International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Gaps in Governance and Execution: Ten Case Studies of Failed PPPs in India

Bhadri Naga Santhoshi Amitha[1], Tanmayi Kasa[2], Srishti Jaiswal[3], Ishu Goel[4], Aditi Pandey[5], Prashant Barsing[6]

[1,2,3,4,5]Researcher, School of Business Management, NMIMS, Navi Mumbai, India
[6]Assistant Professor, School of Business Management, NMIMS, Navi Mumbai, India

Abstract
There are several common factors that have led to the poor performance or failure of numerous Public-Private Partnership (PPP) road projects in India, including unreasonable traffic and revenue estimates, inflexible contracts, unbalanced risk allocation, regulatory hold-ups, and limited oversight. In reviewing ten landmark PPP highway cases, the aim of this study is to emphasize the recurring themes behind the poor performance and failure of PPPs in roads in India; and highlight recommendations such as flexible contracts, proper financial expectations, pre-existing clearances, and proper monitoring. All of these lessons are intended to inform changes going forward to help achieve a more resilient and effective PPP arrangement in the Indian roads sector. This study is limited to secondary data and solely reviews highway cases.

Keywords: Public Private Partnerships, Project Failure, Road Infrastructure, Highway Projects

1. Introduction

1.1 Background of Public-Private Partnerships (PPPs) in Infrastructure Development

India's rapid economic growth has created an urgent necessity for infrastructure-particularly transport infrastructure, public sector resources alone were never sufficient, and increasingly India is relying on the use of Public Private Partnership (PPP) as a cooperative arrangement essentially, the private sector investment provides additional funding with public sector management. PPPs began in the early 1990's, but picked up very quickly since 2000, largely due to public private partnerships being used in combination with the National Highway Development Programme (NHDP). India currently has over 1,825 PPPs, in many economic sectors, with investment of ₹24.9 lakh crore, nearly 56% in transport, of which 48% is in roads and bridges. PPPs were responsible for significant change to infrastructure in the case of roads with the BOT, HAM, and TOT models. Between 2014 and 2023, the National Highway network increased from 96,000 km to presently 153,000 km - an increase of over 60%. The National Infrastructure Pipeline (NIP) is expecting total investment of ₹111 lakh crore (FY 2020-25), of which, it is expected that 22% will come through the use of PPPs. While an PPP can introduce better efficiency and innovations into a public works autonomies project, this type of cooperation arrangement has the downside of contracts, land delays, and revenue risks that deserve full exploration.

1.2 Background of roads and highways and significance of PPPs in India

India has one of the largest road networks (~6.3 million kilometers). National highways are only 2% of

the length but account for 40% of the traffic. Road's transport 65% of goods and 80% passengers. Urbanization and growth of vehicle ownership have given road transport a great deal of pressure for safety and speed.

The government launched the NHDP including many projects such as the Golden Quadrilateral aimed at upgrading roads. Road upgrades need large investments (for example USD 146 billion in the 12th Plan). In addition, the government has used public-private partnerships (PPPs) to share costs, work, and risks with private companies.

1.3 How PPPs help

- Private companies bring money and innovation, reducing government funding pressure.
- Faster, better roads using new technology.
- Higher quality roads with better maintenance.

1.4 Rationale

India is increasingly turning to Public Private Partnerships (PPP) to fill the infrastructure gap by ensuring public oversight and private efficiency. Unfortunately, many PPP projects have experienced delays, contract renegotiation, or cancellation. Issues that are attributed to problems with poor contracts, unclear allocation of risks, weak coordination and unrealistic expectations for returns. Little literature examines failed PPPs; even less focuses on failed Indian PPPs, and none take an in-depth approach for case studies of failed PPPs in India. This paper addresses the gap in the literature by examining failed PPP projects to find patterns and better inform future project design and future management of PPPs.

1.5 Research Objectives

The research objectives are detailed below -

- Identify failing or poorly performing PPP projects based on issues such as termination, large project delays, cost overruns, revenue loss, or legal issues.
- Analyze each of the selected PPP case studies in a format that includes the project context, financing, failed reasons, and outcomes.
- Conduct a programmatic analysis of several failed PPP projects to identify specific recurring patterns and systemic problems.
- Look at how these failures ultimately affect the public and the government overall.
- Identify lessons learned from these failed projects so that similar problems can be avoided in the future.

1.6 Scope of the Study

This research looks at Public-Private Partnership (PPP) projects in India's road and expressway sector that are visibly failing or performing poorly. Among them are terminated projects, delayed projects, cost overrun projects, toll revenue projects, projects involved in legal disputes and involving dissent and public opposition. The focus is limited to highway and urban roads infrastructure because this is one of the more active PPP sectors, and because it has a mixed bag of outcomes. The research excludes PPP outcomes in other sectors such as power, health, or ports. Each PPP project was given an in-depth review according to a common structure in order to draw parallels between failed or failing projects, assess the impact of these failures on the public and taxpayers and the public and taxpayers' sphere of influence over the future of infrastructure planning, development and implementation.

2. Literature Review

2.1 PPP models

Several models of Public-Private Partnerships exist which differ based on who builds, owns, operates and transfers the project.

1. **BOT - Build, Operate, Transfer:** A private company builds the project, then operates it for a specified time and transfers back to the government. It pays for construction and earns revenue through fees collected from their users. This model is common for highway projects.
2. **BOOT - Build Own Operate Transfer**: The private sector company builds, owns, and operates the project for a fixed time period, after this they then transfer operations to the government or another operator for their ongoing operation. This is generally used for ports and highway contracts.
3. **BOO - Build Own Operate:** the private company build, owns, and operates the project with no return of ownership to the government. The government agrees to purchase the service or product from the private company.
4. **BOLT - Build Operate Lease Transfer**: The private sector company builds and owns the project; the project is then leased to the government for an agreed time. After the lease period, ownership is transferred to the government.
5. **DBFOT - Design Build Finance Operate Transfer:** The private company will design, build, finance, and operate the project, then transfer the project back to the government. The private company deals with everything during the contract period.
6. **LDO - Lease, Develop, operate**: The government owns the project but uses a leasing agreement with the private company. The private company will improve the project and operate it for a defined period. This is used in developing airports.
7. **OMT - Operate, Maintain, Transfer:** The project has previously been built by the government. The private company is contracted to operate and maintain the project for a fixed number of years, at which time the project is returned back to the government.

2.2 Review of literature

Risk allocation and contractual challenges

Utilization of risk-sharing arrangements between public and private partners is important to a successful public-private partnership (Chan, et al., 2011). A lack of credible risk allocation between the public and private partners, poorly-written contracts, and a lack of legal protection are causes of failures in P3 endeavors (Grimsey, et al., 2004; Cheung, et al., 2012). Project teams are often not aware of their obligations or do not react to institutional risks early on, leading to delays and disputes. Private developers have abandoned their projects for reasons which include lack of government support, lack of clarity in permits, land problems, and financial stress (Baruah, et al., 2016; Mathur, 2017). The risks described arise from contract misspecification, poor negotiation and communication, and inflexible legal agreements which serve to exacerbate disputes (Rybnicek, et al., 2020). Entering into a contract that is financially feasible in a realistic way, containing flexible provisions within the contract, and more accurate traffic prediction are apparently sine qua non in P3 projects (Shrivastava, et al., 2011).

Causes of project failure and stalled progress

The following causes to failure are commonly cited: land acquisition delays, cost overruns, unrealistic traffic forecasting, and inadequate contract enforcement (Kudtarkar, 2020; Sandeep, 2020). Risk can occur at various stages, from before construction to after, and can be reduced through shadow tolling and hybrid models (Reddy, et al., 2017). Risks arise from excessive prohibitions over participation, long

negotiations, a lack of clear objectives, and little employment (Malek, et al., 2020). There are no singular causes of success or failure to a project; delays are caused by unclear contracts, land acquisition issues, and poor planning on behalf of the developer. Success is more likely with experienced developers and good co-ordination (Garg, 2020).

Sector-specific insights and comparative analysis

Sparse funding diminishes the quality of rail PPP's; private investment can beneficial as long as it is aligned with the needs of the market (Sinha, et al., 2022). Toll-based PPP's have superior performance in maintenance executing; however, they require increased upfront capital at the start (Singh, 2018). Airport PPP" face regulatory, contractual, and operational issues and lack clearer statutes requiring cooperation, including and not limited to regulatory, administrative, and courts (Gupta, 2015). The combination of strong legal frameworks and public-private policy planning were success factors that helped Macau recover from COVID-19 disruptions (Wan et al., 2022). Toll revenue estimation models could help mitigate forecasting uncertainty (Beaty, et al., 2012).

International and cross-sector learnings

PPPs after 2008 highlight lifecycle costing, maintenance, sustainability, and financing (Guzmán et al., 2024). Failure is often due to poor contracts, poorly aligned goals, poor sharing of risks, and financial mismanagement; engagement and balance among participants are critical (Khalid et al., 2024). Trust and performance are enhanced by equal sharing of control (Zhang, et al., 2012). The UK's PFI shows improved benefits to the delivery of projects but has inflexibility and renegotiation risks (Grout, 1997).

Importance of project management

A timely completion is essentially the result of an effective plan, teamwork, and monitoring; a delay is typically a combination of miscoordination and lack of resources (Iyer, et al., 2006). Rights-of-way, utility relocates, and permits are required to be better administered (Mathur, 2017). Legal disputes, lack of proper project selection, and stakeholders' disagreements did increase project risks and risk management needs significant improvement (Baruah, et al., 2016). The literature acknowledges various benefits of PPP such as efficiencies and innovation, but still shows it retains problems of risk allocation, over-optimistic assumptions, substandard contracts, and difficulties of coordination among stakeholders that constrain project outturns. It finds that strong project management capacity, contracts that are flexible but clearly set expectations on rights and obligations, and aligning stakeholders at the outset can mitigate delays and cost overruns. Nonetheless, the limited research established in this area has been linked directly to failed Indian PPP projects comparatively.

3. RESEARCH METHODOLOGY

3.1 Research design

The paper consists of a qualitative investigation of a sample of 15 public-private partnerships (PPP) projects in the roads and highways sector through India to understand the issues and challenges faced at the time of construction, and ultimately, to ascertain why the project eventually failed. The study presents a detailed review of the various issues which led to the failure, including cost overruns, the PPP model, viability gap funding (VGF), revenue shortfall, and the financial state of the private partner in the PPP.

3.2 Data Sources or Data Collection

The study has been conducted using secondary sources of data, including reports from NHAI, CAG, MoRTH, news articles, and scholarly papers.

3.3 Exclusion and inclusion criteria

For the sake of maintaining uniformity across the selection of projects while ensuring there is geographical and model diversity, the following criteria were used to deem a project as a failure -

- Project termination or premature exit by the private partner.
- Significant time delays (beyond contractual timelines).
- Cost overruns or revenue shortfalls.
- Structural or engineering failure (e.g., collapse, safety issues).
- Public opposition or legal disputes.
- Ineffective tolling or traffic forecast mismatch.

3.4 Data analysis method

The approach of the paper was to analyse the cases at several levels,

- Descriptive Analysis
- Within-Case Analysis
- Cross-Case Analysis
- Thematic Analysis

4. ANALYSIS

Case Study 1: Delhi–Noida Toll Bridge (DND Flyway)

Table 1: Project details

Project Name	Delhi–Noida Toll Bridge (DND Flyway)
Location	Delhi–Noida, National Capital Region
Type	Toll bridge with approach roads
Length / Scale	9.2 km total (Main bridge: ~0.555 km)
PPP Model	Build–Own–Operate–Transfer (BOOT)
Concessionaire	Noida Toll Bridge Company Ltd (promoted by IL&FS)
Contracting Authority	New Okhla Industrial Development Authority (NOIDA)

Table 2: Financial and Commercial Data

Total Estimated Cost	₹250 crore
Final Project Cost	₹408 crore
VGF Amount	Not applicable
Equity Contribution	₹100 crore
Debt Financing	₹286 crore (Restructured in 2002)
Revenue Model	Toll-based
Expected Revenue	Based on traffic estimate of 83,000 vehicles/day
Actual Revenue	Based on actual traffic of 18,000 vehicles/day in early years
IRR / FIRR	20% annual return expected; not achieved due to revenue shortfall

Table 3: Outcome and Evaluation Metrics

Project Status	Operational; toll collection stopped by court order
Impact on Public	Strong opposition to tolls; perceived overcharging and long recovery period

Institutional Learning	Highlighted flaws in return clauses, forecasting, and contract structure
Audit Observations	Cost and returns recovered; public audit confirmed over-recovery
Lessons Learned	Need for realistic traffic projections, clear contract terms, and public trust

The Delhi-Noida Toll Bridge (commonly known as DND Flyway) was developed as a public-private partnership project based on a BOOT model by Noida Toll Bridge Company Ltd., promoted by IL&FS. Construction began in 1999 and opened for tolling in 2001. The length of the bridge is 0.555 km. The total length of the project is 9.2 km which includes the length of the approaches. The estimated project cost was ₹250 crores; however, the actual project cost was ₹408 crores. The financial structure of the project was ₹100 crores in equity and almost ₹286 crores in debt. The debt had to be restructured in 2002 as the revenues were not meeting the expectations.

The company could charge tolls until it had recovered its costs and received a 20% return per year or 30 years only. In reality only about 18,000 vehicles crossed the bridge per day while the company had projects 83,000. Due to that distribution of actual traffic versus expected traffic, the company received significantly less revenue than expected to recover costs and receive its yield. In 2016, the Allahabad High Court ordered the Company to stop toll collections. In 2025, the Supreme Court affirmed this decision.

While the current bridge remains operational, the PPP failed financially due to the incorrect forecasts of actual vs expected traffic, the uncertainty of the terms regarding what was considered a return, heated resistance from the public to tolls and the Court removing the company's ability to profit from their investment.

Case Study 2: Ghat-Ki-Guni Tunnel Project, Jaipur

Table 4: Project details

Data Point	**Description**
Project Name	Ghat-Ki-Guni Tunnel
Location	Jaipur, Rajasthan
Type	Twin-tube Road tunnel
Length / Scale	2.8 km (twin-tube)
PPP Model	Build–Operate–Transfer (BOT – Toll)
Concessionaire	Private developer (name not publicly specified; under Jaipur Development Authority)
Contracting Authority	Jaipur Development Authority (JDA)

Table 5: Financial and Commercial Data

Data Point	**Description**
Total Estimated Cost	₹150 crore
Final Project Cost	₹150 crore (as per official records; developer later claimed ₹417 crore)
VGF Amount	Not applicable

Equity Contribution	Not publicly disclosed
Debt Financing	Not publicly disclosed
Revenue Model	Toll-based
Expected Revenue	Based on high traffic forecast on Agra Road (exact numbers not disclosed)
Actual Revenue	Substantially lower than expected; triggered a ₹417 crore compensation claim
IRR / FIRR	Not achieved; revenue model failed

Table 6: Outcome and Evaluation Metrics

Data Point	**Description**
Project Status	Operational; tunnel in use since January 2013
Impact on Public	Discontent over toll charges; questioned the utility and fairness of the project
Institutional Learning	Revealed issues in traffic forecasting, delays in approvals, and weak contract design
Audit Observations	Developer filed for a ₹417 crore arbitration claim due to losses
Lessons Learned	Importance of realistic traffic estimation, timely land acquisition, and robust risk-sharing in PPPs

The Ghat-Ki-Guni Tunnel is a 2.8 km twin tube road tunnel, constructed under a BOT (toll) public-private partnership by the Jaipur Development Authority (JDA). The project was first proposed around 2005 as a means of relieving congestion on Jaipur's Agra Road. Due to delays in land acquisition and approval, the actual construction began in 2011, and the tunnel was opened in January 2013. The total cost of the project was ₹150 crore. The private concessionaire was given tolling rights for 13 years and 5 months.

While the project is operational, it did not achieve its financial goals. This was due to actual traffic volume being much lower than forecast and toll revenues were insufficient. The Times of India (2019) reported that the developer sought ₹417 crore in compensation from JDA because of revenue shortfall and cost escalations, nearly three times the original project cost. The project went into arbitration which speaks to the failure of the business model completely. People were also unhappy with the toll costs, and were questioning if the project made sense.

The tunnel is still usable, but the PPP model was not successful. The figure traffic numbers were inaccurate. Project start was delayed. The tolling scheme didn't generate enough revenue. There are still ongoing legal matters. So, this is a project that failed on a financial basis and also failed under the contract.

Case Study 3: Rajiv Gandhi IT Expressway (SH-49A), Chennai

Table 7: Project details

Project Name	Rajiv Gandhi IT Expressway (SH-49A)
Location	Chennai to Mahabalipuram, Tamil Nadu
Type	Four-lane tolled expressway

Length / Scale	43.7 km
PPP Model	Build–Operate–Transfer (BOT – Toll)
Concessionaire	Tamil Nadu Road Development Company (TNRDC) and IL&FS
Contracting Authority	Government of Tamil Nadu

Table 8: Financial and Commercial Data

Total Estimated Cost	Phase 1: ₹205 crore; Phase 2: ₹105 crore
Final Project Cost	Not publicly disclosed in total; ₹310 crore across both phases (known estimates)
VGF Amount	Not applicable
Equity Contribution	Not publicly disclosed
Debt Financing	Not publicly disclosed
Revenue Model	Toll-based, with a 10% toll hike every two years
Expected Revenue	Based on high traffic growth along the IT corridor (exact projections not public)
Actual Revenue	Lower than forecast; toll hikes created public backlash
IRR / FIRR	Not achieved; funding delays and renegotiation of terms

Table 9: Outcome and Evaluation Metrics

Project Status	Road operational; Phase 2 experienced long delays and quality concerns
Impact on Public	Toll hikes from ₹20 to ₹33 caused dissatisfaction; public opposition grew
Institutional Learning	Highlighted poor demand estimation, inadequate communication, and weak financial planning
Audit Observations	Issues flagged in reports by the Indian Institute for Human Settlements (IIHS) and others
Lessons Learned	Need for robust traffic projections, stakeholder engagement, and financial safeguards in PPP contracts

The IT Expressway, known as Rajiv Gandhi Salai, or SH 49 is a 43.7km road in the state of Tamil Nadu that provides connectivity from Madhya Kailash in Chennai to Mahabalipuram. It was built as a public private partnership under a BOT toll model between the Tamil Nadu Road Development Company and IL&FS. The first phase, which extended from Madhya Kailash to Siruseri (almost 20km) started in the mid-2000s and was estimated to cost ₹205 crore. Phase 2 included further extension to Mamallapuram and construction upgrades that totaled ₹105 crore. The private partner was able to charge the toll for 30 years from commencement of the project in 2006 with a 10 percent hike every two years.

In many ways, the road is fully functional, but the project was not successfully delivered as a PPP. The expected traffic volumes were considerably higher than what was actually experienced. Due to this, revenue from tolls was very low. This also led to delays in funding and renegotiating the terms of the contracts, particularly for phase 2. Toll charges were also problematic. The rates increased from ₹20 to ₹3,3 and drew anger from users and the recurring public criticism. Phase 2 remained delayed for a long

time, and now at the time of writing, it is reported to have structural issues.
As per reports by the Indian Institute for Human Settlements and the Times of India and the Tamil Nadu government, faced significant challenges with traffic forecasting, poor financial returns, and legal and public challenges. So, even if the road can be seen to be physically in use, the PPP model is most obviously not delivering in terms of finance and planning, and subsequently, with public trust.

Case study 4: Tamil Nadu Dindigul Karur Expressways Limited

Table 10: Project details

Project Name	Tamil Nadu Dindigul Karur Expressway
Location	Tamil Nadu - NH-7 stretch between Dindigul and Karur
Type	Four-lane tolled expressway
Length / Scale	77.6 km (68 km + 9.6 km)
PPP Model	Build-Operate-Transfer (BOT)
Concessionaire	Tamil Nadu Dindigul Karur Expressways Ltd (a consortium led by Madhucon Projects & SREI Infrastructure)
Contracting Authority	NHAI

Table 11: Financial and Commercial Data

Total Estimated Cost	US$83.5 million (~₹373 crore)
Final Project Cost	₹373 crore (no public evidence of cost overruns)
VGF Amount	Not publicly disclosed
Equity Contribution	US$33.5 million (~₹149 crore)
Debt Financing	Not available
Revenue Model	Toll-based
Expected Revenue	Forecast based on traffic models; exact figures not disclosed
Actual Revenue	₹79.9 crore (Underperformed due to traffic ramp-up taking longer than expected)
IRR / FIRR	Not publicly available; likely fell short of projections

Table 12: Outcome and Evaluation Metrics

Project Status	Operational but financially distressed
Impact on Public	Delayed opening, unexpected toll charges, and safety risks during construction led to inconvenience, dissatisfaction, and reduced trust in PPP toll projects.
Institutional Learning	Government response, policy change post-failure
Audit Observations	ICRA confirmed repayment delays and downgraded to [D]
Lessons Learned	Need for realistic traffic forecasts, buffer time in contracts, stronger financial planning, and better public communication.

Pursuant to NHDP Phase II, the Dindigul-Karur Expressway was developed under the BOT model for the purpose of widening a 77.6 km stretch of NH-7. It was promoted by Tamil Nadu Dindigul Karur Expressways Ltd. (A Joint Venture of Madhucon Projects & SREI Infrastructure) with specific objectives of improving the flow of intercity traffic, improving regional connectivity, and generating toll

revenues. The project was financed with equity and bank loans and was to become a model for private investments in the development of national highways.

Construction was finished, but notwithstanding the project was commissioned, in its after-commission days it had suffered due to a severely over-predicted traffic volumes where the traffic could never exceed the projected traffic volumes of 15,000 PCUs/day. Therefore, toll revenues fell short of expectations, and the company defaulted on the loan; consequently, the rating of the project was 'downgraded to [D]' by ICRA in 2023. Not only was the concession agreement rigid with no demand risk calibration, or flexibility, to allow adjustment, but there also was no adequate provision for covering a severe market demand disruption. The effect of high tolls, and seemingly inadequate maintenance, increased public dissatisfaction, and significantly diminished public trust in the project.

This case study illustrates the importance of realistic demand forecasting, to support effective risk sharing, and at a minimum contractual flexibility in P3 arrangements. It also highlights the importance of continued public sector governance and meaningful engagement with stakeholders, to support project viability and public satisfaction.

Case study 5: Ranchi-Jamshedpur NH-33 Expansion

Table 13: Project details

Project Name	Ranchi-Jamshedpur NH-33 Expansion
Location	Jharkhand
Type	Highway expansion (4-laning of NH-33)
Length / Scale	~163 km
PPP Model	BOT (Annuity)
Concessionaire	Ranchi Expressways Limited (Madhucon Projects Limited)
Contracting Authority	National Highways Authority of India (NHAI)

Table 14: Financial and Commercial Data

Total Estimated Cost	₹1,479 crore
Final Project Cost	Not completed; the project was terminated before completion
VGF Amount	Not publicly disclosed
Equity Contribution	Not publicly available
Debt Financing	Funding stalled; admitted claims: ₹2,156.89 crore (ICRA, 2025)
Revenue Model	Annuity-based (payments from NHAI, no toll collection)
Expected Revenue	Through government annuity payments post-construction
Actual Revenue	None; the project terminated before any annuity was disbursed
IRR / FIRR	Not publicly available

Table 15: Outcome and Evaluation Metrics

Project Status	Terminated in 2018; Concessionaire under CIRP since Dec 2023
Impact on Public	Increased traffic risk, unsafe roads, public outrage due to incomplete highway
Institutional Learning	Weak enforcement of milestones and financial health checks
Audit Observations	[ICRA]D

Lessons Learned	Avoid undercapitalized bidders; ensure tighter clauses for financial closure

Awarding in 2012 using the BOT-Annuity model, the Ranchi - Jamshedpur NH-33 expansion was set to convert an important 163 km highway corridor and roadway into a four-lane expressway. It was expected that the pilot project would reduce travel duration, improve safety, and enable better freight movement throughout Jharkhand. However, this project suffered significant delays amid the concessionaire's weak financial condition, failure to reach financial closure, and construction mismanagement.

The NHAI failed to act upon the obvious signs of distress on this project early on. The milestones were not enforced, and there was a lack of effective, informed supervision. Ineffectual site management coupled with delays in the contractor's mobilization until late in the contracting processes, contributed to the crisis. While annuity-based models remove the risk of traffic volume from the private party, they do not in turn. These models do not lift the burden of internal financial or execution failure risk which this project highlighted. Ultimately, the project was terminated in 2018, clearly after years of work stagnation and public frustration. By 2023, the company went insolvent under burdensome claims of over ₹2,150 crore. The partially built highway was dubbed an “accident zone,” jeopardizing users and unnecessarily damaging public confidence in PPPs.

This case indicates the need for better financial vetting, excellent ongoing monitoring, more assured contract execution, and swifter interventions. More importantly, it is a reminder that infrastructure projects gone awry affect real people: detracting from safety, efficiency, and confidence in the private sector.

Case study 6: Second Vivekananda Bridge Toll way (Kolkata)

Table 16: Project details

Project Name	Second Vivekananda Bridge Toll way (Sister Nivedita Bridge)
Location	Kolkata, West Bengal
Type	Multi-Span Extradosed Road Bridge
Length / Scale	6.1 km, 6-lane toll way, including a 880-meter cable-stayed main bridge
PPP Model	BOT - Toll
Concessionaire	L&T Infrastructure Development Projects Ltd. (L&T IDPL)
Contracting Authority	National Highways Authority of India (NHAI), in partnership with SVBTC (Special Purpose Vehicle)

Table 17: Financial and Commercial Data

Total Estimated Cost	650 Crores
Final Project Cost	641.4 Crores
VGF Amount	120 Crores
Equity Contribution	126 Crores
Debt Financing	409 Crores
Revenue Model	BOT Model - Toll Collection

Expected Revenue	No Information Available
Actual Revenue	750 Cr (Till Date)

Table 18: Outcome and Evaluation Metrics

Project Status	Completed
Impact on Public	Decongestion, reduced travel time, and economic growth
Audit Observations	Traffic over-estimations, revenue shortfall, delay in completion, social equity gaps
Institutional Learning	Appropriate PPP structuring, Accurate forecasting, and toll pricing

Constructed under a BOT model between 2004 - 2007, the Second Vivekananda Bridge, known as Nivedita Setu, was one of the first urban infrastructure PPPs in India. The project was completed to provide an alternative to the old Vivekananda Bridge, thereby improving connectivity between Howrah and Kolkata, diverting heavy vehicles, and relieving congestion. The bridge was successfully completed on time and is regarded as a success in terms of architecture. However, it is considered unsuccessful in operational and strategic terms. The actual traffic usage has remained far lower than anticipated to the extent of in the order of 50,000 PCUs/day, compared to an estimate of 1.4 lakh, which has resulted in low toll revenue, and a much-extended breakeven period. A primary reason is the existence of a free alternative (the old bridge) which continues to attract users seeking to avoid toll charges on this route.

The project also experienced significant usability challenges. The project remained ineffective due to poor last-mile connectivity, signage, and a lack of strict traffic diversion policies. Very ironically, restrictions on heavy vehicles and two-wheeled vehicles, which were the very traffic to be diverted, further reduced the efficacy of the bridge.

While it has slightly decreased congestion, the project illustrates that an accomplishment related to technical means is not sufficient to achieve success in a PPP. In this case, demand actualization, equitable access planning, traffic regulation and coordinating stakeholders have proved paramount in delivering infrastructure that provides long-term public objectives.

Case Study 7: KMP Expressway (Kundli-Manesar-Palwal, Haryana)

Table 19: Project details

Project Name	KMP Expressway (Kundli-Manesar-Palwal, Haryana)
Location	Haryana, India
Type	Six-lane, access-controlled expressway
Length / Scale	135.65 Km
PPP Model	BOT Annuity - EPC
Concessionaire	M/s KMP Expressway Limited (2004 - 2015), Essel Infra Projects Limited
Contracting Authority	Haryana State Industrial and Infrastructure Development Corporation (HSIIDC)

Table 20: Financial and Commercial Data

Total Estimated Cost	1680 Crores
Final Project Cost	9000 Crores (Including land acquisition and Penalties)
VGF Amount	No VGF Granted
Equity Contribution	₹766 crore - contributed by the concessionaire (Includes only initial phase financing under KMPEL)
Debt Financing	₹,149 crore - raised via a rupee term loan from IDBI and a consortium of 11 banks (Includes only initial phase financing under KMPEL)
Revenue Model	Original BOT Toll Model (2006–2015) Annuity-Based Hybrid Model (2016-Present)
Expected Revenue	1.15 Crore/Day
Actual Revenue	FY24 - 1.30 Crore/Day

Table 21: Outcome and Evaluation Metrics

Project Status	Completed after 16 years of completion
Impact on Public	Decongestion, Reduced Travel Time, Increased Safety
Institutional Learning	Importance of feasibility evaluations and due diligence, consequences of delayed construction, legal and social issues, interagency coordination challenges
Audit Observations	No information available

The KMP Expressway was created to relieve congestion in Delhi by diverting commercial traffic from urban areas to a periphery route that ultimately connects NH-1, NH-2, NH-8, and NH-10. The intent was to improve air quality, alleviate urban traffic congestion, and facilitate long range freight movement. This project was initiated under a BOT concession, starting in 2005 with a projected completion time of 36 months, and faced major obstacles over the preceding decade.

By 2015, only 40% of the expressway was constructed, largely due to contractor underperformance, land and clearance delays, and ineffective project monitoring. The costs of project jumped from ₹1,915 crore to almost ₹9,000 crore due to inflated land costs, a change in scope from four lanes to six lanes, and termination costs incurred.

The Haryana government terminated the contract with the original concessionaire in 2015 due to consistent delays. The project was then reconstructed and executed through EPC contracts: the Manesar-Palwal was awarded an annuity model to Essel Infra, and the Kundli-Manesar stretch was completed through direct government funding.

The failures were attributed to unrealistic revenue estimates, the private players' lack of financial capacity, and inconsistencies in enforcement. While originally not operationally effective, the expressway subsequently activated full service and is vital to regional logistics. The expressway has particularly helped alleviate traffic congestion in Delhi and encouraged the establishment of industrial surrounding development. There still exist challenges such as monetising land and constructing viable roadside amenities.

This case illustrates the need for a realistic financial model, institutional capacity, practical enforcement and adaptable delivery models in the successful PPP posture of large-scale infrastructure.

Case Study 8: Kishangarh–Udaipur–Ahmedabad National Highway Project

Table 22: Project Identification Data

Project Name	Kishangarh–Udaipur–Ahmedabad National Highway Project
Location	Rajasthan, Gujarat
Type	National Highway (6-lane upgrade of NH-79A, NH-79, NH-76)
Length / Scale	555 km
PPP Model	DBFOT (Toll)
Concessionaire	GMR Kishangarh Udaipur Ahmedabad Expressways Ltd (GMR Infrastructure Ltd.)
Contracting Authority	National Highways Authority of India (NHAI)

Table 23: Financial and Commercial Data

Total Estimated Cost	₹7,200 crore (US$1.2 billion)
Final Project Cost	Terminated before construction; no final cost reported
VGF Amount	Not applicable (concessionaire agreed to pay premium)
Equity Contribution	Not executed; no equity contribution deployed
Debt Financing	Not secured due to failure of financial closure
Revenue Model	Toll-based with ₹636 crore/year premium to NHAI (with 5% annual escalation)
Expected Revenue	Projected from toll collections over 26 years; internal premium obligation ~₹32,500 crore
Actual Revenue	Nil (project terminated prior to tolling)
IRR / FIRR	Not applicable (premature termination)

Table 24: Outcome and Evaluation Metrics

Project Status	Terminated by GMR in early 2013; officially closed by NHAI in 2015
Impact on Public	Delay in key highway connectivity; financial loss of expected annual premium for NHAI
Institutional Learning	Importance of securing clearances and toll rates before agreement execution
Audit Observations	Highlighted by Economic Times and Infra PPP World; no formal CAG audit published
Lessons Learned	Avoid aggressive premium bidding without clearance certainty; enforce clear 'conditions precedent'; strengthen dispute resolution in PPP contracts

This 555 km six-lane expressway project, part of the National Highways Development Programme, intended to enhance the Delhi-Mumbai corridor. The project was awarded to GMR Infrastructure in 2011 under a DBFOT (Toll) model contractual agreement and contained a staggering annual premium to the Government of ₹636 crores (with a 5% annual increment). The intention was to improve traffic movement, improve congestion on the corridor, and to shift the financial and operational risk to the private sector, while also generating steady revenue stream to the NHAI.

However, the project stalled, blocked by the environmental clearance process, along with the absence or pathway for a notification for a toll rate, and the lack of financial closure gave GMR no options but to withdraw from the project in December 2013, explaining their withdrawal as an unmet pre-condition of the original tender. By the end of 2013, GMR Infrastructure also reported a list of unresolved risks associated to completion, as well as other "un-contemplated risks". GMR cited the omission of the proper dispute resolution mechanism as making the situation completely untenable.

The wide, gaping hole on the regulatory failure appears to be that the Government of India signed the award without securing pertinent land and approvals beforehand. As much as it needs to be said, this was a calamity of incompetence on the institutions.

The cancellation of the project caused loss of revenues and delays in enhancing a major national corridor. However, the project was later divided into smaller packages and re-tendered, and some of those packages were taken over by IRB Infrastructure. The case illustrates an important principle about planning for PPPs. High value bids are not adequate without credible and executable plans. The government also needs to be as much prepared in advance with land acquisition and clearances before bidding. And most critically, risks need to be shared equitably so that PPPs can be real and viable.

Case study 9: Vadodara–Halol Toll Road Project (VHTR)

Table 25: Project Identification Data

Project Name	Vadodara–Halol Toll Road Project (VHTR)
Location	State Highway 87, Gujarat, India
Type	Four-lane tolled expressway (State Highway widening project)
Length / Scale	Approximately 32 km
PPP Model	BOOT (Build-Own-Operate-Transfer)
Concessionaire	Vadodara Halol Toll Road Company Ltd (later merged into GRICL)
Contracting Authority	Government of Gujarat (GoG), Roads and Buildings Department

Table 26: Financial and Commercial Data

Total Estimated Cost	₹175 crore (approx.)
Final Project Cost	₹161 crore
VGF Amount	Not applicable
Equity Contribution	₹67.9 crore from IL&FS, GoG, AIG, and contractors
Debt Financing	₹93.2 crore syndicated from Indian financial institutions including IDBI, IDFC, SBI
Revenue Model	Toll collection rights for 30 years, commercial activities, CPI-linked toll escalation
Expected Revenue	Projected through tolls and development rights
Actual Revenue	Lower than expected due to reduced traffic
IRR / FIRR	Project IRR: 20%, Equity IRR: 32%

Table 27: Outcome and Evaluation Metrics

Project Status	Operational since 2000; underwent debt restructuring in 2004 due to low traffic
Impact on Public	Helped improve connectivity but traffic lower than projected; limited cost recovery
Institutional Learning	Need for better demand forecasting and clearer risk-sharing mechanisms
Audit Observations	Praised for social and environmental safeguards; concerns over conflict of interest
Lessons Learned	Robust pre-development studies, balanced risk-return profiles, transparency in roles

The Vadodara-Halol Toll Road Project was one of India's first state-level PPP road projects, a pilot project for the Government of Gujarat to improve a 32-kilometre stretch of road designed to serve industrial traffic. Developed through the BOOT model, funded at the time by IL&FS as both an investor and financial and technical advisor, the project aimed to reduce travel time, improve safety, and stimulate regional economic development. It also served as a pilot project for a new approach to deploying PPPs for state-level infrastructure projects. Although, operational since the year 2000, the project faced several issues including high traffic forecasts and public opposition for tolling. Additionally, the lack of revenue protection mechanisms such as VGF, or traffic guarantees, fully exposed the private partner to traffic risk. Low toll revenue created the project's financial viability leading to a debt restructuring in 2004. Also, the confused roles of IL&FS raised governance issues. It underscored the need for institutional lines between public and private were critical.

Altogether the project achieved its connectivity and helped to support growth in the region. However, it struggled with financial sustainability. Still, it yielded important policy lessons especially in terms of realistic demand forecasting, risk-sharing that works, and proper governance also played a role with the governance roadblock in PPP. In addition, all of these learnings were useful also to help foster better PPP arrangements in future infrastructure projects in India.

Case study 10: Trichy Thanjavur Expressways Limited

Table 28: Project Identification Data

Data Point	**Description**
Project Name	Trichy–Thanjavur Expressway Project
Location	NH-67, Tamil Nadu (Trichy to Thanjavur stretch)
Type	Road/Highway Infrastructure (BOT – Toll)
Length/Scale	55.75 km widening and strengthening project
PPP Model	BOT (Toll)
Concessionaire	Trichy Thanjavur Expressways Limited (TTEL), promoted by Madhucon Projects Ltd
Contracting Authority	National Highways Authority of India (NHAI)

Table 29: Financial and Commercial Data

Data Point	Description
Total Estimated Cost	Not explicitly mentioned in public sources
Final Project Cost	Not explicitly disclosed; completed with delays
VGF Amount	None
Equity Contribution	From Madhucon Projects Ltd.
Debt Financing	Bank loans (details not disclosed); project faced debt servicing issues
Revenue Model	Toll-based revenue
Expected Revenue	Not publicly stated
Actual Revenue	Poor revenue due to low traffic and operational inefficiencies
IRR/FIRR	Not achieved due to continued financial losses

Table 30: Outcome and Evaluation Metrics

Data Point	Description
Project Status	Concession terminated by NHAI in March 2023
Impact on Public	Poor maintenance, interrupted road services and loss of confidence in PPPs
Institutional Learning	Need for improved selection of concessionaire, better contract enforcement and monitoring
Audit Observations	Not publicly available, but ICRA noted lack of cooperation and financial trouble
Lessons Learned	Emphasis on due diligence, competent concessionaires, advance signaling of issues and strong enforcement mechanisms

The 55.75 km Trichy-Thanjavur Expressway was awarded to Trichy Thanjavur Expressways Limited (TTEL) the special purpose vehicle (SPV) of Madhucon Projects Ltd. as a public-private partnership (PPP) using a BOT-Toll contract under National Highway Development Project (NHDP) in June 2006 with a concession period of 20 years. The project was initiated to improve connectivity in the region, reduce travel time, and build a foundation for the economy and tourism to prosper between the cities Trichy and Thanjavur. However, although these are positive intentions, TTEL has not performed well in keeping to these objectives, resulting in significant delays. The project has never achieved its Commercial Operation Date (COD) in 2009 and became operational in 2011. TTEL was ultimately unable to complete construction and maintain the highway to an acceptable level after commissioning of the highway.

The company remained in distressing financial circumstances - it posted continued losses, defaulted on its debt service, suffered repeated downgrades, and was given the label by rating agencies "Issuer Not Cooperating". TTEL ended FY2022 with a negative PAT of ₹-10.67 crore, and a very low interest coverage ratio of 3.2x. The NHAI terminated the concession in March 2023 for continued non-compliance. The case exemplifies the need for timely monitoring, enforceable maintenance clauses and project concessionaires who are financial and technical capable. It also demonstrated risks that derived from transparency, as TTEL being 'non-cooperative' led to their lenders and investors not having confidence. Ultimately the failure of the project resulted in disruption of public service delivery and dim

inished trust in the PPP model in the Indian road sector.

5. FINDINGS AND DISCUSSION

5.1 Findings

Table 31: Summary of all findings

Case Number	Case Name	Reason for Failure
1	Delhi–Noida Toll Bridge (DND Flyway)	Overestimated traffic, unclear return terms, strong public opposition, toll collection stopped by court
2	Ghat-Ki-Guni Tunnel, Jaipur	Low traffic and revenue, delays in approvals, weak contract design, developer filed large compensation claim
3	Rajiv Gandhi IT Expressway (SH-49A), Chennai	Low traffic volume, toll hikes causing public backlash, funding delays and contract renegotiation
4	Tamil Nadu Dindigul Karur Expressway	Overestimated traffic, insufficient toll revenue, no contract flexibility, poor communication, delayed repayment
5	Ranchi–Jamshedpur NH-33 Expansion	Weak financial health of concessionaire, poor project management, delays, contract enforcement failure
6	Second Vivekananda Bridge Tollway (Kolkata)	Traffic overestimation, availability of free alternative, poor last-mile connectivity, restricted access
7	KMP Expressway (Kundli-Manesar-Palwal)	Excessively optimistic traffic estimates, weak financial capacity, delays, contract termination and legal Issues
8	Kishangarh–Udaipur–Ahmedabad NH Project	Delayed environmental clearances and toll notifications, lack of financial closure, aggressive premium bid
9	Vadodara–Halol Toll Road Project	Overestimated traffic, insufficient toll revenue, public opposition, lack of revenue protection mechanisms
10	Trichy–Thanjavur Expressway	Construction and maintenance delays, operational inefficiencies, financial distress, termination by authority

5.2 Discussion

This research identifies the principal reasons for failure or substandard performance of several Public-Private Partnership (PPP) road projects in India. The research studies ten particular highway projects that experienced one or more of delays, financial loss and public dissatisfaction, with an aim to identify recurring issues, hurdles and deficiencies affecting PPPs. The findings are compared with existing research to support suggestions for improvement for infrastructure development in India in future projects.

The ten projects were all initiated to achieve private investment, accelerate road infrastructure and enhance public services. They involved various types of PPP models such as BOT (Toll), BOT (Annuity), and DBFOT. Whilst the intentions were good, almost every project had serious impediments such as delays, anticipated low traffic, ongoing court cases and financial hardship. In many examples, such as the Ranchi NH-33, DND Flyway and Trichy–Thanjavur, the public appeared worse off than before indicating that execution and oversight were the weakest links.

Contractual and Governance Failures

In each of the projects, having badly designed concession agreements was a significant issue. As a possi

ble example, for both the Ranchi Expressways and the KMP Expressway, the extremely rigid contracts did not have the ability to allow for sufficient flexibility, were subject to long delays and poor funding. Also, none of the contracts contained 'mid-project reviews', 'renegotiations', or 'penalties for not performing'. All of this supports the thinking of Rybnicek et al. (2020), who stated that if contracts are weak and inflexible, the potential for a project failure is greatly increased. Grimsey and Lewis (2004) go on to argue that weak contracts increase the potential for dispute and delays when unforeseen events occur as well.

Financial Mismanagement and Traffic Estimation Errors

Numerous concessionaires, particularly those along the DND Flyway, Rajiv Gandhi IT Expressway, and Dindigul-Karur Expressway route, were impacted negatively by inaccurate traffic forecasts and unreasonably positive revenue assumptions to the point that they lost revenues, were forced to default on their loans or receive downgrades from rating agencies. Ranchi NH-33 is an example of how the private partner couldn't even complete construction due to lack of available funds even though the contract was signed in an annuity model whereby the traffic risk was non-existent. Mathur (2017), Shrivastava & Rao (2011) notes there is negative effect for all PPP models from incorrect financial modelling and excessive optimism, even the better models will suffer as a result.

Land Acquisition and Regulatory Delays

Projects faced delays until land was transferred to borrower and regulatory issues were resolved. For example, the Trichy–Thanjavur Expressway was delayed for years until the issues of land were resolved. In the cases of Kishangarh-Udaipur -Ahmedabad and KMP, projects were delayed for years due to pending environmental clearance and regulatory approval to utilize utilities. In their respective reviews of the various reasons for the failure of PPPs and reasons for preconstruction delays, Kudtarkar (2020) and Reddy & Sharma (2017) concluded that pre-construction delays undermined public-private partnerships by increasing costs and disincentivizing the private investor.

Lack of Institutional Responsiveness

Public authorities tended to act very slowly when a problem became apparent. As an example, it took NHAI 6 years to terminate the Ranchi Expressway contract, after which it was repeatedly delayed. With the KMP project, there was a long lag between the identification of the problem and a formal termination of the concession. This concurs with Baruah and Kakati's (2016) conclusion that delayed decision-making by public institutions resulted in unfavourable project outcomes. The need for rapid corrective action and empowered responsive teams within government is clear.

Weak Monitoring and Risk Management

The absence of milestone monitoring or early warning systems was mostly witnessed. The case of Second Vivekananda Bridge Toll way case illustrated an inability to detect contract compliance issues and remediate them promptly. Ghat-Ki-Guni Tunnel also experienced escalations in cost without appropriate monitoring of the cost. Beaty and Lieu (2012) indicated that PPPs require real-time tracking of data and clearly defined risk-sharing arrangements, both of which were respectively missing in these cases.

Public Impact and Erosion of Trust

Numerous projects experienced public dissatisfaction. The toll pricing of DND Flyway resulted in protests and lawsuits. Delays on the Ranchi highway created dangerous conditions as work was left incomplete. The Trichy–Thanjavur project and the VHTR project caused complaints about road conditions and unmet commitments from locals. Gupta (2015), Khalid et al. (2024), and other literature

state that such failures decrease perceived public trust in PPPs and will reduce investment in the market by other potential private participants.

Comparison with Successful PPPs

As highlighted by Singh (2018) and Garg (2020), successful PPPs are typically characterized by a strong private partner, in-depth planning, advanced land clearance, and coordination between government and concessionaires. None of the examples that we reviewed ticked all of these boxes. Rather, they illustrate how even promising projects can fail if execution, funding, or monitoring is weak.

To enhance the success of Public Private Partnership (PPP) road projects in India, there are several institutional and policy reforms that need to happen. First, contracts need to offer greater flexibility to make adjustments during the project lifecycle, particularly with unanticipated delays or financial issues. Second, private partners ought to be evaluated rigorously for their net worth, liquidity, and prior execution performance. Third, all interests in land and required approvals should be fully committed before awarding the project, to minimize delays that lead to costly shifts in plans down the road. Furthermore, any payment plan, such as annuities or receipts from toll revenue should be established to be based on measurable progress milestones, to ensure that contractors are paid during planning, design, and execution only if their work is completed to a satisfactory level. Finally, project oversight should also move to a digital and real-time basis, to enable regular visibility and action when necessary. These recommendations align with the findings by Guzmán et al. (2024), who also note lifecycle costing and continuous oversight as paramount to sustainable PPP accomplishment.

The results indicate that PPP failures in India are not caused by one specific problem, but, instead, by a host of failures from weak contracts, financial problems, land acquisition delays, lack of governance, public welfare, injured investor confidence, and a diminishing credibility of infrastructure policy. The lessons learned from these ten projects, in conjunction with how they compare to best practice worldwide, will allow India to make better PPP models that are practical, aware of the risks, and ready to execute.

6. LIMITATIONS

The paper relies solely on secondary data, public reports, audits, media, and previous research, where critical numbers like toll revenue IRR and arbitration outcomes were often missing, inconsistent, or unverifiable, reducing result accuracy and confidence. No interviews with stakeholders such as private firms, government, lenders, or commuters were conducted, meaning direct experiences and decision-making processes are not captured, possibly omitting essential social, political, or managerial factors. Although a consistent template was used, project differences in size, location, PPP model, and disclosure quality make comparison difficult; some cases lack detailed financial data, so broad claims require caution. The selection is biased toward well-documented, widely discussed cases, potentially excluding different patterns seen in lesser-known failures. The study focuses only on roads and highways, so findings may not apply to sectors like power or health. There is no comparison with successful projects, limiting the ability to determine what factors cause consistent failure versus occasional issues, which weakens recommendations. Since PPPs are long-term and policies and environments change over time, brief case reviews may miss the impact of such shifts. These limitations set boundaries for how the results should be interpreted but do not diminish the value of the work. For, this study secondary data has been collected. From the website of KSE the monthly stock prices for the sample firms are obtained from Jan 2010 to Dec 2014. And from the website of SBP the data for the macroeconomic variables are

collected for the period of five years. The time series monthly data is collected on stock prices for sample firmsand relative macroeconomic variables for the period of 5 years. The data collection period is ranging from January 2010 to Dec 2014. Monthly prices of KSE -100 Index are taken from yahoo finance.

7. IMPLICATIONS AND RECOMMENDATIONS

Improvements in PPP Contract Design

Poor design and rigid structuring of concession agreements caused failures in projects like Delhi-Noida Toll Bridge and Ranchi-Jamshedpur NH-33. Future contracts must include clear roles, measurable performance indicators, milestone payments, realistic demand assessments by independent agencies, and flexibility for mid-term reviews, renegotiations, force majeure, dispute resolution, and transparent ROI audits. Third-party evaluators can ensure accountability and public trust. Clarity, adaptability, and transparency are essential.

Need for Robust Risk-Sharing Frameworks

Projects like Dindigul-Karur Expressway failed as concessionaires bore risks they could not manage, such as approval delays and optimistic traffic projections. Risk must be allocated to the party best equipped: government handles land acquisition and clearances; concessionaires manage construction and quality. Contracts should provide for minimum revenue guarantees, annuities, toll adjustments, risk insurance, renegotiation flexibility, and fair windfall sharing. This improves bankability and PPP sustainability.

Role of Government Support and Transparency

Government must proactively support projects throughout their lifecycle. Delays and weak oversight, as in KMP Expressway, caused failures. Governments should ensure land, utilities, and clearances are secured before execution and set up institutional frameworks for coordination. Continuous transparency via public access to contracts, milestones, audits, and digital tools builds trust, reduces corruption, and improves social acceptance. Government credibility is as vital as private efficiency.

Recommendations for Future PPP Project Structuring

Future projects need rigorous feasibility and demand studies by independent agencies, assessing inflation, delays, and risk. Concessionaires should be evaluated on financial and technical capacity beyond lowest bids. Contracts must allow mid-course corrections, clear risk sharing, renegotiation triggers, exit options, and contingency plans. Standardized, flexible contract templates and government capacity for real-time monitoring are necessary. Proactive stakeholder communication on tolls and grievances fosters legitimacy and reduces opposition. Coordinated reforms can unlock PPPs' potential for sustainable infrastructure.

8. CONCLUSION

This research explains why some big road and highway projects in India did not work well. These projects were done under Public Private Partnerships also called PPPs. The goal of PPP is to use the speed of private companies and the support of the government. But many of these projects failed. The reasons are bad planning, slow approval and lack of good teamwork. The contracts were finalized before land acquisition or environmental approval. This was worse with private companies. They faced delays and financial problems.

Good planning is very important. Some companies bid on very high expectations of profit. Then, they were unable to deliver. This resulted in tension and fights. To improve this, we require better contracts. The terms should be easy for everyone. There should be checks at every step. If there is a problem it should be solved quickly. Also, experts should review the work from time to time. This builds trust and avoids project failure.

There is a chance to do better in the future. New ideas like paying based on performance can help. Using computers to track progress in real time can also give early warnings. We should study projects that went well and learn from them. In the end PPPs are a big part of India's plan to grow. But money is not enough. What we really need is better planning strong teams and regular checks. That is how PPPs can bring real change for the people.

References

1. Baruah, P., & Kakati, B. K. (2016). Risk Management in Indian Public-Private Partnership Projects: A Study on Operational Phase Risk. International Journal of Engineering Research and Applications (IJERA), 6(7), 27–34.
2. Chan, A. P. C., Yeung, J. F. Y., Yu, C. C. P., Wang, S. Q., & Ke, Y. (2011). Empirical study of risk assessment and allocation of public-private partnership projects in China. Journal of Management in Engineering, 27(3), 136–148. https://doi.org/10.1061/(ASCE)ME.1943-5479.0000049
3. Cheung, E., Chan, A. P. C., & Kajewski, S. (2012). Factors contributing to successful public-private partnerships: Comparing Hong Kong with Australia and the United Kingdom. Journal of Facilities Management, 10(1), 45–58. https://doi.org/10.1108/14725961211200397
4. Esperilla-Niño-de-Guzmán, Y. Y., Baeza-Muñoz, M. d. l. Á., Gálvez-Sánchez, F. J., & Molina-Moreno, V. (2024). Public–Private Partnership (PPP) in Road Infrastructure Projects: A Review of Evolution, Approaches, and Prospects. Sustainability, 16(4), 1430. https://doi.org/10.3390/su16041430
5. Garg, S. (2020). Few ways to succeed, many ways to fail: Asymmetrical performance of Indian highway PPP projects. Transportation Research Procedia, 48, 3860–3879. https://doi.org/10.1016/j.trpro.2020.08.034
6. Grimsey, D., & Lewis, M. K. (2004). Public-private partnerships: The worldwide revolution in infrastructure provision and project finance. Edward Elgar Publishing.
7. Irwin, T. (2007). Government guarantees: Allocating and valuing risk in privately financed infrastructure projects. World Bank Publications.
8. Khalid, A., Müller, H., & Hassan, B. (2024, September 25). Analyzing failed PPP projects to understand the reasons for their shortcomings and to identify lessons for future initiatives.
9. Malek, M. S., & Gundaliya, P. J. (2020). Negative factors in implementing public–private partnership in Indian road projects. International Journal of Construction Management, 23(2), 234–242. https://doi.org/10.1080/15623599.2020.1857672
10. Mathur, S. (2017). Risk allocation and contractual issues in PPP projects in India. International Journal of Applied Business and Economic Research, 15(20), 191–202.
11. Kudtarkar, S. G. (2020). Failure of operational PPP projects in India leading to private developers' apathy to participate in future projects: A case study-based analysis. Indian Journal of Finance and Banking, 4(2), 17–27. https://doi.org/10.46281/ijfb.v4i2.693

12. Rao, K. R., & Shrivastava, V. K. (2011). Public Private Partnerships (PPP) in road projects: Critical success factors in the Indian context. Proceedings of the 30th Southern African Transport Conference (SATC 2011), 11–14.
13. Singh, R. (2018). Public–private partnerships vs. traditional contracts for highways. Indian Economic Review, 53(1-2), 29–63. https://doi.org/10.1007/s41775-018-0032-0
14. Reddy, N. S., & Sharma, P. (2017). Why PPP modeled infrastructure projects failed: A critical review with a special focus on the road sector. International Journal of Advanced Engineering, Management and Science (IJAEMS), 3(4), 331–335. https://doi.org/10.24001/ijaems.3.4.8
15. Rybnicek, R., Plakolm, J., & Baumgartner, L. (2020). Risks in Public–Private Partnerships: A Systematic Literature Review of Risk Factors, Their Impact, and Risk Mitigation Strategies. Public Performance & Management Review, 43(5), 1174–1208. https://doi.org/10.1080/15309576.2020.1741406
16. Sinha, S., & Chopra, K. (2022). Railway stations redevelopment programme under PPP model in India: A study of consumer perception towards proposed facilities. Cardiometry, (24), 835–842. https://doi.org/10.18137/cardiometry.2022.24.835842