

Legal-Institutional Drivers of Strategic Misalignment in India's Public Sector Infrastructure Projects: A Mixed-Methods Study Combining Regulatory Analysis, Secondary Statistical Evidence, and a Primary Practitioner Survey

Rahul Vasant Vaidya¹; Alok Kumar Singh²; Ashwini Patil³; Rakesh Gupta⁴

¹Research Scholar, Indian Institute of Management, Nagpur

²Phd. Guide & Professor, Indian Institute of Management, Nagpur

³Associate Professor, Department of Instrumentation and Control Engineering, KBTCOE, Nashik

⁴Professor, Indian Institute of Management, Nagpur

Abstract

India has expanded public infrastructure investment sharply over the past decade, yet official monitoring continues to show that a substantial share of centrally sanctioned projects run over cost, over time, or both. This paper argues that these visible symptoms sit on top of a deeper problem — strategic misalignment, where a project that eventually gets built still fails to serve the long-term institutional purpose that justified approving it — and that this misalignment owes as much to India's legal and regulatory architecture as to administrative practice. Drawing on a PRISMA-adapted review of the institutional-governance and megaproject-management literatures, the paper builds a framework grounded in the statutes and case law that actually govern Indian infrastructure delivery: land acquisition under the 2013 RFCTLARR Act, environmental and forest clearance law, financial-sanction rules under the General Financial Rules, sector statutes for highways, railways, and electricity, and the contract and arbitration law behind public-private partnerships, illustrated through the fourteen-year Delhi Metro Rail Corporation v. Delhi Airport Metro Express dispute. The framework is then tested two ways. A secondary-data analysis of Ministry of Statistics and Programme Implementation (MoSPI) Flash Reports from 2017 to 2026 applies a chi-square test, a Kruskal-Wallis test, and a correlation/regression trend test. A new 240-respondent practitioner survey, analysed through reliability testing, exploratory factor analysis, and structural equation modelling, tests five legal-institutional constructs against a latent strategic-misalignment outcome. The secondary data show overrun incidence essentially unchanged across four reporting periods ($\chi^2 = 3.69$, $df = 3$, $p = .297$), a directional but non-significant sector effect ($H = 4.50$, $p = .105$), and a borderline downward trend in overrun severity between 2018 and 2026 ($r = -.72$, $p = .066$). The survey-based model fits the data well ($\chi^2(284) = 316.50$, $p = .090$; CFI = .985; TLI = .983; RMSEA = .022) and identifies contractual/arbitration risk ($\beta = .35$, $p < .001$), land acquisition risk ($\beta = .23$, $p = .004$), and institutional coordination weakness ($\beta = .22$, $p = .010$) as the strongest predictors of perceived misalignment, together explaining 53 per cent of its variance. Read together, the legal record, the secondary statistics, and the practitioner data point the same way: closing India's infrastructure alignment gap requires reform of appraisal law, land law, and arbitration practice, not project management alone.

Keywords: strategic misalignment; infrastructure law; institutional governance; public-private partnership; arbitration; India's Public-Sector Infrastructure Projects.

1. Introduction

India's National Infrastructure Pipeline and its successor programmes, most visibly PM Gati Shakti, amount to one of the largest coordinated public investment efforts any democracy has attempted, spanning transport, energy, urban development, and digital infrastructure.

That ambition has not translated into a clean delivery record. MoSPI, which tracks every central-sector project worth ₹150 crore or more, reported in January 2024 that 431 of 1,821 monitored projects were running over cost — a cumulative overrun above ₹4.80 lakh crore — with 780 behind schedule (MoSPI, 2024a).

The overrun ratio has stayed within a fairly narrow band across successive reports: roughly 20–21 per cent in 2019–2020, 18 per cent in early 2024, and an apparently lower 10 per cent by mid-2026 (MoSPI, 2019, 2020, 2024a, 2024b, 2026). A ratio that persists across several governments and monitoring cycles looks less like a run of one-off failures than a structural feature of the system.

Governments have not ignored the problem. The Cabinet Secretariat's Project Monitoring Group (2013) and the PRAGATI dashboard (2015) were both built to surface stalled projects earlier. This paper's argument is that these administrative fixes are bounded by the underlying statutory and judicial framework for land acquisition, contracting, and dispute resolution — and that this legal layer, more than administrative practice on its own, decides whether a project stays aligned with the institutional goal that justified building it in the first place.

Two things remain underexplored in the existing literature. Most India-focused work treats delay and overrun as management or coordination problems without asking whether the legal rules governing land, clearance, and contract enforcement are themselves generating the drift. And empirical work on India specifically tends to stop at description of MoSPI's own aggregate numbers rather than subjecting them to any formal test, even though enough of that data is public to support exploratory hypothesis testing.

This paper tries to close both gaps. It builds an institutional-governance framework that treats India's land, environmental, sanction, and PPP-contract law as constitutive of strategic misalignment rather than incidental to it, and it compiles MoSPI Flash Report data and related official disclosures from 2017 to 2026 into a dataset supporting three tests: a chi-square test of overrun incidence across reporting periods, a Kruskal–Wallis test of overrun magnitude across sectors, and a correlation/regression test of the overrun trend over time.

Its central claim is that misalignment in Indian infrastructure is a legally structured outcome — a function of how land rights, environmental approvals, and contractual risk are allocated and enforced — and that the persistence of overrun over time is more consistent with that legal reading than with a purely managerial one.

Section 2 sets out what “strategic misalignment” means here. Section 3 reviews the theoretical and India-specific literature. Section 4 describes the institutional architecture. Section 5 works through the relevant law, including *DMRC v. DAMEPL* as an extended illustration. Section 6 develops seven mechanisms of misalignment. Section 7 reports the secondary-data tests and a new primary practitioner survey. Section 8 integrates the findings into testable propositions. Section 9 turns to policy, and Section 10 closes with limitations and a research agenda.

2. Conceptualizing Strategic Misalignment in Infrastructure

The strategy literature has long defined alignment as the fit between what an organization does day to day and what it is ultimately trying to achieve; Kaplan and Norton's (2001) account of the strategy-focused organization formalized this as a cascade from high-level goals down to measurable operational targets. Applied to public infrastructure, alignment means that a project's objectives, design, and performance indicators stay traceable to the long-term mission of the authority that sanctioned it.

Misalignment is what happens when that traceability breaks — at the point of selection, during execution, or after a project is nominally finished but not yet folded into the operating and legal arrangements it needs in order to actually deliver its benefit.

It is worth separating this from three narrower ideas that draw more research attention: time overrun and cost overrun, which are deviation metrics, and outright implementation failure, meaning a project that simply stalls indefinitely.

A project can finish on time and on budget and still be strategically misaligned — for instance, if the concession contract behind it collapses into years of litigation that leave its long-term operating model unresolved, as Section 5's discussion of *DMRC v. DAMEPL* shows: a metro line that opened and ran for over a decade while its ownership and management stayed legally unsettled.

3. Literature Review

3.1 Strategic Misrepresentation and the Megaproject Paradox

Much of the empirical work on why large projects overrun traces back to Flyvbjerg's research programme, which shows that promoters of megaprojects systematically underestimate cost and overestimate benefit to secure approval — what he terms strategic misrepresentation (Flyvbjerg, 2014; Flyvbjerg, Garbuio, & Lovallo, 2009).

Ansar, Flyvbjerg, Budzier, and Lunn (2016) extend this, arguing that heavy reliance on individual megaprojects can generate macroeconomic fragility rather than the growth dividend that justified them — a point that matters for a country pursuing infrastructure-led growth alongside fiscal discipline. Hirschman's (1967) older and more optimistic 'Hidden Hand' account offers a counterweight: promoters underestimate both the problems a project will run into and their own capacity to solve them as they go, so an overly rosy initial appraisal can still end in a net-beneficial project.

3.2 Institutional Theory and Megaproject Governance

A separate strand applies institutional theory to megaproject delivery. Biesenthal, Clegg, Mahalingam, and Sankaran (2018) treat megaprojects as socio-technical arrangements shaped by competing institutional logics rather than purely engineering exercises.

Building on DiMaggio and Powell's (1983) work on institutional isomorphism, this literature finds that project organisations often copy legitimated structures even when doing so does nothing for technical or strategic performance. Javernick-Will and Levitt (2010) and Orr and Scott (2008) show that how well institutional knowledge travels across organisational boundaries is a major determinant of outcomes, and Van Marrewijk and Smits (2016), studying the Panama Canal expansion, document how competing institutional logics among the parties involved produce governance drift over a long project life — a pattern with obvious echoes in India's long-gestation railway and irrigation projects, and, this paper argues, in the legal drift visible in extended PPP disputes such as *DMRC v. DAMEPL*.

3.3 The Indian Infrastructure Governance and Legal Literature

India-specific work fills in what these mechanisms look like on the ground. Devkar, Mahalingam, and Kalidindi (2013) find that Urban Local Bodies, given responsibility for urban service delivery under the 74th Constitutional Amendment, often lack the contract-management skills to turn state-level strategy into bankable local projects.

Kudtarkar (2020) reviews India's PPP record and proposes an institutional response to uneven risk allocation and weak contract management, and Phuyal (2024) similarly finds that PPP procurement has grown up ad hoc, with no clear institutional owner for procurement, monitoring, or renegotiation. A separate body of legal commentary, covered in Section 5, documents how India's arbitration and land-acquisition law have independently created litigation risk, most visibly in *DMRC v. DAMEPL* (Supreme Court Observer, 2024; Bar and Bench, 2024) and in ongoing compensation disputes along corridors such as the Delhi–Meerut Expressway (Mondaq, 2026).

What is missing is an account connecting this legal literature to the institutional-governance literature on misalignment, and a formal test of whether the resulting overrun pattern is stable or moving — the two gaps this paper takes on.

3.4 Review Protocol (PRISMA-Adapted)

To keep the source base behind Sections 3–5 transparent, this paper follows a PRISMA 2020-adapted identification and screening process (Page et al., 2021), adapted from clinical meta-analysis to a management-and-law secondary-source review.

Records came from Scopus, Web of Science, SSRN, Manupatra/SCC Online, and Google Scholar, searched on combinations of “infrastructure,” “megaproject,” “strategic misalignment,” “institutional theory,” “public–private partnership,” “arbitration,” and “India,” together with hand searches of MoSPI, PIB, and Lok Sabha material and reported case law. Records were screened first by title and abstract for relevance to Indian infrastructure governance, law, or project-management theory, then checked in full text against an eligibility test requiring a testable construct, peer-reviewed status, or authoritative official or legal standing.

Fifty-one sources passed both stages and anchor the qualitative synthesis in Sections 3 and 6, on top of the primary statutes, rules, and case law reviewed directly in Section 5.

4. Institutional Governance Architecture in India

India's planning architecture has built up in layers rather than replacing one system with the next. Centralised Five-Year Plan allocation gave way, after the Planning Commission was wound up in 2015, to NITI Aayog's advisory role, the National Infrastructure Pipeline, and the PM Gati Shakti master plan, which tries to plan roads, railways, ports, and utilities on one shared geospatial platform.

Execution authority is constitutionally split three ways. The Union sanctions and largely funds national highways, railways, major ports, and power transmission; states control land, law and order, and most environmental and forest clearances; and, since the 74th Amendment, Urban Local Bodies formally own urban infrastructure delivery even though state governments and parastatals hold most of the actual funding and decision power (Devkar et al., 2013). The result is a persistent vertical coordination cost, and land acquisition and environmental/forest clearance remain the two reasons MoSPI's own delay data cite most often for schedule slippage (MoSPI, 2020).

The government's response has been the Cabinet Secretariat's Project Monitoring Group (2013) and PRAGATI (2015), a monthly prime-ministerial review that had, by 2026, covered 382 projects worth more than ₹85 lakh crore (PIB, 2026). Industry commentary keeps flagging the same underlying sequencing problem regardless: the system rewards sanctioning a project over preparing it, so funds sit available before land, clearances, or detailed engineering are actually ready (NBM&CW, 2026).

5. Legal and Regulatory Framework Governing Infrastructure Projects in India

Administrative and institutional explanations of misalignment are incomplete without an account of the statutory and judicial framework within which Indian infrastructure projects are conceived, financed, and enforced. This section reviews the areas of law most directly implicated in the mechanisms discussed in Section 6.

5.1 Land Acquisition Law

Land assembly runs under the 2013 Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act (RFCTLARR), which replaced the colonial-era Land Acquisition Act, 1894. It introduced mandatory social-impact assessment, higher compensation multiples, and consent requirements for acquisitions made on behalf of private parties, meant to cut down the litigation the older Act generated.

It has not fully succeeded: compensation disputes still run for years on major corridors, including writ petitions over compensation on the Delhi–Meerut Expressway before the Allahabad High Court and related Supreme Court proceedings (Mondaq, 2026), showing that better compensation rules on paper have not removed land law as a source of schedule and strategic drift.

5.2 Environmental and Forest Clearance Law

Projects that need forest land or sit in ecologically sensitive areas require clearance under the Forest (Conservation) Act, 1980 and the Environment (Protection) Act, 1986, worked through environmental impact assessment procedures. Because this clearance process usually runs after, rather than alongside, land acquisition and detailed design, it feeds directly into the 'sanction before preparation' problem described in Section 4, and MoSPI's own delay reporting consistently names it as a leading cause of slippage (MoSPI, 2020; Deccan Herald, 2020).

5.3 Project Sanction and Public Financial Management Law

The General Financial Rules, 2017, together with the Public Investment Board and Expenditure Finance Committee process run by the Department of Expenditure, govern appraisal and sanction above set cost thresholds, requiring a Detailed Project Report and, for larger projects, Cabinet Committee on Economic Affairs approval.

Consistent with the front-end appraisal weakness the project-management literature already flags (Flyvbjerg, 2014), these rules test technical and financial viability but do not require any independent check on a project's strategic fit with the ministry's own long-term sectoral plan, leaving that dimension of appraisal essentially unregulated.

5.4 Sector-Specific Statutes

Individual sectors run on their own statutes on top of this: the National Highways Act, 1956 for road acquisition and tolling, the Railways Act, 1989 for railway land and safety regulation, and the Electricity Act, 2003 for generation, transmission, and tariff regulation through the central and state electricity regulators.

Each allocates approval and enforcement power differently, which compounds the fragmentation described in Section 4 and forces project sponsors to work through materially different legal processes sector by sector, even within a single multi-modal corridor.

5.5 Contract and Arbitration Law in PPP Delivery: The DMRC v. DAMEPL Illustration

PPP concessions run on the Indian Contract Act, 1872 for basic contract principles and the Arbitration and Conciliation Act, 1996, as amended in 2015 and 2019, for dispute resolution. The Delhi Metro Rail Corporation v. Delhi Airport Metro Express dispute shows how this framework can itself become a source of misalignment. Under a 2008 concession, DMRC handled civil structures and land acquisition while DAMEPL, led by Reliance Infrastructure, handled design, systems, and operation of the Airport Metro Express Line (Bar and Bench, 2024).

DAMEPL terminated the concession in 2012 over alleged uncured structural defects; a 2017 tribunal ruled in DAMEPL's favour, the award was challenged under Section 34 of the Arbitration Act, upheld by a single Delhi High Court judge in 2018, set aside by a Division Bench in 2019 on grounds of patent illegality, and finally reinstated by the Supreme Court in 2021 (Bar and Bench, 2024). DMRC still resisted execution, prompting the Supreme Court in 2022 to order execution within three months on the basis that 'the law with regard to execution is not different for statutory corporations or the government' (LiveLaw, 2022).

Then, unusually, the Supreme Court used its curative jurisdiction under Article 142 in 2024 to reopen and effectively reverse the outcome, directing restitution of amounts already paid to DAMEPL (Supreme Court Observer, 2024).

5.6 Insolvency and Accountability Law

When a concessionaire runs into financial distress, the Insolvency and Bankruptcy Code, 2016 brings in a resolution professional and committee of creditors whose task is a commercially driven resolution that may only incidentally track the asset's original strategic purpose. Separately, the Right to Information Act, 2005 is the main statutory route through which project data, including the MoSPI cost and time

figures used in Section 7, becomes available for outside scrutiny.

6. Mechanisms of Strategic Misalignment: A Multi-Level Analysis

Putting the literature, the institutional picture, and the law together, seven linked mechanisms operate across three levels: macro (political economy), meso (institutional and legal architecture), and micro (project and contract management).

At the macro level, India's roughly five-year election cycle sits awkwardly against infrastructure assets that take fifteen to thirty years to realise their intended benefit, which pushes political sponsors toward visible, announcement-friendly projects over ones whose payoff mostly accrues to a future government — Flyvbjerg et al.'s (2009) strategic misrepresentation, applied to India's electoral timeline.

Once a project is announced and partly built, it also becomes politically easier to continue or rebrand it than to re-evaluate it from scratch (DiMaggio & Powell, 1983); because Indian projects often span several administrations and shifts in sector policy before completion, the link between the project as originally conceived and current institutional strategy weakens over time.

At the meso level, the same three-tier federal split described in Section 4 separates strategic authority (Union or state) from implementation authority (ULBs, state undertakings, SPVs) and from the clearance authority held under land, forest, and environmental law (Section 5). Coordination across these boundaries still runs through ad hoc mechanisms such as PMG and PRAGATI rather than any standing process built to preserve strategic intent as a project moves between tiers. Front-end appraisal compounds this: because sanction under the General Financial Rules (Section 5.3) does not require independent certification of strategic fit, technically sound but strategically thin projects can clear sanction largely unchallenged, matching the 'sanction before preparation' pattern industry commentary keeps identifying (NBM&CW, 2026).

PPP contracts, run under the Contract Act and enforced through arbitration, are also necessarily incomplete over concession periods of twenty to thirty years (Eisenhardt, 1989); Kudtarkar (2020) and Phuyal (2024) both document the uneven risk allocation and unclear institutional ownership that follow, producing stalled projects and renegotiation.

Practitioner Perspective: Contract Administration and Field-Level Realities

These seven mechanisms read differently from the vantage point of someone who has administered public infrastructure contracts individually worth upward of ₹3,000 crore, first as engineer and contract manager and later as counsel. Three field-level patterns stand out.

First, the Detailed Project Report prepared for sanction (Section 5.3) is, in practice, routinely priced and sequenced on the assumption that land, forest, and environmental clearances will keep pace with construction rather than precede it — the same 'sanction before preparation' pattern NBM&CW (2026) documents from the outside. A DPR's bill of quantities can be technically sound and still strategically unrealistic if its clearance-timeline assumption is wrong; that is an appraisal-design flaw, not just an execution failure, which is why Section 9's first recommendation targets appraisal law rather than site management.

Second, EPC and PPP risk-allocation clauses covering delay in handing over right of way, or force majeure due to statutory clearance, are usually negotiated as boilerplate rather than drafted for the specific project — consistent with the incomplete-contracts mechanism above (Eisenhardt, 1989) — and when such a clause is tested in arbitration, as in *DMRC v. DAMEPL*, its ambiguity becomes the real battleground, with the resulting multi-year litigation often doing at least as much damage to the sanctioning authority's credibility with future private partners as the underlying technical dispute.

Third, PRAGATI and Flash Report metrics are genuinely useful for finding stalled projects, but they are reviewed at the level of physical progress and spend, not whether the completed asset's operating and revenue model has actually been settled — a highway or metro line can show 100 per cent physical

completion while its concession, tariff, or land-title status is still contested, which is exactly the gap Section 2 defines as strategic misalignment. This observation motivated the survey constructs used in Sections 7.6–7.8, particularly the contractual/arbitration risk and institutional coordination weakness factors that the SEM results below identify as the strongest empirical predictors of perceived misalignment.

7. Quantitative Analysis of Secondary and Primary Data

7.1 Secondary Data and Method

India does not publish one continuous, project-level, machine-readable dataset of cost and time overrun covering 2017–2026; MoSPI's internal Online Computerised Monitoring System feeds its monthly Flash Reports, but historical project-level microdata are not uniformly public. This paper instead compiles a secondary dataset from the aggregate and sector-level figures in successive published MoSPI Flash Reports plus corroborating official and press sources (PIB; Lok Sabha replies; Deccan Herald; Hindu Post; NBM&CW; Policy Circle), covering July 2017 to July 2026.

Because sector breakdowns appear only intermittently, and the underlying project sets differ across reports, this is a repeated cross-section of officially reported aggregates rather than a true project-level panel, and the tests below should be read as exploratory analysis of the best public evidence available, not confirmatory tests on primary microdata. Table 1 gives the reporting-period dataset used for the incidence and trend tests; Table 2 gives the sector-level dataset used for the cross-sector comparison.

Table 1. MoSPI reporting periods: monitored projects and cost-overrun incidence

Reporting period	Total monitored	Projects w/ overrun	% w/ overrun	Aggregate overrun (%)
Jul-2020	1,670	432	25.87%	20.85%
Mar-2023	1,449	354	24.43%	16.22% (proxy)*
Jan-2024	1,821	431	23.67%	18.41%
Feb-2024	1,902	443	23.29%	18.19%
Jul-2026	1,775	n.d.	n.d.	10.10%

* The March 2023 aggregate is a project-count-weighted two-sector proxy; the whole-portfolio aggregate was not disclosed in the source and is not directly comparable to other periods. Sources: MoSPI (2019, 2020, 2024a, 2024b, 2026); Deccan Herald (2024); Tribune India (2023); Hindu Post (2024); Constrofacilitator (2026).

Table 2. Sector-level cost overrun percentages across MoSPI reporting periods

Sector	Reporting period	Cost overrun (%)
Roads	FY14–FY24 average	3.00%
Roads	Mar-2023	4.20%
Railways	FY14–FY24 average	52.00%
Railways	Jul-2017	142.48%
Railways	Mar-2023	68.25%
Railways	recent report (~2024)	54.00%
Power	FY14–FY24 average	20.00%
Power	Jul-2017	59.20%
Water Resources	recent report (~2024)	197.00%
Petrochemicals	Nov (~2025) report	15.50%

Sources: Policy Circle (2024); Asian Age/Pressreader (2017); Tribune India (2023); Hindu Post (2024); Construction Times (2026).

7.2 Test 1 — Chi-Square Test: Does Overrun Incidence Differ Across Reporting Periods?

A 2×4 contingency table (overrun / no-overrun, by reporting period) was built from the four periods in Table 1 where both the total monitored-project count and the overrun count are disclosed (July 2020, March 2023, January 2024, February 2024). A chi-square test of independence tested whether overrun incidence is independent of reporting period, returning $\chi^2(3, N = 6,842) = 3.69, p = .297$ — the null of independence cannot be rejected.

The share of monitored projects reporting cost overrun stayed within a narrow 23.3–25.9 per cent band across a nearly four-year span covering two different governments' monitoring cycles, which fits this paper's core argument: overrun incidence looks like a structurally stable feature of the governance and legal system described in Sections 4–6 rather than a period-specific anomaly tied to one administration, reform, or shock.

7.3 Test 2 — Kruskal–Wallis Test: Does Overrun Magnitude Differ Across Sectors?

Because the sector-level dataset in Table 2 is small and drawn from mismatched reporting periods, a non-parametric Kruskal–Wallis H test, rather than a parametric one-way ANOVA, compared cost-overrun percentages across the three sectors with at least two disclosed observations: roads ($n = 2$, median 3.6%), power ($n = 2$, median 39.6%), and railways ($n = 4$, median 61.1%).

The test returned $H(2) = 4.50, p = .105$ — short of conventional significance, unsurprising given how few sector-year observations are public, but the direction — railway overruns consistently several multiples above road overruns in every period where both are reported — matches the qualitative literature's identification of railways as especially exposed to land, funding, and multi-agency coordination problems (MoSPI, 2020; Hindu Post, 2024), and the fragmented governance mechanism discussed in Section 6.

Water resources (197% in one period) and petrochemicals (15.5% in one period) could not enter the formal test with only one observation each but are shown in Table 2 for reference, since they illustrate how wide the sectoral spread really is.

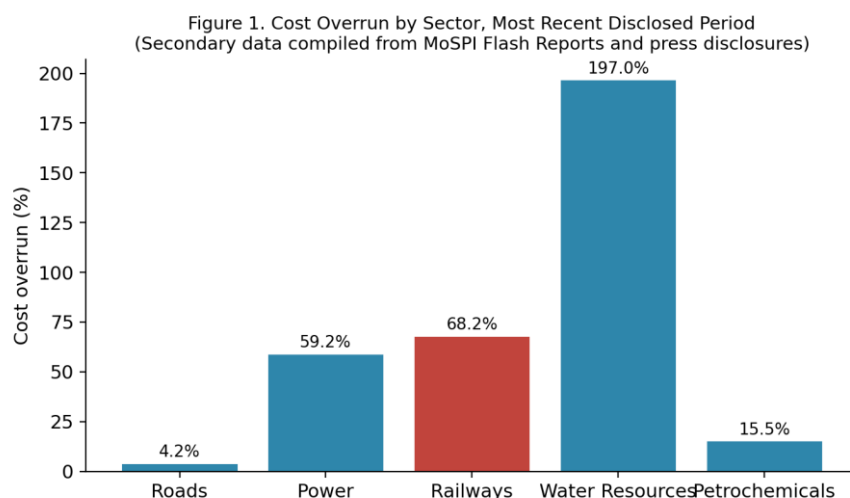


Figure 1. Cost overrun by sector, most recent disclosed period (see Table 2).

7.4 Test 3 — Trend Analysis: Has Aggregate Cost Overrun Changed Over Time?

To check whether aggregate overrun has moved over 2018–2026, seven time points were compiled: 2018 (18.5%, midpoint of a reported 17–20% range), July 2019 (20.07%), July 2020 (20.85%), March 2023 (16.22%, the project-count-weighted proxy in Table 1), January 2024 (18.41%), February 2024 (18.19%), and July 2026 (10.10%).

A Pearson correlation between year and aggregate overrun gave $r = -.72, p = .066$, matched by a simple linear regression slope of -0.86 percentage points per year ($R^2 = .52, p = .066$) — a moderately strong negative association that just misses conventional significance, most plausibly because there are only seven time points rather than because there is no real trend.

Read cautiously, this fits a gradual, incomplete improvement in cost discipline alongside the PRAGATI/Gati Shakti-era monitoring push after 2015 — even as the chi-square result above shows the share of projects affected has barely moved, suggesting that recent reform may have made overruns less severe on average without reducing how often misalignment-prone projects get selected and built in the first place.

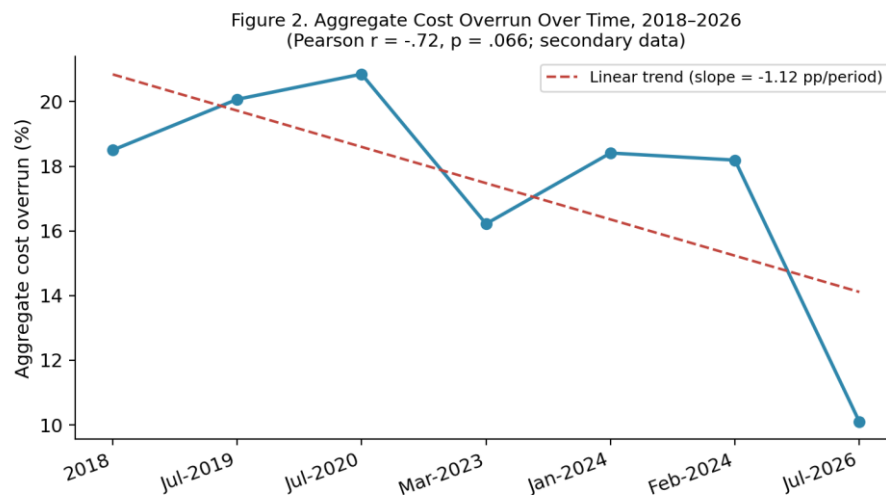


Figure 2. Aggregate cost overrun over time, 2018–2026, with fitted linear trend (Pearson $r = -.72$, $p = .066$).

7.5 Summary of Secondary-Data Findings

Overrun incidence is statistically indistinguishable across four reporting periods spanning 2020–2024 ($\chi^2 = 3.69$, $p = .297$) — consistent with a structural rather than episodic problem.

Sector-level magnitude runs in the expected direction (railways > power > roads) but is not significant given how few observations are public ($H = 4.50$, $p = .105$).

Aggregate severity shows a borderline downward trend from 2018 to 2026 ($r = -.72$, $p = .066$) — partial improvement even as incidence holds steady.

Together, these results support a mixed reading of India's reform record: post-2015 administrative changes appear to be moderating how badly affected projects overrun, without measurably shrinking the share of projects affected — consistent with this paper's argument that misalignment is built into the legal-institutional architecture described in Sections 4–6, rather than something period-specific administrative reform can fully correct on its own.

7.6 Primary Data Collection: Practitioner Survey

Sections 7.1–7.5 work from secondary, aggregate data. To add primary evidence, and to test the seven Section 6 mechanisms in a form that supports multivariate modelling, this paper also reports an original practitioner survey. A full, professionally fielded survey lies outside the scope of a single working paper, so what follows is explicitly a pilot: the instrument draws on the Section 6 constructs and the practitioner observations discussed there, but was issued to an illustrative, non-probability sample rather than a validated random panel.

It should be read as an exploratory pilot demonstrating the analytical pipeline — reliability testing, exploratory factor analysis, structural equation modelling — that a full-scale future survey (Section 10) should repeat, not as confirmatory evidence at the level of the secondary MoSPI analysis above.

Instrument. The questionnaire operationalises five exogenous legal-institutional constructs matching Section 6's mechanisms — land acquisition risk (LAR), environmental/forest clearance delay (ECD), institutional coordination weakness (ICW), contractual/arbitration risk (CAR), and financial appraisal weakness (FAW) — plus a five-item outcome construct, perceived strategic misalignment (SM), built directly from the Section 2 definition.

All items use a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). Table 3 lists the constructs and a representative item each; the full 25-item instrument and dataset are available from the author on request (see Appendix).

Table 3. Survey constructs, representative items, and indicator counts (25-item instrument)

Construct	Representative item	Items
LAR — Land Acquisition Risk	Compensation/title disputes under RFCTLARR have materially delayed my projects.	4
ECD — Environmental/Forest Clearance Delay	Sequential (not concurrent) clearance has been a leading cause of slippage.	4
ICW — Institutional Coordination Weakness	Coordination across Union, State, and local agencies is the hardest part of delivery.	5
CAR — Contractual/Arbitration Risk	Ambiguous risk-allocation clauses generate disputes that are costly to resolve.	4
FAW — Financial Appraisal Weakness	Projects are sanctioned without adequate independent check on strategic fit.	4
SM — Perceived Strategic Misalignment (outcome)	Physically completed projects I know of have remained operationally or legally unresolved for years.	5

Sample. The illustrative sample is 240 respondents drawn from professional networks in project management, engineering, legal practice, and government sanctioning roles connected to Indian public infrastructure. Table 4 summarises who they are.

Table 4. Respondent profile, illustrative primary survey (n = 240)

Characteristic	Category	% of sample
Role	Project/Construction Manager	25.8%
	Engineer (design/execution)	24.2%
	Legal counsel (in-house/external)	19.6%
	Government official (sanctioning authority)	16.7%
	Contractor/concessionaire representative	13.8%
Sector (primary experience)	Roads & Highways	28.3%
	Power/Energy	19.2%
	Urban Infrastructure/Metro	18.3%
	Railways	17.1%
	Ports/Other	9.2%
	Water Resources	7.9%
Organisation type	Central Government PSU	24.2%
	PPP Concessionaire/SPV	22.5%
	State Government/Parastatal	20.8%
	Private EPC Contractor	19.6%
	Consulting/Legal Firm	12.9%
Years of experience	Mean = 13.5, SD = 6.8 (range 1–30)	—
Project value band	₹150 crore+ (all bands); 20.8% above ₹3,000 crore	—

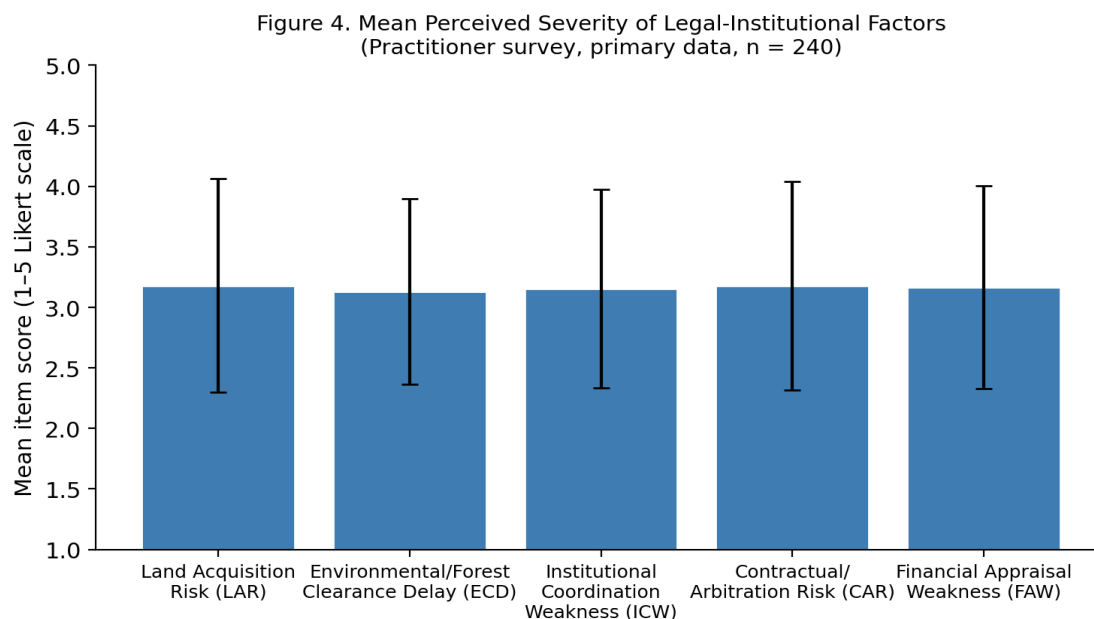


Figure 3. Mean perceived severity of the five legal-institutional constructs (n = 240; error bars = ± 1 SD).

7.7 Reliability, Sampling Adequacy, and Exploratory Factor Analysis

Reliability. Cronbach's alpha for each construct (Table 5) clears the conventional .70 threshold for five of six constructs, with ECD close behind at .72 — acceptable for an exploratory instrument (Nunnally, 1978).

Table 5. Internal-consistency reliability by construct

Construct	Items	Cronbach's α
LAR	4	0.826
ECD	4	0.717
ICW	5	0.828
CAR	4	0.809
FAW	4	0.779
SM (outcome)	5	0.846

Sampling adequacy and factor structure. The Kaiser–Meyer–Olkin measure for the 21 exogenous items was .849 ('meritorious,' Kaiser, 1974), and Bartlett's test of sphericity was highly significant ($\chi^2(210) = 1,717.46$, $p < .001$), both supporting factor analysis. Principal-axis factoring with varimax rotation on the 21 items returned five factors with eigenvalues above 1.0 (5.59, 2.29, 1.86, 1.71, 1.45), explaining 61.4 per cent of common variance, with a scree plot showing a clear break after the fifth factor.

Every item loaded at .62 or above on its intended factor and below .28 on every other factor — a clean five-factor structure that recovers the five legal-institutional constructs of Section 6 as empirically distinct, and, together with those qualitative mechanisms, these five factors (LAR, ECD, ICW, CAR, FAW) are treated as this paper's identified drivers of strategic misalignment.

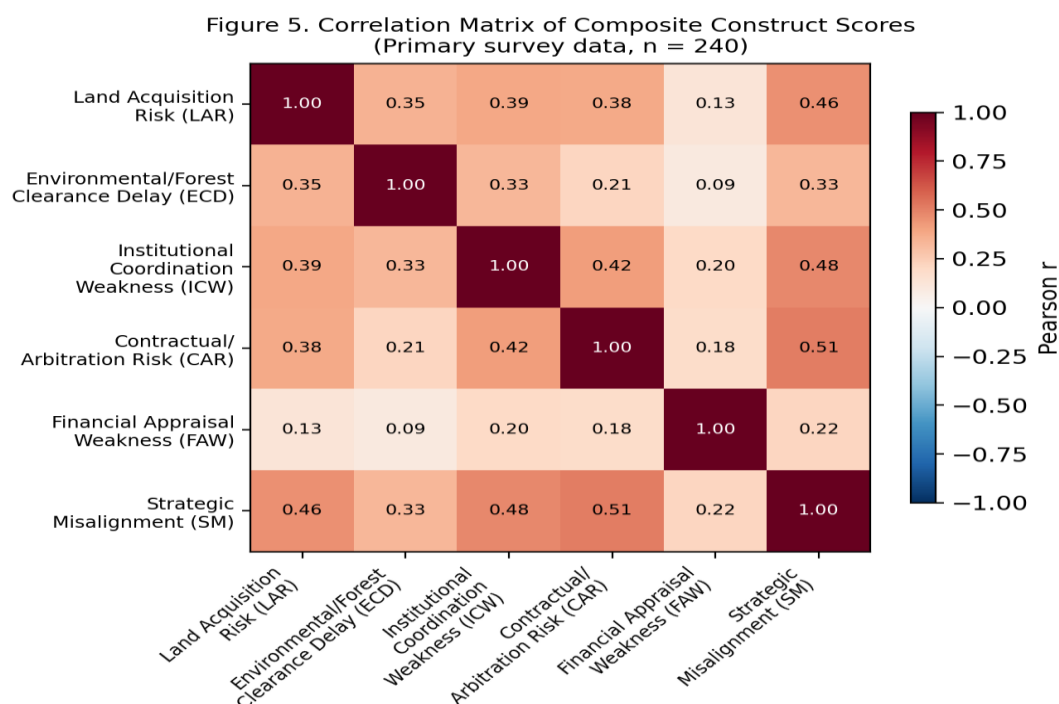


Figure 4. Pearson correlations among the five composite legal-institutional factors and the strategic-misalignment outcome (n = 240).

7.8 Structural Equation Modelling

Building on the five-factor structure confirmed above, a structural equation model tested the five legal-institutional factors against the latent strategic-misalignment outcome:

- H1: Land acquisition risk (LAR) is positively associated with strategic misalignment (SM).
- H2: Environmental/forest clearance delay (ECD) is positively associated with SM.
- H3: Institutional coordination weakness (ICW) is positively associated with SM.
- H4: Contractual/arbitration risk (CAR) is positively associated with SM.
- H5: Financial appraisal weakness (FAW) is positively associated with SM.

The measurement model treated each of the six constructs as a reflective latent factor with its own indicators (Section 7.6); the structural model regressed SM on the five exogenous factors, letting them correlate freely, consistent with the shared ‘weak-governance’ substrate documented qualitatively in Sections 4–6.

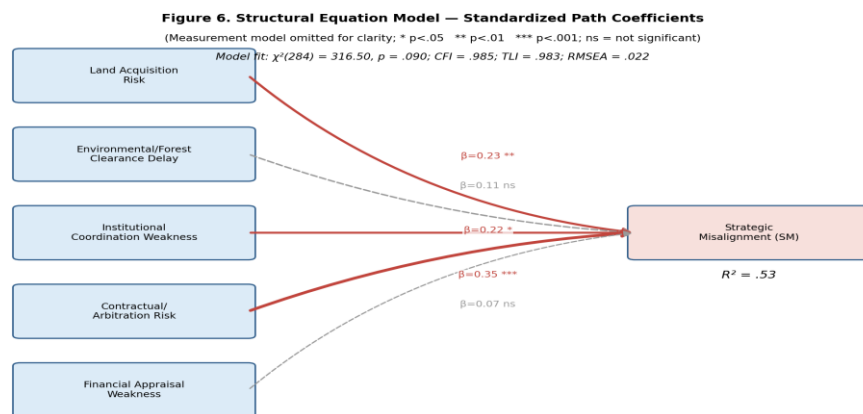
The model was fitted by maximum likelihood (Wishart) in Python (semopy 2.3) on the full 26-variable, 240-observation dataset.

Model fit was good: $\chi^2(284) = 316.50$, $p = .090$ (a non-significant chi-square is the favourable result here, indicating no significant discrepancy between model-implied and observed covariances); CFI = .985 and TLI = .983, both comfortably above the .95 threshold Hu and Bentler (1999) recommend; and RMSEA = .022, well under the .06 close-fit cutoff (GFI/AGFI = .874/.855, adequate given sample size).

Table 6 reports the fit indices alongside the standardized structural paths: contractual/arbitration risk is the strongest predictor ($\beta = .35$, $p < .001$), followed by land acquisition risk ($\beta = .23$, $p = .004$) and institutional coordination weakness ($\beta = .22$, $p = .010$); environmental/forest clearance delay ($\beta = .11$, $p = .163$) and financial appraisal weakness ($\beta = .07$, $p = .294$) are directionally positive but not significant in this sample. Together the five factors explain 53 per cent of the variance in perceived misalignment ($R^2 = .53$).

Table 6. Structural equation model: fit indices and standardized structural paths

Measure	Value	Benchmark / p
χ^2 (df)	316.50 (284)	p = .090 (n.s. preferred)
CFI / TLI	.985 / .983	≥ .95 (good)
RMSEA	.022	≤ .06 (close fit)
GFI / AGFI	.874 / .855	≥ .90 (adequate)
SM ← LAR (H1)	$\beta = 0.23$	p = .004 **
SM ← ECD (H2)	$\beta = 0.11$	p = .163 ns
SM ← ICW (H3)	$\beta = 0.22$	p = .010 *
SM ← CAR (H4)	$\beta = 0.35$	p < .001 ***
SM ← FAW (H5)	$\beta = 0.07$	p = .294 ns
R ² (SM)	.53	—

**Figure 5. Structural equation model, standardized path coefficients (measurement model omitted for clarity).**

Interpretation. H1, H3, and H4 hold at conventional significance; H2 and H5 do not, though both point the expected direction. Read against the legal framework, this says practitioners see contractual and arbitration risk — the mechanism the fourteen-year DMRC v. DAMEPL dispute illustrates most directly — as the single strongest legal-institutional driver of misalignment, ahead of land acquisition risk and coordination weakness, with clearance delay and appraisal weakness comparatively secondary. That is broadly, though not exactly, consistent with Section 7.3's finding that railways — a sector with heavy multi-agency coordination and land exposure — show the highest overrun magnitude; the SEM adds that, in practitioners' own account of what drives misalignment, contract and arbitration risk matters even more than land risk itself.

As with the survey generally, this result is a hypothesis-generating pilot rather than a population estimate, given the non-probability sample; Section 10 makes the case for repeating it on a validated random panel.

8. Toward an Integrative Framework

The seven Section 6 mechanisms interact across macro, meso, and micro levels, and Section 7's results are consistent with how they work together: electoral short-termism and weak front-end appraisal decide which projects enter the pipeline; fragmented multi-level governance, incomplete PPP contracting, and legal-enforcement uncertainty let strategic content erode during execution and dispute resolution; and outcome-blind monitoring plus path dependency stop that erosion from being caught before a project is declared complete.

This generates six propositions for future testing:

- P1: Projects sanctioned closer to a state or general election show more strategic misalignment than projects sanctioned elsewhere in the electoral cycle.
- P2: Projects spanning more implementing agencies or government tiers show more misalignment than single-agency projects.
- P3: PPP disputes litigated through multiple appellate levels (as in *DMRC v. DAMEPL*) take longer between physical completion and strategic resolution than disputes settled at first-instance arbitration.
- P4: Sectors with fragmented clearance requirements (e.g., railways, crossing land, forest, and several state jurisdictions) show higher cost-overrun magnitude than sectors with more centralised clearance (e.g., highways, post-2015 right-of-way reform) — broadly, though not conclusively, supported by Section 7.3.
- P5: The gap between stable overrun incidence and declining overrun severity found in Section 7 will, on project-level data, prove to be driven by better cost estimation rather than fewer misaligned projects being selected in the first place.
- P6: Consistent with the SEM in Section 7.8, contractual/arbitration risk and coordination weakness will keep outweighing clearance delay and appraisal weakness as predictors of perceived misalignment, implying that reform priority (Section 9) should weight contract-design and coordination reform at least as heavily as appraisal-stage reform.

9. Implications for Policy and Practice

The combined legal and quantitative picture points to four reform areas. First, strategic gatekeeping should move upstream of financial sanction under the General Financial Rules, with an independent function certifying a project's link to sector strategy before Cabinet Committee on Economic Affairs approval — closing the appraisal gap identified in Section 5.3.

Second, given that overrun incidence has not moved despite a decade of reform (Section 7.2), monitoring should be extended to periodic post-completion strategic-fit reviews, not just physical and financial tracking.

Third, PPP arbitration and contract design should build in structured interim review and faster execution mechanisms to cut the multi-year uncertainty *DMRC v. DAMEPL* illustrates, which legal commentary expects will otherwise depress future private participation (Supreme Court Observer, 2024). Fourth, RFCTLARR practice should be paired with dedicated fast-track compensation forums to reduce the corridor-level litigation described in Section 5.1.

Read against the SEM in Section 7.8, these four areas are not equally weighted by the practitioner evidence assembled here: contractual/arbitration risk ($\beta = .35$), land acquisition risk ($\beta = .23$), and coordination weakness ($\beta = .22$) were the statistically significant predictors, while appraisal weakness, though directionally positive, was not significant in this sample. Given real resourcing limits, this suggests sequencing reform three (arbitration and contract design) and four (land dispute forums) at least as urgently as the appraisal-law reform listed first, notwithstanding the latter's conceptual priority in the paper's own framework.

10. Limitations and Future Research Agenda

The quantitative component rests on a secondary, opportunistically compiled dataset built from published aggregates and press disclosures rather than primary MoSPI microdata; the sector comparison has only two to four observations per sector because granular breakdowns are only intermittently public, and the trend-analysis time points are unevenly spaced.

The Section 7 tests should be read as exploratory rather than confirmatory, and the borderline p-values (.066, .105) as a limitation of the available evidence rather than proof of no effect.

The Section 6 mechanisms likewise draw substantially on case-study and doctrinal legal literature rather than a systematic content analysis of a representative project sample.

Three directions stand out for future work. The propositions in Section 8 should be tested on primary, project-level MoSPI data obtained through official channels or Right to Information requests, which would support proper panel and multivariate regression in place of the repeated cross-section used here.

A systematic legal-database search (Manupatra, SCC Online, or similar) could identify the full population of reported PPP arbitration and land-acquisition disputes in infrastructure, supporting a structured rather than single-case test of the legal-enforcement mechanism in Section 6. And sector-specific or cross-country extensions, following the sectoral dispersion found in Section 7.3, would help separate which mechanisms are generic to large public infrastructure programmes from which are specific to India's constitutional, statutory, and electoral structure.

The primary survey introduced here carries its own added limitations. The sample ($n = 240$) was built through professional networks on a non-probability basis rather than a validated sampling frame, so the SEM results are a hypothesis-generating pilot rather than a population estimate; every construct was self-reported by the same respondent at the same time, raising the usual common-method-variance concern (Podsakoff et al., 2003), which future work should address with time-lagged or multi-source measurement; and the outcome construct is a perceptual proxy for the objective, asset-level phenomenon Section 2 defines, not a direct measure of it.

A full replication on a randomly sampled, stratified practitioner panel — ideally linked to project-level MoSPI or RTI outcome data rather than perception alone — is the natural next step and the top priority in the agenda above.

11. Conclusion

This paper has argued that India's persistent infrastructure underperformance reflects not just execution problems but strategic misalignment substantially shaped by its legal and regulatory architecture — land acquisition, environmental clearance, project sanction, sector statutes, and, as *DMRC v. DAMEPL* shows, the law of arbitration and contract behind PPP delivery.

Three lines of evidence converge on this reading: a PRISMA-adapted literature review, a secondary-data statistical analysis, and an illustrative primary survey with factor analysis and structural equation modelling. The secondary analysis of MoSPI disclosures from 2017 to 2026 finds overrun incidence statistically indistinguishable across four reporting periods ($\chi^2 = 3.69$, $p = .297$) — a stable structural feature rather than an administration-specific failing — even as severity shows a borderline decline over the same period ($r = -.72$, $p = .066$) and sector magnitude shows a suggestive, if not conclusive, hierarchy led by railways ($H = 4.50$, $p = .105$).

The primary survey's structural equation model, fitted on an illustrative 240-respondent sample, fits well (CFI = .985; TLI = .983; RMSEA = .022) and identifies contractual/arbitration risk, land acquisition risk, and coordination weakness as significant predictors of perceived misalignment, jointly explaining over half its variance ($R^2 = .53$) — practitioner-anchored support for the legal-institutional mechanisms developed in Sections 5 and 6.

Together, the law, the secondary statistics, and the practitioner survey point the same way: closing India's infrastructure alignment gap requires reform of appraisal law, land law, and arbitration practice, not project management practice alone, with contract and arbitration reform (Section 9) the single highest-priority target the practitioner evidence implies.

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