MINISTRY OF PUBLIC WORKS (MPW)
INFRASTRUCTURE IMPLEMENTATION UNIT (IIU)

TERMS OF REFERENCE

Consultancy Services for:

Feasibility Study, Conceptual (Preliminary) Engineering Design, Preparation of Bidding Documents and Engineer's Estimates, and Support to Procurement

for Two Project Road Corridors:

(i) Compound No. 3 – Gban Road; and

(ii) Palala – New Yopea Road

Civil Works Delivery Method: Design-Build-Transfer (DBT)

Financing: World Bank Project Preparation Grant for the Liberia Economic Corridors Project – Grant Facility for Project Preparation No. E7460

September 2026

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1. Background and Context

1.1 Country and Transport Sector Context

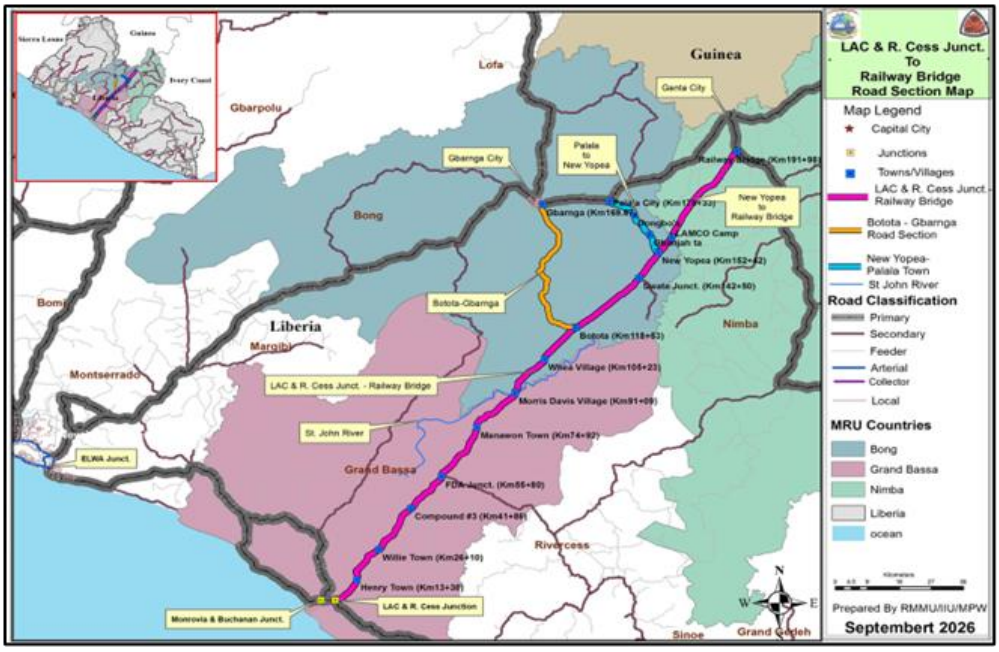
Liberia's road network is central to domestic mobility, agricultural commercialization, access to health and education, regional trade and the integration of rural communities with markets and services. Rural roads are particularly vulnerable to seasonal deterioration where drainage, pavement structure, crossings and maintenance are inadequate. The Government of Liberia, through the Ministry of Public Works, therefore places priority on investments that improve reliable, safe and climate-resilient connectivity.

The Consultant shall verify all current national transport statistics, road-network condition data, population figures and relevant policy references against the latest information available from MPW, LISGIS and other competent authorities at the time of the assignment. The Consultant shall not rely on outdated or unverified secondary data where primary verification is reasonably practicable.

1.2 Assignment Context

The Government of Liberia, through MPW/IIU, intends to engage a qualified consulting firm to undertake feasibility studies and conceptual/preliminary engineering design for two distinct road corridors: (i) Compound No. 3–Gban; and (ii) Palala–Yopea. The consultancy is intended to bridge the gap between strategic identification of the corridors and procurement-ready civil works packages.

Location Map



The two corridors shall be managed under one consultancy for administrative and procurement efficiency, but all technical, economic, environmental and social analyses shall be undertaken and reported separately for each corridor. The Consultant shall clearly identify common assumptions, corridor-specific assumptions and matters requiring further investigation.

1.3 Financing and Procurement Context

The consultancy is financed under World Bank Project Preparation Grant Facility No. E7460 for the Liberia Economic Corridors Project. Selection and administration shall therefore follow the applicable World Bank Procurement Regulations for IPF Borrowers and the approved procurement arrangements applicable to the grant. The World Bank's current Procurement Regulations as the governing reference were incorporated into the financing/procurement arrangements; the applicable edition at solicitation shall be confirmed by MPW/IIU.

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The World Bank Procurement Regulations emphasize value for money, integrity, fit-for-purpose procurement and appropriate use of standard procurement documents. The Consultant shall therefore design its outputs to support transparent, competitive and implementable procurement, while avoiding specifications or packaging that unnecessarily restrict competition.

1.4 Existing Source-Document Position and Data Gaps

The source ToR established a comprehensive framework but retained several corridor-specific placeholders and required field verification. In particular, the intended second corridor is now confirmed by the Client as Palala–Yopea. Exact chainage, coordinates, administrative boundaries, intermediate settlements, road condition, traffic characteristics and final lot packaging shall be established through the assignment.

The Consultant shall maintain a Data Gap Register from inception, identifying each missing item, its source, proposed verification method, responsible expert, expected date of closure and residual uncertainty. No material feasibility or design conclusion shall rely on an unverified assumption without clearly stating its effect on the conclusion.

1.5 Related MPW/IIU Experience

MPW/IIU's Ganta–Tappita assignment has informed institutional arrangements, including review procedures, data provision, bidding-document practice and reporting conventions. The Consultant shall use relevant lessons from prior MPW/IIU road assignments while ensuring that the present designs, procurement strategy and safeguards instruments are tailored to the two Project Roads and their actual conditions.

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2. Project Description and Corridor Definition

2.1 Summary Description the Two Proposed Road Corridors

Item	Compound #3 – Gban	Palala – Yopea
Counties	Grand Bassa – Nimba, potentially crossing Bong	Bong – Nimba
Coordinates	Compound #3: 5°53′30.18″N, 9°58′43.41″W; Gban: 7°08′19.76″N, 8°57′57.05″W	Palala: 7°00′03.91″N, 9°17′24.92″W; Yopea: 6°51′23.00″N, 9°09′43.35″W
Indicative straight-line length	**~178 km**	**~21.4 km**
Indicative actual road length	**~190–215 km**, subject to survey	**~24–30 km**, subject to survey
Corridor character	Long inter-county economic and rural connectivity corridor	Short rural/agricultural connectivity corridor
Terrain	Generally lowland to rolling/undulating terrain, with valleys, streams and wetter sections; terrain may become more rolling toward Nimba	Generally rolling/upland terrain with localized wet areas, streams and valleys
Main road users	Motorcycles, taxis, minibuses, private vehicles, agricultural and commercial trucks; potentially regional freight	Mainly motorcycles, taxis, minibuses, pickups and agricultural/local commercial traffic
Main economic role	Agricultural production, market access, inter-county movement and connection toward the Ganta/Nimba economic network	Farm-to-market access, movement between communities, and access to social and commercial facilities
Maintenance status	Likely variable; some sections may have received periodic or recent maintenance, particularly around Compound #3; full corridor condition requires verification	Likely mainly periodic/local maintenance, with condition and wet-season accessibility to be confirmed
Key engineering issues	Drainage, flooding, culverts, bridges, pavement/subgrade, long corridor logistics and climate resilience	Drainage, culverts, subgrade, seasonal accessibility and localized bridge requirements
Special feature	**Railway/railroad bridge and associated infrastructure near Gban should be specifically investigated**	No comparable railway issue currently identified
Key feasibility focus	Regional traffic, agriculture, freight, railway interface, drainage, climate resilience and economic viability	Agriculture, rural mobility, social access, drainage, climate resilience and economic viability

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2.1.1 Corridor 1: Compound 3 (Grand Bassa) → Gban (Nimba)

This corridor is approximately 220 km given its winding terrain and links Buchanan, Bong County, and Nimba. It runs through Liberia Agriculture Company's (LAC) rubber plantation (Compound 3 is a LAC camp), several named villages, namely, Big Joe Town, Sally Town, Dahn's Town, Saturday Town, etc. The terrain shifts from coastal lowland to hilly ground near the Nimba Range, encompassing an unpaved laterite road with a genuinely mixed maintenance picture: LAC has heavily rehabilitated its section since 2024, ArcelorMittal has graded and restored other stretches, however, it was reportedly "completely impassable" in mid-2025, cutting off access further into Nimba. Usage is mostly motorcycles, local transport, and agricultural/mining-concession traffic.

Coordinates place Compound 3 roughly 15–20 km inland from Buchanan, the Grand Bassa county capital and Liberia's second-largest port, while Gban lies about 10 km south-southwest of Ganta, Nimba's principal commercial town near the Guinea/Côte d'Ivoire border.
The road continues northeast toward Nimba via Bong County, passing near the ArcelorMittal Liberia (AML) iron-ore rail corridor running from Yekepa (Nimba) through Bong to the port of Buchanan (Grand Bassa) — the former LAMCO railway alignment.

A major watercourse crossing is near-certain: the **Saint John River** (282 km long, rising in Guinea's Nimba Range and reaching the Atlantic near Buchanan) flows through or along the boundary of Grand Bassa, Bong and Nimba Counties, and reporting on this corridor specifically references "St. John River communities" along the route. At least one bridge crossing is likely and its condition should be treated as a critical-path item.

2.1.1.1Terrain, hydrology and climate

The corridor descends from Grand Bassa's low coastal plain (near sea level around Buchanan) through undulating lowland rainforest in central Bong County, rising toward Nimba's more dissected, hillier terrain near the Guinea border, where elevations climb toward the Nimba Range/"Iron Mountain" (Liberia's principal iron-ore deposits). Dense secondary and primary tropical forest exist interspersed with rubber and oil-palm plantations and small farms, plus multiple stream crossings beyond the Saint John River, requiring culverts or short span bridges replacements.

Liberia's climate is equatorial, with a pronounced rainy season roughly **May–October** (heaviest June–September) and a drier season November–April; inland annual rainfall typically runs **2,000–3,000 mm**. Unpaved sections are seasonally degraded or impassable to standard vehicles in the wet season.

2.1.1.2 Land use and economic relevance

The Grand Bassa end of the corridor runs through the **Liberian Agricultural Company (LAC) rubber concession** — Compound 3 is itself an LAC plantation camp — and through smallholder farming communities. Further along, the alignment lies close to the **ArcelorMittal Liberia (AML) mining and rail corridor** linking the Yekepa iron-ore mine (Nimba) to the port of Buchanan via Bong County; AML has been rehabilitating rural roads and river crossings in communities along this corridor in all three counties as part of its community-development commitments. The Nimba end, near Gban and Ganta, sits in an area of mixed subsistence agriculture (rice, cassava), cash cropping,

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and proximity to iron-ore mining and, informally, artisanal gold and diamond activity typical of Nimba's border zone.

2.1.1.3 Usage pattern

Reporting on this corridor describes use by motorcyclists ("pehn-pehns") and small commercial vehicles carrying passengers and goods, and by farmers moving produce to market — LAC's rehabilitation work is credited with cutting multi-hour journeys to minutes and reducing crop spoilage. Traffic is likely dominated by local and inter-county passenger/goods movement, agricultural produce (rubber, rice, other food crops) moving toward Buchanan and Ganta markets, and periodic heavy-vehicle movement associated with concession/mining logistics (LAC and AML equipment and supply traffic), rather than significant long-distance through-traffic.

2.1.2 Corridor 2: Palala (Bong) → Yopea (Nimba)

This corridor is about 30km. Palala sits in **Panta-Kpa (Panta Kpaii) District, Bong County**, roughly 20 km east-southeast of Gbarnga, the Bong County capital, and near the main paved Monrovia–Gbarnga–Ganta highway that traverses Bong County. Yopea lies south-southeast of Palala, just across the Bong/Nimba county line, in an area of western Nimba bordering districts such as Boe & Quilla.

2.1.2.1 Indicative routing, administration and terrain

The description of this corridor built mainly from district-level and regional data rather than route-specific sources, is basically indicative. Palala is one of several small settlements in Panta-Kpa District (other named localities include Wrunah, Panta, Waytua and Wolota).
Yopea's based on coordinates is situated in far-western Nimba County, in the belt of districts adjoining Bong (candidates include Boe & Quilla District).

Terrain along this short corridor is gently undulating lowland/upland rainforest typical of central Liberia — lower and less mountainous than the Nimba Range further east, but still forested and cut by streams that would require culverts or small bridges. As a probable link road rather than a county-boundary trunk route, it likely branches off the Gbarnga–Ganta highway near Palala and runs on unpaved laterite/earth surface to Yopea.

2.1.2.2 Land use, economic relevance and usage pattern

Both Bong and Nimba Counties in this area are characterised by smallholder subsistence agriculture (rice, cassava, vegetables), rubber and other tree-crop cultivation, and, in Bong particularly, a legacy of industrial iron-ore mining (the Bong Mine, near Bong Town, well north of this corridor) and forestry. In the absence of route-specific reporting, usage is best assumed to be **low-volume local traffic**: motorcycles, occasional light vehicles, and foot/bicycle traffic connecting Palala, Yopea and intervening farming communities to the Gbarnga–Ganta highway and onward markets.

Both sections flag clear data gaps (exact alignment, river crossings, current condition, traffic counts) for the consultants to verify on the ground, plus a regional-context section on Liberia's road classification, climate, and maintenance institutions that applies to both.

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2.1.3 For both corridors

The feasibility consultants should first verify the **actual road alignment and length by GPS/GIS**, then undertake traffic counts, topographic and geotechnical surveys, drainage/bridge assessments, agricultural and socioeconomic surveys, environmental and social screening, and economic analysis. The final road standard should be determined from the **traffic, engineering, climate and economic results rather than assumed in advance**.

2.2 Project Road A – Compound No. 3–Gban

Parameter	Current ToR Position / Requirement
Origin	Compound No. 3; exact administrative unit and coordinates to be confirmed
Destination	Gban; exact administrative unit, correct spelling and coordinates to be confirmed
Length	To be confirmed by reconnaissance and topographic survey
Existing condition	Source ToR describes an unimproved earth/laterite rural track; Consultant to verify
Settlements	Buchanan, Camp 2, Andrewbli, Gebo Town and Zowenta; all require field verification
Network connections	To be established and mapped through reconnaissance and network analysis

2.3 Project Road B – Palala–Yopea

Parameter	Current ToR Position / Requirement
Corridor	Palala–Yopea, as confirmed by the Client
Origin / destination	Palala and Yopea; exact coordinates and administrative units to be confirmed
Length	To be established by reconnaissance and topographic survey; no unsupported length shall be inserted
Intermediate settlements	To be established through reconnaissance, GIS review and community consultation
Existing condition	To be established through engineering inventory and survey
Network connections	To be established at both ends and at significant intermediate junctions

The Consultant shall prepare a corridor definition sheet for each road showing chainage 0+000, endpoint coordinates, confirmed road length, administrative boundaries, major settlements, junctions, structures, water crossings, environmentally sensitive areas, land-use patterns and proposed ROW. These sheets shall be approved as part of the Inception Report.

2.4 Design Development Philosophy

The feasibility study shall not presume that full-width paved construction is the only viable intervention. For each homogeneous section, the Consultant shall evaluate technically and economically credible alternatives, which may include rehabilitation, improved gravel/laterite standard, surface treatment, bituminous pavement, localized realignment, drainage-only interventions, structure replacement, or staged upgrading. The recommended intervention shall be evidence-based and linked to traffic, climate, materials, life-cycle cost, affordability and social/environmental impacts.

2.5 Corridor-Wide Objectives

- Provide reliable all-season access and reduce travel time and vehicle operating costs.
- Improve access to markets, health, education, administrative services and economic opportunities.
- Improve agricultural supply-chain connectivity and reduce post-harvest transport constraints.

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- Improve road safety for motorists, pedestrians, cyclists and other vulnerable road users.
- Integrate climate resilience into alignment, drainage, pavement, structures and maintenance planning.
- Develop procurement-ready packages that are technically sound, commercially attractive and implementable.

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3. Objectives of the Assignment

3.1 Assignment Phase Structure

This assignment is structured into two discrete phases:

Phase 1 – Feasibility Study The Consultant shall conduct all surveys, investigations, technical analysis, economic and financial appraisal, environmental and social screening, and options analysis necessary to establish whether investment in each corridor is feasible and to identify the preferred investment option(s). Phase 1 concludes with submission and approval of the Final Feasibility Study Report, which shall include a clear go/no-go and preferred-investment recommendation for each corridor.

The Consultant shall not commence Phase 2 activities prior to the completion of an interim review meeting at which the Consultant presents the findings and recommendations of the Phase 1 Feasibility Study to MPW/IIU and receives feedback and agreed direction on the scope and approach for Phase 2.

Phase 2 – Conceptual/Preliminary Engineering Design and Bidding Documents. The Consultant shall prepare conceptual/preliminary engineering designs, cost estimates, and tender-ready bidding documents for each approved corridor/lot.

3.2 Overall Objective

The overall objective is to establish the technical, economic, financial, environmental, social, institutional and implementation feasibility of the Compound No. 3–Gban and Palala–Yopea corridors; identify and recommend preferred intervention strategies and alignments; and provide MPW/IIU with a defensible, evidence-based go/no-go recommendation and investment case for each corridor [Phase 1]; to prepare conceptual/preliminary engineering designs and reliable cost estimates; and develop tender-ready bidding documents and confidential Engineer's Estimates for appropriately packaged works contracts [Phase 2]. Consistent with the intended delivery method for the civil works, the resulting bidding documents shall be structured to procure each Project Road lot under a Design-Build-Transfer (DBT) contract.

3.3 Specific Objectives

Phase 1 – Feasibility Study

- Confirm the physical definition and baseline condition of each corridor through reconnaissance and systematic surveys.
- Assess traffic demand, current and future mobility patterns, freight and agricultural movements, and non-motorized travel.
- Develop traffic forecasts and determine appropriate functional classification, design speed and design criteria.
- Investigate alternative alignments and intervention standards and select the preferred option using a transparent multi-criteria framework.
- Undertake geotechnical, pavement-material, hydrological and structural investigations sufficient for conceptual design and cost reliability.
- Assess climate and disaster risks and incorporate adaptation measures into engineering and maintenance strategies.
- Assess road safety risks and incorporate Safe System principles, appropriate speed management, pedestrian facilities and roadside treatments.
- Identify and develop plausible development scenarios — including development of Buchanan as an export gateway and agro-processing hub, upgrade of the Port of Buchanan, and reform of the Buchanan–Yekepa railway as a multi-user railway — that could materially affect corridor traffic demand; convene a Scenario Validation Workshop with relevant stakeholders; and agree two viable scenarios beyond BAU for full feasibility assessment.

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- Undertake economic and financial feasibility under BAU and the two agreed development scenarios, with EIRR and NPV as primary outputs for each scenario; this is the central deliverable of Phase 1.
- Assess road standard requirements (unpaved gravel, DBST, asphalt pavement, staged upgrading) and phasing/packaging implications under each scenario, with full lifecycle cost analysis integrated into the economic appraisal.
- Undertake economic and financial feasibility, including EIRR, NPV, as primary outputs, and conduct sensitivity and risk analysis; this is the central deliverable of Phase 1.
- Assess affordability, life-cycle costs and future O&M requirements.
- Undertake environmental and social screening and define the safeguards instruments required before construction.
- Assess land acquisition, ROW, livelihood, vulnerable-group and community impacts and define mitigation requirements.
- Produce a defensible go/no-go and preferred-investment recommendation for each corridor.

Phase 2 – Conceptual Design and Bidding Documents:

- Prepare conceptual design drawings, quantities, specifications, implementation strategy and cost estimates.
- Assess local and regional contractor and materials-market capacity and use the findings to determine contract packaging and procurement strategy.
- Prepare complete bidding documents and Engineer's Estimates for each proposed works lot.
- Transfer knowledge and editable data, models, calculations and design files to MPW/IIU.

3.3 Expected Outcomes

- A defensible go/no-go and preferred-investment recommendation for each corridor, supported by a bankable feasibility study with corridor-specific economic, technical, financial, and safeguards findings.
- A preferred alignment and intervention standard supported by quantified economic evidence, with EIRR as the primary decision metric.
- A complete conceptual/preliminary design package suitable for subsequent detailed design and procurement.
- Tender-ready bidding documents for appropriately sized lots with confidential Engineer's Estimates.

4. Guiding Principles and Required Approach

Principle	Application
Evidence-based decision making	Use verifiable primary and secondary data; quantify uncertainty and test material assumptions.
Fit-for-purpose design	Match design standards to traffic, terrain, climate, safety, affordability and intended service level.
Whole-life value	Compare alternatives using life-cycle costs, maintenance requirements and residual value rather than initial CAPEX alone.
Climate resilience	Treat flooding, erosion, drainage failure, slope instability and extreme rainfall as core design considerations.
Road safety	Apply proactive risk identification to protect all road users, especially pedestrians, school children, cyclists and motorcycle users.
Environmental and social sustainability	Avoid and minimize impacts through alignment selection and hierarchy-of-mitigation principles.
Inclusion	Ensure women, youth, persons with disabilities and vulnerable groups are represented in consultations and surveys.

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Procurement neutrality	Avoid unnecessarily restrictive technical specifications, packaging or qualification criteria.
Local participation	Assess opportunities for local employment, materials, subcontracting and capacity development.
Traceability	Maintain a clear audit trail from survey data through analysis, design, quantities, costs and procurement documents.

The World Bank ESF applies a risk-based and proportionate approach and includes standards covering environmental/social risk management, labor, community health and safety, land acquisition/resettlement, cultural heritage, stakeholder engagement, pollution/resource efficiency and biodiversity. The Consultant shall screen the two corridors against the applicable ESSs and financing-specific instruments rather than treating safeguards as a separate post-design exercise.

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5. Scope of Services

PHASE 1 – FEASIBILITY STUDY

5.1 Activity 1 – Mobilization, Inception and Reconnaissance

- Review all available MPW/IIU documents, road inventories, maps, satellite imagery, previous studies, traffic data, accident data, climate/hydrology records, county plans, land information and relevant project documentation.
- Undertake a full corridor reconnaissance for both roads and verify origin/destination points, road trace, settlements, junctions, structures, swamps, streams, steep terrain, borrow areas, quarries and potential constraints.
- Establish a verified chainage framework for each corridor and a preliminary GIS corridor database.
- Prepare a Data Gap Register and Risk Register.
- Agree survey protocols, sampling plans, design standards, review procedures, data formats and stakeholder-engagement arrangements.
- Confirm whether field teams will operate in parallel and demonstrate that the staffing plan is sufficient for the required schedule.
- Hold inception meetings with MPW/IIU, relevant county/district authorities and other agencies.
- Submit an Inception Report and present it to the Review Committee before full-scale field investigations.

5.2 Activity 2 – Topographic, Engineering and Asset Surveys

- Establish survey control tied to the agreed national/geodetic reference framework.
- Survey the existing road alignment and viable alternatives to a level appropriate for conceptual design.
- Collect centerline, edge-of-carriageway, shoulders, drainage, structures, property interfaces, utilities, junctions, buildings and other relevant features.
- Develop digital terrain models, contours and planimetric mapping.
- Survey watercourse crossings, high-water marks, flood extents where identifiable, culverts, bridges and drainage outfalls.
- Record road condition by homogeneous section using a repeatable rating system.
- Locate road safety hazards and vulnerable-user activity areas.
- Establish a georeferenced asset inventory with unique IDs.

5.3 Activity 3 – Traffic and Transport Demand

**Note: Coordination with RETRAP: A traffic data collection exercise is currently ongoing under a separate project (RETRAP). While the Consultant shall be prepared to undertake a full primary data collection program as described below, the Consultant is advised to check with the Client at inception on the availability and quality of RETRAP traffic data before finalizing the survey program. Where RETRAP data are current, complete, and methodologically compatible with the requirements of this assignment, the Consultant shall propose how these can be incorporated to avoid duplication, ensure consistency, and optimize use of project funds. Any decision to rely on or supplement RETRAP data shall be agreed in writing with MPW/IIU and documented in the Inception Report, including an assessment of any data gaps that the Consultant's own surveys must address.

- Conduct classified traffic counts at representative locations, including motorcycles, passenger vehicles, buses, trucks, agricultural vehicles and non-motorized traffic.
- Capture both typical-day and market-day conditions where relevant.
- Undertake origin-destination, roadside and freight interviews where necessary to establish trip purpose and movement patterns.

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- Assess seasonal variation and develop adjustment factors where data permit.
- Collect or estimate axle-load information sufficient to support pavement design.
- Identify induced traffic, diverted traffic and latent demand where material.
- Develop base-year AADT and forecasts for opening year and design horizon under low, central and high scenarios.

5.4 Activity 4 – Socio-Economic and Development Assessment

- Map population, settlements, agricultural production, markets, schools, health facilities, water points and other key services within the corridor influence area.
- Assess travel time, transport cost, reliability and seasonal access constraints.
- Identify agricultural commodities, production zones, aggregation points and market linkages affected by the roads.
- Assess gender-differentiated mobility patterns and barriers.
- Identify vulnerable households/groups and accessibility constraints.
- Assess local employment, skills and enterprise opportunities associated with construction and maintenance.

5.5 Activity 5 – Geotechnical, Materials and Pavement Investigation

- Develop an investigation plan based on geology, terrain, existing road condition and proposed intervention.
- Undertake representative test pits/borings along homogeneous sections and additional investigations at major structures and problematic areas.
- Test subgrade and pavement materials for classification and engineering properties, including moisture-density and CBR as appropriate.
- Identify and assess borrow pits, laterite sources, sand, aggregate and quarry resources, including quality, quantity, environmental constraints and haul distances.
- Assess existing pavement/material sources where applicable.
- Prepare a preliminary pavement design for each homogeneous section and each viable intervention alternative.

5.6 Activity 6 – Hydrology, Hydraulics and Drainage

- Delineate drainage catchments and identify all major and minor watercourses.
- Inventory existing drainage structures and assess hydraulic adequacy and condition.
- Compile rainfall, streamflow and flood information and use accepted methods appropriate to available data.
- Estimate design discharges and water levels using suitable return periods agreed with MPW and the financing partner.
- Assess climate-change implications for rainfall intensity, flood magnitude and drainage robustness.
- Design drainage with appropriate freeboard, erosion protection, outlet treatment and maintainability.
- Identify flood-prone sections and evaluate raising, cross-drainage, realignment or other adaptation measures.

5.7 Activity 7 – Structures and Crossings

- Inventory all existing bridges, culverts, causeways and major drainage structures.
- Assess condition, hydraulic performance, structural adequacy and likely remaining service life where feasible.
- Develop preliminary concepts for replacement, rehabilitation or new structures.
- Provide preliminary hydraulic and structural sizing, foundation considerations, scour protection and constructability requirements.
- Consider temporary traffic management and access during construction.

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5.8 Activity 8 – Alignment and Options Analysis

- Develop at least two technically feasible alternatives where corridor conditions permit.
- Evaluate horizontal and vertical geometry, earthworks, drainage, structures, land impacts, environmental/social impacts, construction complexity and cost.
- Use a documented multi-criteria decision matrix with weighted criteria agreed at inception.
- Recommend the preferred alignment and document rejected alternatives and reasons for rejection.

5.9 Activity 9 – Feasibility and Economic Analysis

(1) Rationale and Scope of Scenario Analysis

The Compound No. 3–Gban and Palala–Yopea corridors serve an influence area whose long-term transport demand is substantially shaped by macro-level development decisions that lie outside the road sector. Several transformative initiatives are under consideration or in early implementation in the Buchanan–Nimba–Grand Bassa corridor, including but not limited to:

- **Development of Buchanan as an export gateway and agro-processing hub**, including the establishment of Special Economic Zones (SEZs) or comparable industrial/processing facilities that would generate significant freight and logistics demand along the corridors;
- **Upgrade of the Port of Buchanan** to complement or extend the functionality of the Port of Monrovia, including expanded cargo handling, multi-commodity export capacity, and potential free-port or transhipment arrangements; and
- **Reform and opening of the Buchanan–Yekepa railway as a multi-user railway**, enabling transportation of commodities beyond iron ore — including agricultural produce, timber, general cargo, and industrial inputs — from the hinterland to the coast, with associated first-mile/last-mile road demand at origination and distribution points along the corridors.
- **Development of Ganta Dry Port:** realization of the Ganta Dry Port, which plan exists to serve as a reginal logistics hub for northern Liberia and the neighboring countries of Guinea and Côte d'Ivoire.

The realization, timing, and scale of these initiatives will fundamentally affect whether the project road corridors are required to carry light rural traffic or heavy freight volumes, and whether an unpaved gravel standard or full asphalt pavement is economically justified. The feasibility study shall explicitly capture this uncertainty through structured scenario analysis rather than relying on a single deterministic traffic forecast.

(2) Business-as-Usual (BAU) Scenario

The BAU scenario shall represent the base case against which all other scenarios are compared. It shall assume:

- No material change to the existing land use, agricultural production, or industrial activity within the corridor influence area beyond observed trends;
- Continuation of current transport modes and freight flows, with growth rates derived from demographic and agricultural productivity projections;
- No realization of the transformative development initiatives listed in Section 5.9 (1); and
- The Port of Buchanan and the Buchanan–Yekepa railway operating under their current configurations and ownership/regulatory arrangements.

The BAU scenario shall be fully quantified, with traffic forecasts developed under low, central, and high sub-cases as described in Activity 3 (Section 5.3).

(3) Development Scenario Identification and Articulation

The Consultant shall, based on its own research and stakeholder engagement during the inception and survey phases, identify and articulate a menu of plausible development scenarios beyond BAU. Each scenario shall be grounded in

documented evidence — including government plans, investment pipeline data, investor commitments, donor-funded studies, masterplans, and policy commitments — rather than speculative assumptions.

For each candidate scenario, the Consultant shall document:

- The triggering development initiative(s) and their current status (planned, committed, under construction, operational);
- The projected timeline and development phasing, drawing on available masterplans and sector roadmaps (e.g., Port of Buchanan development masterplan, SEZ development plan, railway concession or reform documents);
- The direct and induced freight and passenger demand implications for each corridor, quantified where feasible;
- Key uncertainties and risks affecting realization (financing, regulation, policy, market); and
- The implied road standard requirements — unpaved gravel, surface treatment, or full asphalt pavement — and the traffic loading implications for pavement design and lifecycle costs.

The Consultant shall also identify and screen the enabling investments and reforms required outside the Legacy Corridor whose realization is a prerequisite for each scenario's demand assumptions to materialize. This screening shall cover, as applicable:

- Physical infrastructure investments (e.g., port dredging, crane installation, railway track rehabilitation, terminal development, SEZ site development);
- Institutional and regulatory reforms (e.g., multi-user railway access regime, port concession arrangements, SEZ legal framework);
- Financing status (committed, under appraisal, unfunded gap); and
- Indicative timeline for realization relative to the road investment timeline.

The purpose of this screen is not to appraise those investments in detail, but to establish whether the conditions underpinning each scenario are credible, planned, and within a realistic timeframe — and to inform the Scenario Validation Workshop discussion on which scenarios warrant full modeling in the feasibility study. Scenarios whose prerequisite enabling investments are entirely unfunded or have no identified development pathway shall be noted as high-uncertainty cases and treated accordingly in the sensitivity analysis.

The Consultant shall prepare at least **three candidate** scenarios (including BAU) for presentation at the Scenario Validation Workshop.

(4) Scenario Validation Workshop

Before finalizing the scenarios to be carried into the economic, financial, and technical assessment, the Consultant shall convene a Scenario Validation Workshop. The purpose is to:

- Present the candidate scenarios and their underlying assumptions to a broad set of stakeholders;
- Validate the plausibility, timing, and scale of each scenario against the most current development roadmaps and sector plans, including the Port of Buchanan development masterplan, the SEZ development plan, and relevant railway concession or reform documents;
- Synthesize scenario assumptions with confirmed development timelines and phasing; and
- Achieve a working consensus on two viable future scenarios (beyond BAU) to be carried into the full feasibility assessment.

The workshop shall be organized by the Consultant in coordination with MPW/IIU and shall invite, at minimum:

Stakeholder Group	Relevance
Ministry of Public Works (MPW/IIU)	Road sector policy and investment planning
Ministry of Transport	Multi-modal transport policy and railway regulation

Stakeholder Group	Relevance
National Port Authority / Liberia Ports Authority	Port of Buchanan development masterplan
Ministry of Agriculture / relevant agribusiness agencies	Agro-processing hub and agricultural freight demand
SEZ Authority / relevant investment promotion body	SEZ development plans and industrial location decisions
ArcelorMittal / railway concession holder	Buchanan–Yekepa railway reform and multi-user access
Grand Bassa County authorities	Local development planning
Development partner representatives (where available)	Financing pipeline and project readiness
Private sector / logistics operators	Commercial demand intelligence

The Consultant shall prepare a Scenario Validation Workshop Report documenting: scenarios presented, stakeholder inputs, key validation findings against development roadmaps and masterplans, agreed revisions to scenario assumptions, and the two scenarios approved for full assessment. This report shall be submitted to MPW/IIU for written approval before the Consultant proceeds to the full economic and financial analysis.

(5) Economic and Financial Assessment Under Approved Scenarios

Following MPW/IIU written approval of the two agreed development scenarios, the Consultant shall conduct the full economic and financial feasibility assessment under three cases: BAU, Scenario 1, and Scenario 2.

Economic Assessment:

Develop scenario-specific traffic forecasts incorporating the freight generation, modal shift, and trip distribution effects of each development scenario, with explicit derivation of induced and diverted traffic.

- Prepare capital and recurrent maintenance costs for each alternative and road standard option.
- Undertake economic appraisal using HDM-4 or another internationally accepted model approved by MPW/financing partner.
- Quantify direct road-user benefits (vehicle operating costs, travel time) and, where robustly evidenced, wider economic benefits including agricultural productivity, market access, port hinterland connectivity, and industrial logistics efficiency.
- Calculate EIRR, NPV, and BCR for each scenario and each road standard option, enabling a direct comparison of economic viability under BAU and each development scenario.
- Conduct sensitivity analysis within each scenario (cost overruns, demand realization delay, partial scenario realization).
- Present a consolidated comparison table showing EIRR, NPV, and BCR across BAU, Scenario 1, and Scenario 2 for each corridor and road standard option.

Financial Assessment:

- Assess Government funding requirements, O&M burden, and fiscal exposure under each scenario.
- Where development scenarios involve private sector actors (SEZ operators, port concessionaires, railway operators) that could contribute to road financing through user charges, tolls, or infrastructure levy arrangements, assess the financial viability and risk-allocation implications.
- Where a PPP arrangement is warranted by scenario demand levels, prepare an indicative financial model covering revenue, costs, investor returns, and public sector fiscal exposure.

5.10 Activity 10 – Technical Assessment Informed by Development Scenarios

(1) Road Standard Selection Under Scenarios

The Consultant shall assess the technical requirements implied by each scenario and translate these into road standard options. At minimum, the following shall be evaluated and compared:

Standard Option	Description	Applicable Scenario Context
Unpaved gravel/laterite	Improved and maintained natural surface	BAU with low traffic volumes; interim standard for phased development
Surface treatment / DBST	Sealed surface on prepared base	Moderate traffic growth; cost-effective upgrade from gravel
Asphalt pavement	Full structural bituminous pavement	High freight volumes driven by development scenarios; port hinterland and SEZ access routes
Staged upgrading	Initial gravel/DBST with designed upgradability to asphalt	Phased realization of development scenarios; risk-managed investment under uncertainty

For each standard option, the Consultant shall:

- Confirm the traffic loading threshold at which each option is technically justified;
- Determine the structural pavement design for the applicable loading and subgrade conditions;
- Prepare lifecycle cost estimates (capital, routine maintenance, periodic maintenance, rehabilitation, residual value) over the appraisal period; and
- Identify the decision trigger point — expressed in traffic volume terms and development milestone terms — at which a standard upgrade would be warranted under each scenario.

(2) Development Roadmap, Phasing, and Packaging

The Consultant shall develop a phased implementation roadmap for each corridor, integrating the technical standard assessment with the development timelines established during the Scenario Validation Workshop. The roadmap shall address:

- **Phase 1 minimum investment**: The intervention immediately justified under all scenarios including BAU, providing a reliable minimum investment case regardless of scenario realization;
- **Phase 2 trigger-based upgrade**: The additional investment triggered upon confirmed realization of specific development milestones (e.g., SEZ operational, port upgrade complete, railway multi-user access granted);
- **Design-for-upgradeability**: Where Phase 1 falls below the standard warranted by high-growth scenarios, Phase 1 construction shall be designed to be upgradeable at least cost, including appropriate formation width, drainage sizing, structure clearances, and ROW reservation; and
- **Contract packaging implications**: The phasing roadmap shall inform lot packaging recommendations, ensuring Phase 1 works can be contracted and constructed independently of Phase 2 upgrades.

(3) Lifecycle Cost and Maintenance Implications

For each road standard option under each scenario, the Consultant shall prepare:

- Annual routine maintenance cost estimates;
- Periodic maintenance schedules and cost estimates (resurfacing, resealing, overlay cycles);
- Major rehabilitation triggers and cost estimates;
- Total lifecycle costs over the appraisal period in discounted (NPV) terms; and
- A comparison table of lifecycle costs by standard option and by scenario, enabling a whole-life-value comparison.

The lifecycle cost analysis shall be integrated with the economic appraisal so that EIRR calculations reflect the full maintenance cost stream, not capital cost alone.

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5.11 Activity 11 – Feasibility and Economic Analysis (Consolidated)

The economic and financial analysis is the central deliverable of Phase. The Consultant shall devote appropriate expert time and analytical depth to this component, commensurate with its role in the feasibility decision.

- Prepare capital and recurrent maintenance costs for each alternative.
- Undertake economic appraisal using HDM-4 or another internationally accepted model appropriate to the road type and approved by MPW/financing partner.
- Estimate benefits including vehicle operating costs, travel time, accident-related effects where data permit, and other defensible economic benefits (including agricultural productivity gains, market access, and induced economic activity where quantifiable).
- Calculate EIRR, ENPV/NPV and benefit-cost ratio as the primary decision metrics. Results shall be presented by corridor and by alternative option.
- Test construction-cost overruns, traffic growth, delays, maintenance expenditure, discount rate, and other material variables in sensitivity analysis.
- Undertake probabilistic or risk-based analysis where data quality permits.
- Conduct a financial feasibility assessment, including:
    - Government funding requirements and recurrent O&M burden;
    - Identification of financing sources and funding gaps;
    - Affordability under realistic maintenance-budget assumptions;
    - Assessment of risks associated with delayed maintenance and deferred renewals;
    - Where a PPP arrangement (including Design-Build-Transfer or other performance-based modality) is under consideration, assess the financial viability and risk-allocation implications of such arrangements, including an indicative financial model covering revenue, costs, returns, and public sector fiscal exposure.

5.12 Activity 12 – Environmental and Social Screening

- Conduct environmental and social screening early enough to influence alignment of selection and design.
- Identify sensitive habitats, biodiversity, natural habitats, wetlands, watercourses, cultural heritage, community resources and livelihood assets.
- Assess land acquisition, physical/economic displacement and restrictions on land use.
- Identify labor, community health and safety, SEA/SH, child labor, traffic safety and occupational risks.
- Undertake meaningful consultation and establish/strengthen an accessible GRM for the study period.
- Define the environmental/social instruments required before works, including ESIA/ESMP, RAP and other instruments where applicable.

PHASE 2 – CONCEPTUAL/PRELIMINARY ENGINEERING DESIGN AND BIDDING DOCUMENTS

To be commenced after the interim report review is completed.

5.13 Activity 13 – Conceptual Engineering Design

- Establish design criteria and road classification separately for each corridor and homogeneous section.
- Prepare preliminary horizontal and vertical alignment.
- Prepare typical and representative cross-sections.
- Prepare pavement alternatives and recommended pavement structure.

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- Prepare preliminary drainage, culvert, bridge and erosion-control designs.
- Prepare junction, access, pedestrian, market and school-zone treatments.
- Incorporate road safety and climate-resilience measures.
- Prepare construction staging and traffic-management concepts.

5.14 Activity 14 – Full Environmental and Social Assessment and ESHS as per World Bank ESF Requirements

- Update the Environmental and Social Assessment based on the Conceptual Engineering Design of Activity 13.
- Develop ESHS requirements that can be directly incorporated into the bidding documents.

5.15 Activity 15– Cost Estimation and Implementation Strategy

- Prepare quantity take-offs from the conceptual design.
- Develop unit rates using current market information and defensible assumptions.
- Benchmark costs against recent comparable projects in Liberia and the region where reliable data exist.
- State price base date, exchange rates, taxes/duties treatment, physical contingencies and price contingencies separately.
- Prepare life-cycle maintenance costs.
- Develop implementation phasing, construction duration and priority sections.

5.16 Activity 16– Bidding Document Preparation

- Lot packaging assessment: Conduct a formal, evidence-based packaging assessment — as a discrete MPW/IIU and IDA-approved deliverable before drafting begins — applying criteria covering engineering homogeneity, contractor capacity, competition, construction access, implementation scheduling, supervision capacity, funding constraints, scenario-informed phasing (lot boundaries shall be consistent with the Section 5.10.2 phased roadmap so trigger-based standard upgrades can be contracted separately), and community impact.
- Complete bidding document set: Prepare a full set per lot using the applicable World Bank Standard Procurement Document for Design, Build (and Transfer) works (edition and adaptations confirmed with MPW/IIU and the World Bank before drafting), including: Invitation/Request for Bids and Bidding Data; Instructions to Bidders and Bid Data Sheet (evaluation methodology, minimum technical score, financial/technical weighting); Contractor qualification requirements (experience, financial capacity, equipment, key personnel) calibrated to lot size and road standard; and General and Particular Conditions of Contract based on FIDIC Yellow Book or equivalent World Bank DBT document, with Particular Conditions tailored to Liberian legal context.
- Employer's Requirements: The central technical document of the DBT package, developed from the conceptual design. Shall be performance-based and cover: road standard, classification, design speed, and design life; geometric parameters and formation requirements; pavement design criteria consistent with the approved road standard option; drainage design and climate-resilience provisions; structural requirements for bridges and major culverts; road safety measures (speed management, pedestrian crossings, school/market zones, delineation, guardrails); ESHS obligations (ESMP, SEA/SH, labor management, community health and safety); design-for-upgradeability provisions (formation width, drainage sizing, structure clearances, ROW treatment) per the Section 5.10.2 roadmap; QA and testing requirements; and asset transfer and handover certification.
- Contractor's Design Submission and Review Procedure: Specify design submission stages (Basic Design, Detailed Design, Issued-for-Construction); MPW/IIU review and no-objection process; the Consultant's/Engineer's compliance review role; and design change approval procedures.
- Reference/indicative drawings: Provided for information only; the Contractor is responsible for detailed design drawings subject to the review procedure above.

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- Bill of Quantities and pricing schedules: Structured to support competitive pricing, audit, and variation valuation; consistent with the Employer's Requirements and conceptual design quantities; lump-sum elements clearly explained where applicable.
- ESHS requirements: Embedded as measurable, enforceable contract obligations — not informal side requirements — covering applicable management plans, incident notification, worker and community health and safety, SEA/SH measures, traffic management during construction, and environmental controls. ESMP and RAP obligations incorporated by reference to finalized instruments from Activity 14.
- Mandatory forms and securities: Bid security, performance security, advance payment guarantee, retention provisions, parent company guarantee as applicable; all mandatory bid, contract, and security forms.
- Completion schedule and key milestones: Overall completion period, sectional completion dates where applicable, and phasing provisions consistent with the implementation strategy.
- Key personnel and equipment requirements for the Contractor, calibrated to lot size and road standard, where included in evaluation or contract.
- Price adjustment provisions where justified by contract duration and Liberian market conditions.
- Defects/warranty period provisions: Duration, Contractor obligations, and performance security release conditions.
- Asset transfer and handover requirements: Completion certification procedure, as-built documentation, O&M manuals, and training requirements.
- Confidential Engineer's Estimate: For each lot — unit rates from current Liberian market intelligence benchmarked against comparable recent contracts; auditable rate build-ups (labor, materials, equipment, haulage, overheads, profit); stated price base date, contingencies, taxes/duties, and escalation treatment; strictly confidential and disclosed only to authorized MPW/IIU, Review Committee, and financing-partner personnel.
- Technical specifications: Performance-based wherever feasible; free of proprietary references; aligned to the approved road standard and Employer's Requirements; ESHS provisions embedded as enforceable obligations.
- Procurement-readiness review: Before submission to MPW/IIU, conduct and document an internal check covering completeness, internal consistency (Employer's Requirements, specifications, BoQ, qualification criteria), ESHS compliance, World Bank Procurement Regulations conformity, constructability, and Engineer's Estimate confidentiality segregation. Submit the check record alongside the draft documents.

6. Survey and Investigation Specifications

6.1 Topographic Survey – Minimum Requirements

Item	Minimum Requirement
Control	Survey-grade GNSS control tied to agreed national/geodetic reference system; permanent/semipermanent benchmarks at suitable intervals and key structures.
Corridor strip	Normally sufficient width to capture proposed alignment, earthworks, drainage, ROW interfaces and alternatives; indicative 40–60 m, widened at structures/junctions/settlements.
Longitudinal profile	Centerline and critical alternative alignments with sufficient vertical accuracy for conceptual design.
Cross-sections	At regular intervals appropriate to terrain and design complexity; closer spacing at drainage, structures, settlements and geometric constraints.
Structures	Detailed survey of geometry, inverts, water levels, approaches, abutments, culvert barrels and outfalls.
Deliverables	Raw observations, coordinate lists, control reports, DTM, contours, orthophoto/base mapping where available, CAD and GIS layers.

6.2 Geotechnical and Materials Testing

The Consultant shall submit a test plan for approval. The density of investigations shall reflect variability rather than applying a blind uniform spacing. At minimum, the program shall provide representative characterization of each pavement/subgrade unit, problematic locations, major cut/fill areas and all major structures.

- Visual classification and logging of all investigation points.
- Moisture content, particle-size distribution, Atterberg limits and compaction characteristics as applicable.
- CBR testing for pavement/subgrade design under the agreed method.
- Material source quality testing including aggregate strength/durability and gradation where applicable.
- Groundwater observations and foundation information at major structures.
- Laboratory QA/QC, chain-of-custody and calibration records.

6.3 Traffic Survey Program

Pre-Survey Coordination Requirement: Before finalizing the traffic survey program, the Consultant shall consult with MPW/IIU to determine the availability, coverage, and quality of traffic data collected under the RETRAP project. The Consultant shall document this consultation in the Inception Report, identify which survey components can be streamlined or eliminated based on available RETRAP data, and confirm the residual survey program to be executed under this assignment. The goal is to achieve full data adequacy while avoiding duplication of cost and effort.

Survey	Indicative Minimum Coverage	Purpose
Classified counts	Representative stations covering settlements, junctions, homogeneous sections; weekday and market-day where relevant	AADT and composition
Turning counts	Major junctions	Intersection design and safety
OD/interviews	Selected stations/communities	Trip patterns, diversion and economic analysis
Pedestrian/NMT counts	Settlements, schools, markets, activity centers	Inclusive and safety design
Axle-load observations	Representative heavy-vehicle locations	Pavement design

6.4 Hydrology and Hydraulic Investigations

The Consultant shall use accepted hydrological methods appropriate to the data environment and catchment characteristics. All assumptions, rainfall series, frequency analysis, design storms, runoff coefficients/model parameters, return periods and climate-adjustment factors shall be documented and independently checked.

6.5 Road Safety Investigation

- Identify conflict points, poor sight distance, speed-risk areas, settlement crossings, school/market interfaces and roadside hazards.
- Review available crash records and supplement them with community/road-user information where formal data are sparse.
- Undertake a road safety risk assessment of the conceptual alignment and key intersections.
- Recommend speed management, pedestrian crossing, shoulder, delineation, signage, lighting where justified, guardrails and roadside recovery-zone measures.

7. Feasibility Study Methodology

7.1 Technical Feasibility

For each corridor, the Consultant shall establish a technically feasible investment concept and demonstrate constructability. The analysis shall consider terrain, geology, soils, drainage, flood risk, materials, structures, utility conflicts, ROW constraints, settlement interfaces, construction access and maintenance.

7.2 Demand and Traffic Forecasting

Forecasts shall be based on observed traffic and defensible socioeconomic drivers. The Consultant shall avoid mechanically applying growth rates unsupported by evidence. Low, central and high scenarios shall be developed, with explicit assumptions for agricultural production, population, regional trade, diversion and induced traffic.

7.3 Economic Appraisal

The economic appraisal is the primary analytical output of Phase 1. The Consultant shall ensure that the Team Leader, Transport Economist/Traffic Specialist, and Development Economist devote sufficient time to produce an appraisal of the depth and quality required to support a credible go/no-go decision and IDA concurrence.

Component	Requirement
Appraisal period	Propose and justify in accordance with road asset life and financing-partner requirements.
Discount rate	Use the applicable Government/financing-partner rate and document sensitivity to alternative rates.
Benefits	Vehicle operating cost, travel-time, road-user cost and other measurable benefits justified by evidence.
Costs	CAPEX, rehabilitation/renewal, routine and periodic maintenance, and residual value where applicable.
Primary indicators	EIRR and NPV/ENPV — computed for each scenario (BAU, Scenario 1, Scenario 2) and each road standard option; BCR as supplementary
Scenario presentation	A consolidated comparison table of EIRR, NPV, and BCR across BAU and the two agreed scenarios, for each corridor and road standard option
Road standard linkage	EIRR calculations shall reflect the full lifecycle cost (capital + maintenance) of the applicable road standard option, not capital cost alone
Risk and sensitivity	At minimum: cost overrun, traffic-growth, implementation delay, maintenance scenarios, and scenario non-realization; probabilistic analysis where feasible

Presentation	Results shall be presented by corridor, scenario, and road standard option, with a clear comparison table and recommended investment strategy

7.4 Financial and Fiscal Assessment

- Estimate Government funding requirements and recurrent O&M burden.
- Identify potential financing sources and funding gaps.
- Assess affordability under realistic maintenance-budget assumptions.
- Identify risks associated with delayed maintenance and deferred renewals.
- Where a PPP or performance-based arrangement is warranted under any scenario, prepare an indicative financial model covering: projected traffic revenues (if applicable), capital and operating costs, return on investment, risk allocation between public and private parties, and Government fiscal exposure. Assess whether a PPP arrangement is financially viable for each corridor, under which scenario(s), and under what conditions.
- Assess the potential for development-scenario actors (SEZ operators, port concessionaires, Buchanan–Yekepa railway operators) to contribute to road financing or maintenance through user charges, tolls, or infrastructure levy arrangements, and the conditions under which such contributions would be commercially viable.

7.5 Multi-Criteria Analysis

Where alternatives are not distinguishable on economic performance alone, the Consultant shall apply a transparent multi-criteria framework. Suggested criteria include capital cost, economic return, travel-time reliability, population served, agricultural connectivity, climate resilience, safety, ROW impacts, environmental sensitivity, social impacts, constructability and contractor-market capacity. Weightings shall be agreed at inception.

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8. Conceptual (Preliminary) Engineering Design

8.1 Design Standards

The design shall use the applicable MPW road design and construction standards. Where national standards are silent or insufficient, the Consultant shall propose appropriate international standards for approval. Potential references include AASHTO geometric design guidance, TRL tropical pavement guidance, accepted hydrological/hydraulic practice and recognized road-safety principles. The hierarchy and editions shall be agreed at inception. Because the civil works shall be procured on a Design-Build-Transfer (DBT) basis, the Consultant's conceptual/preliminary design is not a substitute for detailed design; it shall instead be developed to a level of definition sufficient to form the technical basis of the Employer's Requirements in the DBT bidding documents (Section 10.2), with detailed design left to the successful Contractor.

8.2 Geometric Design

- Design speed and road classification by homogeneous section.
- Horizontal alignment, sight distance, superelevation and curve geometry.
- Vertical profile, grades, crest/sag curves and drainage considerations.
- Crossfall, shoulders, side slopes and recovery areas.
- Settlement approaches and junction/intersection layouts.
- Pedestrian/NMT facilities where justified.

8.3 Pavement Design

The Consultant shall compare technically viable pavement options using traffic loading, subgrade strength, materials availability, climate, construction capability, maintenance requirements and life-cycle cost. Pavement design shall clearly identify assumptions, design period, reliability and sensitivity to subgrade/material variability.

8.4 Drainage and Climate-Resilient Design

- Use robust drainage hierarchy: surface drainage, cross-drainage, longitudinal drainage and safe outfalls.
- Avoid concentrating flows in ways that create downstream erosion or community impacts.
- Provide climate resilience through conservative freeboard, erosion protection, scour protection, appropriate culvert sizing and maintainable drainage.
- Identify critical failure points and define adaptation measures and maintenance triggers.

8.5 Structures

Prepare preliminary general arrangement drawings and structural concepts for bridges and major culverts, including hydraulic opening, foundation concept, scour protection, construction sequence and indicative quantities. The Consultant shall identify where additional detailed geotechnical investigation will be required during subsequent detailed design.

8.6 Road Safety and User Facilities

- Settlement speed-management measures.
- Safe pedestrian crossing points and continuous pedestrian paths where warranted.
- School and market-area treatments.
- Delineation, warning and regulatory signs.
- Guardrails and roadside hazard treatment based on risk.
- Motorcycle and vulnerable-user considerations appropriate to observed travel patterns.

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9. Environmental and Social, ESHS and Climate Requirements

9.1 Applicable Framework

Where the World Bank finances the assignment/project, the Consultant shall work within the World Bank Environmental and Social Framework and the applicable Environmental and Social Standards, together with the Government of Liberia's environmental and social legal and institutional requirements and project-specific instruments. The World Bank ESF expressly covers integrated risk management, labor and working conditions, community health and safety, land acquisition/resettlement, cultural heritage, stakeholder engagement, resource efficiency/pollution prevention and biodiversity.

9.2 Screening and Impact Avoidance

- Map sensitive environmental and social receptors before finalizing the preferred alignment.
- Apply the mitigation hierarchy: avoid, minimize, restore and compensate/offset only where applicable and required.
- Use alignment options analysis to avoid unnecessary displacement, wetlands, protected/sensitive habitats and cultural heritage.
- Identify cumulative and induced impacts where reasonably foreseeable.

9.3 Land Acquisition and Resettlement

- Prepare a preliminary ROW and asset-affected inventory at a level appropriate to the study stage.
- Identify potential physical displacement, economic displacement and restrictions on land use.
- Document customary and statutory land-tenure issues without making unsupported legal determinations.
- Define the resettlement instrument required before construction and the additional surveys needed to prepare it.

9.4 Labor and Working Conditions

- Assess anticipated labor risks, worker accommodation issues, occupational health and safety requirements and worker grievance arrangements.
- Prohibit child labor, forced labor, discrimination and harassment in the Consultant's own activities.
- Require appropriate PPE, training, incident reporting and emergency preparedness.

9.5 Community Health, Safety and SEA/SH

- Prepare a field HSE plan and community-safety protocol.
- Manage traffic and pedestrian risks during surveys.
- Prohibit SEA/SH, sexual harassment, exploitation, abuse, coercion and discriminatory conduct.
- Provide confidential and survivor-centered referral arrangements consistent with applicable project procedures.
- Report serious incidents promptly in accordance with Client/financing-partner requirements.

9.6 Stakeholder Engagement and GRM

Consultations shall be inclusive, accessible and documented. The Consultant shall engage county/district authorities, traditional/customary authorities where relevant, affected communities, road users, women, youth, persons with disabilities, vulnerable groups, agricultural producers, businesses and relevant government agencies. A study-stage GRM shall record complaints, response times, actions and closure status.

9.7 Climate Risk Assessment

Climate resilience shall be treated as a design input rather than a standalone chapter. The Consultant shall identify exposure, vulnerability and criticality for flooding, extreme rainfall, erosion, heat, slope instability and other relevant hazards;

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quantify consequences where practicable; and incorporate adaptation measures into alignment, pavement, drainage, structures, materials and maintenance.

10. Bidding Documents, Engineer's Estimate and Lot Packaging

10.1 Lot Packaging Principles

The Consultant shall undertake a formal market-capacity and packaging assessment. The source ToR previously contemplated a general lot ceiling of approximately 50 km, but the final packaging shall be evidence-based and approved by MPW/IIU and the financing partner. Length alone shall not determine lot size.

Packaging Criterion	Assessment Requirement
Engineering homogeneity	Avoid splitting critical hydraulic, structural or geological systems where this creates interface risk.
Contractor capacity	Assess likely bidder capability, equipment, finance, experience and geographic reach.
Competition	Avoid lots so large that credible competition is materially reduced.
Construction access	Consider logistics, camps, quarries, borrow sources and haul distances.
Implementation schedule	Allow parallel construction where practical without creating unmanageable interfaces.
Supervision/management	Consider Client capacity and future supervision requirements.
Funding availability	Allow phased investment if funding is constrained.
Community impacts	Avoid unnecessary fragmentation of community access and safeguards responsibilities.

10.2 Bidding Documents

For each works lot, the Consultant shall prepare a complete set of bidding documents using the applicable World Bank Standard Procurement Document or other financing-partner-approved document. The exact document and edition applicable to the procurement shall be confirmed by MPW/IIU and the Bank before issuance. The civil works for each Project Road lot shall be procured and implemented on a Design-Build-Transfer (DBT) basis: the successful Contractor shall be responsible for completing the detailed engineering design (building on the Consultant's conceptual/preliminary design and the Employer's Requirements), constructing the works, and transferring the completed asset to MPW/IIU following satisfactory completion, testing/commissioning and any applicable defects/warranty period.

- Invitation/Request for Bids and Bidding Data as applicable.
- Instructions to Bidders and qualification requirements.
- General and Particular Conditions of Contract, based on the FIDIC Conditions of Contract for Plant and Design-Build (the “Yellow Book”) or the equivalent World Bank Standard Procurement Document for Design, Build (and Transfer) works, consistent with the Design-Build-Transfer (DBT) delivery method adopted for the civil works.
- Employer's Requirements, developed from the Consultant's conceptual/preliminary design, stating performance-based technical, functional and quality requirements sufficient for the Contractor to complete detailed design and construction under the DBT contract.
- Contractor's Design Submission and Review Procedure, including design-submission stages (e.g., basic and detailed design), MPW/IIU's design-review and no-objection process, and the Consultant's/Engineer's role in reviewing the Contractor's detailed design for compliance with the Employer's Requirements.
- Reference/indicative drawings from the conceptual design, provided for information; the Contractor shall be responsible for preparing detailed design drawings for construction, subject to the review procedure above.
- Bill of Quantities and pricing schedules.
- Environmental and Social requirements, including applicable ESMP/ESHS clauses.

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- Forms of bid, securities, contract and other mandatory forms.
- Completion schedule and key personnel/equipment requirements where applicable.
- Price adjustment provisions where justified by the procurement strategy and market conditions.
- Defects/warranty (liability) period, performance security/bond, and asset-transfer and handover requirements and certification procedure marking completion of the Contractor's obligations under the DBT contract.

10.3 Engineer's Estimate

- Prepare a detailed, confidential Engineer's Estimate for each lot.
- Base rates on current Liberia market intelligence, supplier quotations where appropriate, labor, equipment, haulage and logistics.
- Benchmark against recent comparable works contracts.
- Clearly state price base date, currency, taxes/duties assumptions, contingencies and escalation treatment.
- Maintain auditable build-ups from quantities to unit rates to total estimate.
- Keep the estimate confidential and disclose only to authorized Client/Review Committee/financing-partner personnel.

10.4 Technical Specifications and ESHS Integration

ESHS requirements shall be embedded in the bidding documents and not treated as an informal side requirement. The Consultant shall include measurable obligations, reporting requirements, applicable management plans, incident notification requirements, worker/community health and safety provisions, SEA/SH measures, traffic management and environmental controls, consistent with World Bank project practice for integrating E&S/ESHS requirements into procurement documents.

11. Deliverables and Reporting

12.1 Deliverables Schedule

No.	Deliverable	Indicative Due Date	Minimum Content
PHASE 1 – FEASIBILITY STUDY			
1	**Inception Report**	Week 3	Verified corridor definition; methodology; survey plan; standards; data-gap/risk register; stakeholder plan; work plan; staffing/deployment.
2	**Interim Survey & Investigation Report**	Week 7	Topographic, traffic, socio-economic, geotechnical, hydrological, structures and E&S baseline findings.
3a	**Scenario Validation Workshop Report**	Week 9	Candidate scenarios (BAU + at least three development scenarios) presented to stakeholders; validation against port masterplan, SEZ plan, railway reform documents; two agreed scenarios approved for full assessment; submitted to MPW/IIU for written approval before full economic analysis commences.
3b	**Draft Feasibility Study**	Week 12	Alternatives; demand; scenario analysis (BAU + two agreed scenarios); economic appraisal with EIRR and NPV as primary outputs, presented by scenario and road standard option; financial feasibility (incl. PPP and development-actor financing assessment where applicable); road standard and phasing assessment; lifecycle cost analysis; technical, climate, E&S screening; preferred option; go/no-go recommendation.

4	**Stakeholder Validation Report**	Week 14	Consultation records, issues raised, responses and agreed changes.
5	**Final Feasibility Study**	Week 17	All comments addressed; approved corridor-specific recommendations and design package.
6	**Executive Summary**	Week 17	Decision-focused summary for senior Government/financiers.
PHASE 2 – CONCEPTUAL DESIGN AND BIDDING DOCUMENTS (activated only upon written authorization from MPW/IIU)			
7	**Draft Conceptual Design**	Week 23	Alignment, profiles, cross-sections, pavement, drainage, structures, safety, quantities, cost, and lot packaging for approved option(s).
8	**Stakeholder Validation Report (Phase 2)**	Week 24	Consultation records on design, issues raised, responses and agreed changes.
9	**Final Feasibility & Conceptual Design**	Week 27	All comments addressed; approved corridor-specific design package.
10	**Draft Bidding Documents & Engineer's Estimate**	Week 29	Complete lot-specific draft procurement packages and confidential estimate.
11	**Final Bidding Documents**	Week 30	Approved, advertisement-ready lot packages.
12	**Final Data Handover Package**	At completion	Raw data, models, CAD/GIS, calculations, survey files, BOQs, cost build-ups and procurement source files.

12.2 Minimum Feasibility Report Structure

- Executive summary and decision recommendation.
- Project background and strategic rationale.
- Verified corridor description and baseline.
- Traffic and transport demand.
- Socio-economic and development assessment.
- Survey and investigation results.
- Options and alternatives analysis.
- Geometric, pavement, drainage and structures assessment.
- Climate and disaster-risk assessment.
- Road safety assessment.
- Environmental and social assessment.
- Development scenario analysis — BAU, Scenario 1, Scenario 2: assumptions, development timelines (port masterplan, SEZ plan, railway reform), freight and passenger demand implications, and key uncertainties.
- Economic feasibility — EIRR, NPV, sensitivity analysis, and risk assessment, presented by scenario and road standard option (primary decision section).
- Road standard and phasing assessment — unpaved gravel vs. DBST vs. asphalt comparison; staged upgrading concept; development trigger points; lifecycle cost comparison by scenario.
- Financial feasibility — funding requirements, O&M burden, affordability, PPP assessment, development-actor financing potential; scenario-differentiated fiscal exposure.
- Institutional, O&M, and contractor-market assessment.
- Risk analysis and implementation strategy.

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- Conclusions and recommendation — structured around EIRR findings and go/no-go decision for each corridor. Institutional, O&M and contractor-market assessment.
- Risk analysis and implementation strategy.
- Conclusions and recommendation.

12.3 Digital Deliverables

- Native CAD files and PDF drawings.
- GIS geodatabase/shapefiles with metadata and coordinate reference information.
- Survey raw data and processed observations.
- DTMs, profiles and cross-sections.
- Traffic databases and survey forms.
- Geotechnical logs and laboratory results.
- Hydrological calculations/models.
- Economic model files including HDM-4 or equivalent.
- Quantity and cost-estimation spreadsheets.
- Bidding-document source files and final PDFs.

13. Work Plan and Duration

The assignment is structured in two phases. Phase 1 (Feasibility Study) is expected to require approximately 17–18 weeks. Phase 2 (Conceptual Design and Bidding Documents) is expected to require approximately 12–13 weeks. Total assignment duration: approximately 30 weeks, assuming timely Client review and prompt feedback/ guidance on the subsequent activities.

Phase	W1–3	W4–7	W8–12	W13–17	W18	W19–23	W24–27	W30
PHASE 1								
1 Inception	•							
2 Surveys & investigations	•	•	•					
3. Scenario development & candidate articulation		•	•					
4. Scenario Validation Workshop			•					
5 Feasibility analysis (BAU+2 Scenarios)			•	•				
6. Road standard & lifecycle cost analysis			•	•				
7 Consultation/stakeholder validation			•	•				
8. Final Feasibility Report				•				
9. Interim Report Review meeting					•			
Phase 2								
10. Conceptual Design						•	•	
11. Bidding documents							•	•

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12.Final Handover								•

Critical path: inception approval → surveys/data validation → alternatives/feasibility → preferred option → conceptual design → stakeholder validation → final design/BoQ → bidding documents → approval/advertisement → procurement support.

14. Team Composition and Qualifications

14.1 Minimum Key Personnel

Position	Minimum Experience	Indicative Qualification	Core Responsibilities
Team Leader / Highway Engineer	12 years	Civil/Highway Engineering degree; major road feasibility/design; international-financier experience	Overall leadership, design integration, client interface, final technical sign-off.
Highway/Geometric Design Engineer	8 years	Civil/Highway Engineering	Alignment, geometric design, road classification and design standards.
Structural/Bridge Engineer	8 years	Civil/Structural Engineering	Bridges, major culverts, structural concepts and hydraulic interfaces.
Geotechnical/Pavement Engineer	8 years	Civil/Geotechnical Engineering	Investigations, materials, subgrade and pavement options.
Hydrologist/Drainage Engineer	7 years	Civil/Water Resources Engineering	Hydrology, hydraulics, drainage and climate resilience.
Transport Economist / Traffic Specialist	10 years	Transport Economics/Economics/Civil Engineering	Traffic surveys, forecasts, scenario-based demand modelling; HDM-4 economic appraisal; EIRR and NPV calculations across BAU and agreed development scenarios and road standard options; primary responsibility for the Phase 1 economic analysis deliverable.
Financial Analyst/ PPP Specialist	8 years	Finance/Economics/Engineering; experience with public infrastructure financing, multi-modal corridor finance, and PPP analysis	Financial feasibility assessment; Government funding analysis; O&M affordability; lifecycle cost analysis by road standard option; PPP financial modelling where warranted; development-actor financing assessment; scenario-differentiated fiscal exposure.
Development Economist / Regional Economist	8 years	Economics/Development Studies; experience with corridor economic analysis, SEZ/port/rail hinterland studies, and freight demand modelling	Development scenario identification and articulation; analysis of Buchanan export gateway, SEZ, port upgrade, and railway reform demand implications; Scenario Validation Workshop facilitation and report preparation; synthesis of development roadmaps and masterplans into traffic and economic analysis.
Environmental & Social Specialist	8 years	Environmental/Social Science or related	ES screening, E&S instruments, stakeholder engagement and safeguards.
GESI/Social Development Specialist	5 years	Social Science/Development Studies	Gender, vulnerability, inclusion and socio-economic surveys.

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Road Safety Specialist	5 years	Civil/Transport Engineering or related	Safety assessment, Safe System measures and road safety review.
Land/Topographic Surveyors – 2	7 years each	Surveying/Geomatics	Parallel survey teams, control, topography and asset inventory.
GIS/CAD Specialist	5 years	Geomatics/CAD/GIS	Spatial database, mapping, DTM and drawing production.
Quantity Surveyor/Cost Estimator	6 years	QS/Civil Engineering	BoQ, cost estimates and Engineer's Estimates.
Procurement/Contracts Specialist	10 years	Engineering/QS/Procurement or related	Bidding documents, procurement strategy, bid evaluation support.
Community Liaison Officers – 2	5 years each	Relevant social/community qualification	Community engagement and GRM; one assigned per corridor.

14.2 Qualification of key personnel

Position 1: Team Leader / Senior Highway Engineer

- General Experience: Minimum 15 years in road design, feasibility, and/or construction.
- Specific Experience: At least 8 years as Team Leader or Deputy Team Leader on road feasibility and/or design assignments; at least 5 years in Sub-Saharan Africa or comparable tropical environments; at least 3 years on World Bank or MDB-financed assignments.
- Qualifications: Bachelor's degree (minimum) in Civil or Highway Engineering; postgraduate degree is an advantage; registration with a recognized professional engineering body required.
- Key Skills: Road feasibility and geometric design; DBT/Design-Build procurement; FIDIC Yellow Book; World Bank Procurement Regulations and Standard Procurement Documents; Employer's Requirements preparation; multidisciplinary team leadership; HDM-4 familiarity is an advantage.
- Role: Overall technical and administrative leadership across both phases; integration of all technical, economic, E&S, and procurement outputs; primary interface with MPW/IIU and the World Bank; chair of all key meetings including the Scenario Validation Workshop; final sign-off on all deliverables.
- Time Commitment: Minimum 7 person-months across Phase 1 and Phase 2.

Position 2: Highway / Geometric Design Engineer

- General Experience: Minimum 10 years in highway and road design.
- Specific Experience: At least 8 years in road geometric design and alignment studies in Sub-Saharan Africa or comparable tropical conditions; at least two feasibility or design assignments financed by a multilateral development bank.
- Qualifications: Bachelor's degree in Civil or Highway Engineering.
- Key Skills: Geometric design to AASHTO or equivalent standards for rural roads; horizontal/vertical alignment optimization; Safe System integration; CAD-based road design software.
- Role: Reconnaissance and alignment options development; geometric design to conceptual/preliminary level (Phase 2); multi-criteria alignment options analysis (Section 5.8); cross-section and junction design.
- Time Commitment: Minimum 4 person-months across Phase 1 and Phase 2.

Position 3: Structural / Bridge Engineer

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- General Experience: Minimum 10 years in civil/structural engineering with a focus on road structures.
- Specific Experience: At least 8 years in design or assessment of bridges, culverts, and major drainage structures in tropical environments; at least two comparable assignments in Sub-Saharan Africa.
- Qualifications: Bachelor's degree in Civil or Structural Engineering.
- Key Skills: Structural assessment and preliminary design of bridges and major culverts; hydraulic opening sizing; scour assessment; foundation assessment in tropical soils; constructability in the Liberian contractor market.
- Role: Inventory and condition assessment of existing structures; preliminary hydraulic and structural sizing (Phase 1); general arrangement drawings and structural concepts (Phase 2); scour protection and construction traffic management input; cost estimation for structures.
- Time Commitment: Minimum 3 person-months.

Position 4: Geotechnical / Pavement Engineer

- General Experience: Minimum 10 years in geotechnical investigation and pavement design.
- Specific Experience: At least 8 years in pavement design and materials investigation in Sub-Saharan Africa or comparable tropical laterite environments; at least three comparable assignments; soil/materials testing (CBR, Atterberg limits, compaction, aggregate strength); climate-change impacts on pavement performance.
- Qualifications: Bachelor's degree in Civil or Geotechnical Engineering.
- Key Skills: Flexible pavement design using TRL, AASHTO methods, and software (Rubicon or equivalent) for tropical low-volume roads; materials investigation (test pits, borings, laboratory testing, borrow-area assessment); design of unpaved gravel, DBST, and asphalt pavement options for lifecycle cost comparison.
- Role: Design and supervision of geotechnical/materials investigation program; subgrade characterization and pavement design for each section and intervention alternative; materials source identification and quality assessment; pavement design options for each road standard scenario for lifecycle cost analysis; constructability review and Employer's Requirements input (Phase 2).
- Time Commitment: Minimum 3.5 person-months.

Position 5: Hydrologist / Drainage Engineer

- General Experience: Minimum 8 years in hydrology, hydraulics, and drainage engineering for roads.
- Specific Experience: At least 6 years in hydrological analysis and drainage design in tropical or data-scarce environments; climate-resilient design; at least two assignments in Sub-Saharan Africa.
- Qualifications: Bachelor's degree in Civil or Water Resources Engineering.
- Key Skills: Hydrological analysis in data-scarce tropical catchments; hydraulic design of cross-drainage and longitudinal drainage; climate-change adjustment of design flows; flood-prone section identification; erosion and scour risk assessment.
- Role: Catchment delineation and hydrological analysis; inventory and hydraulic assessment of existing structures; discharge estimation and structure sizing (Phase 1 feasibility; Phase 2 conceptual design); climate resilience integration into drainage and alignment recommendations.
- Time Commitment: Minimum 3 person-months.

Position 6: Transport Economist / Traffic Specialist

- General Experience: Minimum 10 years in transport economics and/or traffic analysis.

- Specific Experience: At least 8 years in traffic surveys, demand modelling, and economic appraisal of road investment; at least three road investment studies in Sub-Saharan Africa within the last 10 years; at least 3 years in a primary Transport Economist or Traffic Specialist role.
- Qualifications: Bachelor's degree (minimum) in Economics, Transport Economics, or a closely related field; postgraduate degree in Transport or Development Economics is an advantage.
- Key Skills: Proven proficiency in HDM-4 (model setup, calibration, input preparation, sensitivity analysis); EIRR, NPV, and BCR computation in data-scarce environments; scenario-based freight demand modelling linked to port, SEZ, and railway development; agricultural transport demand and market-access benefit quantification; decision-ready economic presentation for Government and MDB clients.
- Role: Traffic survey program design and supervision (coordinating with RETRAP data per Section 5.3); base-year AADT and composition profiles for both corridors; scenario-specific traffic forecasting for BAU, Scenario 1, and Scenario 2; HDM-4 economic appraisal across each scenario and road standard option; EIRR, NPV, and BCR computation; sensitivity and risk analysis; consolidated scenario comparison table. Primary technical responsibility for the economic feasibility deliverable. Input to Scenario Validation Workshop on demand implications of candidate scenarios.
- Time Commitment: Minimum 4 person-months (Phase 1 intensive). Highest-intensity Phase 1 technical role after the Team Leader.

Position 7: Financial Analyst / PPP Specialist

- General Experience: Minimum 8 years in public infrastructure financing, fiscal analysis, or PPP advisory.
- Specific Experience: At least 5 years in financial feasibility of transport infrastructure in developing countries; O&M cost analysis, lifecycle cost modelling, and Government budget affordability assessments; PPP financial modelling (traffic-based concessions, availability payments, output-based contracts) required if PPP is warranted under any scenario.
- Qualifications: Bachelor's degree in Finance, Economics, Engineering, or a related field; postgraduate degree or professional finance qualification (CFA, ACCA, or equivalent) is an advantage.
- Key Skills: Lifecycle cost modelling (capital, maintenance, rehabilitation, residual value); Government funding requirement and fiscal exposure analysis; PPP financial modelling; assessment of development-actor financing contributions (port concessionaires, SEZ operators, railway operators) through user charges, tolls, or infrastructure levies.
- Role: Financial feasibility assessment under BAU and each agreed development scenario; lifecycle cost estimates by road standard option integrated with EIRR calculations; Government O&M burden and affordability assessment; PPP financial viability assessment where warranted; development-actor financing potential assessment; financial feasibility chapter of the Feasibility Study.
- Time Commitment: Minimum 2.5 person-months (Phase 1).

Position 8: Development Economist / Regional Economist

- General Experience: Minimum 8 years in development economics, corridor economics, or regional economic planning.
- Specific Experience: At least 5 years in corridor economic analysis, hinterland freight demand modelling, or economic assessment of port/SEZ/railway development in Sub-Saharan Africa; demonstrated experience facilitating multi-stakeholder workshops; experience synthesizing sector masterplans into investment analysis. Liberia or West Africa experience is a strong advantage.

- Qualifications: Bachelor's degree (minimum) in Economics, Development Studies, Regional Planning, or a related field; postgraduate degree strongly preferred.
- Key Skills: Corridor economic analysis linking road investment to territorial development outcomes; freight demand modelling linked to port throughput, SEZ industrial production, and railway multi-user reform; synthesis of masterplans (port, SEZ, railway concession documents) into quantified traffic demand implications; stakeholder facilitation and workshop design for scenario validation.
- Role: Lead identification and articulation of candidate development scenarios; research and documentation of current status, timelines, and demand implications of the Buchanan export gateway/agro-processing hub, Port of Buchanan upgrade, and Buchanan–Yekepa railway reform; design and facilitation of the Scenario Validation Workshop (Section 5.9.4); preparation of the Workshop Report for MPW/IIU approval; synthesis of agreed scenario assumptions with development roadmaps; input to the Transport Economist's traffic forecasts and the socio-economic assessment (Section 5.4).
- Time Commitment: Minimum 2.5 person-months (Phase 1, concentrated in Weeks 4–12).

Position 9: Environmental and Social Specialist

- General Experience: Minimum 10 years in environmental and social impact assessment for infrastructure.
- Specific Experience: At least 7 years conducting ESIAs and developing ESMPs for road projects in Sub-Saharan Africa; at least two World Bank-financed assignments with demonstrated application of the ESF and applicable ESSs; experience with stakeholder engagement and GRM management.
- Qualifications: Bachelor's degree (minimum) in Environmental Science, Environmental Management, or a related field; postgraduate degree is an advantage.
- Key Skills: Environmental and social screening against World Bank ESF and national legislation; ESIA methodology; ESMP preparation with measurable obligations and ESHS clauses for bidding documents; SEA/SH risk identification and survivor-centered referral arrangements; community health, safety, and labor management planning; GRM establishment.
- Role: Environmental and social screening and instrument scoping (Phase 1); definition of E&S instruments required before construction; full ESIA/ESMP and ESHS clause development for bidding documents (Phase 2); stakeholder engagement facilitation; GRM establishment and management; E&S integration into alignment selection and design; SEA/SH protocol and staff training.
- Time Commitment: Minimum 3.5 person-months across both phases.

Position 10: GESI / Social Development Specialist

- General Experience: Minimum 7 years in social impact assessment, gender, or community development in infrastructure projects.
- Specific Experience: At least 5 years on road or infrastructure projects with demonstrated GESI analysis; at least two World Bank-financed projects with community-based participatory approaches; at least 3 years in Sub-Saharan Africa.
- Qualifications: Bachelor's degree in Social Sciences, Gender Studies, Development Studies, or a related field; postgraduate degree is an advantage.
- Key Skills: Gender-disaggregated mobility and transport demand analysis; vulnerability mapping; community-based survey design; baseline socio-economic profiling; agricultural and market linkage assessment.
- Role: Socio-economic and development assessment (Section 5.4); baseline settlement and livelihood mapping; gender-differentiated mobility assessment; vulnerability and accessibility assessment; community consultation support; GESI integration into safeguards instruments and bidding documents.

- Time Commitment: Minimum 2 person-months.

Position 11: Road Safety Specialist

- General Experience: Minimum 7 years in road safety assessment or transport engineering.
- Specific Experience: At least 5 years in road safety audits, risk assessments, or Safe System application on road projects in Sub-Saharan Africa or comparable contexts; experience integrating road safety into feasibility and conceptual design.
- Qualifications: Bachelor's degree in Civil/Transport Engineering or a related field; a recognized road safety audit qualification is an advantage.
- Key Skills: Road safety risk assessment (iRAP, Safe System, or equivalent); conflict-point identification; vulnerable road user risk assessment; speed management, pedestrian crossing, school/market zone, delineation, and guardrail design; motorcycle and NMT safety considerations.
- Role: Road safety investigation and risk assessment for both corridors (Section 6.5); assessment of preferred alignment and key intersections; road safety measure recommendations integrated into conceptual design; ESHS requirements input for bidding documents (Phase 2).
- Time Commitment: Minimum 2 person-months.

Position 12: Land / Topographic Surveyors (2 positions)

- General Experience: Minimum 10 years each in geodetic/topographic surveying.
- Specific Experience: At least 7 years in road topographic surveys for design projects; demonstrated GNSS-based survey control, DTM generation, and asset inventory surveys; at least 3 years in Sub-Saharan Africa; at least three comparable road assignments.
- Qualifications: Bachelor's degree (or equivalent professional registration) in Geodetic/Topographic Surveying or Geomatics.
- Key Skills: Survey-grade GNSS, total stations, and digital levels tied to national geodetic reference frameworks; DTM generation, contour production, and cross-section extraction; CAD and GIS data processing; deliverables in agreed open/editable formats.
- Role: Two dedicated survey teams, one per corridor, capable of parallel operation; control network and benchmark establishment; full topographic corridor survey (centerline, edge, drainage, structures, property interfaces, asset inventory); watercourse and structure surveys; DTM and orthophoto production; delivery of all raw and processed data in agreed formats.
- Time Commitment: Minimum 9 combined person-months (4.5 each).

Position 13: GIS / CAD Specialist

- General Experience: Minimum 6 years in GIS and CAD for infrastructure projects.
- Specific Experience: At least 5 years in GIS database management, spatial analysis, and CAD drawing production for road design; experience managing georeferenced corridor databases and producing outputs in standard open formats.
- Qualifications: Bachelor's degree in Geomatics, GIS, or a closely related field.
- Key Skills: ArcGIS, QGIS, or equivalent; AutoCAD Civil 3D or equivalent; geodatabase design and management; coordinate reference system management; integration of survey, geotechnical, traffic, and environmental data layers.

- Role: Spatial corridor database management from inception through completion; GIS-based corridor analysis, mapping, and overlay for alignment options and E&S screening; all drawings, maps, and GIS deliverables in agreed formats; digital deliverable management per Section 12.3.
- Time Commitment: Minimum 3.5 person-months.

Position 14: Quantity Surveyor / Cost Estimator

- General Experience: Minimum 8 years in quantity surveying or cost estimation for civil infrastructure.
- Specific Experience: At least 6 years in road and civil works cost estimation in Sub-Saharan Africa; Bills of Quantities and confidential Engineer's Estimates for World Bank-financed or comparable road projects; market intelligence-based rate development.
- Qualifications: Bachelor's degree in Quantity Surveying, Civil Engineering, or a related field.
- Key Skills: Quantity take-off from conceptual and detailed drawings; unit rate development from current market data (labor, materials, equipment, logistics); cost benchmarking against recent Liberian and regional projects; lifecycle maintenance cost estimation for multiple road standard options; auditable cost build-ups.
- Role: Feasibility-level cost estimates for each alternative and road standard option (Phase 1), including lifecycle cost inputs for scenario comparison; conceptual design quantities and cost estimates (Phase 2); confidential Engineer's Estimates for each lot (Phase 2); BoQ and Engineer's Estimate cross-checking.
- Time Commitment: Minimum 3.5 person-months.

Position 15: Procurement / Contracts Specialist

- General Experience: Minimum 10 years in procurement and contract management for infrastructure.
- Specific Experience: At least 8 years preparing tender documents for major road works financed by the World Bank or comparable MDBs; demonstrated experience with FIDIC Yellow Book or equivalent World Bank Standard Procurement Document for Design, Build (and Transfer) works; at least three comparable assignments supported through bid evaluation to contract award.
- Qualifications: Bachelor's degree in Engineering, Quantity Surveying, Procurement, or a related field; recognized procurement qualification (CIPS or equivalent) is an advantage.
- Key Skills: World Bank-compliant bidding document preparation for DBT civil works; Employer's Requirements and Contractor's Design Submission Procedure; ESHS clause integration; bid evaluation support (technical responsiveness, qualification review, methodology evaluation); conflict-of-interest and procurement-integrity management.
- Role: Procurement strategy review and lot packaging recommendations (Phase 2); complete bidding documents for each lot (Phase 2, Activity 16); Employer's Requirements and Contractor's Design Submission Procedure; Engineer's Estimate procurement-readiness cross-check. (Phase 2 only.)
- Time Commitment: Minimum 3.5 person-months (Phase 2 only).

Position 16: Community Liaison Officers (2 positions)

- General Experience: Minimum 5 years each in community engagement, social mobilization, or community development.
- Specific Experience: At least 3 years in community engagement for infrastructure projects in Liberia or comparable West African contexts; familiarity with local languages, customary governance structures, and community consultation methodologies; experience managing GRMs in field-based assignments.

- Qualifications: A relevant qualification in social sciences, community development, or a related field. Fluency in local languages spoken in the project area is required.
- Key Skills: Community consultation planning and facilitation; GRM management (complaint intake, logging, response, closure); culturally appropriate engagement with women, youth, persons with disabilities, and vulnerable groups; consultation documentation.
- Role: One officer per corridor throughout the assignment; community engagement and consultation facilitation from inception through stakeholder validation; GRM establishment, management, and reporting; support to the E&S Specialist and GESI Specialist in field surveys; liaison with county/district authorities and corridor communities.
- Time Commitment: Minimum 6 combined person-months (3 each).

14.3 Staffing Principles

- The Consultant shall provide sufficient field staff to undertake both corridors efficiently and safely.
- The two survey teams shall be capable of operating in parallel where necessary.
- The Team Leader shall be substantially engaged during field, analysis, design and procurement phases.
- Additional specialists shall be mobilized where identified risks or corridor conditions warrant.
- Local professional and technical staff shall be used to the maximum extent practicable without compromising quality.

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15. Quality Assurance and Quality Control

- Prepare a project-specific QA/QC Plan within the Inception Report.
- Independently check survey control, calculations, hydraulic models, pavement design, quantities and drawings.
- Require independent senior review of critical engineering outputs before submission.
- Maintain revision-controlled document registers and drawing registers.
- Cross-check quantities between drawings, BoQ and Engineer's Estimate.
- Cross-check economic model inputs against the final design and cost estimate.
- Undertake an interdisciplinary constructability review before final bidding documents.
- Undertake a procurement-readiness check before issuance.

15.1 Mandatory Technical Checks

Output	Required Check
Survey	Closure/control checks; coordinate validation; benchmark verification.
Hydrology	Independent review of catchments, rainfall assumptions, design flood and freeboard.
Pavement	Independent review of traffic loading, subgrade/material inputs and design period.
Structures	Independent review of hydraulic opening, foundation assumptions and scour.
Drawings	Interdisciplinary clash/constructability review.
BoQ	Drawing-to-quantity reconciliation.
Cost estimate	Rate-source and arithmetic audit.
Economic appraisal	Input consistency and sensitivity verification.
Bidding documents	Compliance, consistency and completeness review.

16. Data, Software, Equipment and Asset Requirements

- Survey-grade GNSS, total stations, digital levels and calibrated accessories.
- Adequate vehicles, including 4x4 vehicles where required by terrain.
- Geotechnical field equipment and access to an appropriately accredited materials laboratory.
- Licensed CAD, GIS, hydraulic, pavement and economic-analysis software.
- Secure data storage and routine backups.
- PPE, first-aid kits, communications and field safety equipment.

All project data shall be delivered in open or commonly usable editable formats, with metadata and clear file naming. The Client shall receive sufficient information to reproduce key calculations and update the design at subsequent stages.

17. Client Inputs and Responsibilities

- Provide available road inventories, maps, prior studies, traffic and accident information and relevant project documentation.
- Provide the applicable MPW design standards and standard bidding documents available to the Client.
- Facilitate introductions to county/district authorities and relevant national agencies.
- Nominate a Client focal point and counterpart staff.
- Facilitate Review Committee meetings and consolidate comments.

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- Provide timely decisions on key alternatives, standards, packaging and design assumptions.
- Review deliverables within the agreed review period, normally three weeks unless otherwise agreed.
- Undertake Client-side procurement actions including advertisement, formal approvals and contract execution.

18. Institutional Arrangements and Review/Approval

The Consultant shall report to the designated Engineer-in-Charge/Project Manager within MPW/IIU. A Review Committee shall oversee technical review and approval.

Role	Indicative Responsibility
IIU Program Manager	Client coordination and implementation oversight.
Designated Project Engineer-1	Technical review and engineering decisions.
Engineers-in-Charge	Corridor-specific technical interface.
Procurement Specialist	Bidding/procurement review.
Environmental/Social Focal Points	Safeguards coordination.
Financing Partner (IDA)	Review/approval/technical concurrence where required by financing arrangements.

The Consultant shall maintain an Action/Decision Log recording decisions, responsible parties and deadlines. No major scope/design change shall be treated as approved solely through informal correspondence.

19. Risk Management

Risk	Indicative Rating	Required Mitigation
Rainy-season inaccessibility	High	Parallel/seasonal survey planning; alternative access; prioritize critical investigations.
Unverified corridor information	High	Early reconnaissance, GIS verification, community validation and data-gap register.
Land/ROW disputes	Medium–High	Early land-tenure mapping, stakeholder engagement and safeguards screening.
Flooding/erosion	High	Hydrological investigation, climate-adjusted design, resilient drainage and maintenance planning.
Limited contractor capacity	Medium	Market sounding/assessment and evidence-based lot packaging.
Cost escalation	Medium	Transparent price base, market verification, escalation analysis and appropriate procurement provisions.
Weak traffic data	Medium	Primary counts, market-day observations and sensitivity testing.
Safeguards delays	Medium–High	Early screening and instrument scoping; integrate safeguards into alignment/design.
Review delays	Medium	Agreed review calendar, complete submissions and decision/action logs.
Security/field safety	Medium	Security protocols, communications, HSE plan and emergency procedures.

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20. Payment Schedule

The following is indicative and shall be aligned with the final contract conditions and approved procurement arrangement. Milestones should be tied to substantive acceptance rather than mere submission.

Phases	Milestone	Indicative %
Phase 1	**Advance/mobilization against required security**	10%
	Approved Inception Report	5%
	Approved Interim Survey & Investigation Report	10%
	Approved Draft Feasibility Study	15%
	Stakeholder Validation completed and documented	5%
	Completion of Interim Review Meeting and Approved Final Feasibility Study Report	**5%**
Phase 2	**Approved Draft Conceptual Design**	15%
	Stakeholder Validation completed and documented	5%
	Approved Conceptual Design	10%
	Approved Final Bidding Documents and Engineer's Estimates	15%
	Final Data Handover Package accepted	5%
	Total	100%

The procurement-support component may be structured differently where the applicable Standard Form of Contract requires time-based remuneration for demand-driven services. Any such arrangement shall be specified clearly in the RFP.

21. Firm Eligibility and Evaluation Criteria

21.1 Minimum Firm Requirements

- At least 10 years of relevant experience in road feasibility, engineering design and procurement documentation.
- At least three comparable road assignments in Sub-Saharan Africa/West Africa within the relevant recent period, with demonstrated experience on comparable rural/tropical conditions.
- Demonstrated experience preparing bidding documents for major road works and supporting procurement through award.
- Experience with projects financed by the World Bank or another international development-finance institution is strongly relevant.
- Adequate financial, technical and QA/QC capacity for two concurrent corridors.
- No conflict of interest with prospective civil works bidders or the resulting construction contracts.

21.2 Indicative Technical Evaluation

Criterion	Weight
Firm's specific experience and comparable assignments	15%
Methodology, technical approach and work plan	25%
Qualifications and competence of key personnel	35%
Survey/investigation, design, feasibility and climate/ESHS approach	10%
Procurement, lot packaging and bidding-document approach	10%
Knowledge transfer, local participation and GESI approach	5%

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Total	100%

Final criteria, minimum technical score and financial/technical weighting shall be established in the approved RFP and procurement documents and shall not conflict with the applicable World Bank Procurement Regulations or the approved procurement plan.

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22. Confidentiality, Ownership, Ethics and Conflict of Interest

22.1 Ownership

All reports, drawings, models, survey data, calculations, GIS/CAD files, bidding documents, cost estimates and other outputs produced under the assignment shall become the property of the Client in accordance with the contract.

22.2 Confidentiality

The Engineer's Estimates and other commercially sensitive procurement information shall remain confidential and shall not be disclosed to prospective bidders. The Consultant shall maintain appropriate information-security controls.

22.3 Integrity and Anti-Corruption

The Consultant shall comply with applicable anti-corruption, fraud, collusion, coercion and obstruction requirements. The Consultant shall promptly disclose actual or potential conflicts of interest and shall not provide information or assistance that could compromise fair competition.

22.4 Conflict of Interest

The Consultant and its affiliates shall comply with the conflict-of-interest provisions of the applicable World Bank procurement framework and contract. In particular, the Consultant shall not participate as a bidder or otherwise gain an unfair advantage in the subsequent civil works procurement where prohibited by the applicable procurement documents.

23. Governing Law and Dispute Resolution

The consultancy contract shall be governed by the laws and contractual provisions specified in the final contract and financing/procurement arrangements. Dispute-resolution provisions shall follow the applicable World Bank/Client Standard Form of Contract or other approved contractual framework. The final RFP shall state the governing law and dispute-resolution mechanism explicitly.

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Annexes

Annex A – Corridor Definition and Mapping Requirements

- Index map for each corridor.
- Verified start/end coordinates and chainage.
- County/district boundaries.
- Settlement and junction inventory.
- Major structures and watercourses.
- Sensitive environmental/social receptors.
- Proposed ROW and alternative alignments.

Annex B – Settlement and Socio-Economic Inventory

Field	Required Information
Settlement name	Verified name/spelling and local authority
Coordinates	GPS coordinates
Population	Best available estimate and source
Services	Schools, clinics, markets, water, public facilities
Livelihoods	Agriculture, commerce, other major activities
Mobility	Main travel modes and seasonal constraints
Vulnerability	Relevant vulnerable groups/access constraints

Annex C – Minimum Survey Data Forms

- Traffic count sheets
- Household/community survey
- Road asset inventory
- Structure inventory
- Road safety inventory
- Stakeholder consultation record

Annex D – Minimum Drawing Register

Drawing	Indicative Content
G-001	Location and index plan
G-002	Survey control and reference system
G-003	Existing road/asset plan
G-004	Preferred alignment plan and profile
G-005	Typical cross-sections
G-006	Pavement details
G-007	Drainage layout and details
G-008	Bridge/major culvert concepts
G-009	Junction and settlement treatments
G-010	Road safety furniture and signage concept

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Annex E – Data Gap Register

Gap	Corridor	Impact	Verification Method	Responsible Expert	Due Date	Status
Example: exact corridor length	A/B	Cost/design	Topographic survey	Survey Lead	Week 6	Open
Example: settlement inventory	A/B	Social/ROW	Reconnaissance + consultation	Social Specialist	Week 6	Open

Annex F – Risk Register

Risk	Likelihood	Impact	Mitigation	Owner	Status
Access constraints	M/H	H	Seasonal planning and parallel teams	Team Leader	Open
Flooding	M/H	H	Hydraulic assessment and resilient design	Hydrologist	Open
ROW conflict	M	H	Early mapping/consultation	E&S Specialist	Open

Annex G – Minimum Bidding Document Checklist

- Procurement notice/invitation
- Instructions to Bidders and Bid Data
- Qualification and evaluation criteria
- Conditions of Contract
- Employer's Requirements/Technical Specifications
- Contractor's Design Submission and Review Procedure
- Reference/indicative drawings (basis for the Contractor's detailed design under the DBT contract)
- BoQ and pricing schedules
- ESHS requirements and applicable management plans
- Forms and securities
- Completion schedule
- Price-adjustment provisions where approved
- Engineer's Estimate – confidential volume
- Defects/warranty period, performance security, and asset-transfer/handover and completion-certification requirements

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Annex H – Minimum Engineer's Estimate Structure

Cost Component	Required Treatment
Preliminaries	Site establishment, mobilization/demobilization, temporary facilities
Earthworks	Excavation, embankment, unsuitable material, disposal
Pavement	Subgrade, subbase, base, surfacing
Drainage	Culverts, side drains, outlets, erosion protection
Structures	Bridges/major culverts and associated works
Road safety	Signs, markings, delineation, pedestrian/safety measures
Environmental/social	Mitigation measures and applicable provisional items
Traffic management	Temporary access and safety during construction
Contingencies	Physical and price contingencies as approved

Annex I – Indicative Staffing and Level of Effort

Position	Indicative Total Person-Months
Team Leader / Highway Engineer	7.0
Highway/Geometric Design Engineer	4.0
Structural/Bridge Engineer	3.0
Geotechnical/Pavement Engineer	3.0
Hydrologist/Drainage Engineer	3.0
Transport Economist/Traffic Specialist	4.0
Financial Analyst / PPP Specialist	2.5 (Phase 1)
Development Economist / Regional Economist	2.5 (Phase 1)
Environmental & Social Specialist	3.0
GESI/Social Inclusion Specialist	2.0
Surveyors – 2	9.0 combined
Road Safety Specialist	3.0
GIS/CAD Specialist	3.5
Cost Estimator/QS	3.5
Procurement/Contracts Specialist	3.5
Community Liaison Officers – 2	6.0 combined

The above is indicative and shall not relieve the Consultant of the obligation to provide adequate resources for the confirmed corridor lengths, investigation requirements and procurement workload.

Annex J – Reference Framework

The Consultant shall use the latest applicable versions of the following, subject to confirmation in the RFP/contract:

- World Bank Procurement Regulations for IPF Borrowers applicable to the financing arrangement at the time of procurement.
- Applicable World Bank Standard Procurement Documents for consulting and works procurement.
- World Bank Environmental and Social Framework and applicable Environmental and Social Standards.
- Government of Liberia environmental, land, procurement and road-sector laws, regulations and standards.
- Applicable AASHTO geometric/design guidance.
- TRL tropical pavement and unpaved-road guidance where appropriate.

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- Applicable hydrological, climate-resilience and road-safety standards approved by MPW/financing partner.
- FIDIC Conditions of Contract for Plant and Design-Build (Yellow Book), or the equivalent World Bank Standard Procurement Document for Design, Build (and Transfer) works, for the Design-Build-Transfer (DBT) procurement of civil works.

Annex K – Reference Framework

The Consultant shall include, within the Inception Report, a proposed Scenario Validation Workshop agenda, a list of invited stakeholder organizations, the draft scenario assessment framework (including the criteria for evaluating each candidate scenario's plausibility, timing, and demand implications), and the selection criteria for the two agreed scenarios to be taken into the full feasibility assessment. The workshop terms shall be approved by MPW/IIU before the workshop is convened.

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