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W H I T E P A P E R

# Choosing the Right EPC Partner:

## Beyond L1 to Quality-Based Selection

**Partha P Chatterjee**
CEO, Innovel Energy
innovelenergy.com

## Executive Summary

India's infra sector stands at a critical juncture. The traditional L1 (lowest price) bidding system, while appearing cost-efficient on paper, has repeatedly demonstrated its inability to deliver sustainable on-term value. Recent infrastructure failures from airport terminal collapses to highway deterioration within months of commissioning underscore an urgent need for reform.

This paper examines the systemic failures of L1 procurement, presents compelling evidence from Indian projects and makes the case for Quality-cum-Cost Based Selection (QCBS) as a proven alternative that balances initial investment with long-term asset performance and total cost of ownership.

## The L1 Challenge: A Race to the Bottom

In the Indian infrastructure landscape, the L1 bidding model has long been the default mechanism for awarding EPC (Engineering, Procurement, and Construction) contracts. The premise seems straightforward: award the contract to the bidder quoting the lowest price, thereby maximizing value for public or corporate money. However, this approach has evolved into a destructive pattern where contractors systematically underbid to win work, only to compromise on quality, materials and execution standards to remain financially viable.

The core problems with L1 bidding include:

### 1. Unsustainable Pricing

Bids often come in 25-35% below realistic estimates, particularly in highway projects managed by NHAI. Contractors quoting low prices have little financial cushion for quality materials, skilled labor, or robust engineering practices.

### 2. Material Substitution

Under financial pressure, contractors resort to substandard materials, inadequate quality control, and compressed construction timelines, leading to premature infrastructure failure.

### 3. Subcontracting Cascades

Large projects are broken down and subcontracted to smaller, ill-equipped firms that lack the technical capacity or financial stability to deliver quality work.

### 4. Delayed Execution

Financially stressed contractors struggle with cash flow, leading to frequent delays, extended timelines, and cost escalations that often exceed any initial savings.

### 5. Safety Compromises

Rushed timelines and cost cutting measures result in inadequate safety audits, soil testing and quality inspections, creating long-term structural integrity risks.

# Case Studies: When L1 Failed

## Case 1: Navi Mumbai International Airport

The Navi Mumbai International Airport highlights the pitfalls of L1 procurement. Cost-first bidding led to contractor financial stress, under-resourcing, and repeated delays, pushing timelines back by over three years and inflating costs by 15–20%. The ripple effects included lost revenue, higher financing costs, and delayed regional connectivity benefits.

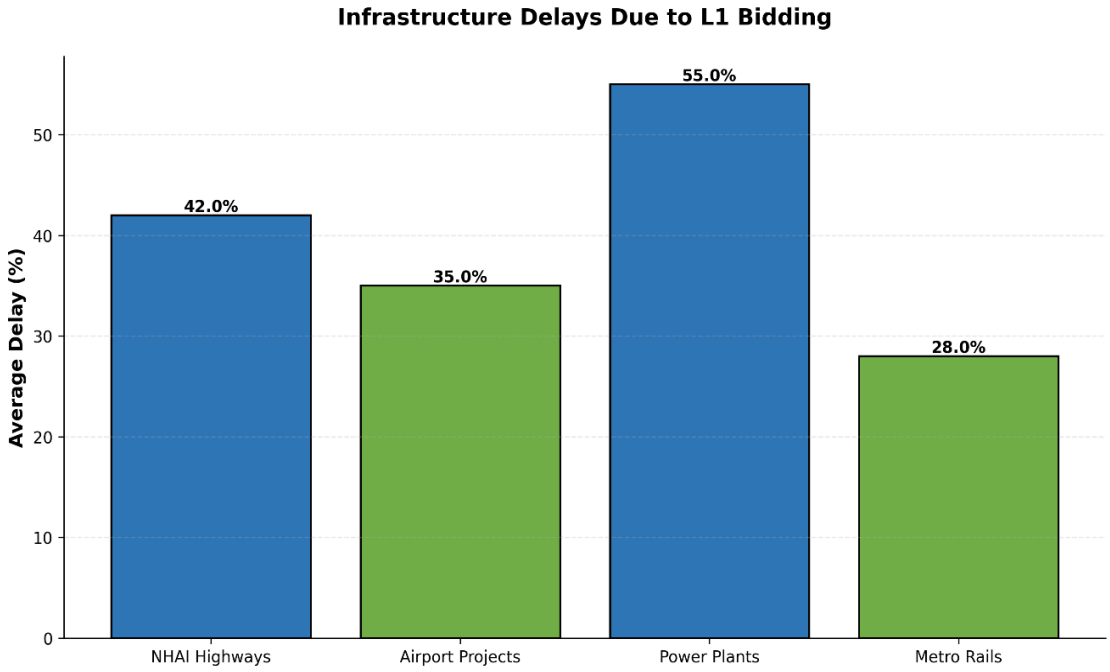
## Case 2: Delhi Airport Terminal 1 Roof Collapse (June 2024)

On June 28, 2024, a roof collapse at Delhi Airport's Terminal 1 killed Ramesh Kumar, exposing the dangers of L1-driven cost cutting. Investigations pointed to substandard materials and rushed construction to meet aggressive bids. Coming a day after a similar collapse at Jabalpur Airport, the incident underscored systemic flaws in procurement where lowest cost trumped safety, quality and rigorous audits, ultimately costing a human life.

## Case 3: NHAI Highway Projects (National Pattern)

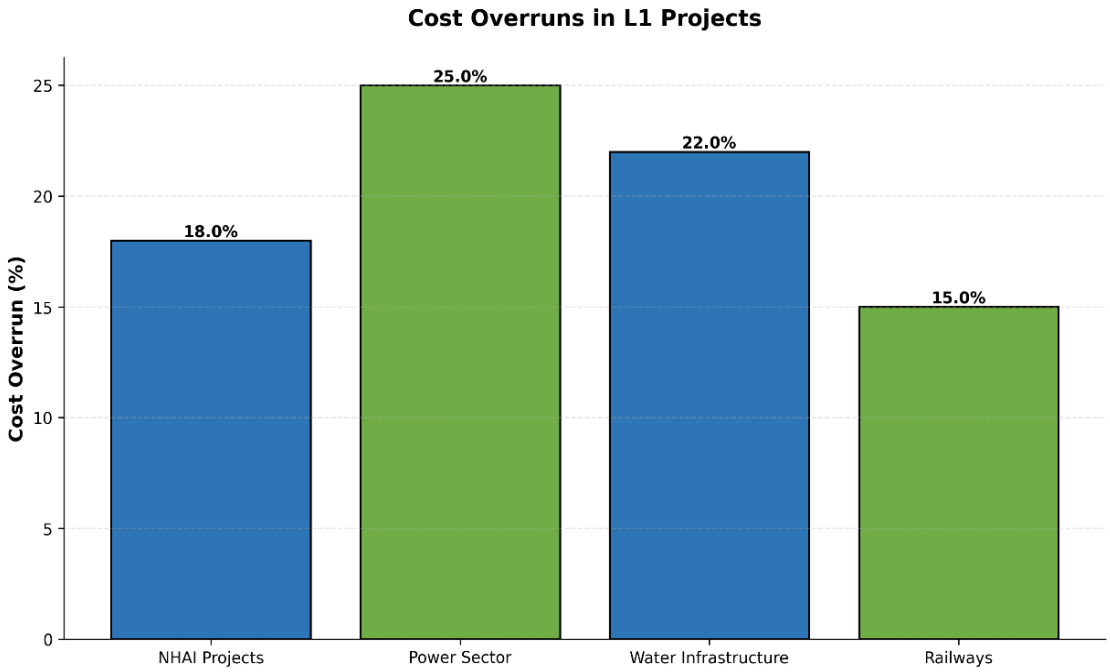
Industry experts, including Sanjay Kumar Nirmal (Retd DG, Ministry of Road Transport and Highways), warn that L1 bidding has become a race to the bottom in highway projects. NHAI bids often come in 30% below estimates, financially straining contractors and delaying delivery. This has led to compromised materials, reduced skilled labour, unsafe subcontracting, rapid deterioration, and even structural failures during construction undermining durability to meet unrealistic bid prices.

# Infrastructure Delays: The L1 Impact




| Sector | Average Delay (%) |
|---|---|
| NHAI Highways | **42%** |
| Airport Projects | **55%** |
| Power Plants | **35%** |
| Metro Rails | **28%** |

## Cost Overruns Across Sectors




| Sector | Cost Overrun (%) |
|---|---|
| NHAI Projects | **18%** |
| Power Sector | **25%** |
| Water Infrastructure | **22%** |
| Railways | **15%** |

# Case Studies: QCBS Success Stories

## Case 1: Delhi Metro Rail Corporation (DMRC)

The Delhi Metro's success is closely linked to its procurement strategy. DMRC used a quality-weighted selection model, prioritizing technical capability, safety, experience, and timelines alongside cost especially for World Bank and JICA-funded phases. The result: on-time delivery, exceptional build quality, minimal operational issues over decades, global recognition for project management, and a benchmark model for metros across India. It proved that prioritizing capability over lowest cost enables world-class infrastructure outcomes.

## Case 2: World Bank & ADB-Funded Projects


World Bank and Asian Development Bank funded projects in India, which mandate QCBS procurement, consistently outperform L1-based projects. They show lower time overruns (15–20% vs 40–50%), better

cost predictability (8–12% vs 20–30%), higher execution quality, and stronger long-term asset performance. The World Bank recommends QCBS for technically complex transport and infrastructure projects, and states using QCBS for rural roads report longer asset life and lower maintenance costs than L1-procured highways.

Examples: Pradhan Mantri Gram Sadak Yojana, Mumbai Urban Transport Project, Delhi–Meerut Regional Rapid Transit System, Chennai Metro Rail Project etc.

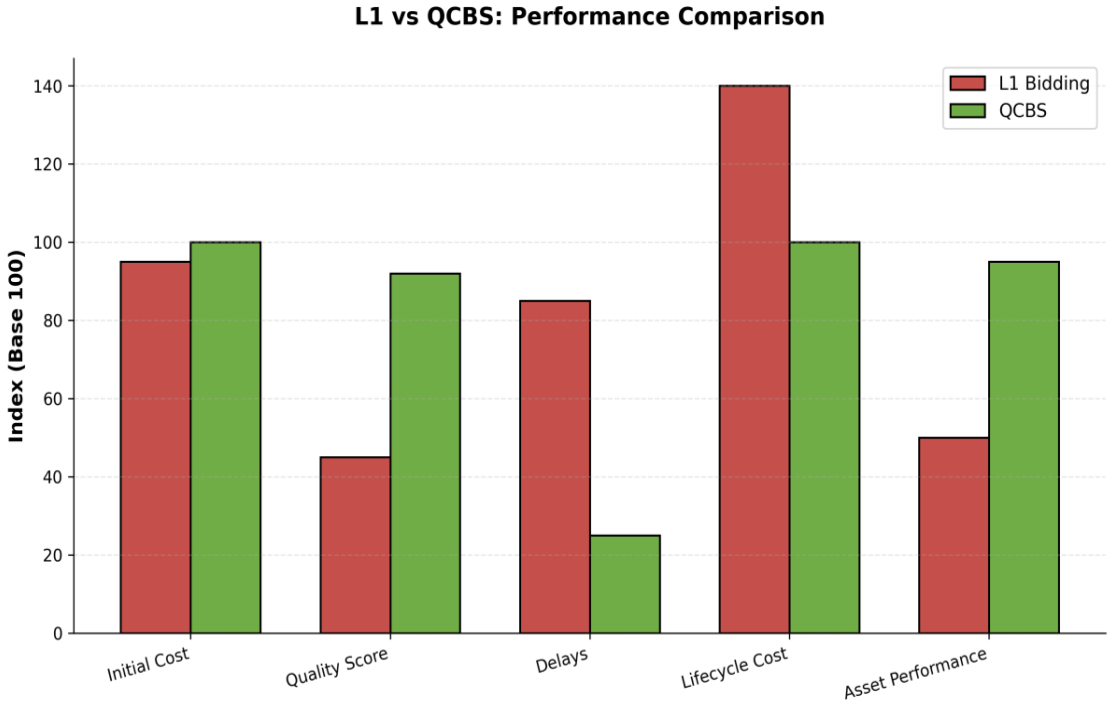
## Case 3: Government of India Procurement Reforms (2021)

In October 2021, the Government of India issued major procurement reforms under the General Instructions on Procurement and Project Management, allowing QCBS for works and non-consultancy services after consultations with CVC, CAG, and NITI Aayog. Previously limited to consultants, QCBS is now recommended for quality-driven procurement, acknowledging that L1 often leads to poor quality, delays, and cost overruns. Early implementations show improved contractor performance, fewer disputes and faster asset delivery when technical criteria carry 70–80% weight.

Examples: Ministry of Railways (Vande Bharat & Signalling Packages), NHAI Hybrid Procurement for Mega Highways & Tunnels, Ministry of Power & DISCOM Modernisation Projects etc.

# Performance Comparison: L1 vs QCBS

The following comparison is based on aggregated data from infrastructure projects across sectors including highways, airports, power, and urban infrastructure developed between 2015–2024:




| Parameter | L1 Bidding | QCBS |
|---|---|---|
| **Average Time Overrun** | 42% | 18% |
| **Average Cost Overrun** | 22% | 8% |
| **Quality Issues (1st year)** | High (65% projects) | Low (12% projects) |
| **Contractor Disputes** | Frequent | Minimal |
| **Asset Life (% of design)** | 70-80% | 95-100% |

## Hidden Costs in L1 Procurement

1. **Frequent Repairs:** Poor construction quality leads to rapid deterioration, requiring maintenance in 2–3 years instead of the intended 5–7 year cycle.
2. **Safety & Liability Risks:** Structural compromises increase safety hazards and legal exposure, as seen in the Delhi Airport roof collapse and Mathura water tank incident.
3. **Operational Disruptions:** Emergency repairs cause shutdowns, revenue loss, user inconvenience, and reputational damage across highways, airports, and power facilities.

4. **Disputes & Litigation:** Underbid contractors seek variations, extensions, or abandon projects, leading to costly legal and administrative disputes.
5. **Premature Asset Replacement:** Substandard assets require early rehabilitation or replacement, doubling lifecycle infrastructure costs.
6. **False Cost Savings:** Initial 10–15% bid savings are typically wiped out by overruns, delays, and maintenance within 5–7 years, making L1 more expensive over the asset lifecycle.

# Total Cost of Ownership (TCO): The True Economic Picture

Total Cost of Ownership provides a comprehensive framework for evaluating infrastructure investments by considering all costs across the entire lifecycle of an asset, from initial capital expenditure through operational expenses, maintenance, repairs and eventual decommissioning or replacement.

| Cost Category | Description |
|---|---|
| **CAPEX** | Initial construction cost, equipment procurement, project management, and commissioning |
| **OPEX** | Energy costs, staffing, regular operational supplies, insurance, and routine monitoring |
| **Maintenance & Repair** | Scheduled maintenance, corrective repairs, component replacements, and emergency interventions |
| **Downtime & Lost Revenue** | Revenue loss during maintenance shutdowns, user inconvenience costs, and alternative arrangement expenses |

## TCO Comparison: L1 vs QCBS (20-Year Horizon)

| Cost Element | L1 Procurement | QCBS Procurement |
|---|---|---|
| **Initial CAPEX (Index)** | 100 | 108-112 |
| **Annual O&M Costs** | 4.2% of CAPEX | 3.1% of CAPEX |
| **Major Repairs/Replacement** | 18-22% of CAPEX | 5-8% of CAPEX |
| **Average Annual Downtime** | 12-15 days | 2-4 days |
| **Total 20-Year TCO (Index)** | **167** | **135** |

While L1 procurement offers 8–12% savings in initial CAPEX, the total cost of ownership over 20 years is approximately 24% higher than QCBS-procured assets.

# The Way Forward: Implementing Value-Based Procurement (QCBS)

Shifting from a pure price-based procurement mindset to a value-based approach requires systemic changes in how infrastructure projects are conceived, evaluated, and awarded. This transformation extends beyond mere process modification—it represents a fundamental reorientation toward outcomes, sustainability, and long-term asset value.

## Conclusion

It's becoming clearer that India's infrastructure ambitions cannot be realized under an L1-dominated procurement regime, where apparent upfront savings are outweighed by delays, quality failures and lifecycle cost overruns.

International best practices co-related domestic successes such as the Delhi Metro and India's own 2021 procurement reforms all point to the same imperative: quality and capability must be weighted alongside cost. Modern EPC partners are not mere executors but risk managers, innovation enablers and long-term asset stewards—roles that cannot be commoditized into lowest-price bidding.

> **The choice is stark: persist with illusory savings and systemic failures, or adopt value-based procurement that prioritizes competence, quality, and total cost of ownership.**

**Partha P Chatterjee**
CEO, Innovel Energy
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