the project. Notable is a very low participation of women in the stakeholder meetings. The AE responded to a question raised by the iTAP concerning the low level of female participation stating that this is acknowledged and not uncommon in public meetings in Bhutan. The project design foresees dedicated gender staff to focus on the needs of women. The project has mapped out future stakeholder events to take place during project implementation. The iTAP recommends that specific care is taken to ensure adequate participation of women, potentially also holding women-only events.
39. The project is aligned with the third nationally determined contribution of Bhutan which includes promotion of electric vehicles. It does not explicitly include the BRT system but rather refers to a light-rail transit system which would, however, incur significantly higher investment costs than the planned bus system.
40. The project is aligned with various national and local plans such as the Low Emission Transport Master Plan, the 2021 Low Emission Development Strategy for Transport, the Water Sector Master Plan, the Thimphu Structure Plan, and the City Core Action Plan. The project activities are also embedded within thirteenth Five-Year Plan (2024–2029) of Bhutan.

41. Project assets will be owned by local entities with public service mandates. Water infrastructure will vest in Thimphu thromde, responsible for municipal water and wastewater delivery, while the transport project assets will be transferred to CBS, which holds the mandate for low-emission public transport in Thimphu. It is notable that no national counterpart finance is included in the project. The iTAP takes note of the explanation provided by the World Bank that such funds do not flow through the World Bank and thus the latter has no control and could not fulfil GCF requirements. However, other comparable projects involving multilateral development banks do benefit from national finance, such as the BRT system in Karachi (funding proposal 85).

42. The executing entity is the Ministry of Finance acting through the Ministry of Infrastructure and Transport. Both are established ministries with past project experience with multilateral development banks including the World Bank. The institutional and technical capacity to manage such projects is nevertheless limited and the ministries lack professional staff with practical experience in these areas. Component 2, which will strengthen the institutional and staff capacities within the executing entities is thus deemed as critical for project success. The World Bank intends to strengthen the project management unit with a project management consultant. While this approach is considered valid in principle, it will be critical to ensure that project success is measured by deliverables in terms of counterpart capability rather than consultant output, in order to avoid dependency on external consultants and to ensure national decision-making.

43. Based on above aspects, the iTAP considers the country ownership of the recipient to be medium to high.

1.7 Efficiency and effectiveness

Scale: N/A

44. The project has adaptation and mitigation benefits. Based on the mitigation investment of the GCF and the expected mitigation impact, the cost per t CO₂ is in the order of USD 350. Compared to other GCF interventions this is a very high cost. However, Bhutan is a very small country and mitigation costs, especially in the transport sector, are thus more comparable to interventions in small island developing states. Mitigation impacts have also been calculated in a conservative manner and are related to a direct project intervention while programme approaches financed by GCF often rely on very optimistic calculations based on assumptions of actual project interventions which might or might not happen. The proposed project, on the other hand, has significant resilience impacts and a large array of important sustainable development benefits.

45. The effectiveness of GCF investments could be enhanced by dedicating more resources to a more comprehensive urban mobility approach as well as by strengthening the approach of Bhutan towards deployment of electric mobility. This would result in a more transformational and larger GHG impact.

46. The iTAP questions the efficiency of spending close to USD 4 million or 15 per cent of the total bus system investment in the procurement of an intelligent transport system including smart ticketing. This is proportionally far more than in other BRT systems. The technical approach used also seems to disregard newest low-cost applications available in this area. As an example, the cost-effectiveness of screen displays at bus stops on a bus priority route with headways of less than 10 minutes during peak times and where delays are potentially in the minutes, can be questioned, since there are far cheaper smartphone applications now available. The current technical design gives the impression of simply copying other larger-scale BRT systems without considering the value added of the particular component and what low-cost alternatives exist.

47. The iTAP recommends that the project team reviews the design of the charging infrastructure based currently on separate fast charging stations. With the daily mileage of Thimphu buses and currently available off-the-shelf electric buses, overnight charging would probably present a more convenient, simpler and lower cost approach. In bus depots, using centralized container solutions for the charging infrastructure with charge piles per bus, considerably reduces cabling costs and allows for smart charging with lower grid stress and grid costs. The iTAP does not exclude that the current technical proposal could be the most effective one but recommends the project to assess other low-cost and smart-energy options as implemented by multiple other cities worldwide.

48. The iTAP recommends a review of expenditure for monitoring kerb-side air quality. Kerb-side air quality will simply monitor what vehicles along the road emit. Logically, the use of electric buses will result in lower values. The reductions in emission (not immission) terms can be estimated based on combustion emission values of fossil vehicles as provided by the widely used European emission model COPERT, for example. Monitoring kerb-side air quality levels will not add additional information and is also not relevant for the health of the city population where ambient air quality is relevant.⁶ Calculating the emission impact is also more relevant for the project as it can effectively separate changes induced by the project from external changes that are not controlled by the project.

49. Money saved in areas such as an intelligent transport system, charging or monitoring, could be used in areas with a potential direct impact on reducing emissions, such as investing additional resources in the implementation of comprehensive urban mobility measures.

50. The total project investment is USD 48 million of which GCF contributes USD 28 million. The World Bank as AE contributes USD 20 million resulting in a co-financing ratio of 0.7:1. GCF contributions are USD 22.4 million grant (80 per cent grant) and the rest a 20-year loan at 0.75 per cent interest rate, while the World Bank contributions are USD 10 million grant (50 per cent) and a 40-year loan of USD 10 million at a 2 per cent interest rate. The grant share for a mitigation project is very high. This is justified by the AE based on the financial situation of Bhutan and the limited potential for cost recovery from water and public transport investments, as well as by rather high unit costs for the transport system due to the small city size.

51. GCF grant finance is used for resilience and infrastructure investments in the transport sector – investments that cannot be recovered with user fees. For bus investments, loans are given. This is justified as the total cost of ownership of electric buses in Bhutan is lower than for comparable fossil fuel buses; with concessional loans the higher upfront investment can be spread out, thus matching the lower operational expenditures of electric buses and allowing for comparable or even lower annual cash disbursements. Buses will also need to be replaced with own means, and a sufficiently high cost recovery from user fees should enable the service provider to make re-investments accordingly. This approach is also compatible with GCF investments in other transport and e-mobility projects, where grants were not used to finance investments with a financial recovery potential and with equivalent or lower total lifetime costs compared to the baseline fossil alternative.

52. Both interventions (water and transport areas) have high economic internal rates of return but are financially non-profitable as user fees can only cover a share of total costs. This is common worldwide for public transport as well as water investments. The Government of Bhutan currently subsidizes these services and will continue to cover the deficits from the service provision. The improved institutional competence and management will result in improved cost recovery – however, also in the future, the Government of Bhutan will need to cover substantial deficits. The government has committed to covering such deficits. At least in the transport sector it would be worthwhile to assess the option that passenger car users could

⁶ Ambient air quality is not monitored with the same approach and equipment as kerb-side air quality.

pay for the deficits of public transport service provision through increased fuel taxes to pay for external economic and environmental costs associated with car usage.

53. The overall iTAP assessment of the project's efficiency and effectiveness is low to medium.

II. Overall remarks from the independent Technical Advisory Panel

54. The iTAP recommends that the Board approve this funding proposal. The project responds to a need of Bhutan and resolves, at least partially, urban mobility and water problems of Thimphu after years of discussing potential solutions without any practical implementation (the initial Concept Note received by GCF was from 2016, thus 10 years ago).

Response from the accredited entity to the independent Technical Advisory Panel's assessment (FP315)

Proposal name:	Bhutan Livable and Resilient Cities Project (LRCP)
Accredited entity:	International Bank for Reconstruction and Development and International Development Association (World Bank)
Country/(ies):	Bhutan
Project/programme size:	Small

Impact potential

The AE welcomes the iTAP's finding that the mitigation and adaptation estimates are materially correct, methodologically sound, and conservative. The project delivers both mitigation and adaptation impacts. Emission reductions are conservatively estimated, with volume constrained by the size of Thimphu rather than by design. 104,000 direct and 270,000 indirect beneficiaries, around 13 per cent of Bhutan's population, will gain from more resilient water and transport services.

Paradigm shift potential

The AE appreciates the iTAP's careful consideration of this criterion. It may be helpful to note that the effort to build replication capability extends well beyond the USD 60,000 line. Sub-component 2.2 carries an envelope of USD 1.83 million directed at strengthening CBS. This includes the establishment of CBS as a state-owned enterprise under a Public Service Agreement with a national mandate to serve other Thromdes, staff training and shadow operations, asset management and capital investment planning, revenue diversification, and national ITS interoperability and smartcard standards. These measures collectively strengthen the agency's ability to carry out its national mandate. In water, the ring-fenced Services Division with SCADA-informed asset management offers a transferable utility model.

Sustainable development potential

The AE welcomes this assessment and shares the iTAP's reading of the benefits: better air quality and lower noise, fewer road casualties, reduced respiratory illness, alongside lower travel and vehicle operating costs. In water, moving toward continuous supply and improved wastewater management lowers waterborne disease risk and the collection burden carried disproportionately by women and girls. Because women in Thimphu rely more heavily on public transport, gains in service quality, safety and accessibility accrue to them directly.

Needs of the recipient

The AE welcomes this assessment. The need is climatic and fiscal at once. Thimphu's infrastructure is concentrated along valley floors and floodplains exposed to monsoon flooding, glacial lake outburst floods, and landslides; non-revenue water exceeds 50 per cent and sources are sensitive to seasonal variability. These pressures are compounded by Bhutan's fiscal position. Since graduation from least developed country status in 2023 the concessional envelope has narrowed, public debt is near 118 per cent of GDP, City Bus Service

holds no borrowing capacity, and both interventions return negative financial rates of return on commercial terms. Institutional capacity, not capital alone, is the binding constraint the project addresses.

Country ownership

The AE accepts the recommendation on women's participation and will apply targeted outreach, including women-only formats and mapping where women access information, supported by dedicated gender expertise within the implementing agency. On counterpart finance, contributions that do not flow through the World Bank cannot be reported as co-financing. Government owns the assets and will cover operating deficits. On consultant dependency, deliverables are defined as counterpart capability: management responsibilities transfer progressively to counterparts, and CBS must run shadow operations and pass a documented readiness assessment before assuming full delivery.

Efficiency and effectiveness

The design choice was made by the AE because grouping chargers near the existing power connection avoids cabling the whole depot for the full fleet from day one on a constrained site that must keep operating, and lets capacity grow with the fleet. Bhutan's hydropower makes smart-charging savings modest, and fewer standard units are easier for CBS to maintain and to flood-protect. On ITS, passenger screens are under one-fifth of the USD 3.84 million, with the balance representing a foundational investment that underpins critical improvements to fare collection, headway management and safety (on-board CCTV), among others, which are necessary to the effective operation and administration of the system. Screens also serve riders without smartphones or internet access and those who have difficulty navigating technology, such as the elderly. The AE acknowledges that kerb-side monitoring measures vehicle emissions rather than population-level air quality. Direct sensor measurement at the corridor nevertheless provides real-world evidence of the emission reductions that modelling can only estimate, and at USD 5,000 the cost is negligible.

Overall remarks from the independent Technical Advisory Panel:

The AE thanks the iTAP for a thorough and constructive review and welcomes its recommendation that the Board approve the proposal.

On the combination of transport and water, the reasoning is both strategic and practical. Strategically, these are the two urban sectors Bhutan has itself identified as climate priorities in its NDC, NAP, and thirteenth Five-Year Plan, each backed by a national instrument the project operationalizes. Transport is where emissions growth concentrates, the power sector already being decarbonized through hydropower, and water is where climate risk to service delivery concentrates.

Practically, many of the investments are geographically co-located, creating synergies in planning, sequencing and climate-proofing that would be lost if the two were financed and delivered separately. The water main upgrade, roadside drainage, and cable ducting for passenger information run along Norzin Lam and the bus priority corridor, delivered alongside the sidewalk works. Opening the same streets once rather than three times lowers cost and shortens disruption. The result is a corridor where the carriageway, drainage, water main, sidewalk and bus service reach a common climate standard at the same time.

ANNEX 8

Gender Assessment & Action Plan

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Acronym

ABS	Ability Bhutan society
ACREWAS	Advancing Climate Resilience of the Water Sector
BAOWE	Bhutan Association of Women Entrepreneurs
BGTP	Bhutan Green Transport Project
CBS	City Bus Services
CoC	Code of Conduct
CSI	Cottage and Small-Scale Industries
CSO	Civil Society Organization
DHS	Department of Human Settlement
DPoB	Disabled People's Organization of Bhutan
DV	Domestic Violence
FGD	Focus Group Discussion
GAP	Gender Action Plan
GBV/SEA/SH	Gender Based Violence Sexual Exploitation Abuse Sexual Harassment
GFP	Gender Focal Person
GPN	Good Practice Note
GRM	Grievance Redress Mechanism
IEC	Information Education and Communication
ITS	Intelligent Transportation Systems

JDWNRH	Jigme Dorji Wangchuk National Referral Hospital
LG	Local Government
LRCP	Livable and Resilient Cities Project
M&E	Monitoring & Evaluation
MIS	Management Information Systems
MoIT	Ministry of Infrastructure and Transport
NCWC	National Commission for Women and Children
PIU	Project Implementation Unit
PMU	Project Management Unit
PPD	Planning & Policy Division
PSA	Public Service Agreement
PWDs	People with disabilities
RBP	Royal Bhutan Police
RENEW	Respect Educate Nurture and Empower Women
SEP	Stakeholder Engagement Plan
SoE	State-Owned Enterprise
SRHR	Sexual Reproductive Health and Rights
SSPD	Spatial and Strategic Planning Division
TT	Thimphu Thromde
TTI	Technical Training Institute
ToT	Training of Trainer

1 Gender Assessment: Introduction

Note: The Gender Assessment, Gender Action Plan (GAP), and the SEA/SH Prevention and Response Action Plan are based on the findings of this assessment and consultations, including discussions led by the Department of Human Settlement (DHS). These are living documents and will be refined and adapted in response to changing contexts during implementation. Final endorsement by the client will be required to support effective implementation.

1.1 PROJECT OVERVIEW

The Livable and Resilient Cities Project (hereafter “LRCP” or “The Project”) aims to enhance livability and climate resilience in Thimphu Thromde, through improved targeted urban infrastructure and service delivery. This project will result in reduction of non-revenue water, improved user satisfaction with public spaces, reduce and avoid GHG emissions through promotion of public transport and promote institutional reforms and improved operational systems by Thimphu Thromde to deliver climate-resilient urban services. The LRCP builds on the Bhutan Green Transport Project (BGTP) and the Thimphu Structure Plan 2023-2047. The PMU for the project is Department of Human Settlements (DHS), Ministry of Infrastructure and Transport (MoIT). While Thimphu Thromde is the PIU and is prepared under the World Bank’s Environment and Social Framework (ESF) for co-financing through the Green Climate Fund.

The project places strong emphasis on gender equality as a central element of its design and implementation. Both the World Bank and GCF recognize that advancing gender equity is not only a matter of rights but also a driver of effectiveness, inclusiveness, and long-term success in climate action. The World Bank integrates gender analysis across its policies and operations—using tools such as the Poverty and Social Impact Analysis (PSIA) and Country Partnership Frameworks (CPFs)—to ensure that climate initiatives address the differentiated needs and contributions of women and men. Similarly, the GCF applies a robust gender policy and action plan to guarantee inclusive participation and gender-responsive approaches in all adaptation and mitigation measures. Within the LRCP, the preparation of ESF instruments is a mandatory requirement, and the Gender Action Plan (GAP), together with the SEA/SH Prevention and Response Action Plan, serve as essential mechanisms to promote social inclusion, protect community rights, and ensure equity. These tools collectively strengthen the project’s environmental, social, and economic sustainability.

1.2 NATIONAL AND INSTITUTIONAL FRAMEWORKS AND LEGISLATIONS SUPPORTING GENDER EQUALITY

The Royal Government of Bhutan has adopted several national laws, policies and frameworks that are relevant from a gender perspective.

National Laws & Policies

The Royal Government of Bhutan has developed a comprehensive framework of laws and policies that support gender equality. The Constitution of Bhutan (2008) provides the overarching guarantee of rights and freedoms, while obligating the State to eliminate all forms of discrimination and exploitation against women. Building on this foundation, the National Gender Equality Policy (2020) sets out a framework to achieve substantive equality across political, social, and economic domains. It is currently being revised to include LGBTQI+ rights and emphasizes mainstreaming gender in climate change and disaster initiatives. The Domestic Violence Prevention Act (2013) protects individuals, especially women and children, from abuse in domestic settings, while the Disaster Management Act (2013) ensures gender perspectives are incorporated through community participation and representation. The National Youth Policy (2011) integrates gender issues by promoting equal access to education, training, employment, and entrepreneurship opportunities for young people while the National Policy for Persons with Disabilities (2019) guarantees equal rights and opportunities for vulnerable and marginalized groups, aiming to improve their quality of life. Finally, the 13th Five Year Plan (2024–2029) underscores Bhutan’s commitment to gender inclusion by promoting equal participation of women and men in national development and strengthening institutions to deliver effective, gender-responsive programs. Together, these laws and policies

ensure protection from discrimination and violence, promote participation and inclusion, and mainstream gender across national development priorities.

Institutional Framework related to Gender Equality in Bhutan

The Royal Government of Bhutan (RGoB) has advanced gender equality through strong legal and policy measures, consistent integration of gender issues into national planning since the 10th Five Year Plan, and alignment with international conventions. The establishment of the National Commission for Women and Children (NCWC) in 2004 was a milestone, serving as the lead agency for gender mainstreaming and rights of women and children. Elevated to autonomous status in 2008, the NCWC developed the National Plan of Action for Gender (2010) to strengthen capacity building, sex-disaggregated data, and gender-responsive monitoring. However, with the Civil Service Reform Act (2022), the NCWC lost its autonomy and was restructured under the Ministry of Education and Skills Development, potentially limiting its independence and influence.

To support mainstreaming, Gender and Child Focal Points (GCFPs) were introduced across ministries, dzongkhags, CSOs, and the private sector, but their effectiveness has been constrained by high staff turnover, limited authority due to junior positions, and inadequate funding for capacity building. The Gender Expert Group (GEG), comprising experts from government, CSOs, and private sectors, provides technical guidance, reviews policies, and supports training, while decentralization efforts since 2013 have sought to strengthen gender integration at local levels, though further capacity building and awareness are needed.

Civil Society Organizations, notably RENEW, play a critical role in women's empowerment, leadership advocacy, and preventing gender-based violence, while international partners such as the ADB, World Bank, and UNDP provide essential technical and financial support. To sum up, Bhutan's gender institutional framework reflects significant progress with clear structures and partnerships, though challenges remain around institutional independence, focal point effectiveness, and local-level capacity.

2. Gender Analysis And Key Gender Gaps In The LRCP

2.1. Limited Representation Of Women In Decision-Making Roles Across DHS - Moit, TT And CBS.

The Department of Human Settlement (DHS) under the Ministry of Infrastructure and Transport (MoIT) will house the Project Management Unit (PMU) for the LRCP. Among its 73 staff, women represent only 29% (21 out of 73), and very few occupy senior or decision-making roles, reflecting broader gender underrepresentation in leadership. The Thimphu Thromde (TT) will serve as the Project Implementation Unit (PIU), responsible for urban infrastructure and water investments. While its overall workforce is nearly gender-balanced, 268 women out of 538 staff (49.8%) - women remain concentrated in labor and support roles (208 of 268 female staff). Only 55 women serve in regular professional or administrative positions, with very limited representation in leadership. Fewer than 10% of women occupy decision-making posts such as division heads or section chiefs. Representation in critical departments like Urban Planning, Finance, and Education is minimal (1–2 women in regular roles). This imbalance underscores weak institutional gender capacity and the need for structured measures to expand women's leadership pathways. In addition, many TT staff lack formal training in gender mainstreaming, social inclusion, and GBV/SEA/SH response. To strengthen gender equity, there is a need for awareness programs, leadership development workshops, and training on reporting and survivor-support mechanisms. This reflects wider national patterns, where women form 49.5% of the population but only 38% of the civil service, with even fewer in senior grades.

The City Bus Service (CBS) is tasked with implementing Intelligent Transport Systems (ITS) and Management Information Systems (MIS), managing electric buses, terminals, depots, and bus stops. While MoIT will procure buses, specialists, and equipment, CBS will focus on daily operations. The LRCP will also support CBS in becoming a financially independent State-Owned Enterprise through a sustainable business model and accountability mechanisms under a Public Service Agreement. CBS employs 95 staff, with women comprising 20 (21%). Of 61 bus drivers, only 7 are female, and of 34 office staff, 13 are women. Just 2 women hold leadership posts (HR/Admin Officer and Supervisor), meaning only about 10% of women are in decision-making roles. This mirrors broader national trends where women make up 44% of the workforce but only 38% of government employees, with senior positions largely male-dominated. Labour Force Survey data (Q4, 2024) further highlights gender disparities: women's unemployment (4.37%) is nearly double men's (2.27%), female urban labour participation in Thimphu is low (31.9%), and youth unemployment among women (21.2%) far exceeds that of men (14.5%). Women also earn significantly less than men (Nu 20,480 vs Nu 27,350 monthly).

A capacity assessment of women staff in DHS, TT, and CBS shows systemic barriers rooted in gender stereotypes that position men as suited for technical and leadership roles, while women are perceived as caregivers or suited for lighter works. Women face limited access to technical training, lack of confidence, underrepresentation in leadership, and challenges balancing family and professional responsibilities. Existing workplace supports (maternity leave, flexible arrangements, childcare services) are valuable but insufficient. Improvements needed include extending paternity leave, providing gender-responsive infrastructure (toilets, crèches), enhancing awareness on gender sensitivity, GBV/SEA/SH safeguards, and introducing mentorship, leadership training, and more family-friendly policies.

Female underrepresentation at specialist and managerial levels restricts the integration of gender perspectives in decision-making, recruitment, and policy development. Within DHS, institutional gender capacity is also weak. The Ministry's Gender Focal Point (GFP), appointed under NCWC, has limited influence due to competing duties in the Planning & Policy Division, with some staff unaware of her role. To address this, the LRCP will strengthen gender capacity by designating a dedicated GFP in the PMU and recruiting an external Gender Expert during implementation. This will ensure effective mainstreaming of gender and SEA/SH response throughout the project.

To sum up, while in LRCP's key institutions - DHS, TT, and CBS, women are well represented numerically but remain significantly underrepresented in leadership and technical roles. Their advancement is constrained by

persistent gender stereotypes, unequal access to opportunities, and limited institutional capacity. To ensure gender-sensitive urban governance and effective implementation of the Gender Action Plan, there is a clear need to strengthen workplace policies, create leadership pathways, provide targeted training and mentorship, and engage dedicated gender expertise.

2.2. WOMEN ENTREPRENEUR'S INCOME WILL BE AFFECTED DUE TO THE REDEVELOPMENT WORKS IN

NORZIN LAM

Women entrepreneurs in Norzin Lam, Thimphu play a vital role in the local economy, but most operate at the lower end of the entrepreneurial pyramid in micro and small enterprises. While women own a higher share of Cottage and Small-Scale Industries (CSIs), they often have lower education levels, limited financial literacy, and face major barriers to accessing capital due to lack of collateral, low risk appetite, and confidence gaps. Many businesses remain small or informal, financed through savings, profits, or borrowings from family and friends, with very few accessing institutional loans despite banks' gender-neutral lending policies.

During the construction phase, women-owned businesses in Norzin Lam will face direct impacts including temporary displacement or relocation of business premises during construction; reduced foot traffic and customer access due to road closures, diversions, and construction barriers; noise, dust, and visual obstruction degrading the business environment and customer experience; potential income loss during peak construction periods, affecting their ability to meet financial obligations; and disruption to supply chains and logistics for inventory and service delivery. Beyond immediate disruption, women entrepreneurs expressed concerns about post-construction changes, including fear of increased rental costs following area upgrading, potentially pricing them out competition from larger, more capitalized businesses attracted to the improved commercial corridor; lack of information about construction timelines, mitigation measures, and compensation mechanisms; and limited participation in planning and decision-making processes affecting their livelihoods.

Barriers to resilience and recovery for women entrepreneurs

Women entrepreneurs in Norzin Lam face compounded vulnerabilities that limit their ability to absorb construction-related shocks and recover post-project. These barriers include:

- Limited access to business and financial management training, sector-specific technical assistance, mentorship, and networking.
- Discrimination and gender stereotypes that restrict women's opportunities and access to resources
- Greater household and childcare responsibilities that constrain time for business operation
- A "crisis of confidence" in engaging with financial institutions.
- Limited awareness of opportunities through CSOs and support networks.
- Low savings and working capital buffers, making them highly vulnerable to income disruptions.

Despite these challenges, women expressed strong demand for training in basic business management, financial management, ICT, digital marketing, branding and leadership. They are often more engaged and confident in women-only spaces, highlighting the importance of tailored mentorship and peer networks.

To address these gender-specific vulnerabilities and ensure women entrepreneurs benefit equitably from the Norzin Lam redevelopment, the project will introduce a comprehensive set of targeted interventions. These include capacity-building through business management and financial literacy training, alongside digital skills development to strengthen resilience and market access. The plan also aims to promote mentorship and peer networking by linking women entrepreneurs with established business leaders and support organizations. During construction, the project will provide livelihood restoration measures like timely communication, improved customer access, temporary vending options, and connections to financial support mechanisms. Post-construction, the plan prioritizes women's access to upgraded spaces, promotes their businesses, and supports their participation in business and municipal platforms. Throughout, gender-responsive stakeholder engagement ensures women's voices are actively incorporated into project planning, implementation, and monitoring.

Further, Civil Society Organizations (CSOs) like RENEW and others can play a crucial role by providing access to finance, training, mentorship, and networking, thereby helping women overcome systemic barriers, strengthen skills, and expand their enterprises. Supporting women entrepreneurs through targeted, project-responsive interventions not only enhances their confidence and opportunities but also contributes significantly to Bhutan's inclusive economic growth and does not inadvertently deepen gender inequalities.

2.3. WOMEN AND PERSONS WITH DISABILITIES REPORTED SAFETY AND ACCESSIBILITY ISSUES WITH BUS SERVICES AND RELATED INFRASTRUCTURE.

The 2023 Bhutan Green Transport Project (BGTP) survey revealed significant gender and disability related challenges in public transport. Risks of harassment are highest for younger women and students. Overcrowding, poor lighting, inadequate driver accountability mechanisms, and absence of formal reporting pathways compound safety and security risks. Women users, particularly married women with young children or lower levels of education, often find city buses uncomfortable due to overcrowding, limited storage space for belongings, and inadequately prioritized seating, leading many to prefer taxis or private vehicles for convenience. Safety concerns remain a key issue: 44% of women feel that public transport requires better security, younger women often avoid buses due to perceived risks of harassment, and many lack awareness of reporting mechanisms for incidents. Suggested improvements include CCTV cameras at bus stops and on buses, more reliable schedules, better route connectivity, and gender-sensitization training for bus drivers and staff.

Women aspiring to work in the transport sector such as drivers, maintenance workers, IT officers, and customer service staff face societal biases that view transport as a male-dominated sector. Female staff also report challenges in balancing professional responsibilities with childcare and eldercare, highlighting the need for safe, supportive, and family-friendly workplaces to enable long-term career participation.

Persons with disabilities (PWDs) encounter further barriers. Individuals with visual impairments need braille signage, tactile markers, and audio announcements for routes and stops, while those with mobility impairments struggle with high bus steps, poorly positioned seats and seat belts, and inconveniently placed grab bars. Female PWDs experience higher levels of discrimination and receive less assistance than male PWDs (33% vs. 55%). Addressing these challenges through gender-responsive and disability-inclusive planning, design, and operations is essential. Improving accessibility, safety, and support for women and PWDs will enhance mobility, foster confidence in public transport, and empower these groups to participate more fully in social, economic, and political life.

2.4. GENDERED IMPACTS OF WATER SHORTAGES AND DISASTERS: TARGETED WASH INTERVENTIONS FOR WOMEN

Women and girls are disproportionately affected by water shortages and disasters such as flash floods, as they bear primary caregiving responsibilities and rely on disrupted water, sanitation, and hygiene (WASH) systems. Their roles as primary household water managers mean that supply disruptions — whether from infrastructure stress, drought, or flooding — translate directly into additional time burdens, health risks (including menstrual hygiene management), and business disruptions for those operating in food, hospitality, and similar services. The LRCP water/WASH component focuses primarily on supply-side resilience and service management. However, the gender dimensions of this component extend beyond hygiene awareness and include: (i) the reliability of supply for female-headed households and women-owned businesses; (ii) communication and access arrangements during planned or emergency shutdowns; and (iii) equitable access to real-time information during water- and flood-related emergencies.

Drawing from the World Bank Entry Points for Integrating Gender in Resilient Infrastructure: Water Systems (2025), women and persons with disabilities are disproportionately impacted by water service disruptions and are often the last to receive emergency information. Gender-inclusive water service management should actively position women and vulnerable groups as direct beneficiaries of improved service reliability, not only as recipients of hygiene awareness campaigns.

Floods damage infrastructure like footbridges and roads, hindering women's mobility and access to health services, while also increasing risks of gender-based violence and limiting participation in disaster preparedness. Domestic water duties and menstrual hygiene management further heighten women's vulnerability during such disruptions.

Water shortages in both urban and rural areas create gender-differentiated impacts that the LRCP interventions aim to address:

- Time burden and opportunity costs: Women and girls spend additional hours fetching water from alternative sources, reducing time for education, income-generating activities, and rest.
- Health and hygiene challenges: Inadequate water supply compromises menstrual hygiene management (MHM), forcing women and girls to use unsafe practices including those in pregnancy, and postpartum care.
- Increased unpaid care work: Women shoulder responsibility for rationing limited water supplies, managing household hygiene with insufficient water, and caring for family members affected by waterborne diseases.
- Economic impacts: Women entrepreneurs (especially in food services, hospitality, and cottage industries) face business disruptions when water supply is unreliable. Street vendors and small restaurant owners in areas like Norzin Lam depend on consistent water access for operations.

LRCP water supply interventions, guided by environmental and social instruments, aim to build climate resilience and integrate gender-responsive planning. Projects like UNDP's ACREWAS target nearly 19,400 people, about half women, improving domestic water access and bridging knowledge gaps in urban disaster-risk water systems. Gender considerations in WASH infrastructure, early warning systems, and grievance mechanisms are essential to address women's disproportionate burden. Beyond infrastructure repair, long-term gender-responsive strategies can transform WASH systems into pathways for gender equality, by reducing unpaid care work, enhancing health, and creating economic and leadership opportunities for women. Promoting women's participation in disaster governance, education, and vocational training strengthens resilience and ensures inclusive, sustainable urban development in Thimphu.

3. Gender Action Plan

3.1. GENDER ACTION PLAN

The LRCP Gender Action Plan (GAP) provides a strategic framework to mainstream gender equality and social inclusion across all project components, ensuring meaningful participation of women, men, and marginalized groups throughout the project lifecycle. It emphasizes women's leadership, decision-making, and equitable access to services, while addressing structural inequalities embedded in cultural norms and power relations.

To this end, LRCP will implement the Gender Action Plan through the following key objectives:

1. Ensure equitable access to project benefits, especially for women, persons with disabilities, and other vulnerable groups;
2. Facilitate inclusive consultation and participation of women and marginalized populations in project planning, decision-making, implementation, and monitoring;
3. Generate and apply gender-disaggregated data to inform evidence-based planning, monitoring, evaluation, and learning.

The LRCP project follows national gender strategies and World Bank guidelines, emphasizing gender-responsiveness, elimination of gender bias and stereotyping, and zero tolerance for sexual harassment and GBV. It dedicates resources to increase women's representation in decision-making, enhance economic opportunities for women entrepreneurs, ensure safe and accessible urban transport for women and persons with disabilities, and promote inclusive awareness campaigns on WASH, climate resilience, and disaster preparedness. Through these measures, LRCP aims to achieve gender-equitable development and contribute to broader national and global gender equality goals.

Implementation of the Gender Action Plan: The Gender Action Plan (GAP) will be led by the Project Management Unit (PMU) within the Department of Human Settlements, supported by a gender expert to integrate gender-responsive strategies across planning, implementation, monitoring, and evaluation. Thimphu Thromde (PIU) and City Bus Services will operationalize GAP activities on the ground, coordinating with the PMU to embed gender considerations in project design, infrastructure, service delivery, and stakeholder engagement. Regular capacity building, monitoring, and reporting will ensure accountability, promoting inclusive participation and equitable outcomes for women, men, and marginalized groups, including persons with disabilities.

Table 1 Gender Action Plan

Impact statement: The project strengthens women's leadership in the transport and water sectors by promoting gender- and disability-inclusive approaches. It expands women's economic opportunities through training and support, improves safe and accessible public transport, and builds knowledge in WASH practices. It also enhances women's ability to manage caregiving, access services, and lead community resilience during water scarcity and flood emergencies.					
Strategic Priority Area	Key Gender Actions	Indicators/Targets	Responsibility	Time Frame	Budget (USD) TBD
Output 1: Women trained through LRCP-supported programs who gain employment in technical, operational, or managerial roles in the urban transport sector					
Activity 1.1 CBS management promotes inclusive recruitment, encouraging applications from men, women & persons with disabilities (PWDs)	Recruitment system of CBS is gender inclusive.	- % of job applicants by gender & people with disabilities. - Outcome indicator: share of female employees (technical, operational, managerial roles) at CBS [baseline: 21%; Target: 30%]	DHS-PMU, CBS, Gender Expert, GFP from the PMU	Year 1 onwards	
Activity 1.2 Offer internships and apprenticeships in operational and technical roles to women at CBS.	Internship & apprenticeship support provided to female staff.	- No. of women enrolled in operational /technical internships & apprenticeship - % of women who successfully complete the full program duration.	DHS-PMU, CBS, Gender Expert, GFP from the PMU	Year 1 onwards	18,000
Activity 1.3 Leadership development training provided for transport sector engineers, with focus on PMU and PIU staff.	Conduct of capacity building trainings for the women engineers	- No. of engineers from PMU and PIUs who participate & complete leadership development training. - At least 50% of women engineers participate & complete the training.	DHS-PMU, PIUs, Gender Expert, local training institutes, relevant CSOs	Year 1 onwards	5,000
Activity 1.4 Develop gender-responsive Human Resource manual of CBS.	Gender responsive HR manual in place.	- Completion status of the gender-responsive HR manual (finalized & approved by management)	DHS-PMU, CBS, Gender Expert, local HR consultant	Year 2	12,000

Activity 1.5 Establish one creche at the bus terminal.	Creche in place.	- Crèche at bus terminal with trained staff. -Complies with safety & hygiene standards.	DHS-PMU, CBS, Gender Expert, local contractors	Year 1	7,500
Output 2: Norzin Lam entrepreneurs and parking fee collectors receive livelihood restoration and economic empowerment support, with at least 70% reporting income recovery to pre-construction levels or higher within 12 months of construction completion					
Activity 2.1 Conduct baseline income assessment and develop business continuity plans for affected women entrepreneurs in Norzin Lam	Women entrepreneurs receive business continuity support	-Baseline income data collected for 100% of affected businesses (disaggregated by gender, business type, income level) -Business continuity plans developed for at least 80% of women-owned businesses	DHS-PMU, Gender Expert, TT-PIU and CSO	Before construction begins	9,000
Activity 2.2 Provide construction-phase income support package including temporary vending spaces/stalls in high-traffic areas; business signage and wayfinding during construction; advance notification system for access routes and closures; and cash grants or rental subsidies for severely affected businesses	Income protection measures implemented during construction.	-Number of temporary vending spaces provided to affected women entrepreneurs -All affected businesses receiving advance construction schedules -% of women entrepreneurs reporting income maintained at >70% of baseline during construction The income recovery indicators specifically for women supported by the project will be measured against the baseline. The project will conduct a baseline survey taking a sample of project affected people, which will include the group	DHS-PMU, TT-PIU, Gender Expert, Construction contractors	Year 2 onwards	16,500

		receiving direct support from project activities on livelihood enhancement. This will be further detailed during finalization of the GAP.			
Activity 2.3 Provide transition support for parking fee collectors (60% women) including skills assessment and job matching; vocational training linked to verified job opportunities; and, job placement assistance with local employers.	Parking fee collectors transitioned to alternative livelihoods.	-100% of parking fee collectors receive skills assessment -At least - 70% of women employed or earning income from micro-enterprise within 6 months of training completion	DHS-PMU, CBS, Gender Expert, GFP from the PMU	Year 1 onwards	8,000
Activity 2.4 Provide post-construction business recovery support including access to microfinance/working capital loans; marketing and visibility campaigns for Norzin Lam businesses; priority allocation for women entrepreneurs in upgraded public spaces	Women entrepreneurs recover and grow post-construction.	-Number accessing microfinance/working capital (with gender-disaggregated data on loan amounts and repayment rates) - Entrepreneurs reporting increased income by more than 15% due to improved access, local footfall, and economic support packages. [Baseline:0; Target: 40%]	DHS-PMU, CBS, Gender Expert, GFP from the PMU and CSO	Year 2 onwards	7000
Output 3: Female public bus users reporting improved safety, accessibility, and comfort in using bus services and related infrastructure (percentage)					
Activity 3.1 Develop gender-responsive operational guidelines for bus services. Adaptive management measures will be undertaken following baseline results.	Bus service guidelines developed to address gender-specific needs and safety.	-Gender-responsive operational guidelines for bus services developed and approved -Number of gender considerations incorporated into the guidelines - Outcome indicator: Female public transport users reporting improved	DHS-PMU, TT-PIU, CBS, Gender Expert, local consulting firm	Year 2	3,000

		safety, accessibility, and comfort in using bus services and related infrastructure [baseline:0; target: 60%] The baseline will include a module on perception of safety among public transport users. This data will be collected pre-operation. The intention of the perception survey on safety especially for women is to help design activities and interventions that improve feeling of safety.			
Activity 3.2 Operational & technical staff show improved knowledge of security, safety & social inclusion in bus operation	Technical staff trained	-Number of operational and technical staff trained on security, safety and social inclusion.	DHS-PMU, TT-PIU, CBS, Gender Expert, relevant CSOs	Year 2 & 3	2,000
Activity 3.3: Built women and disable friendly safe and accessible walkways and bus stops.	Women and disable friendly bus stops in place.	-No. of walkways & bus stops built/upgraded to gender- & disability-inclusive standards (ramps, tactile paving, handrails, lighting, signage). -No. of bus stops equipped with diaper changing tables, CCTV cameras, and emergency bells	DHS-PMU, CBS, TT-PIU, Gender Expert, Construction companies	Year 2 onwards	

Activity 3.4: Bus designs to meet the need of women and PWDs.	Design of the bus made gender and disability inclusive.	-No. of buses with design features: ramps, priority seating, low-floor entry, handrails, audio-visual announcements. -% Buses equipped with stabilized grab handles for women's ease of use -% of women and PWD passengers satisfied with bus accessibility & safety	DHS-PMU, CBS, TT-PIU, Gender Expert, Bus supplier companies	Year 2 onwards	
Activity 3.5: Train bus drivers and transport employees on bystander intervention during an incident of sexual harassment or taking action to improve female users' safety	Bystander intervention trainings provided to bus drivers and employees	Percentage of trained bus drivers and transport employees reporting an increase in knowledge of bystander intervention techniques to address sexual harassment of female transport users, as measured by pre- and post-training assessments. Baseline:0 Target: 70%	DHS-PMU, TT-PIU, CBS, Gender Expert, local consulting firm	Year 2 onwards	5000
Output 4: Women and Vulnerable Groups as Beneficiaries of Water Reliability and Continuity Women					
Activity 4.1 Gender-Disaggregated Consultation on Water Service Scheduling and Shutdown Planning	Prior to any planned shutdown or construction-phase disruption, Thimphu Thromde (TT) conducts gender-disaggregated community consultations to: (i) identify female-headed households, women-owned businesses, and PWD households in affected service zones; (ii) understand the specific water-use needs of each group (domestic, business, menstrual hygiene, caregiving); and (iii) co-design shutdown scheduling and alternative access arrangements that minimize burden on these groups. Consultation records are disaggregated by sex, disability status, and household type, and	% of planned water shutdowns preceded by gender-disaggregated community consultation, with documented response to women's and vulnerable groups' concerns. Target: 100% Emergency WASH kits distributed to vulnerable households include hygiene supplies adequate for menstrual hygiene management. Target: 100%	TT-PIU, Gender Expert	Year 2 & 3	3,500

	findings are formally incorporated into TT's shutdown management plans.				
Activity 4.2 — Proactive, Multi-Channel Shutdown Communication Protocol Reaching Female-Headed Households and Low-Income Residents	develop and operationalize a gender-responsive shutdown communication protocol that: (i) uses multiple channels; (ii) includes advance notice of at least 48 hours for all planned shutdowns, specifying the affected area, duration, and location of nearest alternative water point; and (iii) designates female community focal points in each affected neighborhood — building on existing women's groups or Thromde community networks — to ensure last-mile communication reaches households without reliable phone or internet access	% of female-headed households and vulnerable households in shutdown zones reporting they received advance notice of the disruption and knew where to access alternative water. Target: ≥80%	TT-PIU, Gender Expert	Year 2 onwards	3,500
Activity 4.3 Women-Inclusive Flood and Water Emergency Early Warning and Preparedness	project develops a gender-inclusive emergency water and flood preparedness protocol that: (i) integrates women from target neighborhoods into TT's community flood monitoring networks, providing them with simple, accessible information tools to receive and relay flood and water emergency alerts; (ii) pre-positions emergency water supply arrangements (tanker contacts, bottled water cache locations) prioritizing female-headed households, households with infants, and PWD households in flood-prone zones, with these arrangements documented and community-visible before each monsoon season; and (iii) includes menstrual hygiene management supplies in TT's emergency WASH kits distributed to vulnerable households during floods, in line	% of women in flood-prone target neighborhoods who can correctly identify the local flood warning channel and know the location of their nearest emergency water point. Target: ≥75%	TT-PIU, Gender Expert	Year 2 onwards	4,500

	with WASH Cluster and Sphere Humanitarian standards				
Output 5. Capacity strengthening of Project Management through sensitizations, trainings, gender responsive infrastructures and effective M&E system incorporating gender, youth and vulnerable groups					
Activity 5.1 Recruitment of a Gender Expert in the DHS-PMU to facilitate and support gender equality and social inclusion integration.	Facilitation, support & integration of gender equality, social inclusion in PMU activities	- Gender Expert recruited - Gender is mainstreamed in all the activities of LRCP	DHS-PMU	Year 1 onwards	Included in PMU staff cost
Activity 5.2: Sensitization workshop on gender safeguards for MoIT, Thimphu Thromde, and CBS - Training on basic gender concept: attitudes, norms, stereotypes, parental roles, behaviors, GBV etc. Awareness on SEA/SH: laws, regulations, and reporting mechanism & gender mainstreaming across all project phases and sectors	Conduct of Gender sensitization trainings among the officials	- Information materials developed on gender awareness, rights, and skills for gender mainstreaming in plans and projects -100% of MoIT, Thimphu Thromde, and CBS staff (men and women) sensitized on gender issues and safeguard strategies	DHS-PMU, TT-PIU, CBS, Gender Expert	Year 1 & 2	3,000
Activity 5.3 Sensitization workshop on gender safeguards to the local Community (same content as above) who will be involved with the project	Conduct of Gender sensitization trainings among the local Community members	-Develop simple materials on gender awareness, rights, and skills for community-level mainstreaming. -Sensitize 90% of community members (men, women, vulnerable groups) on gender issues and safeguard strategies.	DHS-PMU, TT-PIU, CBS, LG officials, local community, Gender Expert, GFPs from the PMU	Year 1	5,000
Activity 5.4 Gender responsive infrastructure and workplace design implemented in the offices of DHS, TT and CBS.	All offices have Gender responsive infrastructure in place providing favourable environment	- Number of clean and separate toilet for female with SNVM in place. - Number of toilets with accessible infrastructure for PWDs.	DHS-PMU, TT-PIU, CBS, PPD - MoIT	Year 1	7,500
Activity 5.5 Develop M&E framework to incorporate gender disaggregated data on the	Develop gender responsive monitoring & evaluation mechanism	- Integrate gender into the monitoring system	PMU, Gender Expert, MoAF	Year 1 onwards	Included in monitoring cost

number of women's groups, youth groups and vulnerable groups.		with specific gender indicators; - Collect and maintain gender-disaggregated data to track and analyze gender impacts			
Total					

4 Sexual Exploitation and Abuse/Sexual Harassment

Risk Management: Introduction

4.1 PROJECT OVERVIEW AND SEA/SH RISKS

As per the World Bank's Environmental and Social Framework and screening tool, the project has been rated as having a “moderate” risk for Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH). Nationally, 33% of women in Bhutan aged 15-64 have experienced some form of physical, sexual, or emotional violence in their lifetime (NCWC, 2022). Despite this prevalence, only 4% of survivors seek help from formal institutions, largely due to stigma, fear of retaliation, and limited trust in law enforcement and justice mechanisms (NCWC, 2022).

Moreover, the transport and construction sectors in Bhutan have been flagged as high-risk environments for Sexual Harassment (SH), with a 2023 NCWC study reporting that 28% of female respondents in these sectors experienced some form of harassment at the workplace. Many incidents go unreported due to power imbalances, fear of job loss, and inadequate grievance redressal systems. In the project context, civil works particularly during the construction phase may amplify GBV/SEA/SH risks due to increased interaction between the incoming labor force and local communities, especially women, adolescent girls, and persons with disabilities.

The SEA/SH assessment identified the following key concerns:

- **Labor Influx:** The project will engage skilled and potentially expatriate laborers, necessitating the construction of temporary labor camps near residential zones, schools, and community centers regularly accessed by women and children. The proximity raises risks of sexual harassment, transactional or exploitative relationships (including with minors), and early or forced marriages, which in economically vulnerable communities may be misconstrued as opportunities for social and financial security.
- **Health and Social Impacts:** The influx and settlement of mobile laborers may lead to a heightened risk of sexually transmitted infections (STIs), including HIV/AIDS. Also, social tensions may arise between local residents and migrant workers due to cultural differences, perceived inequalities, or inappropriate conduct of workers. Additionally, there has been an increase in the number of sex workers in Thimphu despite the illegality of sex work in Bhutan. The reason for this increase is primarily due to the economic impact of the pandemic, which has left many people without livelihoods and access to employment opportunities. This issue also raises concerns about laborers interacting with sex workers and then returning to their work place, potentially increasing health and safety risks.

- Sustained Impact: These risks are likely to persist beyond the construction period, emphasizing the need for ongoing community engagement, monitoring, and established response mechanisms throughout the project lifecycle and into post-construction operations.

5 Violence against Women and Children

5.1 VIOLENCE AGAINST WOMEN

Intimate partner violence (IPV) remains one of the most common forms of violence against women worldwide. According to the National Study on Women's Health and Domestic Violence, approximately one in three women (33%) aged 15 - 64 has experienced some form of IPV - be it physical, sexual, emotional, or economic, at least once in her lifetime. Specifically, 24% reported emotional violence, 12% physical violence, and 5% sexual violence. Although Bhutan's reported IPV prevalence of 27% (World Bank Gender Data Portal) is slightly below the global average, it still indicates deep rooted gender based issues that require urgent attention (World Bank, 2023; NCWC, 2018).

Between 2018 and 2023, the Royal Bhutan Police (RBP) recorded nearly 2,500 domestic violence cases. However, these figures likely underestimate the actual intensity of the problem. Survivors often do not report abuse due to societal stigma, fear of retaliation, or normalization of violence within relationships. Data from the 2025 UNDP-NCWC Gender-Based Violence Elimination Strategy shows that 72.5% of women who experienced physical or sexual violence did not seek help from formal institutions, and only 11% reported incidents to the police. Factors such as economic dependency, social pressures, and lack of awareness continue to impede reporting (UNDP & NCWC, 2025).

The COVID-19 pandemic further exacerbated the situation. Lockdown measures and economic hardship led to a noticeable surge in domestic violence cases across Bhutan. The National Commission for Women and Children (NCWC) reported 900 domestic violence cases between 2016 and 2021, with a sharp rise during the lockdown periods. Likewise, RENEW, a leading civil society organization supporting survivors of gender-based violence (GBV), documented a 36.6% increase in GBV cases during the pandemic. While the number of reported domestic violence cases dropped to around 555 in 2022 (from over 700 in 2021), this decline is believed to be influenced by reduced restrictions and improved community outreach (NCWC, 2021; BBS, 2023).

A broader gender-based violence (GBV) context shows even more concerning patterns. A 2017 national survey found that nearly 40% of women had experienced IPV, with 15.8% reporting emotional abuse, and 35% noting controlling behavior by their partners. Alarming, severe physical violence—such as being hit, kicked, or threatened with weapons—was reported in nearly three-quarters of physical IPV cases. The intergenerational impact is equally worrying, with over 60% of children in violent households witnessing abuse, increasing their risk of psychological trauma and future behavioral issues (Bhutan Today, 2024; UNICEF, 2025).

Despite growing awareness and improved legal frameworks, the fight against IPV and GBV in Bhutan is far from over. Organizations such as RENEW and NCWC continue to play a vital role through shelters, counselling, legal aid, and advocacy programs. However, sustained efforts are needed to dismantle deeply rooted gender norms, ensure survivor-centric justice systems, and build resilient communities through education and empowerment.

Between 2020 and 2024, Bhutan's Royal Police recorded 1,527 domestic violence cases linked to alcohol consumption. The number of cases reported annually increased from 182 in 2020 to a peak of 407 in 2022, followed by slight decreases in 2023 (325 cases) and 2024 (316 cases). Alcohol remains a major factor driving domestic violence in the country (Royal Bhutan Police, 2025; Business Bhutan, 2024). RENEW documented 2,536 cases of abuse between 2020 and 2024, covering physical, emotional, economic, and sexual violence. A significant portion of these cases involved perpetrators under the influence of alcohol, illustrating the strong correlation between alcohol misuse and gender-based violence (RENEW, 2025; Asian News Network, 2025). High alcohol consumption

intensifies aggressive behavior and increases the risk of domestic violence, sexual exploitation, and harassment. Households with prevalent alcohol dependency show greater vulnerability to gender-based violence, emphasizing the need for comprehensive community and policy interventions (Business Bhutan, 2024).

Vulnerable groups, especially young girls and women, are disproportionately impacted by child marriage and human trafficking. Although child marriage is legally prohibited in Bhutan, there are cases that it exists in certain regions. Factors such as poverty, low education levels, and traditional practices contribute to this issue. Bhutanese individuals, especially women and children, remain vulnerable to human trafficking. In 2024, 38 suspected trafficking victims were repatriated from a range of overseas destinations. The Government has strengthened efforts by amending the Penal Code in 2021 and acceding to the UN Convention Against Transnational Organized Crime in 2023.

Limited employment options and rural to urban migration have contributed to an increase in sex work, frequently under exploitative or coercive circumstances. Economic hardships, particularly among young women, often drive involvement in transactional sex, highlighting the critical need for expanded economic empowerment and job creation programs for vulnerable populations (RENEW, 2023; UNICEF Bhutan, 2022).

5.2 5.2 VIOLENCE AGAINST CHILDREN

A 2016 NCWC study reported that 64% of children aged 13 - 17 in Bhutan experienced at least one incident of physical violence in their lifetime (NCWC, 2016). About 44.8% faced such violence before adolescence. Recent findings (2022–2023) indicate that physical violence against children remains widespread, with nearly 60% of children still facing abuse (NCWC & UNICEF, 2022). Among children who reported physical violence: 67.3% experienced abuse in school settings, indicating the need for better protection in educational institutions; 43.6% suffered violence at home, mostly by parents, relatives, or siblings.

Sexual violence remains a concern. In 2016, 12.8% of children reported experiencing at least one incident, with slightly more girls (13.5%) than boys (11.9%) affected (NCWC, 2016). Recent reports confirm that about 12% of children continue to face sexual or online abuse, underscoring the need for stronger child protection and awareness campaigns (Druk Journal, 2021; NCWC & UNICEF, 2022).

6 Legislation, Advocacy, and Support Services

6.1 LEGISLATION

Preventing violence against women and children is a national priority in Bhutan, reflected in legal frameworks such as:

Domestic Violence Prevention Act (2013)

It was enacted in Bhutan to address and prevent all forms of domestic violence, with a strong emphasis on protecting women and children. The Act reflects Bhutan's national commitment to ensuring safety, dignity, and equal rights, and identifies the prevention of violence against women and children as a national priority. The DVPA 2013 affirms that safeguarding women and children from violence is central to Bhutan's pursuit of gender equality, human rights, and national well-being.

Child Care and Protection Act (CCPA) of 2011

The CCPA 2011 is Bhutan's comprehensive legal framework for ensuring the rights, care, protection, and well-being of children, in line with international child rights standards, especially the UN Convention on the Rights of the Child (CRC). The Act aims to create a protective, nurturing, and enabling environment for every child in Bhutan, ensuring their survival, development, protection, and participation. The CCPA 2011 reinforces Bhutan's commitment to building a society where every child grows up safe, respected, and empowered.

Penal Code (2004), and the amendments in 2011 and 2021

The Penal Code of Bhutan 2004 is the primary criminal law framework of the country, designed to protect public order, ensure justice, and uphold Bhutanese values. It defines criminal offenses, prescribes punishments, and lays down legal procedures for fair and effective administration of justice. The amendments to the Penal Code in 2011 and 2021 demonstrate Bhutan's commitment to strengthening its legal system and addressing critical issues like child protection and human trafficking.

National Gender Equality Policy (2020)

The National Gender Equality Policy (NGEP) in Bhutan, approved in 2020, aims to provide a framework for ensuring equal rights, opportunities, and benefits for all individuals, regardless of gender, across various sectors and societal levels. It focuses on promoting gender equality through political, social, and economic domains, and is currently being reviewed to integrate perspectives of the LGBTQI+ community. The policy also guides the Royal Government of Bhutan (RGoB) in achieving gender equality through gender-responsive policies, plans, and programs.

Key institutions like NCWC, RBP, and RENEW play critical roles in awareness and survivor support. Since 2021, Women and Child Protection Desks have been established in all 20 dzongkhags, serving over 12,000 women and 3,700 children affected by GBV (UNICEF, 2024). Despite this, limited access to shelters, legal aid, and medical services in rural areas continues to hinder progress. Most advanced services remain concentrated in Thimphu, creating urban-rural disparities (Kuensel, 2024). To bridge these gaps, RENEW opened three new community service centers in 2025, located in Phuentsholing, Dagana, and Trashigang - targeting remote gewogs such as Logchina (One Billion Rising, 2025). NCWC's 2025 Shelter Advisory and the launch of the 2024-2028 National GBV Strategy aim to improve service quality and nationwide coverage (NCWC, 2025; UNDP, 2025).

6.2 SUPPORT SERVICE ACCESS

Organizations like the NCWC and RENEW are crucial in supporting survivors of gender-based violence (GBV), sexual exploitation and abuse (SEA), and sexual harassment (SH). The RBP manages reports related to sexual harassment and exploitation; however, many survivors hesitate to report due to cultural stigma, fear of retaliation, and mistrust of authorities. A 2022 NCWC study highlighted reasons for underreporting, including fear of job loss or social rejection, lack of support from supervisors, and concerns about making the situation worse. To address these issues, Bhutan has increased awareness campaigns and improved survivor services through collaborative efforts between healthcare providers, law enforcement, and social organizations. Despite progress, challenges like limited funding, digital illiteracy, and unequal access to information especially among women continue to affect effective support (NCWC, 2022; UNICEF Bhutan, 2024).

Referral pathways based on the multisectoral model are critical to ensuring a coordinated and survivor-centered response to cases of Sexual Exploitation, Abuse and Harassment (SEA/SH). These pathways clearly define the roles and responsibilities of various service providers, legal, health, psychosocial, and protection actors, at national and local levels. To strengthen accessibility and clarity, the table below outlines the roles, contact details, and services of each stakeholder. This enables timely referrals, informed decision-making, and efficient service delivery across sectors.

Table 2: GBV/SEA/SH Service Providers

Agency	Actors SEA/SH	Role in Referral Pathway	Key Services Provided	Contact Information
Royal Bhutan Police (RBP)	Investigation & Protection	Primary entry point for survivors, especially for legal protection and emergency response	• 24/7 National Helpline (1010) • Filing of complaints & investigations • Immediate protection from perpetrators • Women & Child Protection Unit (WCPU) • Referrals to health and psychosocial support	Emergency Helpline: 1010 WCPU (Thimphu) Email: www.rbp.gov.bt
JDWNRH & District Hospitals	Medical & Trauma Care	Health-based entry point for survivors; mandatory medical response & referrals	• Emergency medical treatment • Sexual assault evidence collection • post-exposure prophylaxis (PEP) • Mental health and trauma care • Child protection	JDWNRH Emergency: +975-2-322602 Email: www.jdwnrh.gov.bt

			screenings and referrals	
RENEW	Counselling & Shelter	Non-governmental organization for holistic GBV response; frontline psychosocial support	• Shelter homes & safe spaces • Psychosocial counselling • Legal aid and case management • Awareness and outreach • CBSS volunteer network	Toll-Free Helpline: 1098 Head Office: +975-2-333534 CBSS: Available in all 20 Dzongkhags
NCWC	Coordination & Legal Service	National policy and coordination body; child and women protection referral hub	• Case referral coordination • Child protection services • Oversight of WCPU and district focal persons • Advocacy and legal support	Hotline: +975-2-334549 Email: info@ncwc.gov.bt www.ncwc.gov.bt
The PEMA Secretariat	Trauma counselling	Specialized agency for mental health and wellbeing	• Trauma-informed counselling • Referral of survivors with mental health needs	Tel: +975-2-330566 Email: info@pema.gov.bt www.pema.gov.bt
District Women and Child Focal Persons	Local case coordination	Frontline contact at district level under NCWC coordination	• Identification and referral of survivors • Local coordination with hospitals, Police, RENEW, CBSS • Awareness and prevention programs	Contact via Dzongkhag Administration Office (Varies by District)
CBSS Volunteers (RENEW)	First response & referral	Community-based frontline workers embedded in local communities	• First response for survivors • Immediate referral to services • Confidential local support • Community outreach, awareness &	Available in all 20 districts Contact via RENEW HQ or CBSS Coordinator

			prevention of GBV, Domestic violence, sexual and reproductive health and legal rights.	
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7 SEA/SH Prevention and Response Action Plan

Objectives of the SEA/SH Action Plan

The SEA/SH Prevention and Response Action Plan for the LRCP construction project outlines a comprehensive, survivor-centered strategy to prevent and address sexual exploitation, abuse, and harassment, especially in settings where large male workforces interact with female workers and nearby communities. Grounded in a gender assessment and aligned with national laws and World Bank safeguards, the plan emphasizes prevention, early detection, and survivor support through localized training and awareness, stakeholder engagement, and the establishment of a dedicated grievance redress mechanism committee.

The plan addresses SEA/SH risks across the project's full lifecycle from construction through operational phases recognizing that risk profiles evolve as the project transitions from infrastructure development to service delivery. During construction, risks primarily stem from worker-community interactions, while operational risks focus on passenger safety and harassment in transit environments. By embedding safety features into infrastructure design and establishing both project-phase and operational grievance mechanisms, the plan ensures sustainable protection for women and girls beyond project completion.

Key components include adapted awareness training materials for SEA/SH in English and Dzongkha, capacity-building for project actors, monthly consultations with community stakeholders, rollout of a Code of Conduct, provision of gender-segregated facilities, and periodic monitoring and evaluation. The approach prioritizes confidentiality, accountability, and inclusion to ensure the project is implemented ethically and responsibly while promoting gender equality and community safety.

SEA/SH Prevention and Response Action Plan

Table 3 outlines the SEA/SH Prevention and Response Action Plan, detailing procedures and protocols that will be enforced throughout the project. The plan includes measures for:

- Preventing SEA/SH occurrences
- Reporting and managing SEA/SH allegations
- Providing survivor-centered support and referrals

- Ensuring accountability through a clear grievance redress mechanism

This integrated approach aims to safeguard affected communities, particularly vulnerable groups, while ensuring the responsible and ethical implementation of all project components.

SEA/SH Risk Mitigation Across Project Lifecycle

The LRCP addresses SEA/SH risks across two distinct phases with tailored prevention and response measures:

Construction Phase SEA/SH Risks

During road construction and upgrading activities, SEA/SH risks are primarily associated with:

- Influx of construction workers into rural communities
- Power dynamics between workers and local populations
- Presence of work camps and interaction with community members, particularly women and girls
- Worker-to-worker harassment within construction sites

Mitigation Measures:

- Mandatory Code of Conduct for all workers and contractors with SEA/SH provisions
- Gender-sensitive worker camps with clear access restrictions and security protocols
- Community awareness campaigns conducted by the GBV Service Provider on SEA/SH risks and reporting channels
- Worker training on prohibited behaviors and consequences
- Confidential GRM channels accessible at all construction sites
- Regular monitoring and enforcement of contractor compliance

8 SEA/SH GRM during Construction

8.1 SEA/SH GRM ARCHITECTURE

The project will implement a differentiated SEA/SH complaint pathway that is separate but linked to the general project GRM. SEA/SH complaints may be received through the broader project GRM entry points (SMS, email, drop boxes, walk-in) or directly through specialized service providers (RENEW hotline, NCWC, District Women and Child Focal Persons, CBSS Volunteers). Once identified, SEA/SH complaints will be immediately channeled into a confidential SEA/SH pathway overseen by a specialized SEA/SH GRM structure, with external referrals managed by the project Gender/GBV Specialist and GBV Service Provider supported by external service providers.

8.2 INSTITUTIONAL STRUCTURE AND ROLES

1. SEA/SH GRM Committee (PMU Level - Department of Human Settlement)

Composition: PMU Director (Chair), E&S Safeguards Specialist, Gender/GBV Specialist, Representative from RENEW/GBV Service Provider

Roles and Responsibilities:

The Project SEA/SH Committee is responsible for addressing project-linked SEA/SH cases through accountability measures while working in close collaboration with RENEW Community Service Center (CSC) for survivor support.

Case-Related Functions:

- Conducts fact-finding and assessment for cases determined to be project-linked (following linkage assessment by the Project GBV Specialist)
- Takes disciplinary action against project personnel or contractors found to have committed SEA/SH violations
- Develops and implements corrective action plans to address systemic issues
- Ensures survivors maintain continued access to services throughout the process
- Closes cases after appropriate project-related actions are completed

Coordination:

- Collaborates with RENEW/CSC on all cases, with RENEW leading survivor case management
- Coordinates referrals to external service providers (RBP/WCPU, health facilities, legal aid, safe homes) based on survivor needs and consent

- Works with the Project GBV Specialist on linkage assessments and response protocols

Decision-Making Boundaries:

- Makes decisions on project accountability actions (disciplinary measures, contractor sanctions, workplace corrective actions)
- Does NOT make decisions on survivor services, case management, legal actions, or medical care.
- Does NOT replace RENEW/CSC's role in survivor-led case management

Confidentiality:

- Operates under strict confidentiality protocols with need-to-know access only
- All members sign confidentiality agreements
- Case information is anonymized in project reporting
- Individual case details are never disclosed beyond committee members with legitimate need-to-know

2. SEA/SH GRM Focal Point (PMU Staff)

Responsibilities:

- Coordinates day-to-day SEA/SH GRM implementation across all project components
- Receives and acknowledges SEA/SH complaints within 24 hours
- Ensures immediate referral to appropriate service providers within 72 hours
- Maintains confidential communication with survivors and service providers (strict need-to-know basis)
- Tracks referrals using anonymized codes in encrypted, access-controlled systems
- Liaises with Gender/GBV Specialist and service provider case managers

Confidentiality Safeguards: The Focal Point operates under strict confidentiality agreements. Individual case details are NEVER disclosed to management, contractors, or community-level structures.

3. Gender/GBV Specialist (PMU Consultant)

Responsibilities:

- Provides technical guidance on survivor-centered response and GBV case management principles
- Trains PMU staff, GRM Committees, and contractors on SEA/SH response protocols
- Ensures alignment with World Bank ESF requirements and Bhutan's national GBV protocols
- Conducts quarterly spot checks to verify survivor-centered procedures remain active
- Supports the SEA/SH GRM Committee in maintaining functional referral arrangements

- Coordinates with GBV service providers and external agencies

4. GBV Service Provider for SEA/SH Response

To ensure professional, survivor-centered handling of SEA/SH cases, the project will contract a specialized GBV Service Provider, preferably a Civil Society Organization (CSO) with demonstrated expertise in GBV prevention and response. The Service Provider will be an integral part of the project structure, supporting both prevention and response activities.

Core Functions:

- Prevention and Capacity Building:
- Conduct GBV/SEA/SH risk and hotspot mapping in project areas to identify vulnerable locations and populations
- Deliver awareness campaigns and community engagement activities on SEA/SH prevention, reporting channels, and available services
- Provide training to PMU staff, contractors, local government officials, and other project actors on survivor-centered response, Code of Conduct, and SEA/SH risk mitigation
- Develop Standard Operating Procedures (SOPs) for SEA/SH response aligned with Bhutan's National GBV SOP and World Bank ESF requirements

GRM Integration and Response:

- Receive and manage SEA/SH cases reported through project GRM channels or directly through the Service Provider's own confidential channels
- Provide survivor-led case management including psychosocial counseling, safe shelter, crisis intervention, and coordination with medical and legal services
- Offer technical guidance to the SEA/SH GRM Committee and Focal Point on maintaining survivor-centered procedures and confidentiality protocols
- Coordinate referrals to external service providers (RBP/WCPU, hospitals, NCWC, PEMA, District Women and Child Focal Points) based on survivor needs and consent
- Manage all SEA/SH data using anonymized codes in secure, access-controlled systems, reporting only aggregated statistics to the project

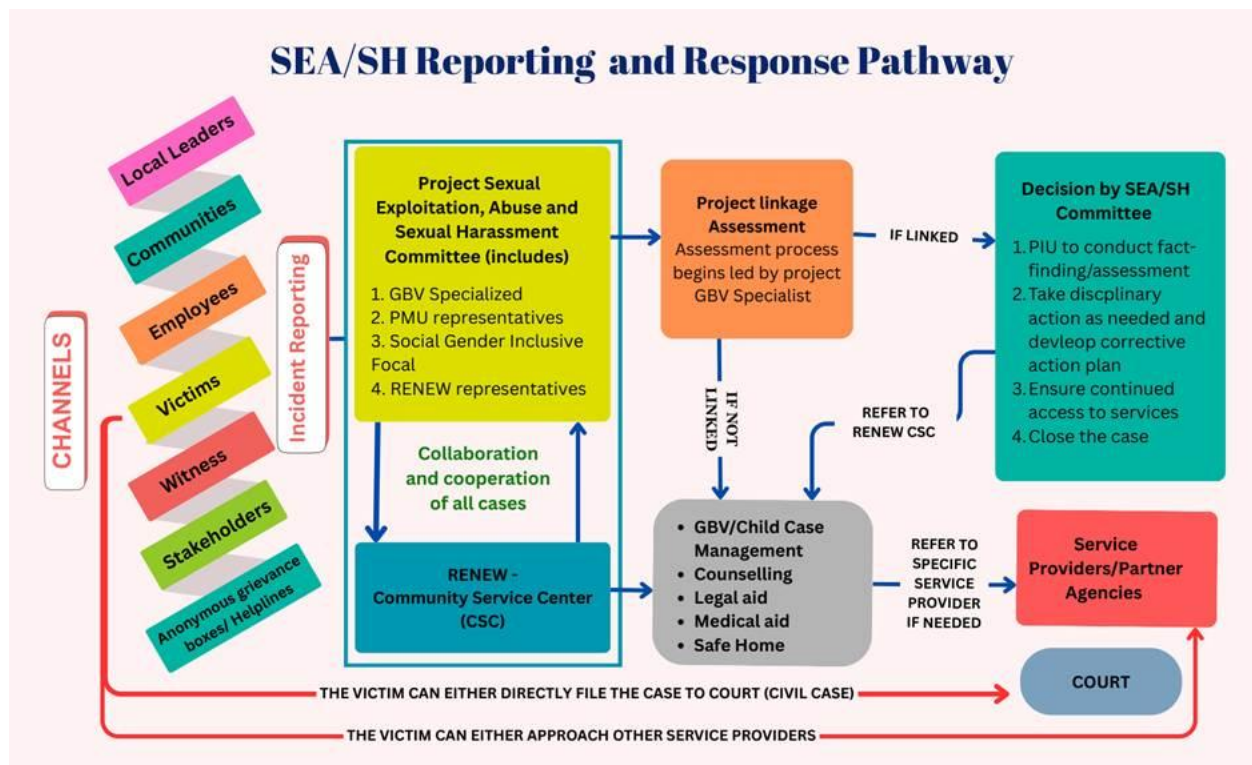
The Service Provider will maintain strict confidentiality in case handling, while working collaboratively with the project team on prevention, training, and system strengthening activities.

5. External Service Provider

A range of service providers in Bhutan deliver coordinated, survivor-cantered support for SEA/SH cases, each with distinct roles. The Royal Bhutan Police through its Women and Child Protection Units handles legal assistance, complaint registration, investigations (with consent), and protection services, while RENEW provides psychosocial counselling, safe shelter, hotline services, and survivor-led case management. Health facilities such as district hospitals and BHUs offer medical care, including post-exposure prophylaxis, emergency contraception, and forensic documentation. The National Commission for Women and Children focuses on child protection, counselling, and coordination, and the PEMA Secretariat supports survivors with legal aid and court processes. At the local level, district focal persons and CBSS volunteers facilitate awareness, referrals, and trusted reporting. Importantly, these providers operate independently of the SEA/SH GRM Committee, engaging through formal agreements to ensure a well-coordinated response.

8.3 SEA/SH REFERRAL PATHWAY FLOWCHART

The following flowchart illustrates the SEA/SH complaint pathway, showing how complaints are received, immediately differentiated from general grievances, channeled through the SEA/SH GRM structure, and referred to external service providers for survivor-centered case management. This is a general SEA/SH GRM adopted by all Word Bank financed large infrastructure projects in Bhutan. A project specific GRM detailing the roles and responsibilities will be developed by the Project GBV specialist.



Operational/User-Facing Road Safety and SEA/SH Risks

During operation, SEA/SH risks shift to road user safety and harassment in transit environments:

- Sexual harassment of women and girls using public transport and waiting at bus stops
- Inappropriate driver conduct toward passengers
- Safety risks for pedestrians, particularly women and children, using improved roads
- Poorly lit roadside areas, bus stops, and rest areas creating unsafe environments
- Lack of emergency response mechanisms for passengers and road users experiencing harassment or distress

Design-Embedded Safety Features:

The project design incorporates road user safety measures that directly mitigate SEA/SH risks:

- Physical Infrastructure: Adequate lighting at bus stops, roadside rest areas, and pedestrian crossing points; safe pedestrian pathways; separate waiting areas where culturally appropriate; visible sight lines to reduce isolated spaces

- **Surveillance and Monitoring:** CCTV installation at key bus stops, terminals, and roadside facilities to deter harassment and support incident investigation
- **Emergency Response Features:** Emergency call buttons or panic alarms at major bus stops and terminals; clearly marked emergency contact information; accessible help points at facilities
- **Driver Accountability:** Driver identification systems visible to passengers on City Bus Service vehicles; complaint mechanisms displayed in buses and at bus stops; driver Code of Conduct requirements in operator agreements
- **Accessible Reporting:** Prominently displayed complaint contact information (hotline numbers, SMS, email) at all bus stops, terminals, and roadside facilities; visual materials showing how to report harassment; multilingual and pictorial signage for accessibility

Operational Phase Grievance Mechanism

City Bus Service GRM:

A fully functioning operational GRM for bus services and related transport infrastructure will be developed and implemented by the City Bus Service prior to the commencement of operations. This operational GRM will be managed independently by the City Bus Service and will include:

- **Scope:** Passenger complaints related to driver conduct, harassment on buses or at bus stops, safety concerns at terminals and facilities, service quality issues, and SEA/SH incidents involving City Bus Service personnel or occurring within City Bus Service infrastructure
- **Reporting Channels:** Multiple accessible channels including dedicated hotline, SMS, online complaint portal, complaint boxes at bus terminals, and in-person reporting to bus terminal managers
- **SEA/SH Provisions:** Specific confidential pathways for handling SEA/SH complaints with immediate referral to specialized service providers (RENEW, RBP/WCPU, health facilities) following survivor-centered protocols
- **Accountability Mechanisms:** Clear procedures for investigating driver misconduct, disciplinary actions for Code of Conduct violations, and regular reporting on complaint resolution
- **Capacity Building:** Training of all City Bus Service staff, drivers, and terminal personnel on passenger safety, SEA/SH awareness, and GRM procedures

The detailed framework for the City Bus Service operational GRM will be developed during project implementation in coordination with the Thimphu Thromde and Ministry of Infrastructure and Transport,

incorporating lessons learned from the project's SEA/SH GRM and ensuring continuity of safety standards established during the construction phase.

Table 3: SEA/SH Prevention and Response Action Plan, LRCP

Note: SEA/SH Action Plan Budget will also be linked with E&S budget.

	Activities to address SEA/SH risks	Timeline	Responsible for Action	Means of Monitoring	Output Indicators	Estimated Budget (Nu)
Outome: 80% project-affected persons demonstrated knowledge of and confidence in SEA/SH reporting mechanisms, with 100% of reported cases receiving survivor-centered response both during construction and operation.						
1. Coordination and materials preparation						
1.1	Develop and adapt materials covering both construction-phase risk and operational-phase risks and SEA/SH materials.	At the start of the project period	DHS-PMU, TT-PIU, CBS, Gender Expert	Training and communication materials developed Strategies developed for dissemination	- Number of SEA/SH training materials adapted and finalized in English and Dzongkha. - Number of IEC materials translated and culturally adapted for target communities.	500,000
2.Training and Capacity Building for LRCP Project Actors						
2.1	Conduct training and awareness for the Project Management Unit (PMU), city bus personnel, relevant stakeholders, and contractors on gender-based violence (GBV), including appropriate procedures for identifying, responding to, and reporting SEA/SH cases, Codes of	Start of the project and operation of the busses	DHS-PMU, CBS, Gender Expert, local CSO	Training report, pictures and videos, information dissemination session reports	- Number of GBV/SEA/SH training sessions conducted. - Number of total individuals trained, categorized by their roles (PMU, relevant stakeholders & contractors) and disaggregated by gender. % of participants demonstrating increased knowledge of GBV and SEA/SH procedures, understand the CoC and survivor-centered response protocols (pre & post training assessments).	600,000

	Conduct (CoC), Grievance Redress Mechanisms and referral pathways for survivors.					
3. Stakeholder consultations and awareness raising on the SEA/SH risks						
3.2	Facilitate the engagement of a variety of stakeholders like local government functionaries, religious leaders, and CSOs (RENEW, DPoB, ABS) at key stages of the SEA/SH action plan to contribute to risk identification, community awareness-raising, and the strengthening of referral and support services.	Consultations need to be done on a monthly basis	DHS-PMU	Monitoring of the implementation of the Stakeholder Engagement Plan (SEP) Reports on ongoing consultations	- Number of stakeholder engagement meetings held, disaggregated by type of stakeholder (e.g., CSOs, government, religious leaders). - Number of stakeholders engaged, disaggregated by gender. - Number of SEA/SH action plan activities supported by stakeholders.	500,000
4. Establish an effective SEA/SH Grievance Redress Mechanism (GRM)						
4.1	Establish a dedicated SEA/SH GRM pathway at the project level with a specialized Project SEA/SH Committee and relevant project personnels	Before the start of the construction work	DHS-PMU, TT-PIU, GRM of MoIT, Gender Specialist, Contractors	Committee in place	- Functioning confidential reporting channels established at all project sites - Number of MOUs established with external service providers (RENEW, RBP/WCPU, hospitals, NCWC, PEMA) .	500,000

					Percent of SEA/SH cases where survivors were referred to appropriate services within 72 hours	
4.2	Contract a specialized GBV Service Provider (preferably CSO) to serve as primary prevention and response mechanism for project SEA/SH	Before construction start	DHS-PMU	Contract signed Service Provider mobilized	- GBV Service Provider contracted and mobilized - Hotspot mapping completed - SOPs for SEA/SH response developed - Number of awareness campaigns conducted - Number of SEA/SH cases received and managed by Service Provider	2,000,000
4.3.	Develop operational GRM framework and SOP aligned with national GBV SOP for City Bus Service to handle passenger complaints of sexual harassment in public transporta and service areas including SEA/SH	12 months before e-bus operations commence	DHS-PMU, CBS, Gender/GBV Expert	Operational GRM framework document, Safety audit reports Outcome indicator: 90% of project-affected persons demonstrated knowledge of and confidence in SEA/SH reporting mechanisms, with 100% of reported cases receiving survivor-centered response both during construction and operation.	- Operational GRM framework developed including SOP for survivor-centric response to complaints of sexual harassment in public transport/space and SEA/SH in project supported activities. - Safety features incorporated in infrastructure designs - City Bus Service staff trained on GRM and SEA/SH protocols	300,000
5. Code of Conduct (CoC) orientation and dissemination						
5.1	Develop and roll out a Code of Conduct (CoC) for contractors and civil works personnel (workers) that defines appropriate behavior and	Before the start of the construction work	DHE-PMU, TT-PIU, contractors, Gender Expert	Orientation sessions – attendance, pictures, register maintained for signed CoCs.	- CoC with SEA/SH content developed within the project. - Number of orientation sessions conducted on the CoC for contractors, workers and site personnel. - Number of site workers and staff who have signed the CoC.	200,000

	highlights SEA/SH risks, ensure comprehensive orientation sessions are conducted, require all on-site personnel to sign the CoC, and widely share the content - including visual materials with workers and nearby communities.					
6. Gender inclusive infrastructure facilities in the project sites						
6.1	Contractors to ensure the provision of separate, safe, and easily accessible toilet and sanitation facilities for women and men at construction sites, with female facilities located at a reasonable distance from male facilities to guarantee privacy and safety; in addition, all public spaces around the project site be adequately lit to enhance security, particularly for women and vulnerable groups.	Prior to the commencement of construction works.	Contractor, DHS-PMU, TT-PIU, Gender Expert, Safeguard Team	Site visit reports, reviews during implementation support missions	• Number of gender segregated toilet and sanitation facilities for women and men that meet minimum safety and privacy standards. • Number of female toilet facilities located at a safe and private distance from male facilities. • Number of public lighting units installed around the project area.	600,000
7. Effective monitoring and evaluation (M&E) mechanism in place						
7.1	Conduct periodic field visits to assess the implementation of SEA/SH activities, and conduct	Throughout the project implementation period	DHS-PMU, TT-PIU, contractors, Gender Expert	Quarterly report and performance review reports produced	• Number of quarterly review meetings held to assess SEA/SH action plan progress.	500,000

	quarterly reviews of the SEA/SH Prevention & Response Action plan to strengthen oversight and provide strategic guidance to implementing agency staff and management.				• % of SEA/SH action plan activities on track (findings from field visits and reviews).	
	Total				•	

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