Terms of Reference (TOR)
Conduct of Wholesale Cost Modelling Analysis for Digital Connectivity Services in Sri Lanka

(International-Firm)

Background and Context

Sri Lanka is intensifying its efforts to build a robust digital economy, guided by the recently institutionalized National Digital Economy Blueprint. Despite this momentum, the country continues to face significant challenges related to infrastructure gaps, limited digital skills, uneven innovation capacity, and governance constraints. Addressing these disparities is essential to ensure inclusive and sustainable digital transformation.

Affordable and inclusive digital connectivity in Sri Lanka depends on efficient wholesale markets for critical infrastructure components such as national backbone, backhaul, ducts and poles, dark fibre/IRU, bitstream, IP transit, and tower & RAN sharing. Sri Lanka's post-2022 recovery requires efficient, transparent wholesale pricing to mobilize private investment, crowd in PPPs, and reduce end-user prices, especially for inclusive connectivity, and ensure ubiquitous access to schools, health facilities and public institutions, MSMEs, and rural communities. International evidence shows that increases in broadband penetration correlate with GDP and productivity gains; therefore, optimizing wholesale cost bases is a priority for sector reform and investment operations.

The Telecommunications Regulatory Commission of Sri Lanka (TRCSL) is the national authority responsible for regulating telecommunications, including spectrum management and service quality oversight. As Sri Lanka accelerates initiatives such as nationwide broadband expansion, 5G deployment, and integration of emerging technologies, the need for cost-efficient wholesale pricing becomes critical to ensure affordability and sustainability.

The Government of Sri Lanka, with support from the Asian Development Bank (ADB), seeks to engage a qualified Consultant to conduct a Wholesale Cost Modelling Analysis for digital connectivity services. The analysis will:
- Develop cost models for key wholesale services (e.g., backbone, backhaul, ducts, poles, dark fiber, bitstream, IP transit, tower & RAN sharing and other markets/services identified);
- Recommend cost-based pricing frameworks aligned with international best practices for each market/service identified; and
- Provide actionable insights to support regulatory decisions, investment strategies, and PPP structuring.

The Consulting Firm shall design and implement a comprehensive wholesale cost modelling program to inform transparent, cost-oriented pricing for digital connectivity services in Sri Lanka. The scope covers the end-to-end development of market baselines, bottom-up cost models (LRIC/BULRIC+), pricing frameworks, regulatory instruments, stakeholder engagement, and institutional capacity building, aligned with TRCSL's legal and regulatory

frameworks and ADB procurement requirements. All work must be technology-neutral, vendor-agnostic, interoperable, secure, and scalable.

Wholesale Products in Scope (non-exhaustive)
- National Backbone and Metro Backhaul (fibre, microwave)
- Ducts and Poles / Civil Works
- Dark Fiber / IRU (Indefeasible Rights of Use)
- Bitstream and Layer-2 Wholesale Access
- IP Transit and Peering
- Wholesale Local Loop / LLU (where applicable)
- Passive & Active Infrastructure Sharing (Tower and RAN)
- Data Centre Colocation and IXPs (as relevant to wholesale)
- Cable Landing Station Backhaul / International Capacity Interfaces

Scope of Services
The firm will:
1. Assess current wholesale market structure
   - Review existing wholesale services, pricing methodologies, and regulatory frameworks.
   - Identify gaps and inefficiencies impacting affordability and competition.
2. Develop cost models
   - Apply internationally recognized methodologies (e.g., Long-Run Incremental Cost [LRIC], Bottom-Up models).
   - Ensure models are technology-neutral, scalable, and adaptable to future network evolution.
3. Recommend pricing frameworks
   - Propose transparent, cost-based wholesale pricing structures.
   - Align recommendations with TRCSL's regulatory objectives and ADB procurement standards.

Key Tasks and Activities

A. Inception, Data and Methodology Setup
A1. Inception Report and Work Plan
- Define methodology, scope, wholesale product list, assumptions, deliverable schedule, and milestones.
- Submit structured data request templates; map stakeholders (operators, ISPs, utilities, public works, PPP units, relevant ministries & govt. institutions, consumer associations).
- Identify risks, mitigation strategies, and quality gates.

A2. Data Strategy and Governance
- Establish data sources and collection processes (operators, utilities, public works, vendors, public datasets).
- Define validation rules, confidentiality protocols (including NDA structures), access controls, audit trails, and versioning.

- Specify file formats and naming conventions; create a data dictionary and a metadata catalog.

B. Market and Network Baseline

B1. Network Topology and Asset Inventory

- Document national backbone, metro rings, access networks (FTTx, HFC, wireless), ducts/poles, towers, data centres, IXPs, cable landing(s), power and civil works.
- Develop standardized network schematics and routing assumptions; identify current and planned expansions, resilience paths, and choke points.

B2. Demand and Traffic Forecasts

- Segment demand by service classes (public institutions, residential, SME/MSME, enterprise).
- Model capacity/peak requirements, geographic distribution, growth curves, technology migration (FTTx, 4G/5G/5G-Advanced), resilience and quality targets (QoS/QoE thresholds), and digital inclusion priorities.

B3. Benchmarking and International Practice

- Compare open access regimes, PPP/co-financing models, governance structures, and wholesale price benchmarks in peer markets.
- Identify best-practice tariff structures and reference offer provisions applicable to Sri Lanka's context.

C. Cost Modelling (Bottom-Up LRIC / BULRIC+)

C1. Model Architecture

- Build modular cost models (Excel/Python) for each wholesale product, with common blocks for:
    - CAPEX: civil works, ducts, fibre, electronics/active equipment, installation, permitting.
    - OPEX: operations and maintenance, energy, leases, insurance, staff, admin.
    - Cost of Capital: WACC, financing assumptions.
    - Asset Valuation: economic depreciation, asset lives, residual values.
    - Productivity Adjustments: efficiency factors and scale economies.
- Optimize network dimensioning (least-cost routes, trench sharing, redundancy/resilience). Ensure auditability and scenario toggles.

C2. Parameterization

- Populate unit costs, equipment prices, lifetimes, routing factors, utilization and fill factors, redundancy/resilience parameters, energy costs, real estate, sharing factors, and spectrum or right-of-way considerations (as relevant).
- Validate parameters through triangulation (operators/utilities, market quotes, benchmarks) and document sources and confidence levels.

C3. Outputs and Analytical Views

- Produce unit costs (e.g., LKR/km, LKR/Mbps, LKR/fiber pair, LKR/site), efficient tariffs (price floors/ceilings), and reference ranges.
- Conduct sensitivity analyses (demand scenarios, discount rates/WACC, unit costs, equipment refresh cycles, energy fluctuation, resilience targets).

- Check compliance against ADB safeguards and ESG considerations (e.g., energy efficiency, environmental impacts of civil works).
- Provide model user guides, version histories, and QA logs.

D. Regulatory Instruments and Pricing Framework

D1. Wholesale Pricing Guidelines

- Translate modelling outcomes into regulatory rules: cost orientation, non-discrimination, margin squeeze tests, accounting separation guidelines, price review cycles, and dispute resolution pathways.
- Define triggers for tariff re-openers and indexation mechanics (e.g., energy, inflation).

D2. Reference Offers / Tariff Schedules

- Draft standardized Reference Offers per product, covering access conditions, service definitions, SLAs, QoS requirements, provisioning/repair timelines, ordering/forecasting processes, and dispute resolution.
- Include publication and transparency protocols and compliance monitoring provisions.

D3. PPP/Open Access Design Considerations

- Provide structured guidance on capacity wholesale, IRUs, co-investment, duct sharing obligations, wayleave facilitation, rural expansion incentives, and safeguards for competitive neutrality.
- Identify procurement-ready clauses supportive of PPP/open access models.

E. Stakeholder Engagement and Capacity Building

E1. Consultation and Validation Workshops

- Present draft models and proposed tariffs to operators, ISPs, utilities, government agencies, and consumer groups; capture feedback and reconcile positions where possible.
- Document comments, decisions, and changes.

E2. Training of TRCSL Staff

- Deliver hands-on training on cost model operation, maintenance SOPs, and the tariff review playbook (including data refresh cadence, governance, and stakeholder escalation protocols).

E3. Finalization and Handover

- Revise models and guidelines incorporating stakeholder feedback; finalize documentation and audit trails.
- Produce user manuals, onboarding guides, and a sustainability plan (including ownership of IP, version control, and periodic updates).

Deliverables and Indicative Timeline and Payment Schedule
Total Duration: 4 months

Week	Activity	Deliverables	Payment schedule
2	**Inception Report**	1. Inception Report and Work Plan 2. Data Strategy and Governance Protocols (including templates and SOPs) 3. Stakeholder map and engagement calendar	10%
5	**Market and Network Baseline**	1. Demand and Traffic Forecast Model and documentation 2. Benchmarking Note with actionable insights for Sri Lanka	10%
8	**Cost Modelling**	1. Cost models 2. Parameter Book and Assumption Register 3. Costing Results Compendium (unit costs, tariff structures) with sensitivity analyses	20%
10	**Regulatory Instruments and Pricing Framework**	1. Wholesale Pricing Guidelines 2. Standard Reference Offers and Tariff Schedules (product-specific)	20%
14	**Stakeholder Engagement and Capacity Building**	1. Workshop materials, minutes 2. Training curriculum, exercises, and SOPs 3. Final models, guidelines, reference offers, and user manuals (with audit trails)	20%
16	**Final Models, Manuals and Handover**	1. Fully operational, auditable cost models (per product) in Excel/Python 2. User manuals 3. Updated SOP 4. Final Wholesale Pricing Guidelines 5. Updated Standard Reference Offers and Tariff Schedules 6. Training completion	20%

Format: Editable files, diagrams, data models, and machine-readable API specs (where applicable).

Team composition

Team Leader / Senior Telecommunications Economist (Wholesale Costing):
- Master's (or higher) degree or equivalent qualification in project management, telecommunications engineering, law, IT, or similar field.
- Minimum 15 years of professional work experience in the area of telecommunications, broadband technologies, and/or similar field.
- Strong experience and knowledge of cost modelling and regulatory pricing in developing countries.
- Excellent facilitation, documentation, and stakeholder engagement skills.
- Language: Proficient in English.

Regulatory and Legal Specialist

- Master's (or higher) degree in an area relevant to telecommunications law, or relevant field.
- Minimum 10 years of professional experience in telecom policies, regulations and laws, including experience in a developing country context.
- Strong conceptual and analytical skills.
- Language: Proficient in English.

The proponent may add in key experts in the proposal as may be needed. All members of the team must have international experience.

Reporting, Coordination, and Logistics
- Reporting Line: To Director General of TRCSL and ADB Task Team (contractual);
- Coordination: Regular check-ins (weekly/biweekly), workshops, and review meetings;
- Location and Modality: Mix of in country and remote work as agreed; availability for site visits; and

Confidentiality, IP, and Data Protection
- All data and deliverables are the property of TRCSL; the Consultant assigns intellectual property rights to TRCSL per contract.
- The Consultant must maintain confidentiality and comply with data protection requirements; use anonymization/pseudonymization for any personal data.