Terms of reference (ToR) for Urban E-Transit Lab: Digital Twin-Based Electric Bus Deployment and Depot Electrification Planning

CONFIDENTIAL

Urban E-Transit Lab: Digital Twin-Based Electric Bus Deployment and Depot Electrification Planning	**Project number/ cost centre: G-012383**
	Tender number

0. List of abbreviations

AG	Commissioning party
AN	Contractor
AVB	General Terms and Conditions of Contract for supplying services and work
FK	Expert
FKT	Expert days
KZFK	Short-term expert
ToRs	Terms of reference

1. Context

India is undergoing one of the world's largest public transport electrification transitions. Driven by national and state-level initiatives to reduce greenhouse gas emissions, improve urban air quality and modernise public transport systems, State Transport Undertakings (STUs) and urban public transport agencies are increasingly deploying electric buses as part of their fleet expansion and renewal programmes. The adoption of electric buses is expected to play a critical role in achieving national climate objectives while improving the sustainability, efficiency and resilience of urban transport systems.

Despite significant progress in electric bus procurement and deployment, many STUs and urban bus agencies continue to face challenges in planning and implementing large-scale fleet electrification programmes. Unlike conventional diesel fleets, electric bus deployment requires integrated planning across vehicle operations, route scheduling, charging strategies, depot infrastructure, electrical systems and grid connectivity. Decisions related to battery sizing, charging infrastructure, transformer capacity, charging schedules, energy demand management and phased fleet expansion are highly interdependent and can significantly affect operational performance, service reliability, infrastructure investments and long-term scalability.

While several agencies have initiated electric bus deployment programmes, many continue to have limited access to structured planning methodologies, analytical tools and technical expertise required to evaluate alternative deployment scenarios and make evidence-based investment decisions. Consequently, charging infrastructure may be over- or under-sized, depot infrastructure may not adequately support future expansion, and opportunities for optimising operational efficiency and lifecycle costs may not be fully realised.

Internationally, digital twin and simulation-based planning approaches are increasingly being adopted to support the planning and implementation of electric bus systems. Such approaches enable transport agencies to create data-driven representations of fleet operations and infrastructure systems, assess route-level energy requirements, evaluate charging strategies, estimate electrical infrastructure needs, forecast energy demand, analyse operational risks and compare alternative deployment scenarios before major investments are undertaken. By enabling informed decision-making, these tools can reduce implementation risks and support more efficient and scalable fleet electrification strategies.

Under the Enabling Accessible, Sustainable and Equitable (EASE) Mobility project, GIZ aims to strengthen the capacity of public bus transport agencies to undertake structured electric bus deployment planning. Through the Urban E-Transit Lab initiative, GIZ intends to support selected State Transport Undertakings (STUs) and urban public transport agencies in applying digital twin-based planning approaches to electric bus deployment, charging infrastructure planning and depot electrification.

The assignment is envisaged as a pilot initiative to demonstrate the application of digital twin-based planning methodologies in at least two participating cities or public transport agencies. In addition to supporting technical planning and decision-making within the selected pilot locations, the assignment shall generate practical lessons, planning methodologies, tools and guidance that can be replicated and adapted by other STUs and urban public transport agencies across India. The overall objective is to establish a scalable and transferable framework for data-driven electric bus deployment planning that supports the accelerated and sustainable transition towards zero-emission public transport systems nationwide.

2. Objective of the Assignment

The objective of this assignment is to support selected State Transport Undertakings (STUs) and urban public transport agencies in India in undertaking structured, data-driven electric bus deployment planning through the application of digital twin-based planning and simulation.

The assignment shall be implemented through a commercially available Software-as-a-Service (SaaS) digital twin platform designed for electric fleet transition and deployment planning, rather than a custom software development exercise. The platform shall support structured analysis of routes, duty cycles, depots, charging infrastructure, grid and load requirements, vehicle parameters, battery sizing, charger sizing, cost implications, emissions impacts and phased rollout options. Its application shall enable the participating agencies to test planning scenarios, validate infrastructure assumptions and translate analytical results into practical deployment decisions, while also generating replicable methodologies and knowledge products for wider use across India.

The assignment shall support participating agencies in assessing the operational, technical, electrical, infrastructure and financial implications of electric bus fleet deployment and expansion. This includes the evaluation of route electrification opportunities, vehicle deployment strategies, charging infrastructure requirements, depot electrification needs, grid integration considerations, operational scenarios and phased transition pathways.

Through the Urban E-Transit Lab initiative, the assignment will demonstrate the application of digital twin-based planning methodologies in at least two participating cities or public transport agencies and generate practical insights to support evidence-based decision-making for electric bus deployment.

In addition to supporting planning activities in the pilot locations, the assignment shall contribute to the development of replicable methodologies, planning frameworks, knowledge products and capacity-building resources that can support wider adoption of electric bus deployment planning approaches by other State Transport Undertakings and urban public transport agencies across India.

The assignment is expected to strengthen institutional capacity for electric bus transition planning, improve the quality of infrastructure and fleet investment decisions, and support the development of scalable and future-ready public transport electrification strategies.

3. Tasks to be performed by the contractor

The contractor shall support participating State Transport Undertakings (STUs) and urban public transport agencies in structured, data-driven electric bus deployment planning through the provision and application of a commercially available Software-as-a-Service (SaaS) digital twin platform for fleet transition and deployment planning.

The assignment shall combine digital twin platform provision, technical assessments, scenario modelling, charging infrastructure planning, depot electrification analysis, transition roadmap development, capacity building and knowledge transfer activities. The contractor shall provide the required platform access, user licences, onboarding, training and technical support, while undertaking the planning and analytical activities described in these Terms of Reference.

The assignment shall support at least two pilot agencies/cities and shall generate planning outputs that are both locally actionable and replicable for wider application by other State Transport Undertakings and urban public transport agencies across India.

The contractor shall ensure that all activities are implemented in close coordination with GIZ and the participating agencies, and that all outputs, methodologies, datasets, analytical assumptions and recommendations are technically robust, clearly documented and suitable for replication and scale-up.

Provision of Digital Twin Platform and Technical Requirements:

The contractor shall provide access to a commercially available Software-as-a-Service (SaaS) digital twin platform for electric fleet transition and deployment planning throughout the implementation period and for a minimum period of twelve (12) months following completion of the assignment.

The platform shall be made available to participating State Transport Undertakings (STUs) and urban public transport agencies involved in the assignment. A minimum of three (3) user licences shall be provided for each participating agency. The contractor shall provide onboarding, user training and technical support during the implementation period.

The proposed platform shall be a proven and commercially available software product with an established user base and demonstrated application in electric fleet transition planning, charging infrastructure planning, fleet operations analysis or transport electrification projects. As this assignment is not a software development project, prototype solutions, spreadsheet-based tools, custom-developed models or software requiring substantial development under the assignment shall not be accepted.

The platform shall support digital-twin-based transition planning, route energy analysis, charging infrastructure sizing, depot electrification assessment, cost analysis and phased deployment planning for electric bus and commercial fleet operations

Minimum Architecture Requirements

The platform shall meet the following minimum architecture requirements:

- Commercial SaaS / Cloud Platform: The platform shall be a customer-facing, multi-tenant SaaS platform specifically developed for electric fleet transition planning and simulation and shall not be limited to spreadsheet-based tools or one-off analytical models.

- Digital Twin Framework: The platform shall be capable of creating a digital representation of vehicles, routes, schedules, depots, charging infrastructure, electrical loads and operational constraints.

- Integrated Transport and Energy Modelling: The platform shall jointly model fleet operations and energy requirements to enable assessment of vehicle deployment, battery sizing, charger sizing and electrical demand.

- Scenario-Based Planning Engine: The platform shall support evaluation and comparison of multiple planning scenarios involving vehicle technologies, battery capacities, charger configurations, operational schedules and deployment strategies.

- Data-Driven Configuration: The platform shall support configuration using route, schedule, GPS, GTFS, depot and vehicle operational data or equivalent datasets.

- Planning-to-Deployment Continuity: The platform shall support the planning lifecycle from initial assessment and scenario evaluation through deployment planning and implementation support.

Minimum Functional Requirements

Functional Area	**Minimum Requirement**
Fleet Transition Planning	Support phased transition planning from diesel, CNG or other conventional fleets to electric fleets.
Energy Consumption Modelling	Estimate route-level and fleet-level energy consumption considering distance, topography, operating conditions, HVAC requirements, passenger load and vehicle efficiency.
Route Feasibility Analysis	Assess whether existing routes, schedules, and duty cycles can be operated using commercially available electric vehicles.
Battery Sizing	Recommend suitable vehicle battery capacity based on daily duty cycle, safety margin, charging strategy, charging window, and operational constraints.
Charger Sizing	Estimate number of chargers, charger ratings, charger allocation, and charger sharing requirements needed to meet daily operations.
Depot Charging Analysis	Evaluate depot charging scenarios including charger utilization, vehicle charging windows, depot load profile, and daily energy demand.
Opportunity Charging Analysis	Evaluate on-route or terminal charging scenarios where relevant.
Operational Simulation and Visualisation	Simulate and visualise vehicle operations, charging activities and energy demand profiles.
Load Profile Generation	Generate location-level and depot-level electrical load profiles.
Peak Load Estimation	Estimate peak demand and grid connection requirements for charging locations.
Managed Charging and Power Optimisation	Assess charging strategies to reduce peak demand and optimise energy costs.
Total Cost of Ownership Analysis	Analyse vehicle, charging, grid infrastructure, operational and energy costs.
Emissions Reduction Analysis	Estimate emissions reductions resulting from fleet electrification.
Rollout and Deployment Planning	Support phased procurement, infrastructure deployment and fleet transition planning.
Scenario Comparison and Reporting	Compare alternative deployment scenarios and generate outputs suitable for planning, budgeting and decision-making.

Platform Maturity and Market Availability Requirements

The proposed platform shall satisfy the following minimum platform maturity and market availability requirements to ensure that the solution is proven, commercially available and suitable for application by public transport agencies during and beyond the assignment period:

- The platform shall be a commercially available software product and shall not be a prototype, proof-of-concept tool or software developed specifically for this assignment.
- The platform shall be available as a Software-as-a-Service (SaaS) application with user access management, technical support and established analytical workflows.
- The platform shall demonstrate applicability across planning, design, deployment and operational stages of electric fleet transition projects.
- The platform provider shall demonstrate relevant experience in fleet electrification planning, charging infrastructure planning, transport simulation, digital twin applications or related advisory services.
- The platform shall demonstrate previous application in electric fleet planning, transport electrification, charging infrastructure planning or comparable mobility projects.

The tenderer shall provide evidence demonstrating compliance with the above requirements, including technical documentation, product specifications, case studies, customer references or equivalent supporting materials.

The contractor's work shall be organised into the following interconnected work packages.

3.1 Work Package 1: Project Mobilisation, Stakeholder Engagement and Baseline Assessment

The contractor shall configure the digital twin platform and establish the baseline operational, fleet, route, depot and infrastructure datasets required for subsequent planning and simulation activities.

The first work package shall establish the operational and analytical foundation for the assignment. The contractor shall support project mobilisation, confirm the planning framework to be applied, review available data, identify information gaps, and develop a validated baseline for the participating agencies.

In particular, the contractor shall:

- participate in the inception and kick-off meeting(s) with GIZ and relevant stakeholders;
- review the scope, objectives, assumptions and implementation approach for the assignment;
- support the identification of data requirements for each pilot agency, including fleet, route, depot, electrical and operational data;
- assess the completeness, quality and consistency of available information and clearly document any data gaps;

- develop planning assumptions where data are incomplete, in consultation with GIZ and the participating agencies;
- structure and validate the baseline dataset to be used for modelling and analysis;
- configure the digital twin / planning environment for the participating agencies, as applicable;
- prepare an inception note or inception report setting out the final methodology, work plan, data requirements, milestones and coordination arrangements.

The baseline assessment shall at minimum cover existing routes and schedules, duty cycles, fleet composition, depot locations and layouts, current energy use, charging windows, electrical infrastructure, transformer and grid connection details, operational constraints and relevant tariff assumptions. The objective of this work package is to ensure that all subsequent analysis is based on a transparent and verified baseline.

Deliverable 1: Inception and Baseline Assessment Report, including methodology, work plan, stakeholder/data requirements, baseline findings and assumptions.

3.2 Work Package 2: Electric Bus Deployment Planning and Route-Level Technical Assessment

The contractor shall undertake route-level and fleet-level technical analysis to determine the suitability of selected routes and operational patterns for electric bus deployment. This work package shall be the core analytical component of the assignment.

Route energy modelling, fleet suitability assessment, battery sizing analysis and route electrification prioritisation shall be undertaken using the digital twin platform.

The contractor shall:

- assess the operational characteristics of selected routes, including trip length, dwell time, duty cycle, peak service periods and operating intensity;
- estimate route-level energy consumption based on vehicle parameters, route conditions and operating patterns;
- identify routes that are suitable for electrification under current operational conditions;
- identify routes that may require operational adjustments, larger battery capacity, opportunity charging or additional infrastructure;
- assess vehicle deployment options and fleet transition implications for the participating agencies;
- evaluate whether proposed battery sizes are operationally adequate for the selected routes and duty cycles;
- assess the impact of reserve margins, degradation allowance, future service growth and operational buffers on vehicle specification;
- develop a route prioritisation logic for electrification sequencing based on feasibility, readiness, energy demand, infrastructure dependency and operational complexity.

The contractor shall compare alternative deployment configurations and clearly identify the operational implications of each option. The analysis shall be sufficiently detailed to support decision-making by the participating agencies and GIZ on route feasibility, fleet suitability and transition sequencing.

Deliverable 2: Electric Bus Deployment Planning Assessment Report, including route energy modelling, battery sizing analysis, fleet suitability assessment and route prioritisation recommendations.

3.3 Work Package 3: Charging Strategy, Depot Electrification and Grid Integration Planning

The contractor shall assess and optimise the charging and electrical infrastructure required to support electric bus operations at the participating agencies' depots or charging locations. This work package shall translate operational requirements into practical infrastructure planning outputs.

Charging infrastructure planning, depot electrification assessment and grid integration analyses shall be undertaken using the platform's charging simulation and infrastructure planning functionalities.

The contractor shall:

- evaluate appropriate charging strategies, including depot charging, opportunity charging, overnight charging, daytime charging, staggered charging and mixed charging strategies;
- compare charging options against operational constraints such as route schedules, vehicle availability, charging windows and service continuity requirements;
- assess the number, type and rating of chargers required under alternative scenarios;
- evaluate charger utilisation, queue risk, redundancy needs and scalability requirements;
- assess depot-level electrical infrastructure requirements, including connected load, maximum demand, distribution arrangements, transformer capacity, load balancing and future expansion provision;
- assess grid integration requirements and constraints, including estimated grid power demand, transformer sizing, connection limitations and load management opportunities;
- evaluate the implications of staggered charging and phased infrastructure development on peak demand and system resilience;
- identify infrastructure assumptions, dependencies and risks requiring attention from the participating agencies or utilities.

The contractor shall clearly indicate the infrastructure implications of each charging strategy and deployment scenario, including technical adequacy, cost implications and future-proofing considerations.

Deliverable 3: Charging Infrastructure and Depot Electrification Assessment Report, including charging strategy evaluation, infrastructure sizing, electrical system requirements and grid integration findings.

3.4 Work Package 4: Scenario Modelling, Operational Simulation and Transition Roadmap

The contractor shall use the digital twin / analytical environment to test alternative deployment scenarios and identify technically feasible, operationally practical and financially informed transition pathways for the participating agencies.

Scenario modelling and transition roadmap development shall utilise the digital twin platform to evaluate alternative fleet transition pathways, charging strategies and infrastructure deployment scenarios.

The contractor shall:

- configure and run scenario analyses for different fleet sizes, battery capacities, charger ratings, charger quantities and charging strategies;
- compare depot-only charging, opportunity charging, mixed charging and phased deployment scenarios;
- simulate operational implications such as vehicle availability, charging loads, charger failure or redundancy conditions, peak demand and future fleet growth;
- assess daily, weekly, monthly and peak energy demand under alternative operating scenarios;
- evaluate CAPEX and OPEX implications of different technical options, including charging infrastructure, electrical infrastructure, energy cost exposure and potential cost impacts of over-sizing or under-sizing;
- identify key technical, operational, infrastructure and financial risks associated with each scenario;
- develop a phased electric bus transition roadmap indicating which routes, depots or service corridors should be electrified first and how deployment can be sequenced over time;
- assess long-term scalability, future expansion needs and infrastructure readiness for subsequent phases of electrification.

The contractor shall present the scenario results in a clear and decision-oriented manner, highlighting trade-offs, assumptions, constraints and recommended deployment pathways. The roadmap shall be practical, implementable and suitable for use by the participating agencies in planning future electrification phases.

Deliverable 4: Electric Bus Transition Roadmap and Scenario Assessment Report, including scenario comparison, cost implications, risk matrix and phased deployment recommendations.

3.5 Work Package 5: Capacity Building, Knowledge Products and Replication Framework

The contractor shall support the preparation of capacity-building and knowledge products that enable the participating agencies, GIZ and other stakeholders to understand, apply and replicate the planning approach beyond the pilot locations.

Capacity-building activities shall include user orientation and practical training on the digital twin platform to support continued application by participating agencies beyond the assignment period.

The contractor shall:

- contribute to the preparation and delivery of technical review meetings and workshops with GIZ and the participating agencies;
- support knowledge transfer on the planning approach, assumptions, modelling logic and interpretation of outputs;
- prepare concise and usable training materials, presentations or guidance notes for technical staff;
- support the development of a replicable electric bus deployment planning methodology that can be adapted by other STUs and urban public transport agencies;
- prepare guidance on data requirements, planning steps, assumptions, analytical logic and interpretation of results;
- support the preparation of a final toolkit, methodology note or similar knowledge product suitable for wider dissemination;
- document key lessons learned from the pilot agencies and translate them into practical recommendations for scale-up.

The contractor shall ensure that the outputs from this work package are concise, modular and suitable for public dissemination, subject to GIZ approval. The knowledge products shall be designed to support adoption by additional agencies beyond the pilot locations and to contribute to the broader replication objective of the Urban E-Transit Lab.

Deliverables 5 and 6:

- Replicable Planning Toolkit and Capacity-Building Package
- Final Project Report and Consolidated Knowledge Package

3.6 Coordination, Reporting and Quality Assurance

In addition to the above work packages, the contractor shall maintain regular coordination with GIZ and participating agencies throughout the assignment. The contractor shall provide periodic progress updates, participate in review meetings, incorporate feedback in a timely manner, and ensure quality assurance across all deliverables.

All outputs shall be:

- technically sound;

- internally consistent;
- clearly documented;
- based on explicit assumptions where required;
- tailored to the participating agencies; and
- suitable for approval, dissemination and future replication.

The contractor shall revise outputs as required on the basis of comments from GIZ and other designated stakeholders, within a reasonable number of revision rounds to be agreed during inception.

Milestones/partial works	**Deadline**	**Criteria for acceptance**
Milestone 1: Mobilisation, Baseline Assessment and Digital Twin Configuration: **Deliverable 1:** Inception and Baseline Assessment Report	30 September 2026	Inception Report approved by GIZ.
Milestone 2: Electric Bus Deployment Planning and Technical Assessment: **Deliverable 2:** Electric Bus Deployment Planning Assessment Report	31 October 2026	Technical assessment report reviewed and approved by GIZ.
Milestone 3: Charging Infrastructure, Depot Electrification and Grid Integration Assessment: **Deliverable 3:** Charging Infrastructure and Depot Electrification Assessment Report	30 November 2026	Infrastructure assessment report reviewed and approved by GIZ.
Milestone 4: Scenario Modelling and Electric Bus Transition Roadmap: **Deliverable 4:** Electric Bus Transition Roadmap and Scenario Assessment Report	31 January 2027	Phased electric bus transition roadmap reviewed and approved by GIZ.
Milestone 5: Capacity Building, Replication Framework and Final Knowledge Products: **Deliverable 5:** Replicable Planning Toolkit and Capacity-Building Package **Deliverable 6:** Final Project Report and Consolidated Knowledge Package	31 March 2027	Final project report and knowledge package submitted and approved by GIZ.

1. Criteria for Eligibility of firms

To be eligible to participate in this tender, the contracting firm must meet the following basic requirements:

I. Commercial Eligibility Assessment

- The firm must be registered as an organization/institution/entity in India.
- The bidder must submit declaration on GWB clauses (refer document 2A)
- Bidder participating in consortium must follow the consortium guidelines mentioned in bidding document.
- Average annual turnover for the last three financial years must be at least 50000 Euros.
- The average number of employees as on the previous year should be at least 5.

II. Technical Eligibility document

The technical assessment is only based on reference projects with a minimum commission value of 10,000 EUR, with atleast 3 reference project in the field of Electric bus transition/deployment planning, public transport electrification, charging infrastructure planning, depot electrification, transport modelling and simulation, or digital twin applications for transport systems., with atleast 2 reference project in India, in last three years.

III. Weighted Criteria

1. Technical Experience

- Experience in electric bus and commercial fleet electrification, including fleet transition planning, route assessment, battery sizing, energy demand forecasting, total cost of ownership analysis, and phased deployment planning.
- Experience in charging infrastructure planning, charger sizing, depot electrification, electrical load assessment, grid integration, EV charging systems, battery energy storage systems (BESS), and renewable energy integration.
- Experience in digital twin applications, route energy modelling, operational simulation, scenario analysis, battery and charger sizing, charging infrastructure planning, and data-driven decision support for fleet electrification projects.
- Experience in providing and implementing customer-facing, multi-tenant, self-service SaaS platforms for fleet electrification planning and simulation. The platform shall be commercially available, TRL 9 or equivalent, with a minimum of two years of demonstrated commercial deployment and shall support route energy modelling, battery sizing, charging strategy development, energy infrastructure sizing, financial analysis, and multi-scenario simulations.
- Experience in public transport operations planning, route feasibility assessment, fleet analytics, software deployment and implementation, user training, technical support, and delivery of international electric bus or sustainable mobility projects.

2. **Regional Experience**: The agency should have experience of working in India
3. **Experience of development projects (ODA financed)**: The agency should have experience of development projects (at least 50% ODA financed)

The bidders must provide documentary evidence for above mentioned criteria. Please refer Annex A of bidding condition for more details.

Period of assignment: from 01 August 2026 until 31 March 2027.

4. Concept

In the tender, the tenderer is required to show *how* the objectives defined in Chapter 2 (Tasks to be performed) are to be achieved, if applicable under consideration of further method-related requirements (technical-methodological concept). In addition, the tenderer must describe the project management system for service provision.

Note: The numbers in parentheses correspond to the lines of the technical assessment grid.

Technical-methodological concept

Strategy (1.1): The tenderer is required to demonstrate a clear understanding of the objectives, expected results and implementation context of the Urban E-Transit Lab initiative with reference to the services described in Chapter 3 (Tasks to be Performed by the Contractor) and the project context described in Chapter 1 (Context) (1.1.1).

The tenderer shall present and justify the technical and methodological strategy proposed for implementation of the assignment. The proposed strategy shall explain how digital twin-based planning approaches, route energy modelling, charging infrastructure assessment, depot electrification analysis, grid integration assessment, scenario modelling and transition roadmap development will be applied to achieve the objectives of the assignment (1.1.2).

The tenderer shall explain the analytical methods, modelling tools, quality assurance measures and validation procedures that will be applied throughout the assignment.

Cooperation with Relevant Stakeholders (1.2): The tenderer is required to identify the actors relevant to implementation of the assignment and describe the proposed cooperation mechanisms with GIZ, participating State Transport Undertakings (STUs), urban public transport agencies and other relevant stakeholders (1.2).

The tenderer shall explain how stakeholder engagement, consultation, coordination and validation processes will be integrated into the implementation approach and how feedback will be incorporated into project outputs.

Steering, Monitoring (1.3) and Operational Planning (1.4): The tenderer is required to describe the proposed approach for steering and coordination of activities under the assignment, including coordination with GIZ and participating agencies (1.3.1).

The tenderer shall describe its proposed contribution to monitoring progress towards the expected results of the assignment and explain how progress against deliverables, milestones and work packages will be tracked and reported (1.3.2).

The tenderer is required to submit an operational work plan and implementation schedule demonstrating how the services described in Chapter 3 will be delivered within the assignment period (1.4.1).

The tenderer shall describe the work steps required to implement each work package and explain how the proposed approach will ensure achievement of all deliverables, milestones and expected results. Dependencies, assumptions and stakeholder contributions shall be clearly identified (1.4.2).

Learning and Innovation (1.5): The tenderer is required to describe its approach to knowledge management and learning throughout the assignment (1.5.1).

The tenderer shall explain how technical knowledge, lessons learned, methodologies and planning approaches developed during implementation will be documented and transferred to GIZ and the participating agencies. The tenderer shall describe how knowledge products and training materials will support continued application of the project outputs beyond the assignment period.

The tenderer is further required to describe how the proposed approach contributes to learning, innovation and scaling-up effects beyond the pilot agencies (1.5.2). In particular, the tenderer shall explain how the planning methodologies, tools and guidance developed under the Urban E-Transit Lab can be adapted and replicated by other State Transport Undertakings (STUs) and urban public transport agencies across India.

Project management of the contractor (1.6): The tenderer is required to describe its approach for project management and coordination throughout the assignment.

The tenderer shall explain:

- the proposed arrangements for coordination and communication with GIZ and participating agencies;
- the roles and responsibilities of the proposed team members;
- the approach for quality assurance and review of deliverables;
- the mechanisms for managing project risks, assumptions and dependencies;
- the proposed personnel assignment plan, including expert inputs (person-days), timing of assignments and allocation of responsibilities across the work packages.

The tenderer shall submit a personnel assignment schedule indicating the deployment of all proposed experts against the activities, work packages, deliverables and milestones defined in Chapter 3.

5. Personnel concept

The contractor shall propose a compact and technically qualified team capable of delivering all work packages, deliverables and milestones under this assignment. Given the scope and duration of the contract, the team shall comprise four experts with clearly defined responsibilities and complementary expertise in electric bus deployment planning, charging infrastructure, digital modelling and knowledge transfer.

The tenderer shall provide a personnel assignment schedule showing the allocation of each expert against the work packages, deliverables and milestones defined in Chapter 3.

Team leader

Tasks of the team leader

- Overall technical responsibility for the assignment, including quality assurance, deadline control and integration of all deliverables.
- Coordination with GIZ, participating STUs / urban public transport agencies, and other project stakeholders.
- Supervision of all experts and consolidation of technical inputs across work packages.
- Technical oversight of route electrification planning, fleet transition analysis, charging infrastructure assessment and transition roadmap development.

- Reporting and presentation of progress, findings and final outputs.

Qualifications of the team leader

- Education/training (2.1.1): university degree (master's level or equivalent) in transport planning, transport engineering, electrical engineering, energy systems, urban planning or a closely related discipline.
- Language (2.1.2): English at C2 level
- General professional experience (2.1.3): 15 years of professional experience in sustainable transport, public transport systems, electric mobility, transport infrastructure planning or related sectors.
- Specific professional experience (2.1.4): 5 years of professional experience in electric bus deployment planning, fleet electrification, charging infrastructure planning, depot electrification or public transport electrification projects.
- Leadership/management experience (2.1.5): 5 years of experience as project manager, team leader or technical lead in advisory or analytical assignments.
- Regional experience (2.1.6): 5 years of professional experience in Asia, including at least 3 years in India in transport, electric mobility or urban mobility projects
- Development cooperation (DC) experience (2.1.7): 3 years of experience in development cooperation, technical assistance or publicly funded infrastructure and mobility projects.
- Other (2.1.8): Demonstrated experience in stakeholder coordination with public sector transport agencies.

Key expert 1: Charging Infrastructure and Depot Electrification Expert

Tasks of key expert 1

- Lead charging strategy assessment and charger sizing.
- Assess depot electrification requirements, electrical load, transformer capacity and grid integration.
- Support analysis of redundancy, expansion potential and load management.
- Contribute to technical reports and infrastructure planning outputs.

Qualifications of key expert 1

- Education/training (2.2.1): University degree in Electrical Engineering, Power Systems Engineering, Energy Systems or a related discipline.
- Language (2.2.2): English at C2 level.
- General professional experience (2.2.3): 8 years of professional experience in electrical infrastructure, energy systems, electric mobility infrastructure or related sectors.
- Specific professional experience (2.2.4): 5 years of professional experience in EV charging infrastructure planning, depot electrification, electrical load assessment, transformer sizing or grid integration projects.
- Leadership/management experience (2.2.5): Not required.
- Regional experience (2.2.6): 3 years of professional experience in India or South Asia.
- Development Cooperation (DC) experience (2.2.7): Experience in publicly funded infrastructure, energy or mobility projects is an advantage.
- Other (2.2.8): Demonstrated experience in planning charging infrastructure for electric bus or commercial electric vehicle fleets.

Key Expert 2: Digital Twin

Tasks of Key Expert 2

- Lead route energy modelling, operational simulation and scenario analysis activities.
- Configure and apply digital twin and modelling tools for fleet electrification planning.
- Assess route electrification opportunities and operational feasibility.
- Support forecasting of energy demand and infrastructure requirements.
- Contribute to transition roadmap development and preparation of analytical outputs.

Qualifications of Key Expert 2

- Education/Training (2.3.1): University degree in Transport Engineering, Systems Engineering, Computer Science, Data Science, Operations Research or a related discipline.
- Language (2.3.2): English language proficiency at C2 level.
- General Professional Experience (2.3.3): 12 years of professional experience in transport analytics, modelling, simulation or related sectors.
- Specific Professional Experience (2.3.4): 7 years of professional experience in transport modelling, digital twin applications, fleet analytics, operational simulation, energy consumption modelling or scenario analysis for transport systems.
- Leadership/Management Experience (2.3.5): Not required.
- Regional Experience (2.3.6): 5 years of professional experience in India or South Asia.
- Development Cooperation Experience (2.3.7): Experience in publicly funded transport, infrastructure or digitalisation projects is an advantage.
- Other (2.3.8): Demonstrated experience in applying data-driven planning tools to public transport systems, fleet operations or transport electrification projects.

Key Expert 3: Transport Modelling Expert

Tasks of Key Expert 3

- Lead route energy modelling, operations and scenario analysis activities.
- Configure and apply modelling for fleet electrification planning.
- Assess route electrification opportunities and operational feasibility.
- Support forecasting of energy demand and infrastructure requirements.
- Contribute to transition roadmap development and preparation of analytical outputs.

Qualifikation of Key Expert 3

- Education/Training (2.4.1): University degree in Transport Engineering or a related discipline.
- Language (2.4.2): English language proficiency at C2 level.
- General Professional Experience (2.4.3): 5 years of professional experience in transport analytics, modelling, simulation or related sectors.
- Specific Professional Experience (2.4.4): 3 years of professional experience in transport modelling, fleet analytics, energy consumption modelling or scenario analysis for transport systems.
- Leadership/Management Experience (2.4.5): Not required.
- Regional Experience (2.4.6): 3 years of professional experience in India or South Asia.

- Development Cooperation Experience (2.4.7): Experience in publicly funded transport, infrastructure or mobility projects is an advantage.
- Other (2.4.8): Demonstrated experience in applying data-driven planning tools to public transport systems, fleet operations or transport electrification projects.

6. Costing requirements

The following basic calculations for the contract for works are reference values for orientation purposes only and are based on the milestones and acceptance criteria defined in Chapter 3 (Tasks to be Performed by the Contractor).

As the contract to be concluded is a contract for works, tenderers shall submit their financial offer as a lump-sum price covering all services necessary for successful implementation of the assignment.

In addition to the lump-sum price, tenderers shall indicate the underlying average daily rate used for calculation purposes. A detailed breakdown of expert days is not required.

The estimated expert days below are indicative only and shall not constitute contractual entitlements.

Milestones/partial works	**Estimated expert days for orientation**	**Deadline**
Milestone 1: Inception, Baseline Assessment and Digital Twin Configuration	25 Expert Days	September 2026
Milestone 2: Electric Bus Deployment Planning and Technical Assessment	35 Expert Days	October 2026
Milestone 3: Charging Infrastructure, Depot Electrification and Grid Integration Assessment	30 Expert Days	November 2026
Milestone 4: Scenario Modelling and Electric Bus Transition Roadmap	30 Expert Days	January 2027
Milestone 5: Capacity Building, Replication Framework and Final Knowledge Products	28 Expert Days	March 2027

Travel expenses	**Quantity**	**Number per expert**	**Total**	**Comments**
Per-diem allowance in country of assignment	4	1	4	to be included in milestone work package cost

Overnight allowance in country of assignment	4	1	4	to be included in milestone work package cost
Transport	**Quantity**	**Number per expert**	**Total**	**Comments**
Domestic flights	2	1	2	to be reimbursed on actuals.
CO_2 compensation for air travel	4	EUR 50 per one way	EUR 200	A budget of EUR 2000 is earmarked for settling carbon offsets against evidence. Please quote the amount after referring to document 1.1 (Co2 Offset Emission guide

Expenses towards travel trips provided above must be part of milestone costing except for Airfare and Co2 emission compensation.

Fixed lump sum price – contract for work

Since the contract to be concluded is a contract for work, we would ask you to offer your services at a fixed lump sum price, which covers the relevant costs (fees.). The assessment of the financial bid is based on the lump sum price tendered. For the purposes of our internal calculations and any subsequent contracts, we would also ask you to state the daily rate used for the tender. A breakdown of the days is not necessary.

Travel Requirements

Travel required for implementation of the assignment shall be included in the lump-sum financial offer.

The contractor shall assume that the assignment will involve travel to at least two participating public transport agencies / pilot cities in India.

Indicative travel locations may include Delhi and two additional city to be identified during implementation. Additional travel locations may be agreed with GIZ during the course of the assignment.

All travel shall be approved in advance by GIZ

7. Requirements on the format of the tender

The structure of the tender shall correspond to the structure of these Terms of Reference. In particular, the technical proposal shall be organised according to the requirements specified in Chapter 4 (Concept).

The tenderer shall clearly demonstrate how the proposed approach will contribute to achieving the objectives defined in Chapter 2 and the deliverables, milestones and acceptance criteria defined in Chapter 3.

8. Requirements on the format of the tender

The structure of the tender must correspond to the structure of the ToR. In particular, the detailed structure of the concept (Chapter 3) should be organised in accordance with the positively weighted criteria in the assessment grid (not with zero). The tender must be legible (font size 11 or larger) and clearly formulated. It must be drawn up in English (language).

The complete tender must not exceed 10 pages (excluding CVs). If one of the maximum page lengths is exceeded, the content appearing after the cut-off point will not be included in the assessment. External content (e.g. links to websites) will also not be considered.

The technical proposal shall not exceed 15 pages, excluding CVs and the personnel assignment schedule. Any content exceeding the maximum page limit will not be considered during the technical evaluation.

External content, including hyperlinks to websites, brochures, presentations or other supporting documents, shall not be considered as part of the technical proposal and will not be evaluated.

The technical proposal shall include at minimum:

- Technical and methodological concept in accordance with Chapter 4;
- Operational work plan and implementation schedule;
- Personnel assignment schedule indicating the allocation of experts against work packages, deliverables and milestones;
- Description of project management and quality assurance arrangements.

The CVs of the proposed experts in accordance with Chapter 5 (Personnel Concept) shall be submitted using the format specified in the application conditions. Each CV shall not exceed four (4) pages and shall clearly indicate the expert's role, responsibilities, duration of engagement and relevance of experience for the proposed position.