

TERMS OF REFERENCE (TOR)

Carbon Project Development and Registration

Yellow Line Bus Rapid Transit (BRT)

Karachi, Sindh Province, Pakistan

Client

Sindh Mass Transit Authority (SMTA)
Government of Sindh

Project

Karachi Mobility Project (KMP)

Financed by

The World Bank

Phase

Phase 1 – Carbon Project Development and Registration

Date

April 2026

Version

Final Draft

Table of Contents

1.	Background	1
2.	Project Description	1
2.1	BRT Yellow Corridor	3
3.	Objective	5
4.1.1	Prior Consideration and Linkage with Ongoing Assignments.....	7
4.1.2	Project Assessment & Structuring:	8
4.1.3	Carbon Market Pathway Assessment	8
4.1.4	Carbon Credit Development Lifecycle.....	9
4.1.5	Baseline Scenario Development:	10
4.1.6	Air Quality Baseline Analysis:.....	11
4.1.7	Additionality Assessment:	11
4.1.8	Emission Reduction Estimation (Ex-Ante):.....	11
4.1.9	Carbon Market Viability Assessment:	13
4.1.10	Project Idea Note (PIN) Preparation and Host Country Engagement:	14
4.1.11	Documentation Preparation (PDD & Approvals):	14
4.1.12	Validation and Verification (VVB) Engagement and Management:.....	15
4.1.12.1	Financial Arrangement for VVB Services	15
4.1.13	Stakeholder Consultation:	15
4.1.14	Risk Management, Accountability, and Contingency Planning:	17
4.1.15	Host Country Approval (HCA) & Article 6 Compliance Requirements:	19
4.1.16	Coverage of Project Influence Area:.....	20
4.2	Monitoring, Reporting, and Verification (MRV) System Design:	20
4.2.1	MRV System Setup.....	22
4.2.2	Long-Term Sustainability & Transition to SMTA Ownership:.....	22
4.2.3	Handover Deliverables.....	23
4.3	Capacity Building and Replicability:	23
4.3.1	Training & Institutional Strengthening	23
4.3.2	Long-Term MRV System Handover.....	24
4.3.3	Knowledge Products & Documentation	24
4.3.4	Replicability Across Other Corridors & Modes	24
4.3.5	Compliance with Pakistani Policy and International Standards	24
4.3.6	Training:.....	25
5.	Timelines and Deliverables	25
5.1	Phase 1: Registration and Pre-Operational Readiness.....	25
5.1.1	Phase-1 Completion Report (including Phase-2 roadmap):.....	27
5.1.2	Early Carbon Market Viability Assessment (Go/No-Go Decision Report)	27
5.1.3	Additional Notes (Applicable to All Deliverables):	28
6.	Required Consulting Services and Team Composition:	28
6.1	Eligibility of Firms:.....	28

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

6.2	Firm Experience Requirements:	29
6.3	Personnel Requirements and Qualifications:	29
6.3.1	Key Experts	29
6.3.1.1	Key Expert 1: Carbon Specialist & Team Leader	30
i.	<i>Responsibilities:</i>	30
ii.	<i>Minimum Qualifications:</i>	30
6.3.1.2	Key Expert 2: Carbon Methodology & Baseline Expert (Environmental Specialist)	30
i.	<i>Responsibilities:</i>	30
ii.	<i>Minimum Qualifications:</i>	31
6.3.1.3	Key Expert 3: MRV & Data Management Specialist	31
i.	<i>Responsibilities:</i>	31
ii.	<i>Minimum Qualifications:</i>	31
6.3.1.4	Key Expert 4: Electric Mobility Expert	31
i.	<i>Responsibilities:</i>	31
ii.	<i>Minimum Qualifications:</i>	32
6.3.1.5	Key Expert 5: Transport Expert	32
i.	<i>Responsibilities:</i>	32
ii.	<i>Minimum Qualifications:</i>	32
6.3.1.6	Key Expert 6: Financial / Carbon Market Specialist	32
i.	<i>Responsibilities:</i>	32
ii.	<i>Minimum Qualifications:</i>	32
6.3.2	NON-KEY EXPERTS (MANDATORY)	33
6.3.2.1	Non-Key Expert 1: Legal Expert	33
i.	<i>Responsibilities:</i>	33
ii.	<i>Minimum Qualifications:</i>	33
6.3.2.2	Non-Key Expert 2: Local Technical Coordinator – Karachi Based:	33
i.	<i>Responsibilities:</i>	33
ii.	<i>Minimum Qualifications:</i>	33
6.4	Payment Schedule	34
6.4.1	Validation and Registration Corrections:	34
6.5	Indicative Expert Input Requirements (Person-Months):	35

List of Tables

Table 2-1: Yellow Corridor Segments	3
Table 2-2: Yellow Corridor Infrastructure Works Packages	5
Table 5-1 Phase-1 Deliverables and Timeline:	25
Table 6-1: Phase-1 Payment Schedule (Deliverable-Based)	34
Table 6-2 Indicative Expert Input Requirements (Person-Months):	36

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

List of Figures

Figure 2-1: Planned Mass Transit Corridors	3
Figure 2-2: Yellow Corridor Segment.....	4

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

List of Abbreviations:

BRT – Bus Rapid Transit
CAR – Corrective Action Request
CL – Clarification Request
DNA – Designated National Authority
FAR – Forward Action Request
GHG – Greenhouse Gas
GS – Gold Standard
HCA – Host Country Approval
ITS – Intelligent Transport Systems
ITMO – Internationally Transferred Mitigation Outcome
KMP – Karachi Mobility Project
K-Electric – Karachi Electric Supply Company
MOCC&EC – Ministry of Climate Change & Environmental Coordination
MRV – Monitoring, Reporting and Verification
PDD – Project Design Document
PIN – Project Idea Note
PPP – Public-Private Partnership
SEPA – Sindh Environmental Protection Agency
SMTA – Sindh Mass Transit Authority
VCM – Voluntary Carbon Market
VCS – Verified Carbon Standard
VVB – Validation and Verification Body

1. Background

The Government of Sindh, through the Sindh Mass Transit Authority (SMTA), is implementing the Yellow Line Bus Rapid Transit (BRT) Corridor in Karachi under the Karachi Mobility Project (KMP) with support from the World Bank. The project envisions the deployment of a fleet of electric buses to decarbonize urban transport, improve air quality, and promote sustainable mobility through modal shift from private vehicles to a mass public transport system.

The Yellow Line BRT is one of the priority corridors planned in Karachi’s BRT network and will operate using battery-electric buses (e-buses). The transition from diesel-powered buses and informal modes to e-buses operating on a high-quality, reliable corridor is expected to generate significant greenhouse gas (GHG) emission reductions. These reductions arise from two sources:

- a) **Fuel switch** – from fossil fuels to electricity; and
- b) **Modal shift** – from private cars and motorcycles to public transit.

To enhance the long-term financial sustainability of the project and unlock climate finance opportunities, the Government of Sindh intends to pursue registration of the Yellow Line BRT as a carbon credit project under an eligible and credible carbon crediting standard. This includes programs such as the **Verified Carbon Standard (VCS), Gold Standard (GS), Article 6.4**, or other internationally recognized carbon mechanisms.

Initial scoping by the World Bank indicates that the electrified BRT project is eligible for carbon crediting under multiple standards and can generate verified emission reductions, which could be monetized to support project sustainability or reinvested in low-carbon mobility initiatives.

SMTA seeks to engage a consulting firm to assess feasibility, prepare carbon project documentation, support validation and registration under an eligible carbon crediting standard, and design a validation-ready Monitoring, Reporting and Verification (MRV) system. Activities related to monitoring, verification, issuance and monetization of carbon credits will be procured separately under a subsequent Phase-2 assignment once BRT operations commence.

2. Project Description

The Project Development Objective (PDO) is to improve mobility, accessibility, and safety along selected corridors in Karachi. The delivery of the Project is designed around a mix of publicly procured contracts needed to deliver the Project infrastructure and consultancies. It also includes a Public-Private Partnership (PPP) contract for the operation of the BRT system over a 10-year concession period, whereby a private operator will finance, procure, supply, operate, and maintain various goods and systems. Based on the financial analysis, and to

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

minimize the operating subsidy, it was agreed that the Project would support the concession via a working capital subsidy. The Project components consist of activities of different natures and scales including infrastructure detailed design and construction supervision, procurement of various consulting services, rolling stock and ITS equipment, construction contracts, capacity building, and stakeholder engagement as well as safeguards and media strategies.

The Project consists of the following three components:

Component I: Urban Road Infrastructure - Yellow Corridor

- a) Rehabilitating or reconstructing road infrastructure (including improving and shifting related utilities such as street lighting, sewer/water supply, drainage, oil pipeline), bridges, and non-motorized transport facilities (such as motorcycle lanes, footpaths, and pedestrian crossing) along the Yellow Corridor and its direct and feeder service routes
- b) Implementing environmental and social recommendations and mitigation measures before and during construction
- c) Carrying out detailed designs, construction supervision activities and third-party monitoring;

Component II: The Development and Operationalization of a BRT System

- a) Constructing and equipping bus rapid transit facilities (including segregated bus ways, interchange facilities, stations, terminals, and depots) along the Yellow Corridor
- b) Providing working capital subsidy for the concession of the BRT operation for the Yellow Corridor
- c) Implementing social management and impact mitigation measures including the labor redeployment for the affected existing bus operators such as drivers, conductors, and route managers
- d) Implementing and monitoring the SMP including its actions to mitigate gender-based violence and actions to improve women’s mobility and economic participation options;
- e) Designing a transit-oriented development strategy for the Yellow Corridor
- f) Providing PPP transaction advisory services for BRT operation concession
- g) Carrying out a program of regular engagement with key stakeholders; and implementing a public relations and media strategy to generate support for and disseminate information on the bus rapid transit system;

Component III: Capacity Building and Technical Assistance

- a) Supporting project management and providing technical assistance for the implementation of social measures
- b) Provision of technical assistance in traffic management and road safety
- c) Supporting the regional transport authorities in automating the management and monitoring of bus route permits
- d) Carrying out capacity-building activities to strengthen SMTA and support the consolidation and improvement of the management of the urban transport sector in Karachi.

2.1 BRT Yellow Corridor

The Yellow Corridor, constituting an integral part of the planned Karachi Mass Transit System (KMTS), spans approximately 21 km from Dawood Chowrangi to Numaish (Figure 2-1) comprising seven segments (Table 2-1) which include two Depots (near Dawood Chowrangi and Christian Colony near Indus Hospital), Bus Stations and Off-Corridor Routes, this corridor envisages a transformative mobility solution for Karachi. Its strategic significance lies in addressing urban mobility challenges, ensuring accessibility, and enhancing safety for over 700,000 individuals, particularly those within the Korangi industrial area.

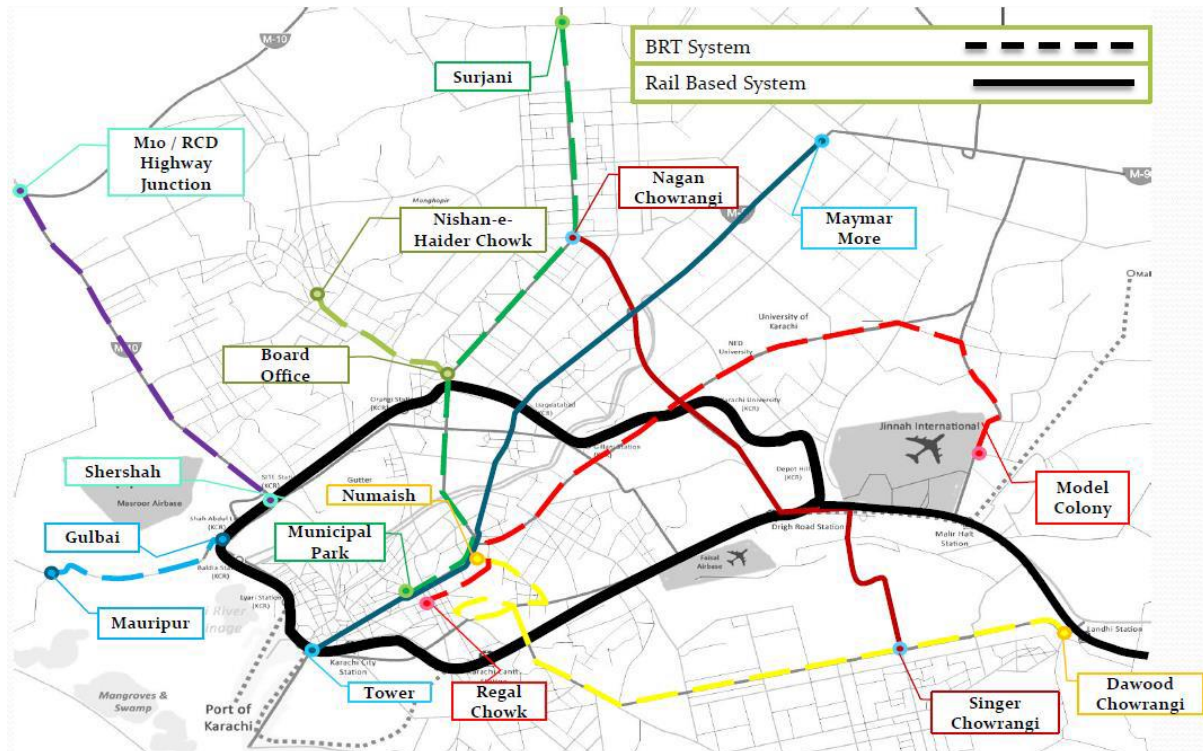


Figure 2-1: Planned Mass Transit Corridors

Table 2-1: Yellow Corridor Segments

Segment	Length [KM]
0 Dawood Chowrangi - from bus depot entrance to Dawood Chowrangi	0.3
1 Future Colony - from Dawood Chowrangi terminal to Mansehra Colony	1.15
2 8000 Road - from Mansehra Colony to Malir River bridge (Jam Sadiq)	10.65
3 Malir River bridge (Jam Sadiq)	1.1
4 KPT interchange	0.85
5 Korangi Road - from KPT Interchange to Shahr-e-Faisal Interchange	3.9
6 Shahr-e-Faisal - from Shahr-e-Faisal Interchange to Shahr-e-Quaideen	1.65
7 Shahr-e-Quaideen - from Shahr-e-Faisal to M.A. Jinnah Road	1.4
Total	21

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

Strategically project is divided into five infrastructure works packages, the Yellow Corridor's development encompasses various segments, from roadworks to bridge construction as illustrated in figure 2-2. The planned improvements and enhancements are poised to alleviate road congestion, optimize traffic management, and address the immediate needs of the communities within its reach. This comprehensive endeavor envisions a modernized urban transportation system that aligns with the Karachi Mobility Project's overarching goals.



Figure 2-2: Yellow Corridor Segment

The PMT has already undertaken the procurement of consulting services to provide Detailed Design, Procurement Support, and Construction Supervision services. This consultant is preparing a detailed design based on the available preliminary design results and recommendations, will finalize the safeguard documents, will prepare the bidding documents for construction contracts (including the Employer's requirements for a 1.1 km long bridge to be undertaken in the EPC mode), provide necessary technical and logistics support during the procurement process of construction works, supervise the construction works, implement the BIM and provide capacity building sessions to the Client. It may be noted that the capacity building and skill development services/training required in these TORs will be different from those included in the above-mentioned contract.

All procurement activities under the KMP will be made using the WB Procurement Regulations for IPF Borrowers for Goods, Works, Non-Consulting and Consulting Services (July 2016; revised November 2017 and August 2018). Based on the Yellow BRT Corridor segments and the complexity of the operations during the construction phase, the summary of anticipated procurement packages is provided in Table 2-2 below. Currently, Package 1: Construction of Depots (Lot-I: Depot # 1 & Lot-II: Depot # 2), and Package 4: 1 km long bridge (segment 3) have already been awarded and are under implementation. The Package 4: Construction of New Jam Sadiq Bridge (Currently known as Taj Haider Bridge) has been substantially completed and opened for public traffic since 29th October 2025. The Package 3A: Road Corridor & BRT Infrastructure, Yellow Corridor has been tendered out and under bid evaluation. The designs and bidding documents for Package 3A: Road Corridor & BRT Infrastructure, Yellow Corridor has been finalized and submitted to the Bank for no-objection. The design and bidding documents for Package 5: Road Corridor & BRT Infrastructure-Yellow Corridor is being finalized.

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

Table 2-2: Yellow Corridor Infrastructure Works Packages

Works package	Priority
Package 1: Lot I (Construction of Depot 1), Lot II (Construction of Depot 2)	I
Package 3: Road corridor & BRT infrastructure (segments 0, 1 and 2)	I
Package 4: Construction of New Jam Sadiq Bridge 1.1 km long (Segment 3)	I
Package 5: Road corridor & BRT infrastructure (segments 4, 5, 6 and 7)	II
Package 6: Off-corridor improvements	II

Apart from the above-mentioned construction contracts, there are contracts related to the procurement of rolling stock, ITS equipment, and operationalization of the BRT corridor in all aspects to be undertaken as a part of the Project. Additionally, there are contracts related to various consultancies (transit-orient demand strategy, stakeholder engagement, etc.) to be undertaken over time as a part of the Project.

Furthermore, independent consulting firms will be hired as Third-Party Monitoring Agent (TPMA) and Project Management Consultant (PMC) to provide a monitoring layer to ensure that the Bank’s funds executed by the implementing agency (i.e., SMTA) are utilized for the purposes specified in the loan agreement and provide expected results

3. Objective

This engagement includes, but is not limited to:

- Estimating the greenhouse gas (GHG) emission reductions expected from the deployment of battery-electric buses and modal shift from private and informal transport modes to the BRT system.
- Identifying the most suitable carbon credit standard and methodology (e.g., Verra/VCS, Gold Standard, Article 6 under UNFCCC, or Global Carbon Council).
- Developing and submitting the required project documentation, including the Project Design Document (PDD), baseline studies, Additionality Assessment, and GHG calculations.
- Facilitating validation and registration of the project under the selected carbon standard, including coordination with accredited Validation and Verification Bodies (VVBs).
- Designing a Monitoring, Reporting and Verification (MRV) framework and monitoring plan consistent with the requirements of the selected carbon standard to ensure readiness for future monitoring and verification once operations commence.
- Conducting an assessment of the potential carbon market viability of the project, including indicative credit volumes, potential revenues, and transaction costs.
- Building institutional capacity within SMTA and relevant stakeholders on carbon markets, project registration requirements, and MRV systems.
- Developing a roadmap for replicating carbon crediting approaches across other BRT corridors or urban mobility projects in Sindh.

The Consultant shall be responsible for performing all analyses, studies, calculations, documentation, consultations, procedural steps, and coordination activities required to successfully prepare, validate, and register the Yellow Line BRT carbon credit project under

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

the selected carbon crediting standard. **The tasks listed in this Terms of Reference are indicative and not exhaustive.** The Consultant shall ensure full compliance with the requirements, methodologies, tools, and procedures of the selected carbon standard, applicable international best practices, and relevant national regulatory requirements.

Any additional work, analysis, documentation, revisions, clarifications, or technical inputs required by the selected carbon standard, Validation and Verification Bodies (VVBs), registries, or competent authorities for successful validation and registration of the project shall be deemed to be included within the Consultant’s scope of services, whether or not explicitly specified in this Terms of Reference. Such requirements shall not constitute grounds for additional financial claims or variations unless explicitly approved in writing by SMTA.

The objective of this assignment is not only to develop and register carbon credit projects, but also to assess and operationalize carbon markets as a financing mechanism to mobilize climate finance, enhance project bankability, and support the long-term sustainability of urban transport interventions.

Carbon credits represent verified reductions or removals of greenhouse gas emissions, where one credit corresponds to one ton of carbon dioxide equivalent (tCO₂e). Such credits must satisfy key principles including additionality, measurability, permanence, and independent third-party verification.

The assignment shall ensure alignment with Pakistan’s Policy Guidelines for Trading in Carbon Markets, including requirements related to project approval, registry participation, avoidance of double counting, and compliance with national and international frameworks, including Article 6 of the Paris Agreement

The assignment shall adopt a finance-oriented approach to carbon markets, recognizing carbon credits as a mechanism to mobilize climate finance, attract private sector participation, and enhance the long-term financial sustainability of low-carbon urban transport systems

4. Scope of Work

The Consultant shall provide end-to-end technical and advisory support to prepare, validate, and register the Yellow Line BRT project as a carbon credit project under a recognized international carbon crediting standard. The assignment shall cover the pre-operational phase of the carbon project and shall include, inter alia, feasibility assessment, project structuring, baseline development, preparation of carbon documentation, validation, registration, and the development of a validation-ready Monitoring, Reporting and Verification (MRV) system in accordance with the requirements of the selected carbon standard and methodology.

Activities related to operational monitoring, verification, issuance, and monetization of carbon credits shall be undertaken under a separate Phase-2 assignment after commencement of BRT operations.

The scope of work shall include, but not be limited to, the tasks required for the successful preparation and registration of the carbon credit project.

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

Notwithstanding the tasks specifically described in this Terms of Reference, the Consultant shall undertake all additional analyses, documentation, coordination, technical inputs, and procedural actions required to successfully prepare, validate, and register the Yellow Line BRT carbon credit project in accordance with the requirements of the selected carbon crediting standard and methodology, applicable international best practices, and relevant national regulations.

Any additional work, clarification, documentation, or revision required by the selected carbon standard, Validation and Verification Bodies (VVBs), registries, or competent authorities shall be deemed to be included within the Consultant’s scope of services, whether or not explicitly stated in this Terms of Reference, and shall not constitute grounds for additional financial claims unless expressly approved in writing by SMTA.

4.1 Registration, Validation and Baseline Development of the Project:

The Consultant shall undertake all activities required to identify, structure, prepare, validate, and register the Yellow Line BRT carbon credit project in full compliance with the requirements of the selected carbon crediting standard(s). The Consultant shall be responsible for producing complete, accurate, and validation-ready documentation necessary for successful validation and registration of the project.

The Consultant shall utilize relevant information generated under the PPP Transaction Advisory assignment as reference inputs, without duplicating previously completed work, and shall independently develop any additional datasets, analyses, or documentation required for carbon credit project development. Lack of available data shall not exempt the Consultant from delivering any required outputs under this assignment.

During the inception phase, the Consultant shall prepare and submit a structured Data Requirement and Collection Plan identifying all datasets required for baseline development, emission calculations, and MRV system design. The Consultant shall proactively coordinate with SMTA, environmental government/private bodies, transport department, carbon policy related organizations and relevant stakeholders to obtain required data and shall clearly identify any data gaps and proposed approaches to address them.

4.1.1 Prior Consideration and Linkage with Ongoing Assignments

The Consultant shall ensure that the development of the carbon credit project is consistent with prior consideration requirements of the selected carbon standard.

In this regard, the Consultant shall:

- Review and document evidence demonstrating that carbon crediting has been considered at an early stage of project development, in accordance with the requirements of the selected carbon standard;
- Prepare and maintain all necessary documentation required to demonstrate prior consideration, including timelines, decision records, and relevant communications;
- Ensure that such documentation is incorporated into the Project Design Document (PDD) and supporting materials for validation.

Terms of Reference (Draft)**Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”**

The Consultant shall also ensure effective linkage with ongoing and previously completed consultancy assignments under the Karachi Mobility Project, including but not limited to the PPP Transaction Advisory and design-related studies.

In this regard, the Consultant shall:

- Utilize relevant data, analyses, and outputs from ongoing assignments as reference inputs, without duplication of work.
- Clearly document how prior studies and project development stages support the carbon project design and baseline assumptions.
- Ensure consistency and continuity between existing project documentation and carbon crediting requirements.

The Consultant shall ensure that all prior consideration and linkage requirements are addressed in a timely manner to avoid any risk to project eligibility under the selected carbon standard.

4.1.2 Project Assessment & Structuring:

The Consultant shall:

- a) Assess the Yellow Line BRT Project from the perspective of the selected carbon methodology, including system boundaries, applicability criteria, project technologies, monitoring requirements, and leakage considerations.
- b) Identify and select the most suitable carbon standard and methodology (e.g., AMS-III.C, AMS-III.U, relevant VCS/GS methodologies, Article 6 tools).
- c) Ensure compliance with the latest methodology version throughout the assignment.
- d) Prepare a Methodology Applicability Note demonstrating full eligibility and compliance.
- e) The Consultant shall conduct a comparative assessment of applicable carbon crediting standards and methodologies and recommend the most suitable option based on methodological applicability, expected emission reduction potential, transaction costs, market demand for credits, and alignment with Pakistan’s regulatory framework and international carbon market practices.
- f) The Consultant shall recommend an appropriate crediting period for the project in accordance with the requirements of the selected carbon standard. The recommendation shall consider the expected operational lifetime of the electric bus fleet, methodological requirements, and long-term monitoring feasibility.

4.1.3 Carbon Market Pathway Assessment

The Consultant shall assess and recommend the most appropriate carbon market pathway for the Yellow Line BRT carbon project.

This assessment shall include, but not be limited to:

- Evaluation of the suitability of the project for participation under the Voluntary Carbon Market (VCM).

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

Assessment of potential participation under **Article 6 mechanisms**, including requirements related to Host Country Approval, corresponding adjustments, methodology requirements, institutional readiness and potential risks.

The Consultant shall:

- Conduct a comparative analysis of applicable carbon market options, including eligibility criteria, transaction requirements, timelines, costs, risks, and expected market demand;
- Assess regulatory and institutional requirements associated with each pathway;
- Identify key risks and constraints, including uncertainties related to evolving international carbon market mechanisms;
- Recommend the most suitable carbon market pathway, supported by technical, financial, and institutional considerations.

The Consultant shall ensure that the recommended pathway is realistic, implementable, and aligned with prevailing market conditions and national regulatory frameworks.

The Consultant shall assess potential carbon credit buyers across voluntary and compliance markets, including corporate buyers, financial institutions, and government-linked mechanisms. The assessment shall include pricing trends, demand dynamics, and potential forward purchase arrangements.

The Consultant shall propose a commercialization strategy, including recommended pathways for carbon credit issuance, holding, transfer, and sale, with consideration of market access, transaction structures, and revenue optimization.

4.1.4 Carbon Credit Development Lifecycle

The Consultant shall define and operationalize the carbon credit development lifecycle for the project up to the stage of validation and registration under the selected carbon standard. This shall include, but not be limited to:

- Project identification and eligibility assessment;
- Baseline scenario development and additionality assessment;
- Preparation of Project Idea Note (PIN) and engagement with relevant authorities;
- Development of the Project Design Document (PDD);
- Validation by an accredited Validation and Verification Body (VVB);
- Project registration under the selected carbon credit standard;
- Design of the Monitoring, Reporting, and Verification (MRV) system to support future monitoring and verification of emission reductions.
- Activities related to post-registration monitoring, verification, issuance, and commercialization of carbon credits shall be undertaken under subsequent phases, as applicable.

The Consultant shall ensure that all stages are aligned with international standards and national regulatory requirements.

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

4.1.5 Baseline Scenario Development:

4.1.5.1 Use of Existing Work:

- a) The Consultant shall use relevant operational other related information developed under the PPP Transaction Advisory project only as reference inputs. The Consultant shall independently determine the specific data and analytical requirements necessary for baseline development in accordance with the selected carbon standard.
- b) Where emission reduction calculations rely on modal shift assumptions (e.g., transition of passengers from private vehicles, motorcycles, or informal transport modes to the BRT system), the Consultant shall provide robust supporting evidence. Such evidence may include passenger surveys, transport demand modeling outputs, corridor travel behavior analysis, or other verifiable datasets acceptable under the selected carbon standard.
- c) The Consultant shall ensure that the baseline scenario is developed using conservative and transparent assumptions consistent with the selected carbon methodology. All baseline parameters, assumptions, emission factors, and activity data shall be clearly documented and justified using verifiable data sources. Any assumptions that may materially affect emission reduction estimates shall be supported by sensitivity analysis and clearly explained in the baseline documentation. The Consultant shall not apply assumptions that artificially suppress or inflate emission reduction estimates.
- d) The Consultant shall assess potential leakage effects arising from the project, including displacement of existing transport services, rerouting of informal transport operators, or traffic redistribution to adjacent corridors. Any identified leakage sources shall be quantified and incorporated into the emission reduction calculations in accordance with the requirements of the selected carbon methodology.
- e) Where necessary, the Consultant shall design and conduct corridor-specific passenger surveys or utilize statistically valid survey datasets to substantiate modal shift assumptions used in emission reduction calculations in accordance with the requirements of the selected carbon methodology.

4.1.5.2 Development of Baseline Data:

The Consultant shall prepare a **complete and methodology compliant baseline scenario**, including all parameters, data, assumptions, calculations, and analyses required under the selected carbon standard. This shall include **any and all additional data collection, surveys, assessments, or analytical work** required to generate a defensible baseline.

4.1.5.3 Responsibility for Data Gaps:

The Consultant shall be responsible for identifying and filling all data gaps using technically justified approaches consistent with the selected carbon standard.

4.1.5.4 Baseline Modeling:

The Consultant shall prepare a transparent baseline model that includes all parameters, assumptions, and technical justifications required for validation.

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

4.1.5.5 Baseline Data Validation and Justification:

The Consultant shall ensure that all baseline parameters used for emission reduction calculations including vehicle kilometers traveled (VKT), passenger demand, modal share, fuel consumption factors, and grid emission factors are supported by verifiable data sources. Where modeled or projected data are used (e.g., modal shift assumptions from transport models or feasibility studies), the Consultant shall provide clear methodological justification, supporting surveys, sensitivity analysis, and conservative assumptions consistent with the requirements of the selected carbon standard.

4.1.6 Air Quality Baseline Analysis:

The Consultant shall prepare a detailed air quality baseline for the Yellow Line BRT corridor, including pollutant trends, concentration levels, spatial analysis, exposure patterns, and expected improvements resulting from electric bus deployment. The analysis must go beyond simple data collection and provide a full interpretation aligned with carbon standard expectations.

The assessment shall be aligned with the recommended carbon market pathway identified under the Carbon Market Pathway Assessment

4.1.7 Priori consideration and Additionality Assessment:

The Consultant shall prepare a complete A_Prior consideration and additionality Assessment using the tools and requirements of the selected carbon standard, including barrier analysis, penetration rates, investment analysis if required, and demonstration that the project is not mandated by existing policy and is not common practice.

4.1.8 Emission Reduction Estimation (Ex-Ante):

The Consultant shall prepare a complete and methodology-compliant ex-ante greenhouse gas emission reduction assessment, which shall explicitly include, but not be limited to, the following:

The assessment shall be structured in a manner consistent with the requirements of the selected carbon crediting standard and shall be directly usable for preparation of the Project Design Document (PDD) without material rework.

4.1.8.1 Ex-ante Baseline Emissions:

Estimated greenhouse gas (GHG) emissions that would occur in the absence of the Yellow Line BRT Project (baseline scenario). This shall represent a realistic and conservative projection of emissions under a “business-as-usual” trajectory and shall be developed in accordance with the selected carbon crediting methodology.

The assessment shall explicitly include, but not be limited to:

- Identification and justification of the baseline scenario, including prevailing transport modes, vehicle mix, and operational characteristics along the corridor.

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

- Estimation of passenger demand and modal share in the absence of the project.
- Determination of emission factors for relevant vehicle categories, consistent with recognized standards (e.g., IPCC or approved methodology defaults).
- Calculation of total baseline emissions over the defined crediting period, with clear assumptions on traffic growth, occupancy rates, and fuel consumption.
- Documentation of all assumptions, data sources, and methodologies used, ensuring transparency, conservativeness, and reproducibility.
- Definition of system boundaries, including geographic, temporal, and operational boundaries, in accordance with the selected methodology.

4.1.8.2 Ex-ante Project Emissions:

Expected greenhouse gas (GHG) emissions associated with the implementation and operation of the electric BRT system under the Yellow Line BRT Project (project scenario). This shall include all direct and indirect emissions attributable to project activities and shall be estimated in accordance with the selected carbon crediting methodology.

The assessment shall explicitly include, but not be limited to:

- Estimation of total electricity consumption of the electric BRT system, including vehicle operations, depots, charging infrastructure, and auxiliary systems.
- Application of appropriate grid emission factors (national or regional), including justification of the selected factor and treatment of grid emission intensity over the crediting period.
- Identification and quantification of any additional emission sources required under the applicable methodology (e.g., upstream emissions, auxiliary fuel use, backup systems, or maintenance-related emissions, if applicable).
- Determination of operational parameters such as fleet size, vehicle kilometers traveled (VKT), energy efficiency, and load factors.
- Calculation of total project emissions over the defined crediting period, with clearly stated assumptions and parameters.
- Documentation of all data sources, assumptions, and calculation approaches to ensure transparency, consistency, and auditability.
- Clear definition of project boundary and emission sources included within the project scenario, consistent with the selected methodology.

4.1.8.3 Ex-ante Emission Reductions:

Calculated Ex-ante emission reductions shall be calculated as the difference between ex-ante baseline emissions and ex-ante project emissions.

The Consultant shall but limited to:

- Apply conservative central assumptions in all calculations and avoid overestimation of emission reductions.
- Conduct sensitivity analysis for key variables, including ridership, vehicle kilometers traveled (VKT), electricity consumption, and emission factors.
- Assess uncertainty associated with key parameters and apply conservative adjustments or methodology-prescribed tools where significant uncertainty exists.

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

- Ensure that all parameters, assumptions, data sources, and formulas are fully documented and presented in a transparent, editable analytical format suitable for validation and review by the Validation and Verification Body (VVB).
- Ensure full compliance with the requirements, tools, and calculation procedures of the selected carbon crediting methodology.

All key parameters influencing emission reductions shall be transparently documented and justified using verifiable data sources. Any optimistic assumptions shall require clear justification and prior written approval from SMTA.

The emission reduction calculations shall be presented in a format directly translatable into PDD emission reduction equations and monitoring parameters.

4.1.8.4 Electricity Emission Factor Determination:

The Consultant shall determine and apply an appropriate grid emission factor for electricity consumption associated with electric bus charging, consistent with the requirements of the selected carbon crediting methodology.

The Consultant shall but not limited to:

- Use the most recent officially published data for Pakistan’s electricity grid or other methodology-approved sources.
- Clearly document the calculation approach, assumptions, and data sources used in deriving the emission factor.
- Account for transmission losses, charging losses, and other relevant system inefficiencies, where applicable.

4.1.9 Carbon Market Viability Assessment:

Following the Ex-Ante Emission Reduction Estimation, the Consultant shall prepare a **Carbon Market Viability Assessment** summarizing the expected annual and cumulative crediting volumes, indicative carbon revenue potential under multiple price scenarios, and estimated lifecycle transaction costs associated with carbon credit development.

These cost estimates shall include, inter alia, validation costs, registry fees, and indicative future costs for verification, issuance, and ongoing MRV over the crediting period.

The assessment shall present projected revenues under multiple carbon price scenarios, estimated lifecycle costs of carbon project development and operation, and the resulting indicative net financial benefit.

The assessment shall explicitly consider carbon market risks, including price volatility, uncertainty in demand, and variability in credit acceptance across different market segments. Sensitivity analysis shall be conducted to reflect these uncertainties.

If the assessment indicates that the project is additional, technically weak or financially non-viable, SMTA may decide not to proceed with further project documentation, validation, or registration activities.

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

4.1.10 Project Idea Note (PIN) Preparation and Host Country Engagement:

The Consultant shall prepare and submit a Project Idea Note (PIN) to the Ministry of Climate Change & Environmental Coordination (MOCC&EC) or others if required, acting as the Designated National Authority (DNA) for carbon market mechanisms in Pakistan.

The PIN shall present a concise and structured description of the proposed carbon project, including but not limited to:

- Project overview and scope;
- Expected greenhouse gas emission reduction potential;
- Proposed carbon standard and methodology;
- Preliminary baseline scenario and justification;
- Indicative monitoring approach;
- Alignment with national climate priorities and policies.

The Consultant shall include, but not limited to:

- Prepare the PIN in accordance with national requirements and international best practices;
- Support SMTA in submission of the PIN to MOCC&EC (DNA);
- Facilitate coordination with the DNA and respond to any queries or requests for clarification;
- Ensure alignment of the PIN with subsequent Project Design Document (PDD) development.

The Consultant shall ensure that the PIN is prepared and submitted **prior to initiation of validation activities** and in a manner that supports subsequent project development under voluntary carbon markets and/or Article 6 mechanisms.

4.1.11 Documentation Preparation (PDD & Approvals):

The Consultant shall perform the following but not limited to:

- a) Prepare the complete Project Design Document (PDD) in accordance with the selected standard.
- b) Prepare all supplementary documents required for registration (baseline study, monitoring plan, Additionality Assessment, risk analysis, etc.).
- c) Support the completion of any required national or host-country approvals.
- d) The Consultant shall ensure that all documentation prepared for project registration including the Project Design Document (PDD), baseline calculations, monitoring plan, and supporting annexes—is fully consistent with the requirements of the selected carbon methodology and is prepared in a manner suitable for independent validation by an accredited Validation and Verification Body (VVB).
- e) The Project Design Document (PDD) shall be consistent with the approved Project Idea Note (PIN) and any guidance received from the Designated National Authority (DNA).

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

4.1.12 Validation and Verification (VVB) Engagement and Management:

The Consultant shall be responsible for the identification, engagement, coordination, and management of an accredited Validation and Verification Body (VVB) for validation of the carbon project under the selected carbon standard.

The Consultant shall:

- Identify suitable VVBs accredited under the selected carbon standard and prepare a shortlist for review by SMTA.
- Support the preparation of required documentation for VVB selection, including scope definition, technical requirements, and evaluation criteria.
- Facilitate the procurement and contracting of the selected VVB, subject to review and approval by SMTA.
- Coordinate all interactions with the VVB throughout the validation process, including scheduling, documentation submission, site visits, and technical discussions.
- Respond to all validation findings, including Corrective Action Requests (CARs), Clarification Requests (CLs), and Forward Action Requests (FARs), and revise project documentation accordingly.
- Ensure timely and complete incorporation of all VVB comments and requirements into the Project Design Document (PDD) and supporting documentation.
- The VVB selection and validation process shall take into consideration the approved Project Idea Note (PIN) and any feedback received from the Designated National Authority (DNA).

4.1.12.1 Financial Arrangement for VVB Services

A provisional allocation for VVB services shall be included within the Consultant’s contract. The Consultant shall estimate indicative VVB costs during the inception phase based on the selected carbon standard, project scope, and validation requirements.

The actual cost of VVB services shall be:

- Determined during the inception phase;
- Subject to prior review and approval by SMTA; and
- Reimbursed against verified invoices and supporting documentation in accordance with the contract provisions.

The Consultant shall ensure that VVB engagement is completed in a timely manner and aligned with the overall project timeline and validation requirements of the selected carbon standard.

4.1.13 Stakeholder Consultation:

The Consultant shall develop and implement a comprehensive Stakeholder Engagement Plan (SEP), ensuring inclusive participation and securing institutional support across the project lifecycle.

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

4.1.13.1 Stakeholder Mapping and Analysis:

The Consultant shall develop and implement a comprehensive **Stakeholder Engagement Plan (SEP)** to secure broad-based institutional support and ensure transparent consultation during project development, validation, registration and early monitoring phases.

4.1.13.1.1 Stakeholder Mapping Matrix:

The Consultant shall prepare a **Stakeholder Mapping Matrix** that:

- a) Identifies relevant stakeholders; categorizes them by interest and influence; and assigns clear roles, responsibilities and points of contact.
- b) Includes, at minimum: Government & regulatory bodies (SMTA, Sindh Transport Department, Karachi Metropolitan Corporation, SEPA and other relevant entities); project entities (KMP team, Private BRT Operator(s), K-Electric); financial partners (World Bank); transport unions and labor groups; civil society & environmental NGOs; local businesses and corridor commercial establishments; academia & research institutions; and affected communities (commuters, residents).
- c) Specifies the level of engagement required for each stakeholder (inform, consult, involve, collaborate).

4.1.13.1.2 Engagement Plan & Feedback Loops:

Based on the matrix, the Consultant shall prepare a structured Engagement Plan that:

- a) States objectives for each stakeholder group and the expected outcomes of engagement.
- b) Describes engagement methods (e.g., targeted meetings, technical workshops, public forums, focus groups, surveys) and the communication channels to be used.
- c) Defines frequency/timing of engagements and an explicit feedback loop mechanism to record stakeholder inputs, consultant responses, and actions taken.
- d) Assigns responsibility for each engagement activity and identifies the SMTA focal point(s) to be kept informed.

4.1.13.1.3 Implementation, Documentation & Reporting:

The Consultant shall:

- a) Execute the SEP and manage all stakeholder consultations, including follow-up actions.
- b) Produce formal Stakeholder Consultation Reports that document participants, issues raised, consultant responses, and resolutions, in a format acceptable to the selected carbon standard.
- c) Provide periodic summaries of stakeholder issues and how they were addressed, to be included in progress reports to SMTA and the World Bank.

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

4.1.13.2 Inclusivity & Safeguards:

The SEP shall ensure gender-responsive and socially inclusive engagement approaches and integrate any E&S / GAP requirements required by the selected standard or by World Bank safeguards.

4.1.14 Risk Management, Accountability, and Contingency Planning:

The Consultant shall develop and implement a comprehensive **Risk Management Framework** covering all activities under this assignment. The Consultant will be responsible for proactively identifying, assessing, mitigating, and reporting risks that may affect timelines, costs, technical quality, or successful validation and registration of the Yellow Line BRT carbon credit project.

4.1.14.1 Risk Identification and Assessment:

The Consultant shall identify and assess risks across operational, technical, methodological, institutional, administrative, and financial dimensions, including but not limited to:

- a) Delays in data availability, stakeholder clearances, validation scheduling, or registry processing.
- b) Technical and methodological risks affecting baseline development, additionally justification, or MRV readiness.
- c) Financial risks, including cost overruns, unexpected revisions, or changes in carbon market requirements
- d) Institutional or coordination risks involving SMTA, operators, utilities, or third-party entities
- e) Risks arising from changes in carbon standards, monitoring requirements, or policy developments

4.1.14.2 Risk Register:

The Consultant shall prepare and maintain a comprehensive **Risk Register** that documents:

- a) Description of each identified risk
- b) Likelihood (low/medium/high)
- c) Potential impact (low/medium/high)
- d) Responsible party
- e) Mitigation and contingency measures
- f) Ongoing status updates

The Risk Register shall be updated periodically and included in all progress reports submitted to SMTA and the World Bank.

4.1.14.3 Mitigation Measures and Contingency Actions:

The Consultant shall propose, maintain, and implement mitigation measures, including:

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

- a) **Provision of internal contingency funds** within the Consultant’s financial and resource planning to manage unforeseen technical revisions, validator queries, documentation updates, or delays, ensuring that such risks **do not result in any additional financial claims on SMTA**
- b) Phased budget allocation and resource planning
- c) Early-warning indicators for potential delays or schedule slippage
- d) Alternative methodological pathways where applicable
- e) Backup plans for verification timelines, data collection, and registry delays
- f) Measures to address data gaps and ensure MRV readiness
- g) Contingency planning for delays in BRT operationalization

4.1.14.4 Accountability for Technical Accuracy and Compliance:

The Consultant shall ensure that the selected methodology, baseline, Additionality Assessment, monitoring plan, and GHG calculations remain accurate, complete, and compliant with the requirements of the selected carbon standard / international standards.

Any methodological errors, omissions, or inconsistencies in technical documentation or calculations **shall be corrected by the Consultant at its own**, without financial or schedule implications for SMTA.

4.1.14.5 Accountability for Delays:

The Consultant shall:

- a) Issue **written early-warning alerts** within **three (3) working days** of identifying any potential delay
- b) Rectify delays arising from inadequate planning, weak coordination, or technical misjudgment
- c) Undertake required corrective actions **at no additional cost to SMTA** where such delays arise from the Consultant’s deficiencies

4.1.14.6 Accountability for Cost Overruns:

Any cost overruns shall be borne solely by the Consultant:

- a) Misinterpretation of carbon standard requirements.
- b) Incomplete or inadequate documentation requiring resubmission.
- c) Calculation or methodological errors.
- d) Data losses or gaps caused by Consultant-side processes.
- e) Additional validator or registry requirements arising from Consultant shortcomings.
- f) Any other shortcomings, errors or gap during the complete analysis.

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

4.1.14.7 Transparent Reporting and Supervisory Cooperation:

The Consultant shall:

- a) Maintain full transparency in technical assumptions, calculations, communications with validators/registries, and decision-making
- b) Provide timely and accurate information, documentation, and clarifications to SMTA and the World Bank
- c) Fully cooperate with SMTA’s oversight and supervision
- d) Acknowledge that any concealment or withholding of material information shall constitute a breach of contractual obligations

4.1.14.8 No Additional Costs without Prior Approval:

SMTA shall not be liable for any additional costs unless **explicit written approval** is provided in advance.

Any work undertaken without such approval shall be at the Consultant’s own cost and risk.

4.1.14.9 Support to SMTA and Project Leadership:

The Consultant shall:

- a) Maintain continuous coordination with the designated SMTA Project Manager
- b) Keep SMTA fully informed of risks, delays, technical decisions, and emerging challenges
- c) Ensure that performance issues arising from Consultant-side negligence shall not be attributed to SMTA or its project leadership

4.1.15 Host Country Approval (HCA) & Article 6 Compliance Requirements:

The Consultant shall support SMTA in assessing and fulfilling applicable host-country requirements related to carbon crediting and potential participation under Article 6 of the Paris Agreement.

The Consultant shall perform the following tasks, including, but not limited to:

- a) Review and summarize national procedures issued by the Ministry of Climate Change & Environmental Coordination (MoCC&EC) / Designated National Authority (DNA) related to carbon crediting and Article 6 participation.
- b) Prepare all required documentation to support Host Country Approval (HCA), Letters of Endorsement (LoE), or equivalent authorizations required under applicable national procedures.
- c) Assess the potential suitability of the Yellow Line BRT project for participation under voluntary carbon markets and/or Article 6 mechanisms.
- d) Provide guidance to SMTA on institutional, regulatory, and documentation requirements associated with potential future participation under Article 6 mechanisms, including considerations related to corresponding adjustments and international transfers.

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

- e) Ensure that any Article 6–related requirements relevant to project registration are appropriately reflected in the Project Design Document (PDD) and supporting documentation.

Implementation of Article 6 transactions, ITMO transfers, corresponding adjustments, or registry operations shall not form part of this Phase-1 assignment.

4.1.16 Coverage of Project Influence Area:

The baseline assessment, emission reduction estimation, and all related carbon accounting analyses shall cover not only the Yellow Line BRT main corridor but also all directly connected feeder services, overlapping routes, and affected parallel public transport and para-transit services within the defined influence area of the project. The Consultant shall account for both direct and induced modal shift impacts arising from the BRT system and its feeder network.

The Consultant shall clearly define the project boundary and leakage zones in accordance with the selected methodology and provide justification for inclusion or exclusion of feeder routes, parallel corridors, and affected transport services.

The Consultant shall also assess potential displacement or restructuring of informal transport services and incorporate any resulting impacts in the baseline scenario or leakage assessment, consistent with the requirements of the selected carbon methodology.

4.2 Monitoring, Reporting, and Verification (MRV) System Design:

The Consultant shall develop and implement a complete Monitoring, Reporting, and Verification (MRV) framework in accordance with the requirements of the selected carbon crediting standard and methodology. The MRV system shall be designed as a core component of carbon credit quality assurance, recognizing that robust MRV is a key determinant of market acceptance, pricing, and long-term credibility of carbon assets.

The MRV system shall ensure accuracy, transparency, traceability, and long-term sustainability under the ownership and operational control of SMTA.

Any carbon project registry accounts established for the purpose of project registration and future credit issuance shall be maintained under the ownership and control of SMTA or the Government of Sindh. The Consultant shall support SMTA in establishing, configuring, and managing the registry account in accordance with the requirements of the selected carbon standard.

The MRV system shall include clear data archiving protocols to ensure that all monitored data, calculation files, analytical models, and supporting documentation are securely stored and retained for a minimum period consistent with the requirements of the selected carbon standard and methodology.

The MRV system shall define procedures for periodic updates of grid emission factors and other external parameters used in emission reduction calculations, in accordance with the requirements of the selected carbon methodology.

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

The Consultant shall establish robust quality assurance and quality control (QA/QC) procedures for all monitored data, including data validation checks, reconciliation procedures, and error detection protocols to ensure the accuracy, completeness, and consistency of monitoring information.

The MRV framework shall clearly define all monitored parameters required under the selected carbon methodology, including but not limited to vehicle kilometers traveled (VKT), electricity consumption for bus charging, passenger ridership, operational hours, vehicle availability, grid emission factors, and any other parameters required for emission reduction calculations.

4.2.1 Institutional Arrangements for Carbon Project Management

The Consultant shall support SMTA in defining and formalizing the institutional arrangements for the development, registration, and management of the carbon credit project.

In this regard, the Consultant shall:

- Identify and clearly define the roles and responsibilities of all relevant entities involved in the carbon project, including project ownership, implementation, and coordination functions.
- Support SMTA in determining the appropriate entity to act as the **carbon project account holder** and focal point for engagement with the selected carbon standard and registry;
- Define roles related to carbon credit ownership, registry account management, and future carbon credit transactions;
- Ensure that institutional arrangements are aligned with the requirements of the selected carbon standard and any applicable national regulations, including Article 6 considerations;
- Provide recommendations on governance structures, internal workflows, and coordination mechanisms required for efficient management of the carbon project.

The Consultant shall ensure that the proposed institutional framework is practical, clearly documented, and agreed with SMTA to avoid delays during validation, registration, and future implementation phases.

The Consultant shall define carbon credit ownership structures and ensure clarity regarding rights to carbon assets. The Consultant shall also assess and propose measures to avoid double counting of emission reductions, including alignment with national greenhouse gas accounting frameworks.

The Consultant shall further assess whether emission reductions are intended for domestic use or international transfer, including implications for corresponding adjustments under Article 6 of the Paris Agreement and consistency with Pakistan’s Nationally Determined Contributions (NDCs).

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

4.2.2 MRV System Setup

The Consultant shall:

- a) Develop a complete MRV Plan consistent with methodology requirements, covering all monitored parameters, data sources, collection frequency, and QA/QC procedures.
- b) Design simple and practical monitoring templates and digital tools (e.g., spreadsheets, dashboards, databases) for operational use by SMTA and operator(s).
- c) Establish clear roles and responsibilities for SMTA, operators, and any third parties involved in monitoring activities.
- d) Configure data management protocols, version control systems, and secure data-archiving procedures.
- e) Ensure the MRV system is validation ready.
- f) The MRV system shall define all monitored parameters required under the selected methodology, including but not limited to vehicle kilometers traveled (VKT), electricity consumption for bus charging, passenger ridership, fleet operational hours, vehicle availability, grid emission factors, and any other parameters required for emission reduction calculations.
- g) The Consultant shall establish quality assurance and quality control (QA/QC) procedures for all monitored data, including validation checks, data reconciliation procedures, and error detection protocols to ensure accuracy and integrity of monitored information.

The MRV Plan shall include minimum required data resolution (monthly VKT per vehicle, monthly electricity consumption per depot/charger, route-level ridership, charging logs, operational hours, and downtime logs).

4.2.3 Long-Term Sustainability & Transition to SMTA Ownership:

To ensure long-term sustainability after completion of the assignment, the Consultant shall:

- a) Develop a **MRV Transition & Handover Plan** detailing how MRV responsibilities will be fully transferred to SMTA.
- b) Train designated SMTA staff on:
 - i. Data collection and reporting
 - ii. Use of MRV templates and tools
 - iii. Preparation of periodic monitoring reports
 - iv. Responding to VVB queries
 - v. Registry operations
 - vi. Future Credit issuance procedures
- c) Provide SMTA with full access and permanent ownership of all MRV tools, templates, digital systems, dashboards, spreadsheets, formulas, and documentation.
- d) Establish a clear roadmap for SMTA to independently prepare future monitoring reports and manage subsequent verifications without external dependence.
- e) Advise SMTA on staffing needs, internal workflows, and integration of MRV duties into SMTA’s operational structure.

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

4.2.4 Handover Deliverables

Before closure of the assignment, the Consultant shall provide SMTA with:

- a) A “MRV Operations Manual” covering all steps required for future monitoring, verification, and issuance.
- b) Editable master templates for all MRV documents.
- c) Passwords, access keys, and configuration details for digital MRV systems.
- d) A capacity-building report summarizing training sessions, participants, and competency achieved.
- e) A full handover certification confirming that SMTA can independently manage MRV activities.

All project data, analytical models, PDD versions, MRV tools, templates, and documentation prepared under this assignment shall be the exclusive property of SMTA. The Consultant shall not reuse, sell, or disclose project-specific data without SMTA’s prior written consent

4.3 Capacity Building and Replicability:

The Consultant shall conduct structured capacity-building activities for SMTA and relevant stakeholders covering key aspects of carbon project development, including baseline development, Additionality assessment, and preparation of carbon project documentation, validation processes, and implementation of Monitoring, Reporting and Verification (MRV) systems in accordance with the selected carbon standard.

4.3.1 Training & Institutional Strengthening

The Consultant shall:

- a) Conduct structured capacity-building workshops covering all stages of carbon credit development including baseline preparation, Additionality Assessment, carbon project documentation, validation processes, and MRV system implementation.
- b) Provide hands-on training for SMTA personnel on all tools, models, templates, and software used in the assignment.
- c) Develop a step-by-step operational manual for SMTA staff detailing responsibilities, workflows, data management practices, reporting formats, and timelines.
- d) Deliver at least two practical training simulations (mock MRV cycles, mock validation response, and mock registry submission).
- e) Ensure the transfer of editable models, spreadsheets, dashboards, and calculation files with complete documentation.

The Consultant shall ensure that all knowledge is transferred in a manner that allows SMTA to maintain and operate the MRV system and manage future carbon project activities independently

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

4.3.2 Long-Term MRV System Handover

The Consultant shall:

- a) Develop a long-term MRV Transition Plan describing how responsibility will progressively shift from the Consultant to SMTA.
- b) Train designated SMTA staff on the full MRV cycle, including monitoring procedures, data archiving, QA/QC systems, and reporting.
- c) Provide SMTA permanent access to all MRV tools (including digital systems), along with user guides and technical documentation.
- d) Ensure the MRV system is fully embedded within SMTA’s operational processes and can be executed without external support.

4.3.3 Knowledge Products & Documentation

The Consultant shall prepare:

- a) A comprehensive Carbon Crediting Toolkit for Public Transport Electrification in Sindh.
- b) Methodology-compliant templates for future BRT and e-mobility carbon credit projects.
- c) A Lessons Learned Report and Good Practice Guide for replication.
- d) Editable spreadsheets, emission factor libraries, and calculation frameworks for use by SMTA across future corridors.

All materials shall be delivered in editable formats and become the sole property of SMTA.

4.3.4 Replicability Across Other Corridors & Modes

The Consultant shall:

- a) Provide a detailed strategy for extending the carbon crediting approach to other BRT corridors (e.g., Red Line, Green Line, Orange Line) and to other vehicle categories (e.g., e-rickshaws, city buses, feeder services).
- b) Highlight corridor-specific and methodology-specific conditions that must be considered for future carbon projects.
- c) Provide recommendations for scaling carbon crediting in Sindh’s public transport sector, including institutional arrangements, staffing needs, and long-term governance structures.

4.3.5 Compliance with Pakistani Policy and International Standards

The Consultant shall ensure:

- a) Full compliance with Pakistan’s approved policies, frameworks, or guidelines for carbon trading, Article 6 readiness, and voluntary carbon market practices.
- b) Full alignment with World Bank requirements for institutional capacity development.

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

- c) That all training materials, tools, and manuals remain consistent with the selected international carbon standard(s).

4.3.6 Training:

Training, capacity building, handover, and knowledge transfer shall not be conditional on any incentives, additional payments, or separate arrangements. All required capacity development activities shall be fully included within the Consultant’s scope and cost.

5. Timelines and Deliverables

The Consultant shall provide technical support for the preparation, validation, and registration of the Yellow Line BRT carbon credit project during the pre-operational phase of the BRT system. The assignment shall focus on project structuring, preparation of carbon documentation, validation, registration, and the development of a validation-ready MRV system.

The assignment is expected to be completed within **eighteen (18) months** from contract signing.

All deliverables shall be submitted in editable formats and shall include supporting datasets, analytical models, calculation spreadsheets, and relevant documentation necessary for validation and registration of the carbon project.

5.1 Phase 1: Pre-Operational Readiness (Deliverables):

This phase consists of all preparatory actions required for the Yellow Line BRT to be registered under an internationally recognized carbon standard, and for the MRV system to be fully designed before operations begin. Each deliverable must include all technical files (datasets, baselines, models, GIS files, calculations, PDD annexes, and stakeholder documentation).

Table 5-1 Phase-1 Deliverables and Timeline:

#	Deliverable	Timeline (from contract signing)
1	Inception Report , including methodology, work plan, stakeholder strategy, review of applicable standards and an itemized fee schedule (VVB fees, registry fees, issuance costs, HCA fees, legal charges, transaction costs, contingencies).	By Month 1
2	Ex-ante GHG Emission Reduction Estimation (baseline & project scenarios).	By Month 3
3	Early Carbon Market Viability Assessment including prior consideration and additionality assessment (Go/No-Go Decision Report)	By Month 4
4	Stakeholder consultation and summary report	By Month 5

Terms of Reference (Draft)**Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”**

#	Deliverable	Timeline (from contract signing)
5	Project Idea Note (PIN) Preparation & Submission to MoCC&EC/DNA	By Month 5
6	Draft Project Design Document (PDD)	By Month 6
7	Final PDD (including internal review and pre-validation refinement)	By Month 8
8	MRV System Design (Validation-Ready) & Handover Framework (monitoring plan, templates, QA/QC, roles, data systems) The MRV system shall be subject to review during validation and revised as required based on VVB feedback.	Month 9-13
9	VVB Identification, Procurement & Contracting (with SMTA approval)	By Month 9
10	Validation Process (including site visits, CARs, CLs, and responses to VVB queries)	Month 9–13
11	Submission for Registration & Successful Registration with Selected Carbon Standard	Month 15
12	Capacity Building & Training Sessions	Month 14-16
13	Phase-1 Completion Report (including Phase-2 roadmap)	By Month 18

The sequencing of deliverables has been designed to reflect the standard lifecycle of carbon project development and registration, ensuring logical progression and full compliance with the requirements of the selected carbon standard.

In particular:

- The Project Idea Note (PIN) and engagement with the Designated National Authority (DNA) shall be completed prior to initiation of validation activities;
- The Project Design Document (PDD) shall be prepared and iteratively finalized, incorporating internal reviews and stakeholder inputs, prior to formal submission to the Validation and Verification Body (VVB);
- The Monitoring, Reporting and Verification (MRV) system shall be developed to a validation-ready stage prior to validation;
- Validation activities, including responses to Corrective Action Requests (CARs) and Clarification Requests (CLs), and required document revisions, shall be completed prior to submission for registration;
- Registration shall be pursued only upon successful completion of validation under the selected carbon standard.

The timeline incorporates adequate time for VVB procurement and mobilization, iterative validation cycles, and PDD finalization processes, ensuring realistic implementation and alignment with international best practices.

.

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

5.1.1 Phase-1 Completion Report (including Phase-2 roadmap):

The Consultant shall prepare a comprehensive Phase-1 Completion Report summarizing all activities undertaken, outputs delivered, and key findings of the assignment.

The report shall also include a detailed Phase-2 Roadmap outlining the implementation strategy for post-registration carbon project activities.

The roadmap shall include, but not be limited to:

- Monitoring and data collection plan for the operational phase;
- Verification schedule and engagement strategy with the Validation and Verification Body (VVB);
- Carbon credit issuance process and indicative timelines;
- Registry account management, including credit issuance, holding, transfer, and retirement procedures;
- Institutional roles and responsibilities for Phase-2 implementation;
- Indicative cost estimates for verification, issuance, and registry operations;
- Potential carbon market engagement and commercialization strategies.

5.1.2 Early Carbon Market Viability Assessment (Go/No-Go Decision Report)

The Consultant shall prepare a detailed Early Carbon Market Viability Assessment based on the ex-ante emission reduction estimates. The assessment shall include, but not be limited to, the following:

- Estimated annual and cumulative emission reduction volumes and potential crediting volumes.
- Applicable carbon credit methodologies and key conservativeness requirements.
- Estimated lifecycle transaction costs associated with carbon crediting, including validation costs, registry fees, and indicative future verification, issuance, and MRV costs over the crediting period.
- Projected carbon revenue under multiple price scenarios (e.g., low / medium / high).
- Indicative net financial benefit or deficit over the crediting period.
- Sensitivity analysis considering key variables such as ridership levels, grid emission factor changes, energy consumption assumptions, and other relevant parameters.
- A clear recommendation on whether the Yellow Line BRT project should proceed to Project Design Document (PDD) development and registration under the selected carbon standard.

5.1.2.1 Decision Rule:

If the Early Carbon Market Viability Assessment concludes that carbon credit generation is financially non-viable, technically weak, or unlikely to generate meaningful net benefits, SMTA may decide not to proceed with further carbon project development.

In such a case:

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

- SMTA may decide not to proceed with PDD preparation, validation, or registration of the carbon project.
- Only deliverables completed and approved up to that stage shall be payable.
- The Consultant shall not be entitled to claim additional compensation for activities that are not undertaken following the Go/No-Go decision.
- Any continuation of carbon project development activities beyond this stage shall require explicit written approval from SMTA.

5.1.3 Additional Notes (Applicable to All Deliverables):

- Payments under this assignment shall be linked to the successful completion and acceptance of deliverables, rather than the passage of time.
- The contract may include appropriate performance security and liquidated damages provisions for non-delivery or delayed delivery of critical milestones, in accordance with applicable procurement regulations.
- All deliverables shall be subject to review and approval by SMTA “no-objection” from the World Bank.
- Any additional external costs (e.g., Validation and Verification Body (VVB) fees, registry fees, or other carbon standard-related charges) not included in the approved fee schedule shall not be payable by SMTA without prior written approval.
- All analytical models, datasets, templates, calculation tools, reports, and digital systems developed under this assignment shall remain the sole property of SMTA and shall be provided in fully editable formats

6. Required Consulting Services and Team Composition:

The Sindh Mass Transit Authority (SMTA) intends to engage a qualified consulting firm or a consortium of international and national firms to deliver the services outlined in this Terms of Reference. Given the technical, regulatory, and market-driven nature of carbon crediting, firms are strongly encouraged to form consortiums combining international expertise with local implementation capacity in Pakistan.

6.1 Eligibility of Firms:

- Firms may participate individually or as part of a consortium (joint venture or sub-consulting arrangement).
- The consortium must include at least one international firm with proven experience in carbon credit project registration, and one national firm with urban transport or clean-energy expertise in Pakistan.
- The lead partner must have the legal capacity to sign a contract with SMTA and manage all consortium activities.
- Firms must not be blacklisted by any government, IFI, carbon standard, or UN agency.

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

- Preference will be given to consortiums demonstrating prior collaboration and clear division of responsibilities.
- All firms must declare absence of conflict of interest, particularly regarding carbon credit buyers, brokers, and registries.

6.2 Firm Experience Requirements:

The firm/consortium must demonstrate:

- Minimum 5 years of experience in carbon market development, GHG accounting, MRV, or carbon project registration (e.g., Verra, Gold Standard, CDM, Article 6.4, and GCC).
- Experience in transport, electric mobility, or modal-shift projects.
- At least three (3) successfully registered carbon credit projects, preferably in transport, fuel switching, renewable energy, or urban projects.
- Previous assignments with government agencies, IFIs (World Bank, ADB, GIZ), or major utilities.
- Demonstrated experience in designing MRV frameworks, monitoring protocols, and verification support.
- Proven ability to coordinate with public-sector institutions, transport departments, utilities, and local stakeholders in Pakistan.
- Demonstrated experience in urban transport planning, public transport systems, or electric mobility projects, including BRT systems or modal shift analysis, is required.

6.3 Personnel Requirements and Qualifications:

The Consultant shall assemble a multidisciplinary team with the skills, experience, and capacity necessary to deliver the full scope of services described in these Terms of Reference. The team shall include the Key Experts and Non-Key Experts listed below.

The Consultant may propose a mix of local and international experts. There is **no restriction on nationality**, provided that the team collectively demonstrates:

1. **Strong international experience** in carbon methodologies, MRV, validation, verification, and carbon market transactions; and
2. **Strong local presence** and ability to conduct on-ground data collection, coordination, stakeholder engagement, and continuous support in Karachi.

Each expert’s Curriculum Vitae (CV) must include:

- Signed availability declaration for the duration of assigned inputs;
- Full description of relevant experience;
- Evidence of similar assignments;
- Specific roles and responsibilities in past carbon credit or e-mobility projects.

The following Key and Non-Key Experts are required:

6.3.1 Key Experts

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

6.3.1.1 Key Expert 1: Carbon Specialist & Team Leader

i. Responsibilities:

- Provide overall leadership and strategic direction for the assignment.
- Prepare and manage the project implementation plan, work breakdown structure, timelines, and deliverable schedule.
- Ensure full alignment with the selected carbon standard, methodology requirements, and World Bank guidelines.
- Lead coordination with SMTA, World Bank, VVBs, Ministry of Climate Change (DNA), K-Electric, and other stakeholders.
- Ensure quality assurance for all deliverables including baseline analysis, Additionality Assessment, Project Design Document (PDD), MRV system design, validation support, and project registration documentation...
- Lead technical responses to validator queries and corrective action requests.
- Manage internal team coordination, integration of technical inputs, and preparation of consolidated reports.
- Lead preparation of the Phase 1 Completion Report and Phase 2 roadmap.
- Any other key tasks not explicitly mentioned but necessary for this role in accordance with internationally accepted carbon credit practices.
- Demonstrated experience in transport sector projects, particularly urban mobility or public transport systems, is highly desirable.

ii. Minimum Qualifications:

- a) Master’s degree in Climate, Environment, Energy, Engineering, or related discipline.
- b) Minimum 15 years of professional experience.
- c) At least 5 registered carbon credit projects (VCS, GS, CDM, or Article 6).
- d) Participation in carbon credit project development in the transport sector
- e) Demonstrated experience in managing multidisciplinary teams.
- f) Strong communication and stakeholder management skills.

6.3.1.2 Key Expert 2: Carbon Methodology & Baseline Expert (Environmental Specialist)

i. Responsibilities:

- Identify the most suitable carbon methodology and demonstrate applicability.
- Prepare methodology applicability note, baseline scenario, project scenario, and all ex-ante GHG calculations.
- Conduct Additionality Assessment (regulatory, financial, barrier, common practice).
- Integrate air quality baseline analysis and co-benefits.
- Prepare sensitivity analysis for ridership, VKT, grid emission factor, and other drivers.
- Prepare technical sections of the PDD and all related annexes.
- Support responses to VVB technical queries.
- Any other key tasks not explicitly mentioned but necessary for this role in accordance with internationally accepted carbon credit practices.

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

ii. Minimum Qualifications:

- Master’s degree in Environmental Sciences, Energy, Climate, or related field.
- At least 10 years of experience in carbon methodologies, baseline development, and GHG accounting.
- Demonstrated significant experience preparing PDDs and supporting successful validation of at least 5 carbon credit projects
- Participated in the carbon credit projects in the transport sector

6.3.1.3 Key Expert 3: MRV & Data Management Specialist

i.Responsibilities:

- Design a complete MRV Plan aligned with methodology requirements.
- Develop monitoring templates, digital tools, data workflows, and QA/QC procedures.
- Lead development of MRV reporting dashboard and data management procedures.
- Train SMTA/operator staff on MRV processes.
- Design the MRV framework, monitoring templates, data management procedures, and QA/QC protocols required for future monitoring and verification once project operations commence.
- Support the preparation of validation-ready MRV documentation.
- Develop MRV Operations Manual and full handover framework.
- Any other key tasks not explicitly mentioned but necessary for this role in accordance with internationally accepted carbon credit practices.

ii. Minimum Qualifications:

- Master’s Degree in Engineering, Energy, Environmental Science, Data Science, or similar.
- Minimum 7 years of MRV system design and monitoring experience.
- Prior work in carbon monitoring, transport monitoring, or transport -sector MRV preferred.

6.3.1.4 Key Expert 4: Electric Mobility Expert

i.Responsibilities:

- Provide technical inputs on electric bus specifications, battery capacity, charging systems, and depot power requirements.
- Model energy consumption (kWh/km) under various operational conditions.
- Provide project emission calculation parameters and operational assumptions.
- Support integration of EV operational data into MRV templates.
- Train relevant staff on EV-specific monitoring needs.
- Respond to VVB questions related to e-bus operations.
- Any other key tasks not explicitly mentioned but necessary for this role in accordance with internationally accepted carbon credit practices.
- Document operational energy consumption assumptions for electric buses, including charging efficiency, auxiliary loads, operational conditions, and other factors affecting electricity consumption for emission reduction calculations.

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

ii. Minimum Qualifications:

- Degree in Mechanical/Electrical/Automotive Engineering or Energy Systems.
- Minimum 7 years’ experience in EV or electric bus planning/operations.
- Knowledge of charging infrastructure and fleet energy modelling.
- Any other key tasks not explicitly mentioned but necessary for this role in accordance with internationally accepted carbon credit practices.

6.3.1.5 Key Expert 5: Transport Expert

i. Responsibilities:

- Review EY’s modeling outputs and validate assumptions for carbon methodology use.
- Provide refined baseline and project VKT, ridership, load factors, and modal shift parameters.
- Prepare GIS-based corridor mapping, leakage zones, route shape files, and spatial analysis.
- Support methodology expert with transport parameters in baseline and project scenarios.
- Any other key tasks not explicitly mentioned but necessary for this role in accordance with internationally accepted carbon credit practices.
- The Transport Expert shall play a central role in supporting carbon baseline development, emission reduction estimation, and validation of transport-related assumptions used in the carbon methodology

ii. Minimum Qualifications:

- Degree in Transport Engineering, Urban Transport Planning or Civil Engineering,
- Minimum 10 years of professional experience.
- Demonstrated experience in VKT modelling, modal shift analysis, and corridor mapping.

6.3.1.6 Key Expert 6: Financial / Carbon Market Specialist

i. Responsibilities:

- Conduct carbon market viability analysis based on projected emission reductions.
- Prepare carbon revenue projections under multiple price scenarios.
- Support preparation of the Early Carbon Market Viability Assessment (Go/No-Go report).
- Provide advisory inputs on carbon market structures and future monetization pathways for SMTA.
- Ensure financial analysis aligns with World Bank project appraisal practices.

ii. Minimum Qualifications:

- MBA, CFA, ACCA, CA, or equivalent.
- Minimum 7–10 years of experience in climate finance or carbon markets.

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

- Demonstrated experience with ERPAs, carbon pricing, or carbon transaction advisory.

6.3.2 NON-KEY EXPERTS (MANDATORY)

6.3.2.1 Non-Key Expert 1: Legal Expert

i. Responsibilities:

- Prepare legal documentation for Host Country Approval (HCA).
- Ensure compliance with Article 6 authorization, registry requirements, and corresponding adjustments.
- Provide legal advisory inputs related to Host Country Approval (HCA), Article 6 readiness, and regulatory compliance associated with carbon project registration.
- Advise SMTA on contractual and regulatory risks.

ii. Minimum Qualifications:

- LLM with at least 8 years’ experience in international environmental law, carbon markets, or public-sector contracting.
- Demonstrated experience with ERPAs or Article 6 processes preferred.

6.3.2.2 Non-Key Expert 2: Local Technical Coordinator – Karachi Based:

i. Responsibilities:

- Serve as local focal point between SMTA and the Consultant’s team.
- Coordinate field visits, meetings, workshops, and stakeholder engagements.
- Support data collection, validation, and follow-up with operator, K Electric, and local agencies.
- Maintain documentation flow and ensure timely provision of local inputs.

ii. Minimum Qualifications:

- Bachelor’s/Master’s degree in Engineering, Planning, or relevant field.
- Excellent communication and coordination skills.
- Must be based in Karachi.

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

6.4 Payment Schedule

Payments to the Consultant shall be **linked to deliverables achieved**, not time elapsed, and subject to approval by SMTA and *No Objection* from the World Bank.

Table 6-1: Phase-1 Payment Schedule (Deliverable-Based)

#	Deliverable	Payment %
1	Inception Report (methodology review, work plan, stakeholder strategy, standards review, cost schedule)	10%
2	Ex-ante GHG Emission Reduction Estimation (baseline & project scenarios)	10%
2a	Early Carbon Market Viability Assessment including prior consideration and additional assessment (Go/No-Go Decision Report)	10%
3	Stakeholder Consultation & Summary Report	10%
4	Draft and Final Project Design Document (PDD) aligned with selected carbon standard	10%
5	Identification and engagement of a Validation and Verification Body (VVB), with approval	5%
6	Support for validation, including site visits and responses to VVB queries	10%
7	Submission of project documentation and successful registration with the selected carbon standard and uploaded in the registry	15%
8	MRV system design, including monitoring plan, data collection templates, and roles/responsibilities handover	5%
9	Capacity building sessions for SMTA and implementing stakeholders on MRV, carbon markets, and project registration	5%
10	Phase 1 Completion Report, including roadmap for Phase 2 implementation and pending requirements	10%

The engagement of the validator(s) shall be carried out either through a competitive tendering process or through direct negotiations, as appropriate.

The consultant shall be responsible for selection, contracting and managing payments to the validator in accordance with agreed contractual milestones. These payments will be reimbursed to the consultant within 30 days upon submission of valid invoices and supporting documentation. The cost of validator services shall not be considered as part of the financial evaluation of the consulting.

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

The consultant will guide and help with processing the documents related to standards in due time. SMTA, project owner, will be responsible for any payments to the standard.

6.4.1 Validation and Registration Corrections:

Any revisions, clarifications, additional analyses, or documentation required by the Validation and Verification Body (VVB), the selected carbon standard registry, or relevant competent authorities during the validation or registration process shall be addressed and completed by the Consultant as part of the original scope of services. Such revisions shall not constitute grounds for additional payments, contract variations, or extension of time unless the requested changes arise from factors beyond the Consultant’s control and are explicitly approved in writing by SMTA.

6.5 Indicative Expert Input Requirements (Person-Months):

The Consultant shall provide a multidisciplinary team with adequate inputs to deliver all tasks and milestones defined in these Terms of Reference. The person-month requirements below are indicative minimum commitments expected for the assignment and reflect intermittent, task-based mobilization over the 18-month duration of the project.

The proposed level of effort reflects not only the technical requirements of carbon project development and registration, but also the strong emphasis on **capacity building and institutional strengthening** embedded within this assignment.

In addition to core technical tasks, the Consultant shall:

- Conduct structured training and capacity-building sessions for SMTA and relevant stakeholders;
- Develop operational manuals, toolkits, and knowledge products;
- Support institutional strengthening to enable SMTA to independently manage Monitoring, Reporting and Verification (MRV) systems and future carbon project activities;
- Ensure effective knowledge transfer and long-term sustainability of project systems.

Accordingly, the proposed person-month inputs account for both technical deliverables and comprehensive capacity-building and institutional development requirements, ensuring that SMTA is fully equipped to manage carbon project activities beyond the duration of this assignment.

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

Table 6-2 Indicative Expert Input Requirements (Person-Months):

Expert Role	Indicative Person-Months (PM)	Input Nature
1. Carbon Specialist & Team Leader	8 PM	Intermittent
2. Carbon Methodology & Baseline Expert (Environmental Specialist)	7 PM	Intermittent
3. MRV & Data Management Specialist	5 PM	Intermittent
4. Electric Mobility Expert	3 PM	Short-Term
5. Transport Modelling & GIS Expert	2 PM	Short-Term
6. Financial / Carbon Market Specialist	2 PM	Intermittent
7. Legal Expert (Article 6 and Carbon Regulatory Compliance)	1 PM	Short-Term
8. Local Technical Coordinator – Karachi Based	5 PM	Part-Time / As Needed

- The person-month estimates provided above are indicative and intended to guide bidders. Consultants may propose alternative staffing arrangements provided the scope of services is fully covered.

6.6 Evaluation of proposals

6.6.1 Technical component:

Category	Sub- criteria	Weight/score
Company or consortium experience	As described in section 6.2	15
Methodology and approach to TOR	Illustrating clear understanding of the assignment and methodology and detailed workplan	20
Key experts	Key expert 1	15
	Key expert 2	15
	Key expert 3	5
	Key expert 4	10
	Key expert 5	5
	Key expert 6	5
	Non-key expert 1	5
	Non-key expert 2	5
Total		100

The threshold for an eligible technical component shall have a minimum technical score of 80%.

6.6.2 Financial component

The maximum score for the financial component is 20 points. The maximum score shall be allocated to the lowest priced proposal. All other proposals shall receive point in inverse proportions according to the following formula:

Terms of Reference (Draft)

Carbon Project Development and Registration for “Yellow Line BRT – Karachi, Sindh Province, Pakistan”

$P = M * (L/E)$, where

P : Point for the financial proposal being evaluated

M: Maximum number of points for the financial proposal

L: Price of the lowest priced proposal

E: Price of the proposal being evaluated

- **Evaluation of the technical and financial components for total Scoring:**

The score for the technical component is added to the score of the financial component to arrive at the total score of the proposal. The proposal with the overall highest score is the best proposal.