

The background of the cover is a photograph of a modern train traveling on a concrete bridge. The train is white with blue accents and has the word 'तोरळा' (Torla) on its front. The bridge spans a city with a hazy skyline in the background, including a prominent dome. The image is overlaid with a geometric design of white lines and yellow triangles. The title text is positioned on the left side of the image.

Channelizing Domestic and Global Capital for Infrastructure Financing

September 2026

CONTENT

Foreword	05
----------	----

Executive Summary	07
-------------------	----

01	
The Scale of the Challenge: India's Infrastructure Financing Gap	11

1.1 Sizing India's infrastructure requirement through 2047

1.2 FY26-31 financing gap: Sources and Challenges

1.3 Sources of supply-side capital and potential gap between demand and supply of infrastructure finance

1.4 What this report covers

02	
Constraints on Infrastructure Financing: The Structural Gaps Behind India's Shortage of Fundable Projects	18

2.1 Limited proven commercial models in many sectors

2.2 Need for public capital recycling to meet future capex requirements driven by shift in the sectoral mix

2.3 Commercial viability, tenor mismatch and non-standard pricing limit investment from alternate capital pools

2.4 Same capital base finances both construction and operational phases

2.5 Project-level information remains fragmented

2.6 Need for enhancement in project pipeline announcements

2.7 Mechanisms for fast-tracking approvals still evolving

2.8 Project execution challenges continue to constrain the flow of financeable projects

03

The Domestic Capital Landscape: Sources, Barriers, and What Can Unlock Them

32

3.1 Sources of domestic capital and contribution to infrastructure funding

3.2 Structural barriers to domestic capital flow financing and initiatives to unlock capital

04

Global Capital: Sources, Barriers, and What Can Unlock Them

39

4.1 Sources of global capital

4.2 Structural barriers / key considerations for global capital flow and initiatives to unlock capital

05

What Will Make Capital Flow: Interventions via Financing Instruments and Enablers

46

5.1 A broader set of instruments and enablers is reshaping infrastructure financing

5.2 Growth in infrastructure finance and variation in instrument adoption

5.3 International precedents of sector-specific vehicles to unlock domestic capital

5.4 India's market conditions and their influence on scalable financing instruments and enablers

06

Unlocking the Capital: A Roadmap for Domestic and Global Flows

56

6.1 Five themes to unlock infrastructure capital

Foreword



Mr. Rajkiran Rai G.

Managing Director, National Bank for Financing Infrastructure and Development

India stands at a defining moment in its development journey. With rising incomes, rapid urbanisation, expanding industrial activity and growing aspirations, the country is laying the foundations for the next phase of sustained growth. The Honourable Prime Minister Shri Narendra Modi's vision of Viksit Bharat by 2047 provides a clear national ambition for this journey. Achieving it will require infrastructure to be built ahead of growth, supporting productive cities, reliable energy, efficient logistics, digital connectivity and improved access to essential services across the country.

The scale of this opportunity is significant. India is targeting an economy of about USD 30 trillion by 2047, while the infrastructure investment requirement through this period is estimated at INR 680–770 trillion. Nearly half of this requirement is expected to arise from urban infrastructure, reflecting the changing needs of a rapidly developing economy. Meeting this requirement will require government capital expenditure to be complemented by private sector capital, with domestic and global capital pools participating across sectors and stages of the infrastructure lifecycle.

Our earlier report, *Catalysing Infrastructure Investment & Innovation: Towards Viksit Bharat 2047*, examined the scale and evolving composition of India's infrastructure investment requirement. It highlighted the shift in the investment mix, with urban infrastructure emerging as the single largest requirement through 2047, alongside continued growth in sectors such as power, airports and ports.

Building on that, it is my privilege to introduce the report, *Channelizing Domestic and Global Capital for Infrastructure Financing*, prepared in collaboration with Boston Consulting Group. The report focuses on strengthening the flow of capital towards India's evolving infrastructure needs over the coming two decades. It examines the financing requirement across the project lifecycle and distinguishes between projects that are yet to be announced, projects moving towards financial closure and projects where financing or execution can be unlocked. Each requires a different response—from stronger project preparation and sequencing to appropriate financing

structures and timely capital deployment. The report also assesses the capacity of existing domestic capital pools and the role that global capital can play as India's infrastructure pipeline develops.

A central theme of the report is the opportunity to align what infrastructure projects require with what different capital pools are able to provide. Each pool brings a different liability structure, risk appetite and regulatory mandate, and is suited to different stages of the infrastructure lifecycle. Strengthening project readiness, commercial bankability, risk allocation and capital recycling can help connect projects with the capital best suited to finance them, while widening participation across domestic and global investors.

The report therefore explores practical pathways to enable capital to flow at greater scale. These include stronger project preparation, standard contracts and risk-allocation frameworks, recycling of capital from operational assets, greater participation by insurers and pension funds, and increased deployment of patient global capital. It also examines financing instruments and enablers including credit enhancement, InvITs, AIFs, private credit, securitisation and blended finance. Their ability to scale will depend on suitable assets, a deep investor base, supportive legal and market infrastructure and credible institutions.

At the National Bank for Financing Infrastructure and Development, we remain committed to supporting this evolution of India's infrastructure financing ecosystem. Through stronger project-level information, financing instruments and platforms that facilitate capital deployment, NaBFID seeks to enable a wider pool of capital to participate in India's infrastructure growth.

The opportunity now is to translate India's infrastructure ambition into sustained action, supported by deeper participation from domestic and global capital and a financing ecosystem capable of meeting India's evolving needs on the path to Viksit Bharat 2047.



Mr. Ashish Garg

Managing Director and Senior Partner, Boston Consulting Group

India's ambition to become a USD 30 trillion economy by 2047 will require infrastructure to precede growth rather than follow it. Urbanisation, energy security and universal connectivity will all depend on infrastructure that raises productivity across sectors. The sectoral investment mix is also shifting, with urban infrastructure expected to account for almost half of the requirement through 2047, alongside continued investment across other key sectors. India's forward infrastructure pipeline will remain predominantly greenfield. Financing approaches will therefore need to evolve with changing commercial models and different stages of the project lifecycle.

It has been a privilege for BCG to collaborate with the National Bank for Financing Infrastructure and Development on this report, Channelizing domestic and global capital for infrastructure financing. The report examines India's infrastructure requirement, the capacity of different capital pools, and the instruments, enablers and processes through which capital can be deployed across the project lifecycle.

A key insight from this work is the importance of building a deeper pipeline of financeable projects. Around 30–31% of the FY26–47 requirement currently sits in sectors with a proven, bankable financing model. The report classifies sectors into four types based on financial viability and ecosystem maturity, providing a basis to understand where established models can be applied at greater scale and where financing structures or project economics can evolve further. Project preparation, demonstrated revenue mechanisms, risk allocation, approvals, project-level information and capital recycling can together support projects as they move through development, construction and operations.

The domestic capital landscape offers significant capacity across government, banks, insurers, pension funds, mutual funds, developers and sponsors, and UHNI and HNI capital. Existing pools, growing at current rates and within prevailing regulations, can fund a large part of the FY26–31 requirement. There is also additional investible capacity available within existing regulatory limits. Greater participation can be enabled by aligning infrastructure with the liability structures, risk appetites and investment horizons of different pools, while recycling capital from operational assets into new greenfield projects.

Global capital can complement these domestic sources. Global infrastructure capital is expanding, with infrastructure assets under management expected to grow at approximately 12% annually through 2030. Different pools can play distinct roles. Multilateral development banks and bilateral lenders are suited to greenfield and earlier-stage infrastructure, international commercial banks can finance construction and expansion-stage projects, while pension funds, insurers and sovereign wealth funds are natural owners of operating infrastructure. Project readiness, commercial bankability, currency risk, aggregation, asset recycling and credible exit pathways will shape how these pools participate in India.

There is also an opportunity to broaden the set of financing instruments and enablers used in India. Credit enhancement, InvITs, AIFs, private credit, securitisation and blended finance can play different roles as regulation, investor participation and the underlying asset base develop. Their ability to scale will depend on suitable and sufficiently standardised assets, a deep investor base, strong legal and market infrastructure, credible institutions and catalytic capital where required.

The opportunity ahead is to strengthen the infrastructure financing ecosystem so that projects, capital pools, instruments and institutions can work together more effectively. A deeper pipeline of financeable projects, greater participation across domestic and global capital pools, and more efficient capital recycling can support the scale of investment India will require through 2047 and contribute to the country's progress towards Viksit Bharat.

Executive Summary

India needs INR 680–770 trillion of investment through 2047, of which INR 168–172 trillion falls in the years till FY31, a critical element to achieving a USD 30 trillion economy by 2047. The Economic Survey 2025-26 assesses that every rupee of public capital expenditure generates 2.5 to 3.5 times its value in GDP over the medium term.

Shifting infrastructure demand and financing requirements

- The pattern of infrastructure demand will shift significantly in comparison to the past, and the financing playbook that helped the development over the last decade will not naturally extend to the sectors carrying the next two decades of demand. Urban infrastructure now accounts for almost half the total requirement through 2047, more than power, roads and rail combined. This matters because urban infrastructure projects come with different counterparties, different commercial models and different funding structures.
- Road development was delivered on a standardised model with NHAI as the central authority, toll-based revenue, and mature structures in BOT, HAM and TOT built for financing at scale. Urban infrastructure has none of those advantages as revenue comes from water, sanitation and transit services that are more price-sensitive. Individual projects are small and dispersed and ownership of these projects lies with multiple municipal bodies.
- The pipeline also skews heavily towards new construction, at roughly 80–85% greenfield against 15–20% brownfield. Greenfield projects have no operating history, financing continues to rely disproportionately on bank lending and Government capex, while many capital pools that cannot invest below AA remain outside the early stages.

Infrastructure financing gap and project pipeline constraints

- Of the INR 168–172 trillion required through FY31, INR 38–40 trillion has been financed, leaving an INR 130–132 trillion gap across three categories, each requiring a different solution.

- Approximately INR 78–80 trillion is yet to be translated into an announced project pipeline, and since capital cannot be committed against projects that do not yet exist on paper, the constraint at this stage lies in project origination.
- A further INR 31–32 trillion has been announced since 2023 and awaits financial closure to move into construction.
- The residual INR 21–22 trillion remains stalled, having been announced prior to 2023 and held up for reasons that lie largely outside the control of financiers or developers.

Existing capital pools and the residual funding gap

- Existing pools, growing at current rates and within current regulations, can fund most of the requirement, leaving a gap of INR 2–3 trillion annually.
- Central and state capital expenditure together account for 80–85% of the additional capital that domestic sources can supply, and both remain constrained by fiscal targets, with the Centre having budgeted a fiscal deficit of 4.3% of GDP for FY27.
- Institutional capital contributes less than its size would suggest, and the binding constraint differs by pool. Banks have limited incremental lending capacity and continue to fund long-tenor assets against shorter-tenor deposits.
- Insurers and pension funds hold liabilities of the tenor that infrastructure requires, yet remain concentrated in the highest rating band and prefer operational assets. Mutual fund portfolios are structurally short-dated. Developer equity is constrained by project economics that leave returns below corporate and private-equity hurdle rates.
- Private wealth faces a limited supply of investible products, alongside tax treatment that reduces post-tax returns. Closing the residual gap will therefore require either capital from outside these pools or a change in the terms on which the existing pools may invest.



Bankability constraints across infrastructure sectors

- Only about one-third of the FY26-47 requirement sits in sectors where a proven commercial model exists today, which makes the supply of bankable projects the first constraint on financing. Sectors may be classified on two considerations, whether the risk-adjusted return is viable on the asset's own earnings and whether the modalities for financing it are already established. Sectors are also evaluated across a third factor, the socio-economic return, that assesses whether a project creates overall benefits for the society and the economy to justify public investment.
- Category A sectors, which are financially viable with established financing modalities, account for about 34-36% of the requirement, are already financed at scale. National highways, renewable generation, transmission, telecom, major airports and ports each offer a solvent counterparty, a standard contract enforceable on default, and enough transaction precedent for lenders to price risk.
- A further 2-3% of the requirement sits in Category B sectors, which are viable but lack established financing modalities. Haulage on the general rail network is cost-recovering, but the revenue sits in the Ministry of Railways' consolidated accounts, so there is no ring-fenced entity for a lender to underwrite.
- Category C sectors, at 5-6%, present the converse position. Financing modalities are established, but the risk-adjusted return is not viable on asset earnings alone. State highways, solid waste management and sanitation therefore depend on public support to bridge the gap, whether through annuity payments or viability gap funding, and payment risk continues to rest with state entities and municipal bodies.
- The largest share of the requirement, 55-57%, falls in Category D sectors, which offer neither viability nor established financing modalities. Metro fares do not cover operating cost or debt service, water tariffs are set below the cost of supply, and irrigation and

river linking carry no user charge. Public funding consequently remains the primary route for financing these assets.

Enforceable payment obligations unlock private capital

- Where the payment obligation is made enforceable, private capital follows it irrespective of the size of the public contribution.
- A waste-to-energy project in Andhra Pradesh bound multiple urban local bodies, through a lead body, into a single payment obligation and sold power under a twenty-year must-run agreement, on the strength of which lenders and sponsors funded construction in full.

Capital recycling, market infrastructure and revenue certainty

- The same capital base finances assets through both construction and operation, so new construction depends on balance-sheet growth rather than on turnover of the existing book.
- Banks' liabilities are short-term deposits, yet continue to hold exposure through an operating life that requires 20-to-25-year capital. The intended pattern is for completed assets to transfer to long-term investors, releasing lender capital for fresh construction. Securitisation, the corresponding route for lender loan books, remains constrained.
- Supporting market infrastructure is also underdeveloped, with no central data repository. NaBFID is now working to resolve this.
- Revenue certainty and transparent risk pricing are the further conditions that private capital assesses before committing. Revenue has to service an investor's return, not merely cover operating cost, so property tax, water charges and similar levies need to be addressed.

- Even where revenue exists, the terms rarely hold for the life of the asset, since tariff revision is discretionary and escalation is not always indexed to inflation. Transparent risk-based pricing is also unavailable outside the more established sectors, and where benchmarks, yield curves and credit data are thin, capital pools default to the safest available paper and leave the remainder of the market unpriced.

Undeployed domestic capital and channel-specific constraints

- Domestic pools hold approximately INR 2–3 trillion of investible capacity permitted under existing regulations that remains undeployed. Beyond this headroom, each channel faces a specific constraint. Banks' credit-deposit ratio has risen from 73.5% to 83.4% over four years, infrastructure credit grew 9.2% in FY26, relatively slower than other categories. Approximately 76% of bank infrastructure exposure was in power and roads as of June 2025.
- Insurers and pension funds hold the liability profile that infrastructure requires, but their effective investible universe is narrower than their formal mandate, and they remain concentrated in AAA even though IRDAI permits AA and provides an infrastructure route down to A with EL1. Their preference for operational assets also sits against a pipeline that is 80–85% greenfield. Mutual funds are structurally short-dated with approximately 73% of open-ended debt AUM in overnight-to-short-duration categories and under 1% in long-duration funds. For private wealth, InvIT interest distributions are taxed at the applicable slab rate against 12.5% on long-term listed equity gains, which weakens post-tax competitiveness.
- Several of these constraints are addressable through capability rather than regulation. Since unused AA headroom already exists, the direct lever is to build the credit-assessment and monitoring capability needed to hold AA paper with confidence, and for pension funds, comfort with the wider universe that PFRDA permits.
- Product-level approvals can open channels quickly, as EPFO's first InvIT investment of INR 2,035 crore in NHAI's National Highways Infra Trust followed the Central Board of Trustees' 2024 approval of PSU-sponsored InvITs. IRDAI's new route permitting

insurers to hold debt of operational infrastructure SPVs, with single-SPV exposure up to 20%, avoids the 3% InvIT cap and corresponds to the risk profile insurers prefer.

Global infrastructure capital and India's competitive position

- Global capital is reallocating towards infrastructure, but India competes for it against markets that already hold most of it.
- Infrastructure AUM (in alternates) has grown from USD 80 billion in 2005 to USD 1.8 trillion in 2025 and is expected to grow at 12% annually to 2030, though North America and Europe together accounted for 82% of global infrastructure AUM as of Q1 2024.
- Multilateral development banks and bilateral lenders can carry development and execution risk, which suits greenfield and early-stage infrastructure, though they require demonstrated readiness before sanction, with some banks' checklist calling for at least 30% of tendering to be complete and other players reported as having required 80% of land acquisition done prior.
- Sovereign wealth funds, pension funds and insurers enter once assets are operational and de-risked and require credible monetisation routes even over multi-decade holding periods.

Infrastructure financing instruments and market constraints

Three instruments and enablers have the potential to scale in India while two currently remain underdeveloped.

1. Partial Credit Enhancement can help lower-rated bonds access institutional capital. Infrastructure Risk Guarantee Fund could reduce construction-stage financing risk.
2. InvITs can recycle mature operating assets and release capital for new infrastructure investment, meaningful scale is being established in India.
3. AIFs and Private Credit can channel long-term institutional capital into infrastructure.

- Some instruments remain constrained by deeper market constraints. Securitisation remains limited as a route to institutional capital. Credit Default Swaps lacks sufficient underlying credit depth and liquidity.

Conclusion

India's infrastructure capital expenditure requirement through FY31 exceeds what existing pools of capital can supply. Disaggregated across sectors and across pools, however, the shortfall is not a single shortage of capital but a set of specific mismatches between what projects require and what each pool is able to provide. Fiscal ceilings bind public capital and credit-deposit ratios bind banks, while insurers and pension funds are bound by liability matching and corporate capital by its hurdle rate.

Addressed in those terms the problem becomes tractable.

Projects will have to be originated and structured to reach a fundable state rather than an announced one. Public capital will have to realign towards the sectors that cannot yet attract private capital, and to rotate faster once assets are built. Institutional pools will have to be equipped to use the headroom they already hold. Global capital will have to be met with the project readiness, exit visibility and certification architecture it requires. None of this falls to a single actor, and it will require coordinated action across regulators, Government and institutional investors.



Build a sustained pipeline across the project lifecycle to enable capital and investor rotation

Around INR 78-80 trillion of FY26-31 requirements are yet to translate into an announced pipeline. Bringing forward new projects and keeping existing projects progressing across the lifecycle can create a sustained pipeline across stages, enabling capital and investors to rotate as project risk changes.



Deepen capital available at each lifecycle stage through financing instruments and enablers

More capital can compete for investible projects at each stage when financing instruments and enablers are suited to different investor risk, return and tenor requirements. Credit enhancement, guarantees, InvITs, securitisation, AIFs and private credit can enable participation across different investor risk-return profiles.



Develop viable commercial models and payment structures, particularly for urban infrastructure

Only 34-36% of FY26-47 requirements sit in sectors with proven bankable financing models. In sectors such as urban infrastructure, clear payment obligations, reliable revenue mechanisms such as tariffs or annuities, and viability gap funding where needed can make more projects financeable.



Improve market efficiency through standardisation, stronger underwriting and better information

Newer sectors lack comparable operating histories, standard contracts and agreed risk metrics. Standard contracts, clearer risk allocation and common performance benchmarks can strengthen underwriting. Separately, an infrastructure data platform can reduce information asymmetry and improve project benchmarking.



Align government and regulatory enablers to widen domestic and global capital participation

Government and regulators are already widening investment routes, while INR 2-3 trillion of domestic institutional capacity remains undeployed within existing regulatory limits. Greater use of this headroom and stronger credit-assessment capability can support domestic deployment. For global capital, project readiness, long-tenor currency hedging and credible exit pathways remain key enablers.

Source: BCG Research

01

The Scale of the Challenge

India's Infrastructure Financing Gap

1.1 Sizing India's infrastructure requirement through 2047

India has set a vision for a USD 30 trillion economy by 2047. It needs infrastructure to be built ahead of growth

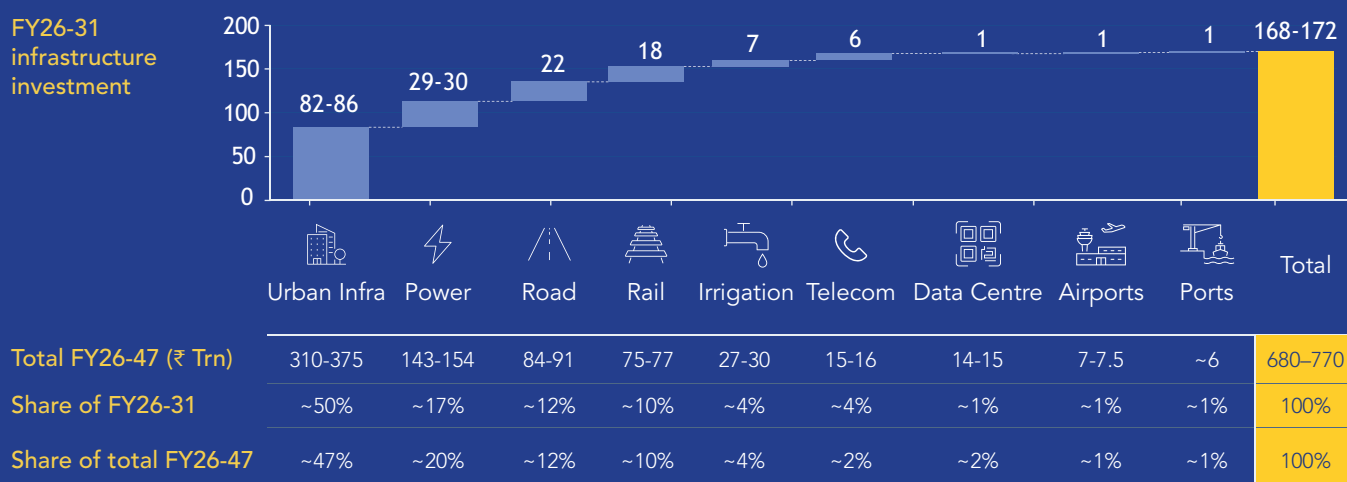
India is targeting a USD 30 trillion economy by 2047 – a sevenfold increase in GDP from USD 3.9 trillion in FY26.¹ For India to achieve this ambition, strong infrastructure build will be a critical enabler. Urbanisation, energy security, and universal connectivity, which are pillars of Viksit Bharat 2047 ambition, all depend on infrastructure assets that need to be developed.

Infrastructure development has a multiplier effect on GDP growth – the Economic Survey 2025-26 assesses that every rupee of public capital expenditure generates 2.5–3.5x in GDP over the medium term, lowering the cost of doing business and raising productivity across sectors.² It is also a catalyst for social transformation enabling access to education, healthcare, sanitation and mobility making it central to the inclusive dimension of the Viksit Bharat 2047 vision.



1. MoSPI - PIB Press Release, Provisional Estimates (PE) of Annual Gross Domestic Product (GDP) for the Financial Year (2025-26) and Quarterly Estimates of GDP for the Fourth Quarter (Q4, January-March) of FY 2025-26, June 2026
2. Economic Survey 2025-26

Exhibit 1.1 | Infrastructure requirement from key segments



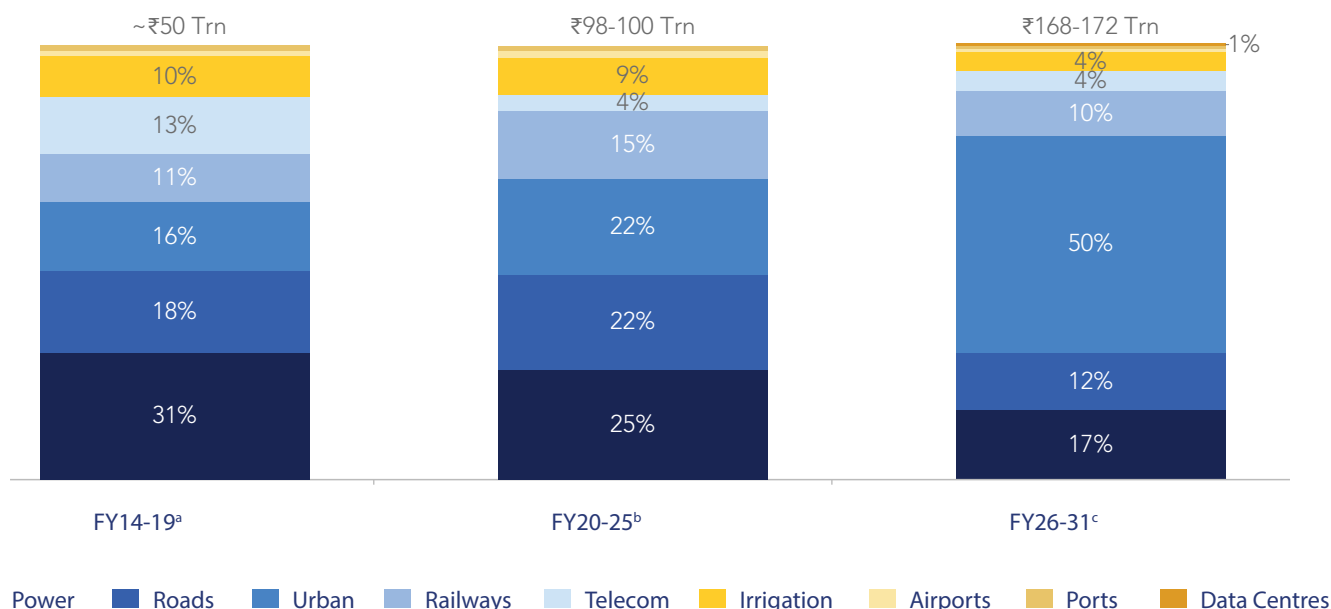
Source: NaBFID-ICRA Research - Catalysing Infrastructure Investment & Innovation: Towards Viksit Bharat 2047, 2025

The total infrastructure investment requirement is INR 680–770 trillion through 2047

through 2047³, with INR 168–172 trillion needed from FY26- FY31.⁴ Urban infrastructure⁵ dominates on scale, accounting for almost half the total requirement, more than power, road, and rail combined.

Exhibit 1.1 charts the total infrastructure requirement to achieve the Viksit Bharat vision at INR 680–770 trillion

Exhibit 1.2 | Trends in sectoral share of capex



Source: National Infrastructure Pipeline (NIP); NaBFID-ICRA – Catalysing Infrastructure Investment & Innovation: Towards Viksit Bharat 2047, 2025

a. Sectoral share as per NIP

b. Sectoral share as projected by NIP

c. Sectoral share as projected by NaBFID-ICRA research

3. NaBFID-ICRA – Catalysing Infrastructure Investment & Innovation: Towards Viksit Bharat 2047, 2025

4. FY26–31 requirement derived by adding one year of spending at the FY31–47 annual run-rate to the published FY26–30 figure

5. Urban infrastructure includes urban transport (urban roads, Regional Rapid Transport System, Metro, EV stations, etc.), water supply & sanitation, solid waste management, social infrastructure incl. education and healthcare

The pattern of infrastructure demand will shift significantly in comparison to the past

As shown in Exhibit 1.2, between FY15 and FY25, roads and power segments accounted for almost half of the infrastructure capex share but the requirement going forward is shifting and urban infrastructure will now be the single largest requirement till 2047.

This matters because urban infrastructure projects come with different counterparties, different commercial models, and different funding structures from roads or rail or power segments. The financing playbook that helped the development of these segments over the last decade will not naturally extend to the sectors carrying the next two decades of demand. For example, road development was predominantly driven in the national highways segment with a standardised model. NHAI acts as a central authority combining toll-based user-pay revenue, with BOT, HAM and TOT structures for financing and monetization at scale, and has revised its concession agreements repeatedly into a standard template.

Urban infrastructure has none of these advantages as the revenue comes from diverse services such as water, sanitation, and transport services that are more price-sensitive, individually the projects are small and dispersed, and ownership of these projects lies with multiple municipal bodies rather than a single central agency. Annuity-based structures like HAM are evolving in some sub-sectors such as water and sanitation but these remain isolated transactions rather than standardised, sector-wide models. The commercial

model for financing such infrastructure is therefore still evolving.

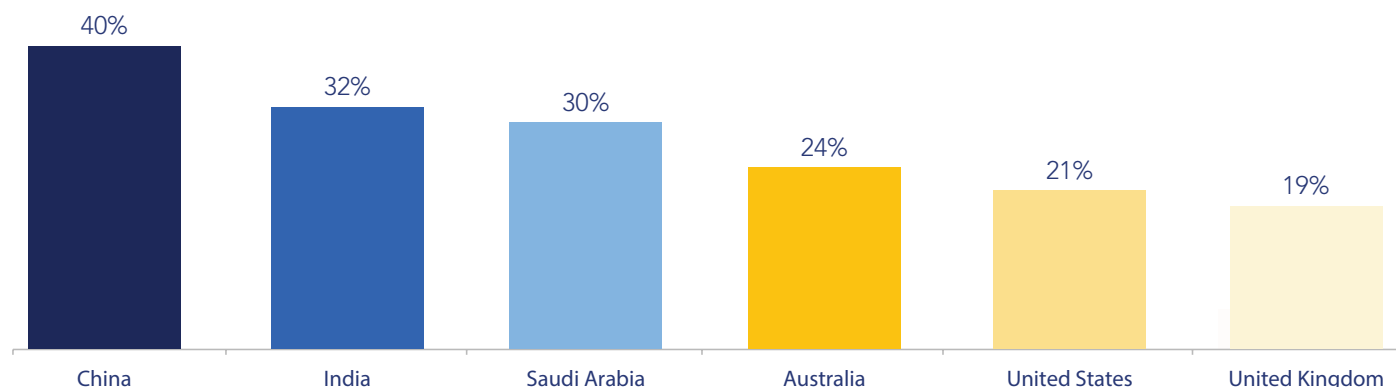
Beyond the shifting pattern among established infrastructure sectors, new sectors such as data centres and nuclear power are now emerging and are expected to grow rapidly. Data centre capacity is expected to triple by FY30, requiring INR 1.2–1.5 trillion of investment, close to 1% of the FY26–31 requirement⁶, while nuclear capacity is targeted to more than double by FY31, and ten-fold by 2047.⁷ Every new sector comes with its own nuances, and risks that challenge the conventional appraisal process.

The new pattern of infrastructure investment demand requires a change in capital sourcing and deployment strategies. This is a key theme that will be explored through the report.

India's future pipeline will continue to be dominated by greenfield projects

India's future infrastructure pipeline skews heavily toward new construction rather than expansion or refinancing of existing assets at roughly 80-85% greenfield against 15-20% brownfield.⁸ According to World Bank, nearly 70% of the urban infrastructure that India will need by 2047 is yet to be built.⁹ In roads segment, ICRA estimates that approximately 53,000 km of greenfield national highway construction is projected between 2025 and 2037, an addition of over a third to the existing 146,195 km network before new construction moderates and brownfield lane augmentation becomes the priority.¹⁰

Exhibit 1.3 | Gross Fixed Capital Formation (GFCF) as % of GDP, 2025



Sources: World Bank

6. NaBFID-ICRA – Catalysing Infrastructure Investment & Innovation: Towards Viksit Bharat 2047, 2025

7. Department of Atomic Energy; Nuclear Energy Mission, Union Budget 2025-26; PIB: A New Chapter in India's Nuclear Journey

8. BCG research; GlobalData PLC

9. World Bank, Gearing up for India's Rapid Urban Transformation, 2024

10. NaBFID-ICRA – Catalysing Infrastructure Investment & Innovation: Towards Viksit Bharat 2047, 2025

This reflects the stage of India's development. As shown in Exhibit 1.3, India directs a materially higher share of output to capital formation than mature economies, at levels comparable to economies still building out their infrastructure networks. Mature economies invest less because their networks are substantially complete, so a larger share of their investment goes to upgrading rather than new construction.

Greenfield projects are inherently riskier than established operating infrastructure assets, as they are exposed to construction, land acquisition, and utilization ramp-up risks. Long-term patient capital, which requires stable and predictable cash flows, therefore does not usually participate at this stage, and financing leans disproportionately on bank funding and Government capex apart from private sector equity funding.

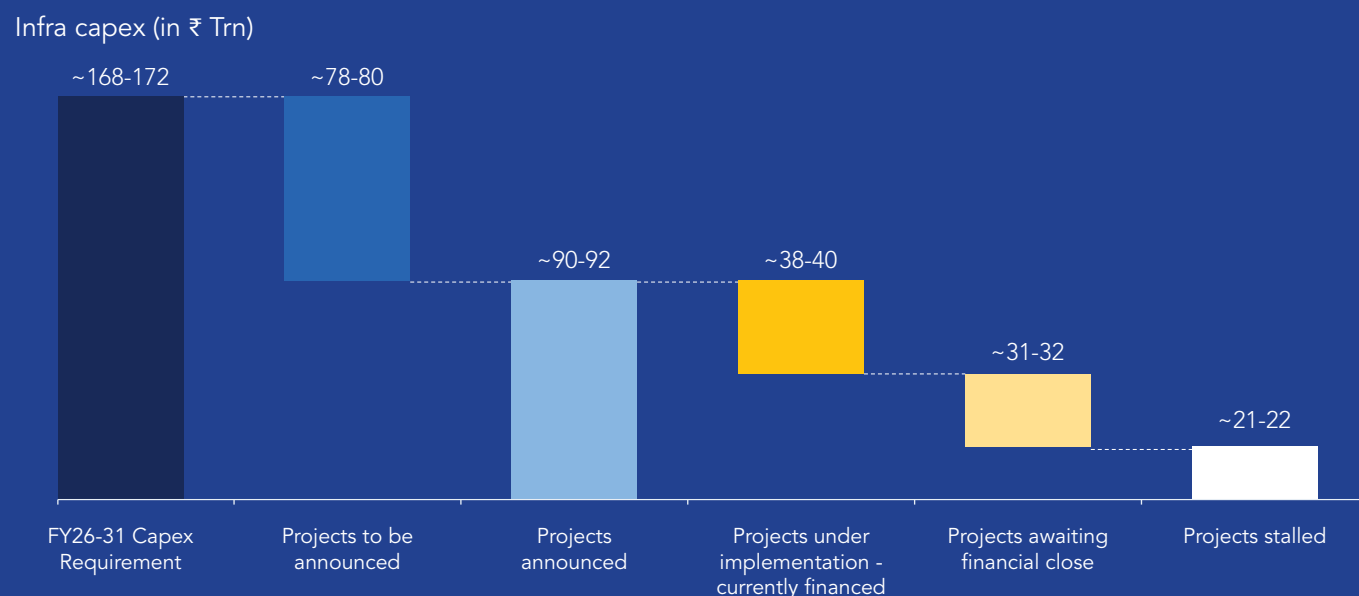
1.2 FY26–31 financing gap: Sources and Challenges

Of the INR 168–172 trillion need until FY31, only INR 38–40 trillion has been financed to date, with projects accounting for a further 18% of the need expected to reach financial closure over FY26–31.

Projects are classified by status – unannounced (implied by sectoral demand but not yet listed in any pipeline), announced-awaiting-funding (listed and appraised but not at financial close), and stalled (delayed beyond original timeline) using PAIMANA's project-level tracking as the basis for the funding-stage classification.

The detailed methodology is laid out in appendix 1.

Exhibit 1.4 | Project pipeline against FY26-31 infrastructure capex requirement



Sources: BCG Research; NaBFID-ICRA Research - Catalysing Infrastructure Investment & Innovation: Towards Viksit Bharat 2047; PAIMANA, Ministry of Statistics & Programme Implementation¹¹

11. Project Assessment Infrastructure Monitoring and Analytics), the Ministry of Statistics and Programme Implementation's project-tracking database

As highlighted in Exhibit 1.4, there is a ~INR 130-132 trillion demand-side gap across three categories until FY31, each requiring a different solution:

- **~INR 78–80 trillion: Projects awaiting announcement.**

The priority here is identifying the right projects, structuring them for private-sector financing, and sequencing implementation based on financing availability.

- **~INR 31 – 32 trillion: Projects awaiting financial closure.** Announced since 2023, they are still awaiting financial close to move into construction.

- **~INR 21–22 trillion: Projects stalled.** Announced pre-2023, these have not progressed to financing for reasons largely outside the control of financiers or developers

Under National Infrastructure Pipeline (NIP), 1,139 of 13,984 approved projects were under implementation as of August 2025.¹²

1.3. Sources of supply-side capital and potential gap between demand and supply of infrastructure finance for the next 5 years

As demand materializes, private capital will need to play a major role in financing.

Existing pools, growing at current rates and within current regulations, can fund a large part but not all

the FY26–31 requirement. Of the INR 168-172 trillion required through FY31, INR 38–40 trillion is already funded and progressing to implementation. The remaining requirement of approximately INR 130-132 trillion is what the supply side has to meet.

As shown in Exhibit 1.5, Central and State capex together account for 70-75% of additional capital that domestic sources can supply. Government capital expenditure has been the principal source of infrastructure financing to date, and it has been rising in absolute terms, yet its share of GDP has stayed close to 3% in recent years.¹³ The Centre is committed to reducing debt from 55.6% of GDP in FY27 to 50±1% by FY31, which in turn caps the fiscal deficit, budgeted at 4.3% of GDP in FY27 against 4.4% in FY26. Within that constraint, capex competes with other committed spending, limiting scope to increase capex as a share of the GDP. States are similarly constrained – the 16th Finance Commission has set an annual fiscal deficit ceiling of 3% of GSDP for each state over the FY27 to FY31 period, and most states are already budgeting at or near that level, so additional borrowing for capital expenditure has little headroom.¹⁴ Government capex on infrastructure is projected to average INR 16-18 trillion a year over FY27-31. Any spending above that level would widen the fiscal deficit, and therefore limits further Government investment.

Banks' credit-deposit ratio has climbed from 73.5% in June 2022 to 83.4% by June 2026, so incremental lending now depends on the pace of deposit growth. Tenor mismatch is a further constraint, since banks fund infrastructure loans of 10 to 15 years with deposits of three to four years. Insurers, pension funds and mutual funds face constraints of their own. For developer and sponsor equity, the binding constraint is return on offer, because project economics in

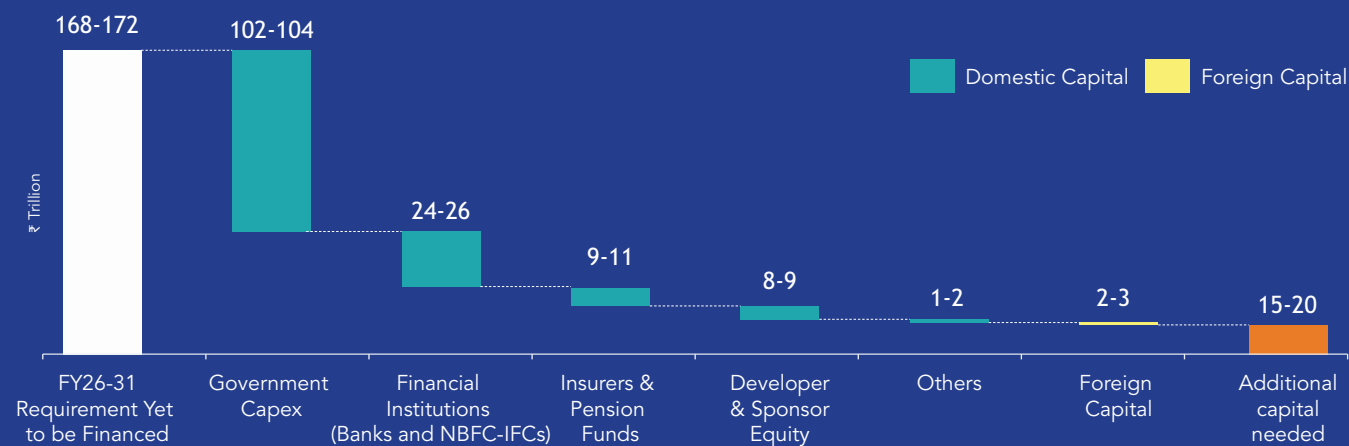
12. NaBFID-ICRA Research - Catalysing Infrastructure Investment & Innovation: Towards Viksit Bharat 2047, 2025

13. NaBFID-ICRA Research - Catalysing Infrastructure Investment & Innovation: Towards Viksit Bharat 2047, 2025

14. RBI State Finances 2025-26



Exhibit 1.5 | Capital available for infrastructure against the FY26–31 requirement



Sources: Union Budget 2026-27; Crisil Intelligence; RBI; IRDAI Annual Reports 2020-21 to 2024-25 and Handbook on Indian Insurance Statistics; PFRDA; SEBI Annual Report 2025-26 and AMC portfolio disclosures; DPIIT; ICRA; BCG Research

several sectors leave equity returns below corporate and private-equity hurdle rates, and greenfield projects load land, approval and construction risk onto sponsor equity before cash flows are established.

The gap of INR 5-10 trillion remains as the residual once each existing pool has invested to the limit of prevailing regulations. Closing it will require capital from outside these pools, or a change in the terms on which the existing pools may invest. Chapters 3 to 5 examine both in detail.

1.4 What this report covers

This report primarily focuses on issues and roadmap with respect to mobilizing private sector capital to meet India’s infrastructure demand on the path to Viksit Bharat 2047. It sets out where the gap between requirement and available capital can be closed, and what should change for capital to reach the assets that need it.

The financing requirement is assessed across sectors and anchored based on the shift in the demand curve going forward. Financing capacity is assessed across each capital pool as limiting factors differ materially across, for example, fiscal ceilings for public capital, credit-deposit ratios for banks, asset-liability matching for insurers and pension funds, and return thresholds for corporate capital. Disaggregated this way, the gap is not a single shortfall of capital but a set of specific mismatches between what projects require and what each pool is able to provide.

Addressing those mismatches requires institutional arrangements for ease and facilitation of infrastructure investment. Determining which arrangements are needed requires an understanding of the infrastructure financing ecosystem and how capital travels to an infrastructure asset in India. As the exhibit highlights, a project begins at origination, where borrowers, public or private, conceive, structure and bring it to market. Capital is priced against the entity raising it, so the same asset attracts different

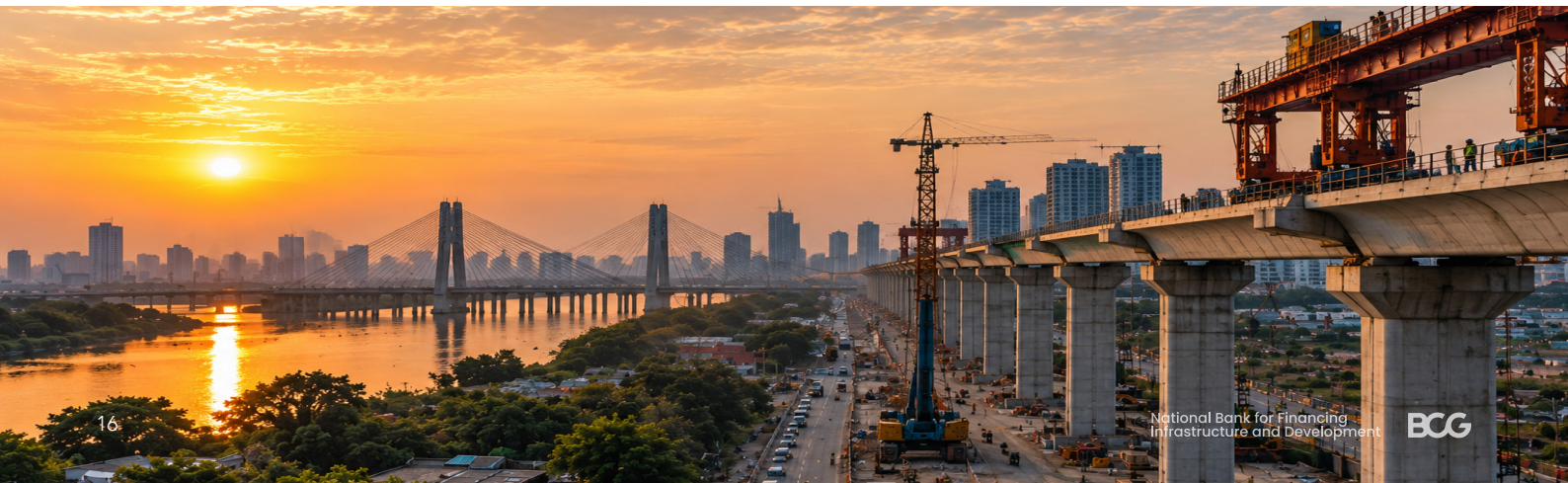
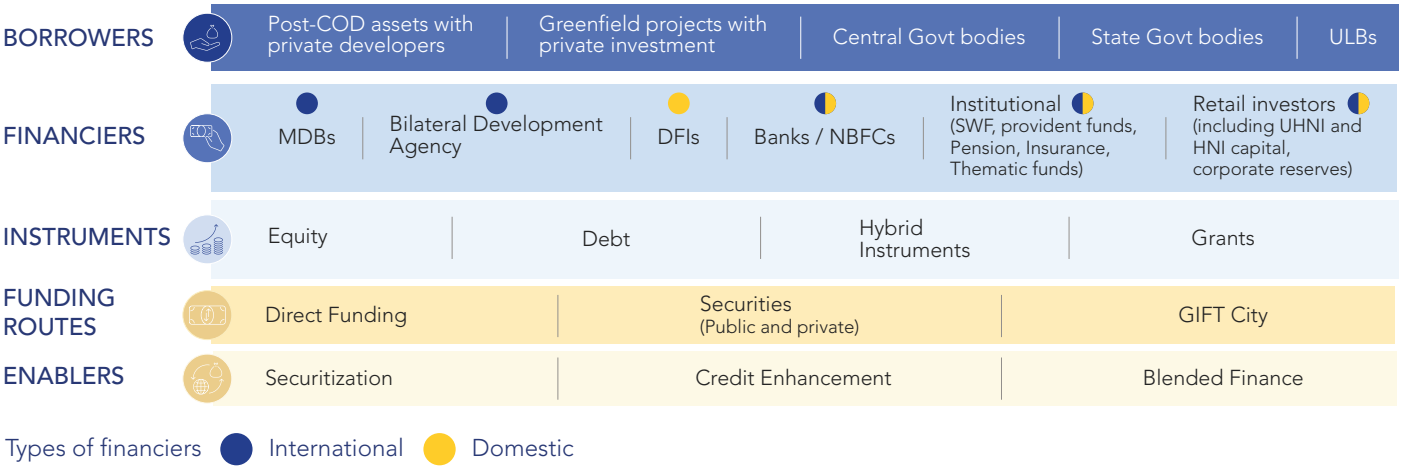


Exhibit 1.6 | Indian infrastructure financing ecosystem



terms depending on who is borrowing. At appraisal and financial close, financiers enter, and which pool participates depends largely on whether the asset is still under construction or already operating. The instrument determines the form the capital takes at that point, for example, equity and project finance debt during construction, bonds and refinancing once revenue is established. The funding route determines where the exposure is held directly or in a listed domestic security, or offshore through GIFT City. Securitization, credit enhancement, and blended finance mechanisms act as enablers at relevant places.

The report works through these layers in that order. Chapter 2 address constraints that limit projects reaching a fundable state. Chapters 3 and 4 address constraints that limit deployment by domestic and global financiers despite the capacity available. Chapters 5 and 6 address instruments and processes through which capital can be deployed with Chapter 5 examining each mechanism and Chapter 6 lays out the key themes that could support unlocking capital for infrastructure financing.



02

Constraints on Infrastructure Financing

The Structural Gaps Behind India's Shortage of Fundable Projects



Chapter 1 showed investment needs shifting towards Power, Airports and Urban Infrastructure. The nature of funding will require a shift as most of the forward requirement sits in many sectors without the proven, bankable models that carried last decade's build-out. The first constraint is therefore not capital but the supply of bankable projects that reach sanction and award and carry payment obligations institutional investors can hold.



Exhibit 2.1 | Structural gaps across the infrastructure project lifecycle

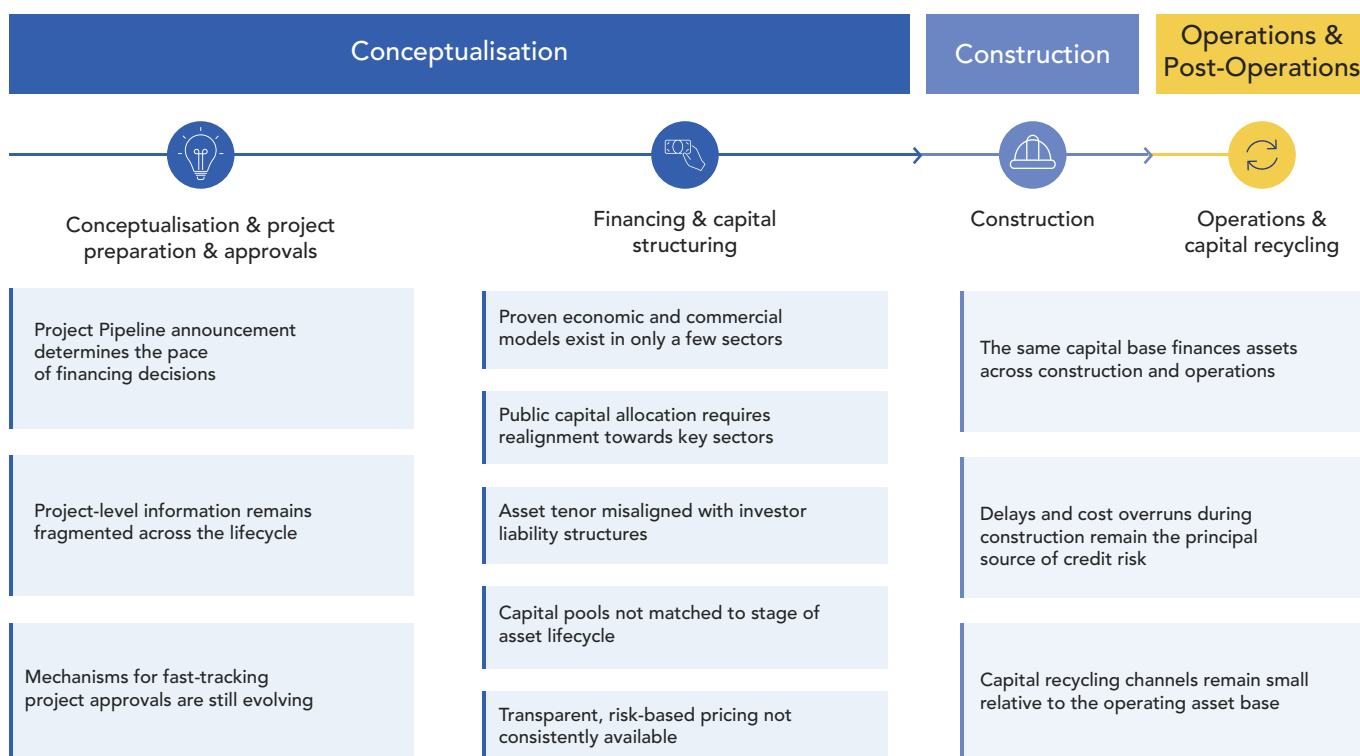


Exhibit 2.1 summarises the structural gaps across the infrastructure lifecycle. Each is discussed in detail through the chapter. Gaps across development centre around pipeline visibility and approvals, financing on the availability of workable modalities and bankable structures, and construction and operations on the capacity to recycle capital.

2.1 Proven economic and commercial models exist in only a few sectors

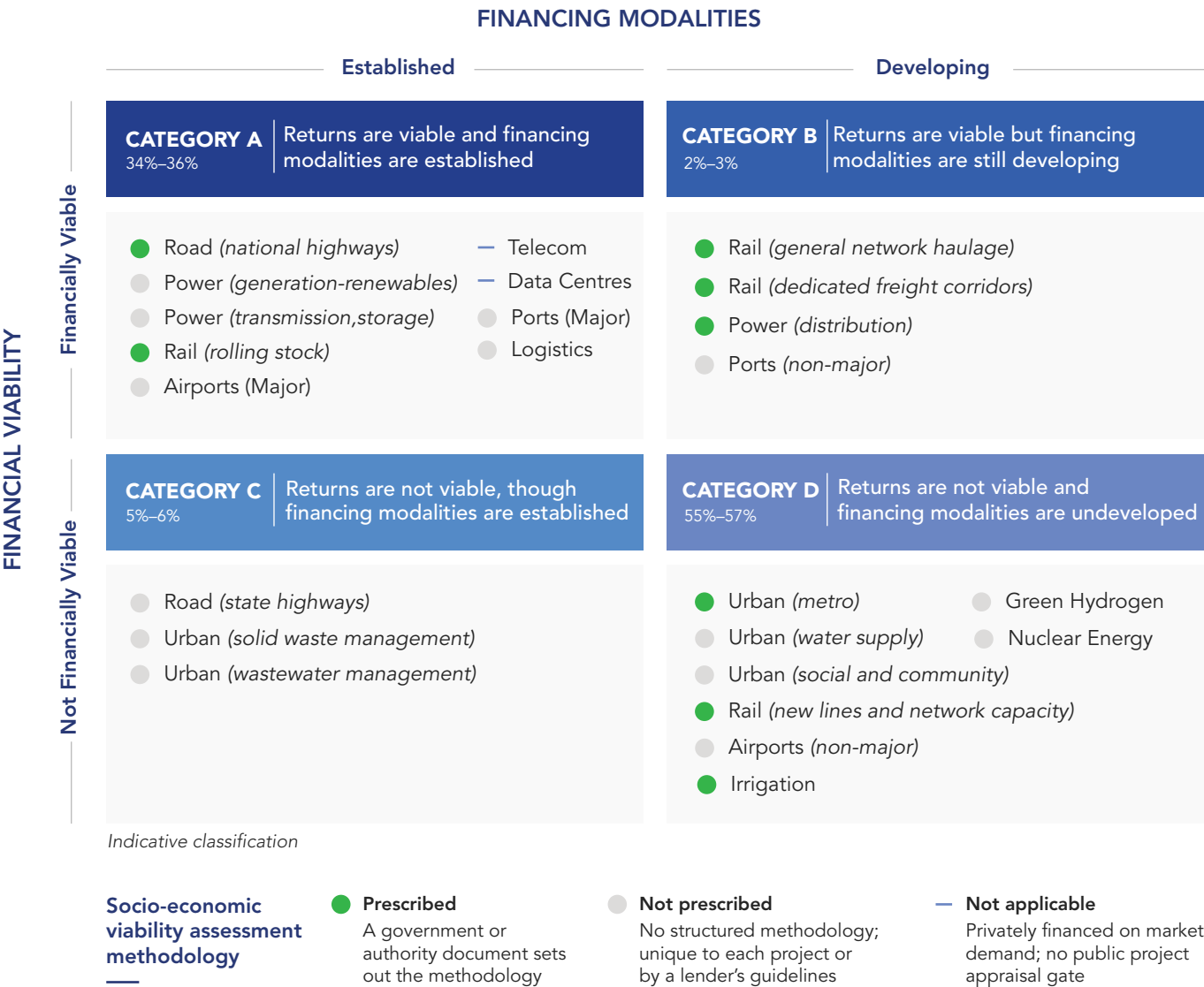
Only 34–36% of India's FY26–47 requirement sits in sectors with a proven, bankable financing model today. The rest needs either a new financing structure or a change in project economics before private capital participates.

Three factors determine how a sector is financed:

- 1 Financial viability** – whether the asset generates a risk-adjusted return that is viable.
- 2 Financing modalities** – whether that return has been converted into an obligation a lender can enforce, which requires a counterparty able to pay and a contract that specifies who bears which risk – Model Concession Agreement (MCA) in highways, Power Purchase Agreement (PPA) in renewables or Operation, Management and Development Agreement (OMDA) in airports, and a forward pipeline such as National Monetization Pipeline, Bharatmala or the Solar Energy Corporation of India (SECI) auction calendar.
- 3 Socio-economic impact** – whether the project creates enough overall benefits for society and the economy to justify its costs. It is measured by the economic internal rate of return (EIRR), which counts benefits the project does not earn as revenue – time saved, higher agricultural output, improved health outcomes, reduced accidents or emissions.

Infrastructure sectors can therefore be classified across four categories based on the first two factors.

Exhibit 2.2 | Indicative classification of sectors based on financial viability and financing modalities



X% — Share of FY26–47 infrastructure capex requirement
Source: BCG Research

Category A – Financially viable, financing modalities established. 34-36% of the requirement.
The risk-adjusted return is viable and has been converted into a financeable instrument – a solvent, identifiable counterparty, a standard contract enforceable on default, and a pipeline with sufficient precedent for lenders to price risk against.

Category B – Financially viable, financing modalities still developing. 2–3% of the requirement.
The risk-adjusted return is viable, and the underlying payer is mostly creditworthy; but the conditions and setup enabling the flow of financing is still evolving. For example, funding appraisal methodology or information for pricing risk appropriately is not well established or the project/financing terms and conditions are yet to be standardized.

Category C – Not financially viable, financing modalities established. 5–6% of the requirement.
Financing modalities are established in the sector, but viability and risk-adjusted return profile of the projects is not attractive enough for funding.

Category D – Not financially viable, financing modalities undeveloped. 55–57% of the requirement.
The risk-adjusted return is not viable, so no reliable claim exists for a lender to structure, irrespective of counterparty or contract design. However, many of these projects are high on socio-economic impact.

Many infrastructure sectors with overall project viability and established funding modalities still depend on government capex support.

These sectors are ripe for private capital investment and need instruments to recycle capital out of operating

assets, so that government funds can be used in other categories.

Sector	Counterparty	Standard Contract	Pipeline	Details
Roads (National Highways)	National Highways Authority of India (NHAI)	Model Concession Agreement (MCA) / Hybrid Annuity Model (HAM) contract	Bharatmala Pariyojana	Government funds all construction under EPC, the model for most projects, and 40% under HAM, which guarantees annuity payments regardless of traffic. HAM was 25–30% of MoRTH awards in FY24. ¹⁵ TOT auctions and InvITs monetise operating assets.
Power (Generation - Renewables)	Solar Energy Corporation of India (SECI) / National Thermal Power Corporation (NTPC)	Auction-discovered PPAs (Power Purchase Agreement), 25-year term	SECI / NTPC auction calendar	Public counterparty guarantees payment irrespective of offtake. Default model for new utility-scale renewable capacity, PPAs guarantee reliable payments over 25 years. ¹⁶
Power (Transmission)	POWERGRID state discoms	Transmission Service Agreement (TSA)	National Electricity Plan (Transmission) to 2032	Public counterparty assures cost recovery on line availability rather than usage. Inter-state transmission, awarded through tariff-based competitive bidding, accounts for around 72% of planned transmission capex, so the enforceable model covers most of the spend. ¹⁷
Power (Storage)	SECI, NTPC; state discoms	Battery Energy Storage Purchase Agreement (BESPA); standard PSP (Pumped Storage Project) PPAs	National Electricity Plan (Storage) to 2032	Public counterparty pays for capacity kept available regardless of dispatch. Private developers including Greenko, Torrent and Tata Power won 1,344 MW of pumped storage in a SECI auction in July 2026, on a build-own-operate basis. ¹⁸
Telecom (incl. data centres)	End user (subscribers, enterprise customers, hyper-scalers)	Direct commercial contract with customer	Not centrally sanctioned	Privately owned and financed. User-pay revenue with no public counterparty needed
Airports (major)	Airports Authority of India (AAI)	Operation, Management and Development Agreement (OMDA)	National Monetization Pipeline (NMP) 2.0	Government provides the asset and takes a revenue share, with no payment obligation. OMDA guarantees a regulated tariff plus a share of retail and duty-free revenue for 30–50 years; viability rests on land as well – non-aeronautical revenue is major revenue driver. ¹⁹
Ports (major)	Major Port Authority, e.g. Jawaharlal Nehru Port Authority (JNPA)	Landlord concession agreement, ~30-year term	Ministry of Ports, Shipping and Waterways (MoPSW) Public-Private Partnership pipeline	Government provides the asset and takes a revenue share, with no payment obligation. JNPA has operated fully under this model since July 2022; landlord concessions guarantee cargo-linked revenue share. ²⁰
Rail (freight terminals)	Private operators (own/lease terminals)	Commercial freight tariffs, terminal leases	Ongoing — 79 private freight terminals ²¹	Privately owned and financed on the operator's own balance sheet, against its own freight revenue.

15. MoRTH annual report FY2024

16. Central Electricity Authority (CEA), Monthly Installed Capacity Report, Nov 2025

17. Ministry of Power – National Electricity Plan (Transmission), Oct 2024

18. SECI – RfS for Pumped Storage Plants (PSP-I), Dec. 2025

19. AERA – Delhi Airport OMDA

20. MoPSW PIB – Maritime India Vision 2030, Jul 2026

21. Ministry of Railways, Annual Report 2024-25

Sector	Counterparty	Standard Contract	Pipeline	Details
Rail (rolling stock)	Indian Railway Finance Corporation (IRFC)	IRFC Standard Lease Agreement, 30-year cost-plus finance lease	Annual rolling stock procurement plan	IRFC leases rolling stock to the Ministry of Railways on a cost-plus finance lease, so its debt is backed by the government, not by the freight the wagons carry.
Logistics (warehousing and multi-modal logistics)	End user (third-party logistics, e-commerce); National Highways Logistics Management Limited (NHLML)	DBFOT-based (Design, Build, Finance, Operate and Transfer) MCAs for multi-modal logistics parks	Bharatmala Pariyojana – 35 park locations	Five multi-modal parks have been awarded under standard concession, due to be operational by FY27. ²² Warehouses are privately owned and financed against occupier lease rentals, with no public payment obligation.

Category B sectors – account for 2-3% of the FY26–47 requirement

Risk-adjusted return is feasible in these sectors; however, financing modalities need to be enhanced.

Sector	Counterparty	Standard Contract	Pipeline	Details
Rail (General network freight haulage)	Revenue consolidated within Ministry of Railways	Haulage charges are commercial not project-specific	No vehicle exists to finance a defined slice of network capacity	Freight haulage earns an operating surplus, but revenue sits within the Ministry of Railways' consolidated accounts with no ring-fenced vehicle for a lender to underwrite.
Rail (Dedicated freight corridors)	Dedicated Freight Corridor Corporation of India Limited (DFCCIL) – ring-fenced SPV	Track Access Charge (TAC) agreement – no concession template for private participation	Eastern & Western Dedicated Freight Corridors largely built; no pipeline of future corridors	TAC has not attracted commercial capital – revenue is limited to track access
Ports (non-major)	State maritime boards	BOOT (Build-Own-Operate-Transfer) concession agreement	State level; not centrally sanctioned	Operating assets with an established cargo base are privately financed and trade at commercial valuations; limited private-sector participation in new greenfield tenders.
Power (distribution)	End consumers billed by the licensee; state discoms	Distribution franchisee agreements	State-level privatisation and franchisee awards	Licensees bill consumers directly, and retail tariffs now nearly cover the cost of supply. Each state structures privatisation separately, so lenders have no standard licence terms to price against.

22. MoRTH/PIB – Multi-Modal Logistics Parks, April 2025



Success Case Study: Brazil rail freight: Letting concessionaires fund new lines from existing freight revenue

Brazil faced a similar situation. Its rail freight concessionaires earned enough on their own traffic to support investment, but expansion required a public concession auction, which left them no way to build against those earnings. Its 2021 Legal Framework of Railroads let existing concessionaires build and own new lines against their own freight earnings. In October 2022 alone, the National Land Transport Agency approved five such contracts worth BRL 16.7 billion.²³ The constraint was never economics or counterparty quality, but it was the absence of a route to pledge existing revenue against a defined asset.

Category C sectors – account for 5-6% of the FY26–47 requirement

Risk-adjusted return is not viable on asset's earnings alone, but government support can lead to private capital participation with established financing modalities.

Sector	Counterparty	Standard Contract	Pipeline	Details
Roads (State highways)	State Public Works Department / state road development corporation	Planning Commission MCA for Annuity Projects; state HAM variants	State road development programmes, by individual states	Toll revenue is insufficient on most state highways, so annuity substitutes; contract structure is established and lenders finance against it
Urban infrastructure (Solid waste management)	Municipal / state bodies	DBFOT concession with tipping fee	Not established	Urban Local Bodies (ULBs) pay per tonne processed regardless of user fee collection; payment risk remains for municipal bodies. Primary collection is not financially viable and delivered as municipal service.
Urban infrastructure (Wastewater treatment)	Municipal / state bodies	Concession with contracted treatment payment, typically an annuity linked to performance	Not established	Tariffs do not cover treatment costs, so a contracted public payment substitutes for the user charge; payment risk remains with municipal bodies.

23. ANTT – Five railway authorisations, Oct 2022



Success Case Study: Andhra Pradesh waste-to-energy project: Pooling municipal obligations into a bankable structure

The project bound multiple ULBs, through a lead body, into a single payment obligation lenders could enforce. Alongside a per-tonne processing fee, the project sells power to the state distribution company under a twenty-year must-run agreement, so revenue rests on two public counterparties. Lenders and sponsors funded construction in full against three conditions – the state waste corporation signed as a confirming party, outstanding debt plus a premium on equity payable on default, and substitution rights. Viability gap funding of roughly 12% of cost was released only once the project was operational and applied to repay debt.²⁴

Category D sectors – account for 55-57% of the FY26–47 requirement

Public funding will remain the primary route for financing infrastructure projects which lack financial viability and infeasible financing modalities.

Sector	Counterparty	Standard Contract	Pipeline	Details
Urban infrastructure (most metro projects)	Metro Special Purpose Vehicle (SPV) – sovereign-backed	Not established – VGF / central grant / centre-state equity substitutes	Each corridor negotiated individually between centre and state	Fares don't cover operating costs or debt service, so no private concession is written.
Urban infrastructure (water supply)	Municipal / state bodies	Not established	Not established	Tariffs are set below cost of supply, so revenue does not cover debt service; funded through central mission grants and municipal budgets. ²⁵
Urban infrastructure (social – education, healthcare)	Municipal / state bodies	Not established	Not established	Revenue is generally insufficient to justify project cost, so funding comes from mission grants and state budgets. District hospitals and medical colleges recover part of their cost through student fees and paying patients, with PPP models still evolving.
Rail (new line & network capacity)	Ministry of Railways funds construction; no project entity holds line	Not established	National Rail Plan	Funded through gross budgetary support; revenue is not attributable to individual projects, so viability is not demonstrated at project level.
Airports (non-major)	Airports Authority of India	Not established standalone – bundling with larger airports	11 airports in five bundles, 50-year concessions	Passenger volumes do not usually cover operating cost or capital charge; funded through AAI's internal accruals and cross-subsidy across its network.

24. NaBFID research

25. Report on Municipal Finances, Reserve Bank of India, November 2024

Irrigation & river linking	None – no user -charge-backed entity	Not established	Not established	No user-charge base; dependent on public funding entirely.
Nuclear energy	Nuclear Power Corporation of India (NPCIL)	Not established; SHANTI Act, 2025 rules yet to be notified. ²⁶	Nuclear Energy Mission – 100 GW by 2047	Long build periods and high capital cost keep returns below private hurdle rates, and capacity has been funded from the government budget and NPCIL accruals. No private project has been licensed.
Green hydrogen	None – for most capacity; SECI and state refiners for tendered volume	Emerging – purchase agreements under SIGHT (Strategic Interventions for Green Hydrogen Transition) tenders	National Green Hydrogen Mission – 5 MMT by 2030	Tendered volume only covers a small share of the 2030 target. Capacity beyond that is being built against expected demand, with no contracted supply

Hong Kong Mass Transit Railway Corporation: Attaching land value to a transit asset to make it bankable

Hong Kong addressed the revenue coverage constraints structurally, by attaching a separate, bankable revenue stream to the asset. The Mass Transit Railway Corporation received development rights over land around new stations at pre-rail prices; property income then funded construction and operations, converting a transit authority into a commercially accountable, listed entity.²⁷

Category C and D sectors account for almost two-thirds of the FY26-47 requirement and cannot be financed on asset earnings alone. Where the financial return does not support private capital, the case for public capital rests instead on the socio-economic return, expressed as an economic internal rate of return (EIRR). Socio-economic return is appraised across all four categories, but it is the primary basis for prioritising projects in Category C and D sectors.

As Exhibit 2.2 shows, a prescribed methodology for that appraisal exists in only a few sectors, roads among them. Elsewhere, the EIRR is computed project by project by appraising consultant, or against multilateral development bank guidelines, so two projects in the same sector can be appraised on different assumptions. A common methodology would give public and concessional capital a consistent basis for allocation and allow projects to be compared across sectors.

2.2 Public capital needs recycling to meet future capex requirements driven by shift in the sectoral mix

Only one-third of infrastructure financing need is in sectors where private capital financing is common.

National Infrastructure Pipeline (NIP), published in 2019, set out INR 111 trillion of projects for FY20-25, to be funded 39% by the Centre, 40% by states and 21% by the private sector.²⁸ Realized outcomes diverged with central and state capex accounting for 90% of India's infrastructure capex over FY21–25 and private capital delivering roughly half of its envisioned funding.²⁹ With public capital carrying more of the requirement than intended, its allocation across categories becomes more consequential.

Public allocation to Category A sectors cannot simply be redirected. Roads is the clearest case, still depending largely on public capital despite commercial models in HAM and TOT. HAM was 25 to 30% of MoRTH awards in FY24, with BOT below 1% and the balance EPC. Government funds all of construction under EPC and 40% of project cost during construction under HAM, so most road construction

26. Department of Atomic Energy, Public Consultation on Draft SHANTI (Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India) Rules and Draft SHANTI Regulations

27. Hong Kong Government – Rail-plus-Property funding model

28. Report of the Task Force on National Infrastructure Pipeline, Department of Economic Affairs, 2020

29. Economic Survey 2025–26

cost sits on the public balance sheet by design. TOT monetises assets only once built and does not reduce that commitment.

The government's role differs across the rest of Category A sectors. In renewables and transmission, it is the paying counterparty and not the funder. In major ports and airports, it provides the asset and takes a revenue share, with no payment obligation. Telecom, data centres and private freight terminals are financed privately. Reducing public allocation to Category A is therefore a lever only in roads, where it is not available.

Recycling is the available lever. NMP 2.0, launched in February 2026, targets INR 16.72 trillion of monetisation potential over FY26–30, with INR 10 trillion to be invested back into new capex. Realizing this requires development of new mechanisms for capital recycling and application of existing mechanisms on a larger scale.

For example, in ports sector, berths and terminals are concessioned under the landlord model, where the major port authority retains ownership and takes a revenue share, with assets reverting on concession expiry. Of 49 PPP projects worth ~INR 510 billion approved since FY20-25 worth ~INR 130 billion have been awarded.³⁰ In roads, operating stretches with established traffic are bid out under Toll-Operate-Transfer, transferring tolling and O&M for a 20-year concession against an upfront payment while ownership remains with NHAI which has raised approximately INR 490 billion through this route till FY25.³¹

Recycling velocity and redeployment of proceeds are both policy variables. The faster the rotation and the more decisively proceeds move to Category C and D sectors, the smaller the residual gap left for private capital to fill.

2.3 Supply-side challenges on revenue certainty, transparent risk-based pricing and asset liability tenure mismatch affect private capital participation

Establish financing modalities are limited to a few key sectors (as highlighted in section 2.1). Assets need a demonstrated revenue mechanism, toll, tariff, annuity or regulated charge, robust enough to service an investor's return. Enhancement of property tax, water charges and similar levies remains to be addressed.³²

Revenue terms are not always fixed for the life of the asset. Institutional investors seek stable, inflation-linked returns, yet fare and tariff revision is often discretionary, and escalation is not always indexed to inflation. Predictability of revenue over the concession period determines whether private capital pools participate and to what extent.

Financiers often face asset-liability mismatch, as Exhibit 2.4 outlines. The tenor and cash-flow of the financing need to line up with what the financiers' own liability profile. Infrastructure debt is often long-duration, at times more than 10 years, and only pools whose own obligations extend that far can hold it without a mismatch. Insurers and pension funds are therefore natural long-term infrastructure investors, while banks and mutual funds gravitate to short-tenor structures.

30. MoPSW annual report 2025-26

31. NHAI, Asset Monetization Strategy for Roads Sector

32. Report on Municipal Finances, Reserve Bank of India, Nov 2024



Exhibit 2.4 | Characteristics of capital pools investing in infrastructure assets

Category	Pools	Tenor	Risk appetite	Market and asset familiarity
Long-tenor institutional	Pension funds, life insurers	15-30 yrs	Low – investment-grade, operating assets only	Moderate – deep in listed debt, limited project-level appraisal capability
Short-tenor regulated	Banks, NBFC-IFCs, mutual funds	3-4 yrs	Moderate – AA+ rated assets preferred	High for banks and NBFC-IFCs in roads and power; developing in other sectors
Return-led private	Domestic private credit	5-10 yrs, exit-driven	Selective – high risk only at equity-level returns	Low – sector knowledge is uneven and infrastructure appraisal capability is thin
Patient global	Sovereign wealth funds, infrastructure funds, global pension and annuity capital	10-25 yrs	Moderate – contracted or regulated revenue preferred	Developing – reliant on external benchmarks, ratings and certification

Source: BCG Research

Private capital pools enter the asset life cycle at defined stages – once a levy, tariff or contracted cash flow is established. Even projects that appear likely to attract private capital only have a limited number of stages at which such capital is deployed. For example, in case of the Mumbai–Ahmedabad high-speed rail corridor, over 80% of total expenditure is on land acquisition and civil construction which precedes any cash flow and cannot be financed by commercial capital pools.³³ Hence, only a portion of overall project value is investible by private capital despite availability.

Transparent risk-based pricing is not available always – capital only commits at scale where reliable benchmarks, yield curves, and credit data allow risk to be priced with confidence. Where this information is missing or unreliable, capital pools default to the safest and familiar paper and simply do not price the rest of the market.

2.4 The same capital base finances infrastructure assets across construction and operational phases

Infrastructure assets carry a materially different risk profile once operational than during construction, yet the capital financing them do not change hands accordingly – banks and NBFC-IFCs continue to hold exposure through the operational life, so new construction is funded through balance-sheet growth rather than through turnover of the existing book.

For banks, the mismatch is structural as most of their liabilities are shorter-term deposits than the 20–25-year capital an operational asset requires. Such long-term capital is held more naturally by insurers and pension funds.

33. JICA-ODA loan agreements for the Mumbai-Ahmedabad High Speed Rail Project (Tranches I-V), 2018–2023; NHRCL

Exhibit 2.5 | Shift in financing structures across the project lifecycle

💡 Conceptualisation	🏗️ Construction	🔄 Operations & Post Operations
Budgetary allocations - sponsoring authorities and CPSEs	Government budgetary capex and internal accruals	Institutional and foreign equity
	Developer and sponsor equity	Banks and NBFC-IFCs - exposure retained
	Capital grants - Viability Gap Funding	Refinancing - Infrastructure Debt Funds
Sponsor's own at-risk spend on project preparation	Banks	Bonds held by insurers and pension funds
	NBFC-IFCs	
	DFI lending - multilateral and bilateral	Post Operations - InvITs

Source: RBI, ICRA Research, DEA, SEBI, NIDB investor presentation

As Exhibit 2.5 shows, the development stage has no dedicated capital pool. Sponsoring authorities, whether central or state entities, public sector undertakings or municipal bodies, fund DPRs, feasibility and design work from departmental budgets, while bidders in PPP projects carry their own development costs at risk. Institutional financing enters only at construction, where banks and NBFC-IFCs hold majority of the responsibility.

Instruments exist to transfer completed assets to long-term investors, but uptake remains limited relative to the operational asset base.

The intended pattern is for completed assets to move to long-term investors, releasing lender capital for new construction.³⁴ Two routes exist – InvITs, used mainly for government and sponsor-led monetisation, and securitisation, which applies to bank and NBFC-IFC loan books.

InvIT penetration remains low and monetisation is concentrated in central-government owned assets, with state-held asset base largely unaddressed.

InvIT AUM crossed INR 7 trillion in March 2025, against INR 33.3 trillion of infrastructure credit across banks and NBFC-IFCs in June 2025.³⁵ Telecom and roads sectors dominate InvIT AUM, and only a small share of the

wider highway network sits under InvIT structures; solar, logistics, airport and port assets remain largely outside InvIT structures. Growth is constrained by limited retail participation, regulatory caps on insurance and pension holdings, and the absence of currency hedging tools.

Securitisation is the corresponding route for bank and NBFC-IFC loan books, but volumes are small for three reasons.

- 1 Securitisation framework offers limited scope for infrastructure lending.** Preferential capital treatment requires that no single borrower exceed 1% of a pool, or 2% in specified cases, a condition infrastructure's large ticket sizes usually cannot satisfy.³⁶ A securitised loan therefore falls outside STC treatment and attracts higher risk weights on the tranches retained, while the bank continues to bear legal, administrative, and rating costs.
- 2 Investor participation in securitised assets is limited, partly for regulatory reasons.** Insurance and pension regulations limit investment in securitised instruments, require a very high minimum credit rating, and in some cases prevent insurers from investing in the type of company structure used to hold pooled loans. Hence, the eligible buyer base is narrow even for a well-priced pool.
- 3 Supporting market infrastructure is under-developed.** There is no central data repository for such transactions, no independent servicing function, and stamp duty treatment varies by state raising the cost and uncertainty of structuring a pool.

34. Report of the Committee on Revisiting and Revitalising the PPP Model of Infrastructure Development (Kelkar Committee), DEA, Ministry of Finance, November 2015

35. SEBI National Conclave on REITs and InvITs – 2025; NaBFID-ICRA Research - Catalysing Infrastructure Investment & Innovation: Towards Viksit Bharat 2047, 2025; NHAI Annual Report 2024-25

36. Master Direction – Reserve Bank of India (Securitisation of Standard Assets) Directions, 2021

Bank/NBFC capital therefore continues to be deployed in operational assets and constrains financing for new construction. Capital recycling is therefore needed to enable financing of new greenfield projects. Without effective capital recycling, additional capital pools will only deliver marginal benefit, and its feasibility depends on conditions at both the issuer and investor ends.

2.5 Project-level information remains fragmented, a gap NaBFID's data platform is intending to close

India has no single, standardised source of high-quality data connecting the full lifecycle of an infrastructure project across sectors.

Multiple platforms are available across ministries, regulators and private providers. Data on these existing platforms carries three structural challenges.

- **Availability** — financing data such as financial closure and debt servicing is rarely captured alongside project data, and actual costs, realised revenues and utilisation are not recorded for all projects.
- **Quality** — validation standards differ across sectors, updates are infrequent, and coverage is thin across sectors such as gas transmission.
- **Accessibility** — platforms such as the Project Monitoring Group, PM Gati Shakti and NHAI's Data Lake were designed for planning and monitoring by the agencies that operate them, so access is role-based and data is not structured for export or linkage.

The effect compounds through the project lifecycle. At conceptualisation, project details are published by the sponsoring ministry or agency and aggregated in PM Gati Shakti, NIP and NMP, each for its own purpose, with consolidation managed by lenders. At appraisal, feasibility, cash-flow and DSCR (Debt Service Coverage Ratio) data sits with no single entity, and historical performance is not consolidated for underwriting. At financing, final DPRs are often not shared with lenders even after award, and borrower track records are not compiled across portfolios. Monitoring carries the

highest cost – the awarding authority and each lender appoint their own independent engineers, duplicating cost with no systematic link between delay and financial outcome. Structured monitoring in operations covers only a narrow high-risk subset; and penalties, deductions and curtailment reach lenders unstructured. Deviations do not feed back into appraisal, so projections are not benchmarked against comparable assets.

NaBFID is building a national infrastructure data platform to close this gap consolidating lifecycle project data under common definitions, calibrating access to user need, benchmarking new proposals against performance of comparable assets, and flagging deviations in operating projects early.

2.6 Project pipeline announcement determines the volume of capital deployment

Approximately INR 80 trillion of the FY26–31 requirement is yet to be translated into an announced project pipeline.

Chapter 1 disaggregated the FY26-31 requirement by financing status. The unannounced share presents a different constraint than the rest as capital cannot be deployed against projects that do not yet exist on paper, and the funding model for a project cannot be settled until the project itself is defined.

The unannounced pipeline sets a ceiling on how much can be built in the period regardless of how much capital is available. Urban infrastructure accounts for nearly half of the requirement and is the segment where announcement depends on municipal and state planning capacity rather than on central ministries or corporate boards.³⁷

Where planning capacity is absent, projects surface only when a funding window opens. A project assembled to a funding deadline has no completed feasibility work, no settled land or approval position and no defined revenue stream – the three things a lender must price. It is therefore not fundable at the point it is put forward.

37. Reforms in Urban Planning Capacity in India — NITI Aayog, Sep 2021

The Urban Challenge Fund is designed to expedite project planning and announcement, by requiring project preparation, a defined revenue stream, and a committed lender ahead of central assistance.

Approved in February 2026, it places preparation ahead of the funding request and makes central assistance unavailable against a concept. A city must define scope, establish how the project will earn revenue, and secure a lender or private partner. A project that clears these requirements comes to market with the revenue stream and committed lender a financier needs to price risk. Central assistance of INR 1 trillion covers up to 25% of project cost, conditional on at least 50% being raised from municipal bonds, bank loans or PPPs, with INR 4 trillion of urban investment expected till FY31.³⁸ The constraint therefore shifts from announcement to preparation, and delivery will depend on how quickly cities build the capability to prepare projects.

NaBFID is bridging the gap by helping sponsors builds preparation capacity. Its transaction advisory services support state governments, parastatals, urban local bodies and private sponsors from feasibility and risk allocation through concession design and bid management. NaBFID has also established a dedicated academy for knowledge dissemination, capacity building and skill development across the infrastructure financing ecosystem with programs for officials from ULBs, state governments, banks and DFIs.

2.7 Mechanisms are still evolving for fast-tracking project approvals

The Task Force on NIP found that delay in obtaining clearances is the most common reason for infrastructure projects to stall and recommended that all key clearances be secured before a project is awarded. The Kelkar Committee had made a similar case, calling for an institutional mechanism to resolve approvals within fixed timelines.³⁹

Sectors that are overseen by a central authority with a defined mandate have seen material improvement in clearance timelines and approval volumes.

NHAI's land acquisition process was reorganised around the Bhoomi Rashi portal in 2018 reducing notification time from 3–6 months to 1–2 weeks.⁴⁰ NHAI has since layered a standardised 336-day schedule on top, with fixed timelines per stage. Telecom shows the same pattern. A 2022 rule amendment made GatiShakti Sanchar the statutory single window for right-of-way applications, and average disposal time fell from 448 days in 2019 to about 60 days in 2024.⁴¹ PARIVESH, the environment ministry's portal, reduced average environmental clearance time from 105 days to single digits by 2023–24.⁴²

The common thread is a defined, time-bound process with monitoring attached. Where such a mechanism is absent, approval positions cannot be settled during preparation, delaying the point at which a project can be announced with defined scope and schedule. That constrains capital allocation, as neither public budgets nor private lenders can commit against an open approval position.

The gap is wider at state level, where land conversion, municipal and local body permissions are yet to be brought under similar time-bound mechanisms and would require nodal agencies at state level with defined mandates to administer them.

Urban infrastructure, power and railways account for over 75% of the FY26-47 requirement, the sectors where adapting NHAI's timeline and telecom's statutory single window would matter most, on a mechanism that is already proven.

38. MoHUA – PIB Press Release, Feb 2026

39. Report of the Committee on Revisiting and Revitalising the PPP Model of Infrastructure Development (Kelkar Committee), DEA, Ministry of Finance, November 2015

40. Ministry of Road Transport and Highways (MoRTH), Annual Report, FY2019

41. PIB, Gati-Shakti Vision for Telecom Infrastructure – Right of Way Rules Amended for Faster 5G Roll-out, Aug 2022

42. MoEFCC Annual Report 2023-24

2.8 Project execution challenges continue to constrain the flow of financeable projects

The pace of execution determines when announced projects become financeable. A project reaches the financing market when its scope, cost and schedule are settled, which depends on land readiness, clearances and the sequencing of dependent assets rather than the availability of capital.

Land acquisition and right of way remain the most common constraints. Of approximately 7,200 project issues resolved through the PRAGATI system, 35% were related to land acquisition, 18% to right of use or way and 20% to environmental clearances.⁴³ Until these are settled, cost and schedule remain undefined, delaying commitment from both public budgets and lenders.

RBI's project finance guidelines of June 2025 require land acquisition to be complete for at least 75% of non-PPP projects and 50% of PPP projects before financial closure.⁴⁴ In roads, MoRTH's milestone framework effective 1 June 2025 requires more than 90% of right of way to be secured for bids to be received.⁴⁵ These measures strengthen credit quality of assets that reach the market, shifting the constraint upstream into project preparation.

A project can be built on time and still not earn, if the assets it depends on are not ready. In power, transmission readiness determines when generation capacity begins earning revenue. Crisil notes that transmission constraints are limiting renewable deployment in the western states, despite their higher solar generation potential.⁴⁶

Land readiness, sequenced approvals and coordinated commissioning would bring forward the point at which private capital can be committed and widen the set of projects available to it. Project preparation therefore needs to be addressed for capital to reach the assets that require it.

The structural gaps do not fall evenly across sectors or capital pools, and no single actor can close them – it requires coordinated action across regulators, government and institutional investors. The succeeding chapters turn to the supply side of this effort. Chapter 3 examines the domestic capital pools – banks, insurance, pension funds and mutual funds – the gaps limiting their allocation to infrastructure, and the vehicles to channel it. Chapter 4 extends the analysis to global capital assessing the scale and conditions under which global capital can be mobilised.



43. CRISIL Roads & Highways Sector Report, May 2026

44. RBI (Project Finance) Directions, 2025

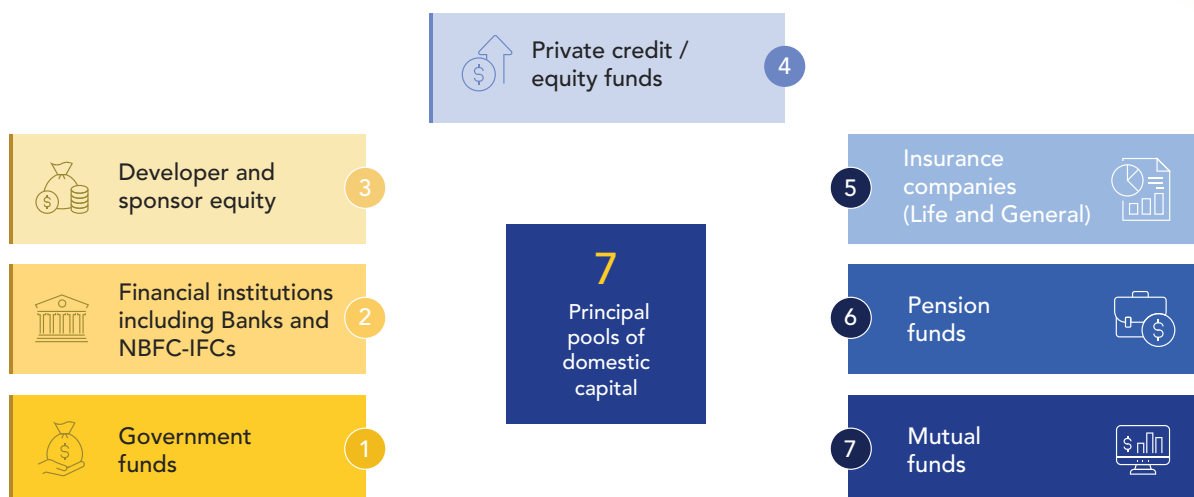
45. MoRTH Circular No. NH-24028/02/2024-H dated 6 May 2025

46. CRISIL, India Outlook 2026: Wading Through Squally Waters, March 2026

03 The Domestic Capital Landscape

Sources, Gaps, and What Can
Unlock Them

India's infrastructure envisages huge investments of INR 168-172 trillion from FY26-31.
There are primarily 7 pools of domestic capital



3.1. Existing pools already sit on unused regulatory headroom, in addition to normal growth that adds further capacity through FY31

Approximately INR 2–3 trillion of investible capacity permitted under existing regulatory limits remains undeployed.

The first source of capacity is regulatory headroom. Several pools are already permitted, under today’s rules, to hold a sizeable share of their book in infrastructure. IRDAI mandates insurers to invest at least 15% in housing and infrastructure, and PFRDA caps pension fund debt exposure at 45% of AUM.⁴⁷

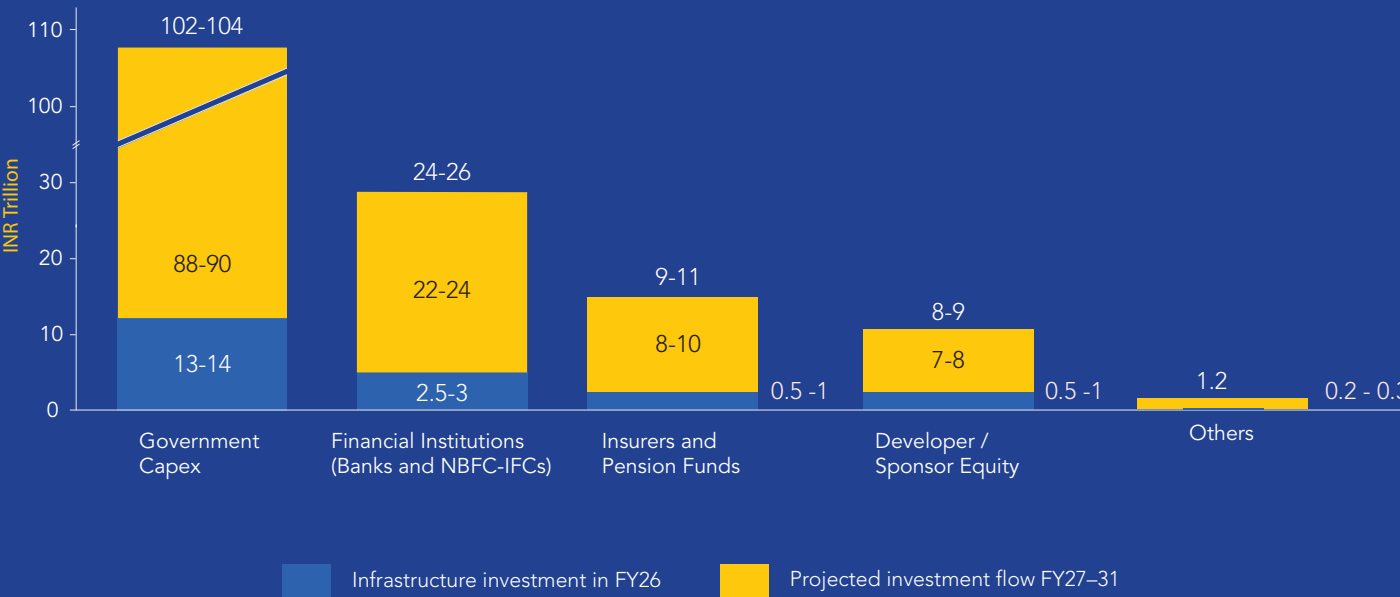
Even within those caps, significant headroom exists for additional capital deployment to infrastructure financing. Large insurers hold almost INR 2 trillion of separate headroom before hitting their regulatory ceiling as current allocation stands at 9% against a housing & infra requirement of 15%. IRDAI’s July 2026 amendment widens this channel, permitting insurers to hold up to 20% of the debt of an operational infrastructure SPV rated AA or above where proceeds refinance existing debt.⁴⁸ Pension funds have ~INR 0.6 trillion of separate infrastructure headroom against the 15% sector benchmark, with current average allocation at ~12% of AUM.

Channeling this capital will need resolution of structural issues we discuss later in this chapter. Deployment will take further time to materialise before funds begin flowing at scale.

The second source of capacity is growth-led. As each pool’s balance sheet expands along a normal growth trajectory, additional capital becomes available over the next 5 years. Exhibit 3.1 below sets out both lenses against each source’s current base of investment:

47. PFRDA, Master Circular on Investment Guidelines for Government Sector, Dec 2025
48. IRDAI (Actuarial, Finance and Investment Functions of Insurers) (Second Amendment) Regulations, 2026

Exhibit 3.1 | Contribution of domestic capital to infrastructure capex till FY26-31



Sources: Union Budget 2026-27; Crisil Intelligence; RBI; IRDAI Annual Report 2024-25; PFRDA; SEBI Annual Report 2025-26 and AMC portfolio disclosures; DPIIT; Capgemini World Wealth Report, as reported by IANS; UBS Global Family Office Report

3.2. Sources of capital face source - specific constraints that keep them on the sidelines of infrastructure

Each of these pools brings a different liability structure, risk appetite and regulatory mandate to the table. Their ability to deploy capital into infrastructure also depends on whether expected returns are commensurate with the risks involved, alongside the pool-specific constraints discussed below:

3.2.1 Banks and NBFC-IFCs

Constrained lending capacity, structural tenor mismatch and the absence of underwriting benchmarks outside power and roads confine bank lending to sectors with proven bankable models.

Banks' overall room to lend is limited and stretched across competing credit needs. As explained in Chapter 1, the credit-deposit ratio has climbed from 73.5% to 83.4% over the past four years. Within that shrinking room, infrastructure is losing share to other sectors – infrastructure credit grew just 9.2% Y-o-Y in FY26, well behind medium industries (21.8%), micro and small industries (32.7%), services (19%), and agriculture (15.6%).⁴⁹

The asset-liability mismatch is structural and constrains long-term infrastructure lending as banks fund predominantly through shorter-duration liabilities (3-4 years) while infrastructure loans typically run for 10–15 years.⁵⁰

Banks also lack established underwriting benchmarks across much of the emerging greenfield pipeline. While repeated financing cycles have created established risk frameworks for roads and power, newer sectors lack comparable operating histories, standard contracts and agreed risk metrics. Reflecting this concentration of experience, ~76% of bank infrastructure exposure was in power and roads as of June 2025.⁵¹

NBFC-IFCs have overtaken banks as the largest source of infrastructure credit but lend across a narrower set of sectors. RBI requires NBFC-IFCs to hold at least 75% of assets in infrastructure loans. As of June 2025, NBFC-IFCs they held 58% of infrastructure credit against 42% for banks, and their loan books grew at a 12% CAGR over FY2020 to FY2025, against 5% for banks. Public IFCs account for 96% of the category's aggregate loan book, so sectoral allocation reflects the mandates of institutions such as PFC, REC and IRFC. Capacity has shifted from banks but remains tied to the sectors the IFCs were established to finance.⁵²

Commercial bankability remains a prerequisite in every case as banks cannot finance projects without predictable debt-servicing cash flows and appropriate risk allocation. As estimated in Chapter 2, only ~34–36% of future requirements currently have proven bankable models.⁵³

Against these constraints, seasoned infrastructure loans can be transferred to long-term investors so that banks can redeploy capital to new projects through mechanisms such as securitization. The securitization framework, however, could help accommodate concentrated infrastructure pools, such as operational roads, transmission and renewable-energy loans, which typically comprise fewer, larger-ticket exposures.⁵⁴

Government and sector regulators can develop standard contracts, risk-allocation frameworks and project-performance benchmarks that give banks a common base for underwriting new infrastructure sectors like green hydrogen and data centres.⁵⁵ Data required for this can be developed as a separate platform as NaBFID is trying to do with NIDP. Redirecting NBFC-IFC capacity, however, may require further assessment of existing mandates, since public IFCs dominate the category lend within defined sectoral mandates.

49. RBI, Current Rates and banking statistics; RBI, Sectoral Deployment of Bank Credit, June 2026

50. NaBFID-CRISIL Intelligence, Partial Credit Enhancement: New Paradigm for Infrastructure Finance, September 2025

51. NaBFID-ICRA, Catalysing Infrastructure Investment & Innovation: Towards Viksit Bharat 2047, 2025

52. NaBFID-ICRA, Catalysing Infrastructure Investment & Innovation: Towards Viksit Bharat 2047, 2025

53. BCG analysis; NaBFID-ICRA, Catalysing Infrastructure Investment & Innovation; MoSPI, PAIMANA

54. RBI, Securitization of Standard Assets Directions, 2021; NaBFID-CRISIL Intelligence, Partial Credit Enhancement

55. DEA, PPP Risk Allocation Guide, 2025; DEA, Reference Guide for Concession Principles, 2026

3.2.2 Insurance companies and pension funds

Insurers and pension funds offer the asset-liability match infrastructure requires, yet their effective investible universe is materially narrower than their formal mandate and remains concentrated in operational, highly rated assets.

Regulatory ceilings constrain InvIT and AIFs exposure. IRDAI caps InvIT/REIT unit exposure at 3% of fund size, with 5% per trust; debt exposure is capped at 20% of a trust's outstanding debt. PFRDA caps cumulative InvIT/REIT units and debt at 3% of total Pension Fund AUM; a fund may hold no more than 15% of the outstanding debt of a single InvIT/REIT issuer and 5% of the units of a single issue. IRDAI caps combined exposure to private companies, AIFs and VFs at 3% for life insurers and 5% for general insurers.⁵⁶

Infrastructure debt may not always offer sufficient additional return for the risks involved. The incremental yield on infrastructure bonds can be limited relative to their credit, liquidity and tenor risks. This can reduce the case for insurers and pension funds to increase allocations to infrastructure debt.⁵⁷

NBFC-IFCs have overtaken banks as the largest source of infrastructure credit but lend across a narrower set of sectors. RBI requires NBFC-IFCs to hold at least 75% of assets in infrastructure loans. As of June 2025, NBFC-IFCs they held 58% of infrastructure credit against 42% for banks, and their loan books grew at a 12% CAGR over FY2020 to FY2025, against 5% for

banks. Public IFCs account for 96% of the category's aggregate loan book, so sectoral allocation reflects the mandates of institutions such as PFC, REC and IRFC. Capacity has shifted from banks but remains tied to the sectors the IFCs were established to finance.

Greenfield projects do not match the preferred risk profile. Pension funds prefer operational assets with established and predictable cash flows over construction-stage projects. This creates a mismatch as ~80–85% of India's forward infrastructure pipeline is greenfield.⁵⁸

Infrastructure AIFs and unlisted InvITs lack the secondary-trading mechanisms that institutional investors rely on to exit positions, limiting participation in unlisted vehicles. State-sponsored SPVs, and bonds generally carry different governance and repayment risks than centrally-backed equivalents – weaker standalone credit profiles, their guarantees are a contingent claim on a constrained state balance sheet rather than a sovereign undertaking, and concession terms vary by state, further constraining investors.⁵⁹

Although credit-enhanced (CE) bonds are formally rated on par with organically rated AA instruments, insurers do not treat the two as equivalent in practice. The CE suffix signals reliance on external support rather than the issuer's own credit, with unsupported rating separately disclosed; exposure to issuer's insolvency persists despite the enhancement; and where enhancement covers only part of the tenor, or lapses on specified milestones, exposure reverts to the unsupported rating for the residual tenor. This limits the practical uplift credit enhancement is intended to provide.⁶⁰

56. IRDAI, Master Circular on Actuarial, Finance and Investment Functions, May 2024; PFRDA, Master Circular on Investment Guidelines for Government Sector, Dec 2025

57. NaBFID-CRISIL Intelligence, Partial Credit Enhancement, September 2025; BCG expert consultations

58. NITI Aayog, National Monetization Pipeline: Monetization Guidebook, 2021; NaBFID-ICRA; BCG analysis

59. ICRA, Rating Methodology - Infrastructure Investment Trusts, August 2025; BCG expert consultations

60. NaBFID-CRISIL Intelligence, Partial Credit Enhancement, September 2025; BCG expert consultations.





Several of these constraints are addressable.

The AA-versus-AAA gap could be treated as a capability build, not just a regulatory-cap question. Insurers already have unused AA headroom, so credit-assessment and monitoring capability need to be built to hold AA paper with confidence. For pension funds, this also means building comfort with the wider infrastructure universe permitted by PFRDA, including eligible A-rated infrastructure paper with EL1, rather than relying only on higher-rated issuances.

NaBFID's PCE facility can be used to bring more infrastructure bonds into the AA-rated investment universe. The facility can provide partial credit enhancement to suitable infrastructure bonds and help improve their rating, including from A to AA where feasible. For this to translate into investment, insurers would also need to recognize credit-enhanced bonds appropriately within their internal credit policies.⁶¹

AIF allocation may be treated as an explicit strategic asset allocation decision. Because the AIF cap is a shared budget across categories, an infrastructure-AIF strategy may be sized deliberately at portfolio

level rather than treated as a free-standing bucket. Insurers may also treat participation in ongoing SEBI/IRDAI valuation and secondary-trading standardization consultations as part of their own risk-readiness work, and can calibrate credit policy separately for centrally backed versus state-sponsored infrastructure assets.

The CBT-approved (Central Board of Trustees) infrastructure investment route can be extended. EPFO's (Employees' Provident Fund Organisation) first INR 2,035 crore InvIT investment in NHAI's National Highways Infra Trust followed CBT's (Central Board of Trustees) 2024 approval of PSU-sponsored InvITs/REITs, demonstrating that product-level approval can open new infrastructure channels; this framework can be progressively extended to other high-quality operational infrastructure structures.⁶²

The new operational-SPV debt route can also be built on with IRDAI now permitting insurers to hold debt of operational infrastructure SPVs, with single-SPV exposure up to 20%.⁶³ The route avoids the 3% cap applicable to InvITs/REITs and covers only built, operating projects – the preferred risk profile for insurers.

61. NaBFID-CRISIL Intelligence, Partial Credit Enhancement, September 2025; BCG expert consultations.

62. NaBFID-CRISIL Intelligence, Partial Credit Enhancement, September 2025.

63. IRDAI (Actuarial, Finance and Investment Functions of Insurers) (Second Amendment) Regulations, 2026

3.2.3 Developer and sponsor equity

Developer equity is constrained by project returns that remain below corporate and private-equity hurdle rates and by higher early-stage project risks.

Project economics in several infrastructure sectors do not generate adequate risk-adjusted equity returns. Weak cost recovery, uncertain demand and insufficient contracted revenues leave project returns below corporate and private-equity hurdle rates, diverting capital towards alternative investments.⁶⁴

Greenfield projects carry higher early-stage risk which further limits corporate investment. Sponsors must fund land, approvals and construction before project cash flows are established, increasing the risk undertaken. This can also limit the number of new projects that a corporate balance sheet can fund at the same time.⁶⁵

Limited monetisation channels keep sponsor equity tied up. Infrastructure developers depend on a build, stabilise, monetise and reinvest cycle, but monetisation remains shallow across several asset classes, slowing the redeployment of equity into new projects. InvIT penetration remains only ~1.3% for state highways, ~2.6% for transmission lines, ~1.5% for solar capacity and ~5.9% for gas pipelines.⁶⁶

Both constraints are addressable through project structuring and asset recycling. Greater project viability and payment certainty could support wider equity participation, using predictable payment structures and viability-gap funding where project revenues are insufficient.⁶⁷ The waste-to-energy project discussed in Chapter 2 attracted sponsor equity on the strength of its payment certainty. Multiple municipal payers were consolidated behind a single lead body, power was contracted for twenty years on must-run terms, and a defined termination payment covered outstanding debt and a premium on equity if the authority defaulted. Against those terms sponsors funded a fifth of project cost and lenders the remainder, covering construction in full.

Sponsors may also be enabled to monetise completed assets and recycle the equity into new projects. Smaller completed projects can be combined into larger InvIT portfolios that are suitable for long-term investors, allowing sponsors to release capital from completed assets and use it to fund new construction.⁶⁸

3.2.4 Mutual funds

Mutual fund debt portfolios are structurally short-dated and rated more conservatively than regulation requires, limiting participation in long-tenor project-level infrastructure.

Short-term scheme composition limits the patient capital available for infrastructure. Approximately 73% of open-ended debt AUM at FY26-end sat in overnight-to-short-duration categories, while under 1% sat in long-duration funds of more than seven years, limiting the pool available for long-tenor infrastructure assets.⁶⁹

Shift towards wholesale investors further reinforces shorter-duration and low-volatility preferences: Following the 2023 debt-Mutual Fund tax changes, retail inflows into debt funds have reduced and the investor base is increasingly corporate/institutional, which typically prefers shorter-duration assets and limited NAV volatility, further limiting investment in long-tenor infrastructure.⁷⁰

Credit-risk preferences restrict participation in project-level infrastructure. Mutual funds typically remain in AA+ and above securities, even where regulation permits lower-rated debt, leaving much of greenfield/SPV paper outside the effective investible universe.⁷¹

Unlisted infrastructure debt has limited access to mutual fund capital. SEBI caps eligible unlisted NCDs at 10% of a scheme's debt portfolio, constraining mutual fund participation where infrastructure financing is raised through unlisted rather than listed debt instruments.⁷²

Open-ended redemption requirements are a further constraint on long-tenor investment. SEBI requires

64. DEA, PPP Risk Allocation Guide, 2025; DEA, Viability Gap Funding Scheme.

65. RBI, Project Finance Directions, 2025; DEA, PPP Risk Allocation Guide, 2025.

66. BCG analysis based on MoRTH, CEA, MNRE, PNGRB and InvIT disclosures..

67. DEA, Viability Gap Funding Scheme; DEA, Reference Guide for Concession Principles, 2026.

68. NITI Aayog, National Monetization Pipeline: Monetization Guidebook, 2021; NHAI, Asset Monetization Strategy

69. AMFI, Monthly Report / Monthly Note, March 2026

70. Finance Act 2023; AMFI investor data; BCG analysis

71. SEBI, Master Circular for Mutual Funds, 20 March 2026; NaBFID-CRISIL Intelligence, Partial Credit Enhancement; BCG expert consultations

72. SEBI, Master Circular for Mutual Funds, 20 March 2026

redemption proceeds to be returned within 3 working days and most open-ended debt schemes to hold $\geq 10\%$ of net assets in liquid assets. This creates a liquidity mismatch with infrastructure debt that has a much longer investment horizon.⁷³

Addressing these constraints requires changes in the supply and tradability of infrastructure instruments. The supply of adequately rated infrastructure bonds could be expanded through credit enhancement and listing, to bring more infrastructure paper into the AA+ universe.⁷⁴

Addressing these constraints requires changes in the supply, allocation and structure of infrastructure instruments. The supply of adequately rated infrastructure bonds could be expanded through credit enhancement and listing, to bring more infrastructure paper into the AA+ universe. SEBI's February 2026 categorisation circular permits a new sectoral debt fund category, exempt from sectoral concentration limits, but requiring at least 80% of the portfolio in debt rated AA+ and above. A dedicated infrastructure debt fund therefore becomes viable as the rated pool deepens.⁷⁵

Mutual fund access to listed infrastructure vehicles could be widened. Classifying InvITs as equity-related instruments similar to SEBI's reclassification of REITs⁷⁶, can move infrastructure holdings from a residual allocation into schemes' equity allocation. It would also make InvITs eligible for equity indices, bringing passive index funds into infrastructure alongside active schemes.

SEBI's Specialized Investment Fund (SIF) framework permits close-ended and interval strategies whose redemption frequency is set by the AMC. SEBI has also exempted SIF interval strategies from the requirement to hold only securities maturing before the next transaction period and gives mutual fund capital access to long-tenor infrastructure assets it cannot otherwise hold.

3.2. 5 Private Credit / Equity Funds:

Private wealth deployment is constrained by the limited supply of investible infrastructure products and by tax treatment that reduces post-tax returns relative to alternative investment routes.

The limited supply of investible infrastructure products restricts how much private wealth can deploy: While entry thresholds for infrastructure bonds have fallen substantially, with privately placed debt securities now starting at INR 10,000, private AIFs generally require a hefty minimum commitment of INR 1 crore. Additionally, the investible universe remains narrow as it has not been matched by sufficient growth in listed InvITs, infrastructure AIFs or debt products, leaving limited avenues for capital to deploy at scale.⁷⁷

Greenfield infrastructure is available mainly through private-market funds rather than listed products. Development-stage exposure is primarily provided through infrastructure AIFs, private equity and private-credit funds, while listed infrastructure vehicles are more focused on operational assets. Private investors seeking greenfield exposure therefore generally need to invest through private-market vehicles which face information asymmetry.⁷⁸

Tax treatment lowers the effective return available to individual investors. InvIT interest distributions are taxable in the individual's hands at the applicable slab rate, while other investment opportunities like long-term listed-equity gains are taxed at 12.5%. This weakens the post-tax competitiveness of interest-heavy infrastructure products.⁷⁹

The post-tax attractiveness of infrastructure investments needs to be improved. The tax treatment of interest income from infrastructure vehicles may be reviewed, and targeted incentives for long-term infrastructure investment considered, so that these products can compete more effectively with other alternatives for private credit / equity fund capital.

Each of these constraints will need to be addressed effectively if these pools are to contribute more to infrastructure. How that might be done is explored further in Chapter 5 and 6 of this report.

73. SEBI, Master Circular for Mutual Funds, 20 March 2026

74. DEA, National Infrastructure Pipeline Task Force Report, 2020; SEBI, Master Circular for Mutual Funds, 20 March 2026

75. SEBI, Categorization and Rationalization of Mutual Fund Schemes, Feb 2026

76. SEBI, Reclassification of Real Estate Investment Trusts (REITs) as equity related instruments for facilitating enhanced participation by Mutual Funds and Specialized Investment Funds (SIFs), Nov 2025

77. SEBI, Debt Denomination Circular, 3 July 2024; SEBI, AIF Regulations; Bharat InvITs Association market data

78. SEBI, AIF Regulations; NITI Aayog, National Monetization Pipeline: Monetization Guidebook; NaBFID-ICRA

79. Income-tax Act, sections 115UA and 194LBA; Income Tax Department, capital-gains guidance

04

Global Capital Landscape:

Sources, Barriers, and What Can Unlock Them



4.1 Global portfolios are reallocating towards infrastructure, but India must still compete for capital

Global infrastructure capital is growing rapidly, but the relevant question for India is not how much capital exists but which pool can finance which stage of which asset.

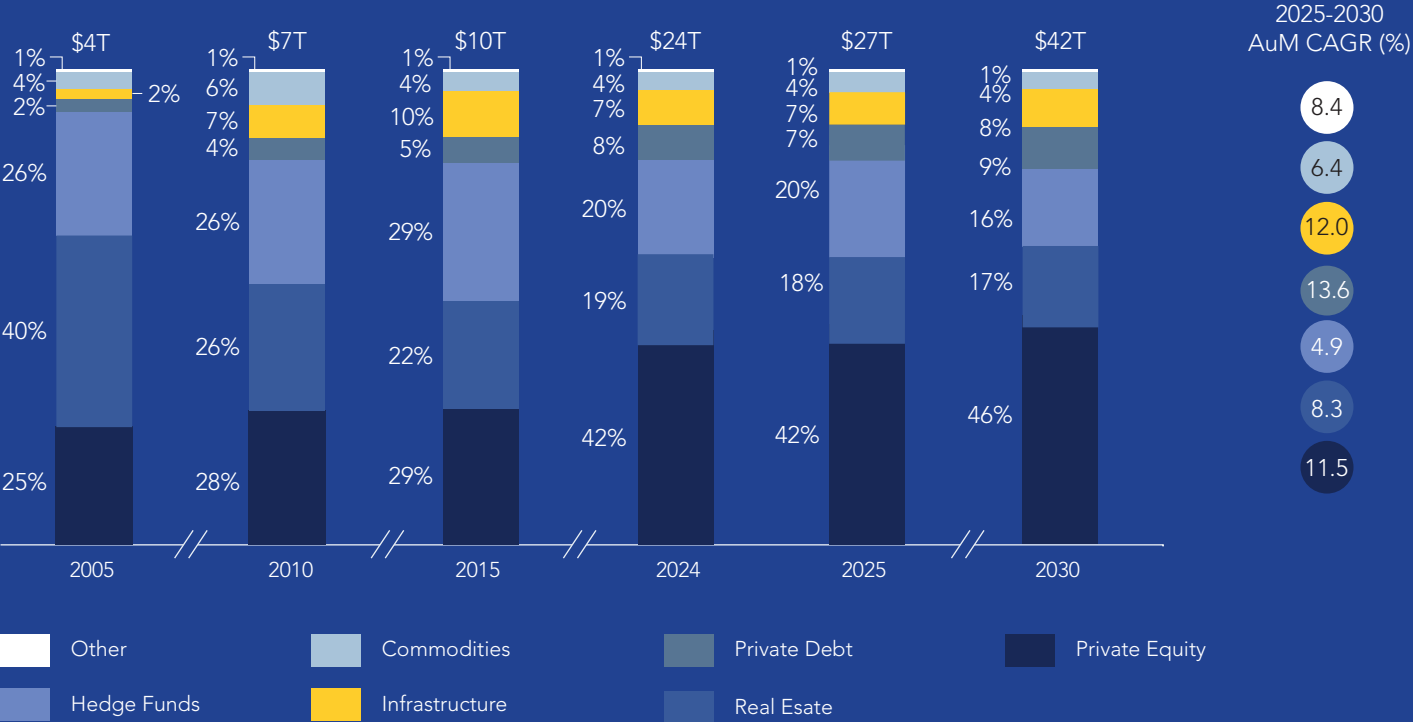
Infrastructure is one of the fastest-growing alternative asset classes globally. Infrastructure AuM has increased from approximately USD 80 billion in 2005 to USD 1.8 trillion in 2025, as depicted in exhibit 4.1. Infrastructure investment is expected to grow at approximately 12% CAGR through 2030. Allocation by pension funds, insurers, sovereign wealth funds and alternative asset managers towards long-duration real assets is expected to increase by 2030.⁸⁰

80. BCG Analysis



Exhibit 4.1 | Global alternative investments AuM split by product (% , USD trillion)

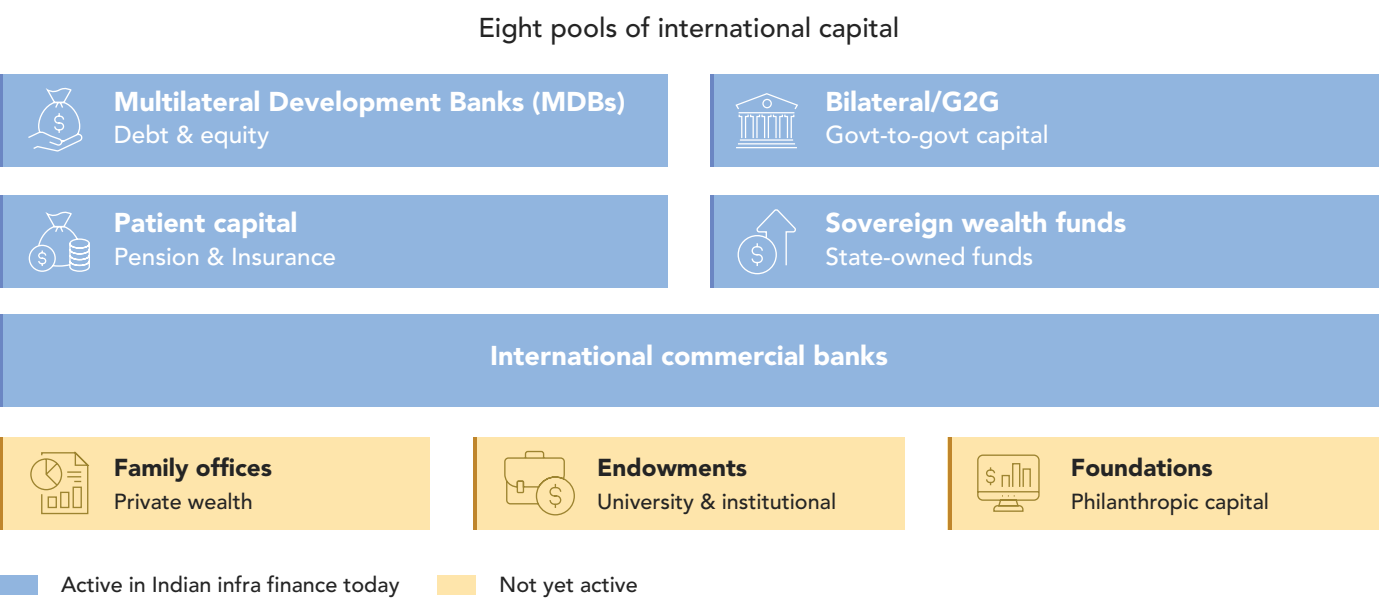
Global alternative investments AuM split by product (% , \$T)



Source: BCG Global Asset Management Market Sizing Database, 2026

This creates a larger pool of capital potentially available to Indian infrastructure, but capital availability does not automatically translate into capital deployment. There are eight sources of international capital, as highlighted in exhibit 4.2. The Indian infrastructure sector draws on five principal pools of international capital:

Exhibit 4.2 | Principal pools of capital for Indian infrastructure



4.2 Global capital pools face common barriers to infrastructure funding deployment in India, with specific constraints by investor type

Global investors do not face one common infrastructure-financing problem in India. Deployment in India depends on the availability of assets that fit the mandate, risk appetite and return profile of each investor pool.

Investor participation varies across the infrastructure lifecycle because each capital pool has a different mandate, risk appetite and return requirement. MDBs and G2G lenders are suited to greenfield projects. Their development mandates allow them to support projects with broader economic and social benefits and to take greater exposure to development and execution risk, and they fund project preparation, design and capacity building.

For example, ADB approved a US\$240 million loan for Chennai Metro Phase II in 2025, as part of a US\$780 million financing facility for the project.⁸¹ JICA is the principal financier of India's flagship Mumbai–Ahmedabad High-Speed Rail corridor, having committed ~JPY 1.05 trillion in ODA loans across five tranches since 2017. Beyond financing, JICA supports feasibility studies, design, training, station-area development, and deployment of Shinkansen experts to NHSRCL.

India is ADB's largest public sector borrower, taking USD 4.2 billion of the USD 18.7 billion ADB committed from its non-concessional window regular ordinary capital resources in 2025.⁸² At IBRD, the World Bank's non-concessional sovereign window, India drew USD 2.35 billion of USD 40.9 billion in 2025.⁸³

SWFs, pension funds and insurance companies typically enter later once assets are operational and de-risked. Their objective is to match long-duration capital with stable, predictable cash flows. They prefer mature assets with demonstrated operating performance and limited construction risk.

For example, CPP Investments invested INR 20.8 billion in NHAI's National Highways Infra Trust in 2025, taking its cumulative investment in the InvIT to INR 57.6 billion.⁸⁴

Exhibit 4.3 | Capital pool challenges across the project lifecycle

	MDBs	Bilateral/G2G	International commercial banks	Pension funds & insurance	Sovereign wealth funds
Bankability & readiness	✓	✓	✓	✓	✓
Currency risk	✓	✓	✓	✓	✓
Project-readiness thresholds	✓	✓	-	-	-
Policy & regulatory reversals	✓	✓	✓	-	-
Multi-stage approvals	✓	✓	-	-	-
Land acquisition readiness	✓	✓	✓	-	-
Limited scaled operating assets	-	-	-	✓	✓
Weak exit & monetisation visibility	-	-	-	✓	✓
Sustainability & governance standards	✓	-	✓	✓	✓

81. ADB, ADB Approves \$240 Million Loan for Chennai Metro Expansion in India, 13 December 2025.

82. ADB, Annual Report 2025

83. World Bank Group, Annual Report 2025

84. CPP Investments, "CPP Investments Announces Third Follow-on Investment in India's National Highways Infra Trust," March 2025

Even where capital is available, projects must first cross two thresholds: they must be investible on their own merits, and foreign investors must be able to earn acceptable returns after currency risk.

As shown in Exhibit 4.3, two constraints are common across investor types:

- Limited availability of bankable, investment-ready projects constrains deployment across capital pools:** Global investors require projects to meet minimum thresholds on commercial and

economic viability, financial bankability, execution readiness, risk allocation and exit visibility. Refer to chapter 2 for project-level constraints.

- Currency risk can materially reduce the attractiveness of infrastructure investments:** With project revenues largely INR-denominated, foreign investors face currency mismatch against international funding and return expectations. INR depreciation can reduce foreign-currency returns, while long-tenor hedging can be costly or unavailable for the full project life.

Beyond these common considerations, capital pools differ materially in their deployment requirements.

Exhibit 4.4 | Investment pre-conditions for global capital pools

Capital Pool	Horizon	Pre-conditions for deployment	Select India investments
MDBs and Bi-laterals/G2G	20-30 years incl. 5-10-year grace	- Sovereign guarantee or sovereign-linked borrower - Land, approvals and design substantially advanced before appraisal or disbursement - Environmental & social commitment plan agreed pre-appraisal - Minimum EIRR bar cleared at appraisal - Projects financed within agreed cooperation sectors - Procurement under lender's own bidding rules; concessional terms carry tied procurement obligations	- Delhi–Ghaziabad–Meerut RRTS (ADB \$1.5 Bn, AIIB \$500 Mn, NDB \$500 Mn) - Amaravati Capital City Development (ADB \$800 Mn) - Chennai Metro Phase 2, Lines 4 & 5 (AIIB \$800 Mn) - Mumbai–Ahmedabad High Speed Rail (JICA \$6.8 Bn) - Surat Metro Phase 1 (KfW \$500 Mn, AFD \$300 Mn) - Green Energy Corridors (KfW \$700 Mn)
Institutional - SWF, pension, insurance	8-10 years	- Enter operational assets with stabilized cash flows - Long-term contracted or regulated revenue - Documented exit path before entry	- Brookfield India roads portfolio IndInfraVIT (CPP Investments, Allianz \$1 Bn) - National Highways Infra Trust (CPP Investments \$600 Mn) - IRB Infrastructure Trust (GIC \$500 Mn)
International Commercial Banks	3-7 years	- Creditworthy offtaker under long-term contract - Construction risk allocated upfront - Strong sponsor support behind borrower - Refinancing of operational or near-complete assets	- Adani Airports ECB (FAB, Barclays, Standard Chartered \$750 Mn) - AdaniConneX Data Centres (DBS, MUFG, Clifford Capital \$800 Mn) - Juniper Green Renewables (HSBC, DBS, Barclays and NaBFID \$215 Mn)

Exhibit 4.4 shows the horizon each global capital pool can hold and the conditions it applies before deploying. MDBs and Bilateral lenders face common deployment conditions.⁸⁵ Sovereign-backed lenders can hold exposure through construction and the ramp-up years that follow. Commercial banks and institutional investors need a shorter path to stabilised cash flows and typically enter once the asset is operational.

4.2.1 MDBs and Bilateral/G2G capital

MDB deployment in India has been concentrated in roads, urban development (including water and sewage), renewable energy, and transmission / grid infrastructure. They are increasingly shifting towards urban transformation (city transformation including waste, solid water, power grid, metros), transport and logistics corridors, rural water and waste, renewable energy, electric mobility, ports driven by urbanisation, climate goals, and the push for more sustainable growth.

Bilateral lenders are active across transport, energy, urban infrastructure, water and climate resilience, with future deployment likely to remain concentrated in these sectors aligned with economic development, urbanisation, energy transition and climate-resilience objectives.

MDBs and Bilateral/ G2G capital face certain common constraints before deploying infrastructure funding in India.

Project readiness is assessed before sanction, so preparation must be substantially complete at appraisal.

Lenders typically look for a meaningful share of tendering or contract award to be completed before financing is finalised. *For example, World Bank projects in India have targeted contracts equivalent to 30% of project value being ready before disbursement.*⁸⁶

Policy reversals and changing policies can impact project implementation and reduce lender visibility. *For example, the proposed US\$300 million World Bank*

*financing for Amaravati was withdrawn following a change in priorities, amid ongoing concerns around land pooling and resettlement.*⁸⁷ *The Bank approved USD 800 million for the programme in 2025, co-financed by ADB at USD 789 million, once those concerns had been addressed.*⁸⁸

Multi-stage government, safeguard, and lender approvals can take a year or more, delaying cash flows and reducing investor returns. Approval timelines across MDB transactions can vary materially by project.

Substantial land acquisition may need to be completed before financing / disbursement progresses.

For large transport projects, lenders such as JICA assess land acquisition and resettlement readiness as part of project appraisal and implementation.

International examples show that investing depends not just on project availability, but on how projects are structured and de-risked.

Long-term concessions and standardised contracts improve revenue visibility and investor confidence.

Public risk-sharing can absorb demand or early-stage risks that private investors may not take.

For example, Brazil uses 30–35 year water concessions⁸⁹, while the Philippines uses long-term airport concessions under a unified PPP framework.⁹⁰ Korea's BTO risk-sharing model shares investment and operating risk between government and private operators, while South Africa's renewable model uses long-term PPAs and revenue protections to reduce demand risk.⁹¹

Asset aggregation can create the scale and diversification required by institutional investors. Standardised regulation reduces transaction costs and execution uncertainty. *For example, Saudi Arabia bundles wastewater assets into clusters under long-term O&M contracts, creating more standardised investment opportunities. For example, Brazil's national water framework and the Philippines' unified PPP framework provide clearer rules, approval processes and contractual structures for private participation.*

85. ADB, Procurement Regulations for ADB Borrowers; ADB, Standard Bidding Documents; World Bank, Procurement Regulations for IPF Borrowers; World Bank, Environmental and Social Framework; World Bank, Environmental and Social Standards (ESS1–ESS10)

86. World Bank Group, Country Partnership Framework for India FY18–FY22, 2018.

87. World Bank, Amaravati Sustainable Infrastructure and Institutional Development Project documentation

88. World Bank and ADB project documents, 2025PIMAC, Risk-Sharing BTO and Risk-Adjusted BTO frameworks;

89. Government of Brazil, New Legal Framework for Basic Sanitation; BNDES, Water and Sanitation Concession Project documentation

90. PPP Center, Bohol-Panglao International Airport PPP Project

91. PIMAC, Risk-Sharing BTO and Risk-Adjusted BTO frameworks; Department of Mineral Resources and Energy / IPP Office, standard Power Purchase Agreement and Implementation Agreement documentation

Sector-specific models are critical, with different structures suited to waste, water, rail, healthcare and renewables. Different sectors require different structures (LTOM for waste, long-term concessions for water and rail, risk-sharing PPPs for metros, BLT/leasing for healthcare and PPAs for renewables) rather than a single common PPP model.

4.2.2 International commercial banks:

The constraint for international commercial banks is that projects must clear commercial thresholds on cash-flow visibility, sponsor strength and risk allocation, while offshore funding must remain attractive after currency and tax costs.

International commercial banks typically participate through project-finance loans, syndicated facilities, external commercial borrowings (ECBs), refinancing and sustainability-linked loans. They can finance construction-stage assets, but usually require stronger commercial bankability and contractual protection than development-finance institutions.

Deployment in India has been concentrated in renewable energy, power and grid infrastructure,

and selected transport assets, with growing activity in battery storage, data centres, and other transition infrastructure. Future deployment is likely to broaden further towards energy-transition and digital infrastructure, including battery storage, grid stability, data centres, biofuels and circular-economy assets, alongside continued financing of renewables and mature transport platforms.⁹⁵

Execution and contractual risks remain important. Banks typically look for contracted revenues, creditworthy offtakers, clear construction-risk allocation and strong sponsor support. Projects without these protections are less likely to meet commercial underwriting thresholds.

Withholding tax can further reduce the attractiveness of international bank funding. Interest paid to non-resident lenders may be subject to Indian withholding tax, with the applicable rate depending on the financing structure and statutory provision. This can raise the all-in cost where the borrower bears or grosses up the tax.

92. DBS India, India was DBS' fastest-growing sustainable finance market in 2025, 2026



4.2.3 Pension funds, insurance and sovereign wealth funds:

The constraint is the limited supply of scaled, operational assets suited to pension funds, SWFs and insurers. Even with long investment horizons, these investors still require credible exit pathways and compliance with international sustainability standards.

Pension funds, insurance and SWFs have been concentrated in roads, renewable energy, and transmission infrastructure. These sectors offer established operating models and relatively visible cash flows.

Investor interest is broadening beyond traditional infrastructure into logistics, digital infrastructure, circular-economy assets, airports and ports, supported by structural demand drivers including e-commerce and supply-chain formalisation, rising data consumption and cloud/AI adoption, tighter sustainability requirements, passenger growth and expanding trade volumes.

Long-horizon investors are well suited to hold infrastructure over extended periods, but typically prefer de-risked, cash-generating brownfield assets.

As a result, India's ability to attract more patient capital depends on creating a deeper pipeline of scaled, operational assets and vehicles such as InvITs that can efficiently recycle them into institutional ownership. *For example, CPP Investments and Allianz anchored IndInfra around a portfolio of operational toll roads, while CPP Investments' investments in NHAI InvIT have similarly funded acquisitions of brownfield operating roads.*⁹³

Limited exit visibility can materially extend holding periods and deter investors. Investors can tolerate extended holding periods but still require credible eventual monetisation routes to underwrite returns and manage portfolio liquidity. Weak or unpredictable exit markets can therefore reduce investment appetite.

For example, AMP Capital invested in Gujarat Pipavav Port in 2001 and exited only around the 2010 IPO, after an earlier IPO attempt by the port was shelved due to weak capital market conditions.

International sustainability standards are increasingly embedded in institutional investment frameworks. Large public pension funds and SWFs benchmark against international sustainability standards, with TCFD/CDP used for climate reporting, GRI for sustainability disclosure etc. This raises the bar for accessing international institutional capital, as gaps in ESG disclosure, climate reporting, or governance may limit eligibility.

Way forward:

- 1 Improve project readiness and policy predictability** to increase MDB and bilateral deployment.
- 2 Create scalable investment platforms:** Aggregate operating assets for diversified and standardised cash flows.
- 3 Provide clearer tax treatment for qualifying foreign SWFs and pension funds:** Clear eligibility rules let funds underwrite their after-tax return.
- 4 Develop long-tenor currency hedging capacity:** Build institutional capacity to hedge long-tenor rupee exposure, since available instruments do not extend to the 20-to-25-year life of most infrastructure assets.
- 5 Use credit enhancement to widen the investible universe:** Credit enhancement can improve the credit quality of otherwise unviable infrastructure assets.
- 6 Use blended finance to crowd in private capital:** Deploy public, or concessional capital in the riskier or less-commercial parts of a project, allowing private investors to fund the more bankable tranches or operating components.

93. CPP Investments, "Anchor Investors in First Private Infrastructure Investment Trust in India," May 2018

What Will Make Capital Flow:

Interventions via Financing Instruments and Enablers



5.1 A broader set of instruments and enablers is reshaping infrastructure financing



As financial markets have matured, a broader set of capital-market instruments and enabling structures have emerged to address infrastructure's specific characteristics, including but not limited to scale of capital needed, long investment periods, return profiles and risks such as construction delays and revenue uncertainty.

This has broadened the pool of capital available to infrastructure, bringing in multilateral and bilateral institutions, corporates as well as sovereign and other

institutional funds and, increasingly, high-net-worth investors. Capital is now provided through a wider range of instruments, including structured debt and hybrid capital.

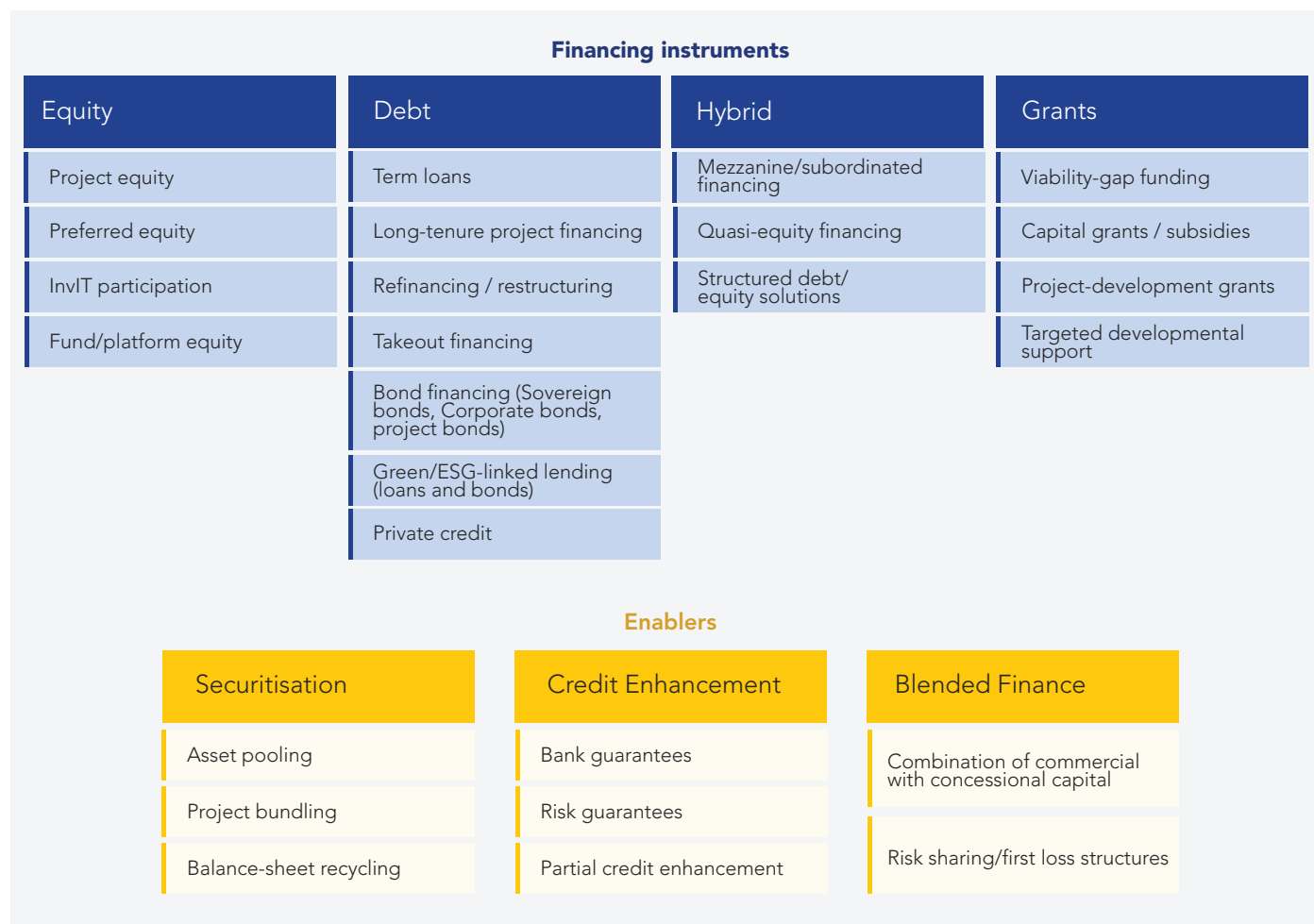
The role of these instruments and enablers is therefore not simply to add another source of capital, but to allocate risk more effectively, convert infrastructure assets into investible forms and match projects at different stages of maturity with investors that have different risk, return and liquidity requirements.

5.2 Global infrastructure finance has broadened, but instrument adoption remains uneven

The product landscape as seen in exhibit 5.1 comprises specific offerings across the four financing instrument classes, supported by cross-cutting enablers.

Exhibit 5.1 | Infrastructure financing instruments & enablers global landscape

non exhaustive



Debt provides long-term capital against expected project cash flows, while equity absorbs greater project risk in return for a residual claim on returns. Hybrid instruments sit between the two, providing more flexible risk-sharing than senior debt, while grants support projects where commercial revenues alone are insufficient. Private credit provides an additional route to debt and structured capital outside traditional bank

and bond markets. Alongside these instruments sit three key enablers: securitisation, credit enhancement and blended finance. Rather than acting as standalone sources of capital, they help reshape risk, pool or package assets, improve credit quality, or combine concessional and commercial funding to attract a wider set of investors.

These instruments and enablers have reached different levels of scale globally

Established and widespread structures: Debt remains the backbone of infrastructure financing in primary markets. World Bank tracked around USD 380 billion of private investment in infrastructure projects in primary markets in 2023, of which roughly 78% was financed through debt. Within infrastructure projects involving private investment, banks and other financial institutions accounted for 45% of private infrastructure financing in 2023, up from 33% in 2013, highlighting the continued importance of bank-led financing.⁹⁴

Newer instruments and enablers gaining scale: Fund/platform equity, private credit and green financing are becoming more important sources of infrastructure capital. Private infrastructure fund AUM reached around USD 1.5 trillion in 2024, after growing at about 16% CAGR over the previous decade, showing the increasing role of pooled institutional capital in the sector.⁹⁵ Private credit is also expanding into infrastructure: 12 infrastructure debt funds raised USD 11.4 billion in 2023, providing an additional source of long-term debt outside traditional bank lending. Green financing is scaling up within infrastructure.⁹⁶ In 2023, 62% of private infrastructure investment was classified as green investment, while green financing accounted for 79% of infrastructure loan financing and 42% of bond financing.⁹⁷

Targeted and emerging structures: Guarantees, blended finance and securitisation are used selectively, mainly where conventional financing cannot absorb all project risks or where assets need to be pooled to reach investors. New cross-border guarantee commitments for infrastructure reached USD 59.1 billion in 2023. The World Bank analysed 407 blended finance infrastructure deals in Low- and Middle-Income Countries worth USD 104.3 billion over 2000–2024, with project structures accounting for 52% of deals and 62% of total deal value.⁹⁸



94. World Bank, Infrastructure Monitor 2024, 2025

95. Neuberger Berman, Constructing the Future: Building Resilient Portfolios with Infrastructure, 2025

96. Preqin

97. World Bank, Infrastructure Monitor 2024, 2025

98. World Bank, Infrastructure Monitor 2024, 2025

Instruments and enablers have scaled differently across markets, sectors and asset types

Developed markets support a broader range of infrastructure financing instruments enabled by deep capital markets and large institutional investor pools. Mature bond markets allow public authorities to fund infrastructure directly, as seen in the US municipal bond market, which had around USD 4.2 trillion outstanding at end-2024.⁹⁹ Corporate and sustainable bond markets provide another route, particularly for clean energy, transport and green buildings. This depth is matched by a large institutional investor base able to hold long-duration infrastructure assets: North America and Europe together accounted for 82% of global infrastructure AUM in Q1 2024.¹⁰⁰

Emerging and lower-income markets rely more on guarantees, credit enhancement, blended finance and concessional capital to reduce risks that commercial investors may be less willing to take. Infrastructure accounted for around 30-40% of longer-tenor cross-border guarantees in low- and middle-income countries. Blended finance is also more prominent in developing markets, with Sub-Saharan Africa accounting for 38% of blended-finance infrastructure projects over 2000-24. These structures are particularly important where political, payment or project risks make purely commercial financing harder to attract.¹⁰¹



99. SIFMA, U.S. Municipal Bonds Statistics, 2025

100. Preqin, Infrastructure Global Report 2025

101. World Bank, Infrastructure Monitor 2024, 2025

Key drivers shaping instrument and enabler adoption across markets

Global experience shows that adoption of instruments depends on whether the assets, investors and market around it are suited to the product, and whether risks or weak project economics can be addressed.

A set of key drivers helps explain why some instruments have scaled more successfully than others across markets:

- **Suitable and sufficiently standardized underlying assets:** Instruments that pool, refinance or transfer risk require assets that can be assessed and compared with reasonable consistency. Greater standardization makes it easier to pool assets, evaluate their performance and price risk, supporting structures such as Securitisation and other asset-backed financing.
- **A deep investor base with matching risk and duration needs:** Long-tenor bonds, infrastructure funds, pooled vehicles and private credit require investors that can commit capital for long periods and tolerate relatively limited liquidity. Pension funds, insurers, sovereign investors and other long-term institutions are therefore important for these instruments to develop at scale.
- **Strong legal and market infrastructure:** Capital-market instruments and risk-transfer structures depend on clear legal rights, standard documentation, reliable ratings and pricing, and sufficiently liquid underlying markets. Market infrastructure such as trading, settlement and central clearing can further improve transparency and reduce transaction and counterparty risks.
- **Credible institutions able to absorb risks that investors cannot:** Guarantees and credit enhancement become important where projects are commercially viable but individual risks, such as political, payment, sovereign or currency risk, remain difficult for private investors to bear. Institutions with the capacity and credibility to take these risks can improve project credit quality and widen the pool of potential capital.
- **Catalytic capital where commercial risk-return is not yet sufficient:** Blended finance, concessional debt, grants and first-loss capital are relevant where project risks or returns are not yet sufficient to attract fully commercial financing. By absorbing specific risks or improving project economics, catalytic capital can help bring in private debt and equity that would otherwise remain unavailable.





5.3 International precedents of sector-specific vehicles to unlock domestic capital

Internationally, countries have set up contextual strategies to address the demand-supply gap

Malaysia and Thailand each built a purpose-specific vehicle to channel domestic savings into infrastructure: a government-owned asset company that borrows on behalf of financially weak operators, and a listed fund that monetizes toll revenue from operating expressways.

Malaysia moved water infrastructure borrowing from state operators to a government-owned asset company that can raise funds in the capital market

In Malaysia, state water operators did not generate enough revenue to fund capital expenditure, and their balance sheets could not support long-term borrowing.

The Water Services Industry Act 2006 separated asset ownership from operations. Pengurusan Aset Air Berhad (PAAB), a wholly government-owned asset-funding and financing vehicle, acquired state water assets, assumed the states' federal water loans and leased assets back to licensed operators for 45 years.

Funding therefore shifted from federal loans to the capital market, with lease income from the operators servicing the debt. PAAB funds new capital expenditure by borrowing from private markets under an AAA-rated USD 4.94 billion sukuk programme, backed by Ministry of Finance.¹⁰²

102. PAAB Sustainability Statement 2024

Thailand monetized thirty years of future toll revenue from two operating expressways to fund new construction

In Thailand, new expressway construction depended on Government borrowing, public-private partnerships and annual budget allocations. Two operating expressways generated steady toll revenue, but only over the remaining concession period, so it could not fund new assets.

In 2018, the Thailand Future Fund acquired the right to 45% of net toll revenue from Chalong Rat and Burapha

Withi expressways for thirty years, funded by a public offering of units in the fund. The Expressway Authority of Thailand retained ownership and operations, so transfer was of revenue rather than the asset.

Funding therefore shifted from the budget to domestic capital markets. The offer raised USD 1.37 billion, targeting domestic investors, with a minimum subscription of USD 300 and an eight-year tax exemption on distributions. Proceeds funded new construction and a further fund of USD 3.06 billion is in preparation.¹⁰³

103. <https://ppp.worldbank.org/library/thailand-future-fund-tffifRBI>



5.4 India's market conditions shape which financing instruments and enablers can scale

Global experience shows that financing instruments scale only when the surrounding market supports them, including the availability of suitable assets, investors, market infrastructure and risk-sharing capacity. The same set of instruments therefore need to be viewed differently in India. Some have long been part of infrastructure financing, while others are only now becoming viable as regulation, investor participation and the underlying asset base has developed.

The global financing universe can therefore be mapped to three distinct trajectories in India. Traditional channels such as bank and project lending, equity and public support remain established and continue to form the financing base. A second group, including credit enhancement, InvITs, AIFs and private credit, has historically been smaller or slower to develop but has the opportunity to scale as the conditions supporting these products improve. A third group, particularly CDS and Securitisation, remains constrained by deeper concerns in market depth, liquidity, standardization and investor participation, limiting near-term scale.

These three trajectories provide the basis for assessing which existing channels remain important, where new instruments can play a larger role, and where deeper market development is still required before adoption can be scaled.

Three instruments have the opportunity to scale in India

Credit enhancement could expand across both bond and project financing

Partial Credit Enhancement (PCE) can help lower-rated bonds access institutional capital. Partial Credit Enhancement covers part of the debt-service risk on an eligible bond, helping to improve its rating and investor appeal. India introduced PCE guidelines in 2015, but adoption remained limited. The 2025 framework strengthened the structure, raising the maximum enhancement from a single provider from 20% to 50%

of an issue.¹⁰⁴ NaBFID's PCE facility, for example, is intended to catalyze infrastructure bond issuance by improving credit ratings and crowding in long-term institutional investors, is an early sign that the revised framework has an opportunity to translate into market activity.¹⁰⁵

PCE creates an opportunity to bring more pension and insurance capital into lower-rated bonds. Pension funds can invest in specified A-rated infrastructure bonds, while insurers can invest in AA-and-above paper. These investors are particularly well suited given their long-term liabilities and existing allocations to corporate and infrastructure debt.

One sector where PCE could work well is urban infrastructure. Municipal bodies often require long-term financing, but lower credit ratings can limit access to institutional investors.

Infrastructure Risk Guarantee Fund could reduce construction-stage financing risk. The Infrastructure Risk Guarantee Fund (IRGF) was announced in the Union Budget 2026-27 to address risks during infrastructure development and construction, when lenders are typically most exposed to delays and execution uncertainty. The Fund is intended to provide calibrated partial credit guarantees to lenders, reducing the amount of project risk they have to bear and potentially encouraging greater lending to infrastructure developers. The Budget provides INR 10 billion for the Fund in FY27.

InvITs can recycle mature assets and bring in long-term institutional capital

Infrastructure Investment Trusts (InvITs) allow investors to hold a share in a pool of revenue-generating infrastructure assets. India introduced the structure through SEBI regulations in 2014. The public InvIT framework is designed mainly for mature assets.

Adoption has increased as India has built a larger pool of operating infrastructure that can be monetized. By September 2026, 27 InvITs were registered with SEBI, spanning infrastructure such as roads, power transmission, renewable energy, telecom and warehousing;¹⁰⁶ InvIT AUM was already around INR 7 trillion by March 2025, highlighting their growing role in monetizing operational infrastructure assets.¹⁰⁷

InvITs can work particularly well for roads, transmission,

104. RBI

105. NaBFID, Launch of Partial Credit Enhancement Product, 18 September 2025.

106. SEBI, Registered Infrastructure Investment Trusts, September 2026

107. SEBI, REITs and InvITs – From Niche to Mainstream, November 2025

renewable energy and other operating assets with relatively predictable cash flows. These characteristics also match the long investment horizons of pension funds, insurers, sovereign wealth funds and other institutional investors. Broadening institutional participation therefore represents an important opportunity for further scale.¹⁰⁸

AIFs and private credit can channel long-term institutional capital into infrastructure

Alternative Investment Funds (AIF) provide a regulated route for investors to pool capital into private assets. In India, Category I includes dedicated infrastructure funds, while Category II can invest through private equity, private credit and hybrid strategies. Private credit is typically offered through Category II AIFs rather than as a separate regulated structure. The market has reached meaningful scale: as of March 2026, Category I Infrastructure Funds had INR 205.7 billion commitments, while the much broader Category II market had INR 12.74 trillion, providing a sizeable pool that infrastructure can potentially tap.¹⁰⁹

AIFs also provide a route for foreign and institutional capital into infrastructure. Foreign investors contributed around 48% of the INR 139.9 billion raised on a gross basis by Category I Infrastructure Funds as of March 2026.¹¹⁰ Sovereign wealth funds, pension funds, development institutions and other long-term investors are well suited to these structures because they can commit capital for longer periods and gain exposure through professionally managed portfolios rather than investing project by project.

NaBFID has planned a USD 500 million Category II equity AIF in GIFT City. It illustrates how the structure can help address an equity financing gap in infrastructure and mobilise domestic and foreign equity for infrastructure projects.¹¹¹

Private credit extends the same framework into infrastructure financing. It provides negotiated, often longer-tenor financing where standard bank loans or public bonds may offer less flexibility.

India's private credit market remains relatively small, at around USD 25-30 billion of AUM,¹¹² but is growing. Infrastructure and utilities accounted for roughly a quarter of private-credit deal volume in 2024,¹¹³ with renewable energy also emerging as a user of structured credit.

Some instruments remain constrained by deeper market weaknesses

A third group of instruments has a regulatory basis in India but does not yet have the market depth needed to scale meaningfully. This is particularly true for securitisation and credit default swaps (CDS). Both depend on deeper underlying debt markets, broader investor participation and stronger market infrastructure.

Securitisation remains limited as a route to institutional capital

India's securitisation market operates through two routes, but they serve very different purposes. Direct Assignment (DA) is largely a bilateral transfer of loan pools used by banks to meet priority-sector lending requirements in areas such as agriculture, MSMEs and housing. No SPV is created and no securities are issued, so DA does little to broaden the capital-market investor base. Pass-Through Certificates (PTCs), by contrast, pool receivables in an SPV and issue securities backed by the underlying cash flows, allowing banks and NBFCs to access capital-market investors and recycle their balance sheets. Yet PTCs remain comparatively underdeveloped, limiting securitisation's potential as a broader source of funding.

Institutional participation also faces restrictions. For insurers, securitized housing and infrastructure assets require a AAA rating to qualify as approved investments, with securitized-asset exposure capped at 10% of investment assets for life insurers and 5% for general insurers. Government-sector NPS/UPS/APY investment guidelines similarly cap asset-backed, trust-structured and miscellaneous investments at 5%. These limits reduce the investor pool available to absorb securitized infrastructure loans at scale.¹¹⁴

108. Knight Frank, Infrastructure Investment Trusts (InvITs) in India: Mapping Future Potential, 2025

109. SEBI, Data relating to activities of Alternative Investment Funds (AIFs)

110. SEBI, Data relating to activities of Alternative Investment Funds (AIFs)

111. Mint, India's Youngest Infrastructure Financier Looks Beyond Debt, 25 March 2026

112. S&P Global, India's Private Credit Market Is Coming of Age, 2025

113. REDD Intelligence, 2024 India Private Credit Report

114. IRDAI, PFRDA

CDS lacks sufficient underlying credit depth and liquidity

The more fundamental constraint for CDS is India's bond market. Corporate bonds were only 14% of GDP in 2023, compared with 54% in Malaysia and 79% in South Korea. Moreover, 94% of corporate bond issuance in 2023 was rated AAA or AA, leaving relatively little lower-rated credit where demand for credit protection is likely to be strongest.¹¹⁵

Only a handful of CDS trades have been publicly disclosed, largely on AAA rated public-sector entities. Central clearing has also not yet been operationalized. Together, limited credit diversity, weak secondary liquidity and incomplete market infrastructure leave CDS with little room to scale until the underlying corporate bond market deepens.

Infrastructure finance is broadening, but scale will depend on the ecosystem around it

Infrastructure finance is becoming more varied, but the ability of individual instruments and enablers to scale

depends on the market around them. Global experience shows that asset quality, investor depth, regulation and market infrastructure matter as much as the product itself. India reflects this pattern. Bank lending, public capital and targeted support such as VGF will continue to provide the financing base, while newer instruments and enablers can increasingly complement them. PCE can widen access to institutional bond capital, InvITs can recycle mature operating assets, AIFs can pool domestic and foreign capital, and private credit can provide more flexible long-term financing. At the same time, enablers such as securitisation and CDS are likely to remain limited until deeper concerns in the corporate bond market, investor participation and secondary-market liquidity are addressed. The opportunity for India is therefore not simply to introduce more instruments and enablers, but to build the wider ecosystem around them, including suitable assets, supportive regulation, a broader investor base and stronger market infrastructure, so that each can scale where it is most effective.

115. NITI Aayog, Deepening the Corporate Bond Market in India, December 2025



Unlocking the Capital:

A Roadmap for Domestic and Global Flows

India's Viksit Bharat 2047 ambition of becoming a USD 30 trillion economy depends on infrastructure being built ahead of growth with INR 680–770 trillion of infrastructure investment needed through 2047. Of the INR 168–172 trillion needed by FY31, only INR 38–40 trillion has been financed to date. Chapter 2 showed that capital is only part of the problem. Nearly INR 80 trillion of the requirement is yet to translate into an announced project pipeline, while many projects that do emerge face evolving commercial models, weak project preparation, fragmented project-level information and unsettled approvals. Chapters 3 and 4 showed the constraints on deployment of capital. Domestic pools face limits on capacity, risk appetite and returns, while global investors require investment-ready assets and acceptable returns after currency risk. Chapter 5 identified instruments such as credit enhancement, InvITs and AIFs that can bridge the financing gap, but also showed that they scale only when the surrounding ecosystem is developed enough to support them.

This chapter highlights that no single institution or instrument can close these gaps alone; coordinated action across the infrastructure-financing ecosystem is needed to unlock private capital mobilisation at scale.



6.1 Five themes to unlock infrastructure capital



Build a sustained pipeline across the project lifecycle to enable capital and investor rotation

Around INR 78-80 trillion of FY26-31 requirements are yet to translate into an announced pipeline. Bringing forward new projects and keeping existing projects progressing across the lifecycle can create a sustained pipeline across stages, enabling capital and investors to rotate as project risk changes.



Deepen capital available at each lifecycle stage through financing instruments and enablers

More capital can compete for investible projects at each stage when financing instruments and enablers are suited to different investor risk, return and tenor requirements. Credit enhancement, guarantees, InvITs, securitisation, AIFs and private credit can enable participation across different investor risk-return profiles.



Develop viable commercial models and payment structures, particularly for urban infrastructure

Only 34-36% of FY26-47 requirements sit in sectors with proven bankable financing models. In sectors such as urban infrastructure, clear payment obligations, reliable revenue mechanisms such as tariffs or annuities, and viability gap funding where needed can make more projects financeable.



Improve market efficiency through standardisation, stronger underwriting and better information

Newer sectors lack comparable operating histories, standard contracts and agreed risk metrics. Standard contracts, clearer risk allocation and common performance benchmarks can strengthen underwriting. Separately, an infrastructure data platform can reduce information asymmetry and improve project benchmarking.



Align government and regulatory enablers to widen domestic and global capital participation

Government and regulators are already widening investment routes, while INR 2-3 trillion of domestic institutional capacity remains undeployed within existing regulatory limits. Greater use of this headroom and stronger credit-assessment capability can support domestic deployment. For global capital, project readiness, long-tenor currency hedging and credible exit pathways remain key enablers.

Source: BCG Research

1. Build a sustained pipeline across the project lifecycle to enable capital and investor rotation

A sustained infrastructure pipeline depends on projects moving steadily from announcement to financial closure, implementation and operations. Around INR 78–80 trillion of FY26–31 requirements are yet to be translated into an announced project pipeline. Identifying the right projects and structuring them for financing and sequencing implementation can help address this gap. Projects which are already in the pipeline, consistent assessment can help identify viable but underperforming assets and create routes for restructuring, re-bidding or transfer where appropriate. As projects progress and their risk profile changes, the investor base can shift depending on the project's current stage. Banks and NBFC-IFCs provide much of the construction-stage financing, while insurers, pension funds and sovereign wealth funds are better suited to operational assets with stable cash flows, which can release lender and sponsor capital for new projects.

2. Deepen capital available at each lifecycle stage through financing instruments and enablers

Each stage of the lifecycle can benefit from having multiple pools of capital competing for investible projects, rather than depending on a narrow set of financiers. Different investors have different tenor, risk and return requirements, and financing instruments and enablers can create opportunities suited to them. Credit enhancement and guarantees can widen access to institutional bond capital; NaBFID's PCE facility, for example, aims to catalyze infrastructure bond issuance by improving credit ratings and crowding in long-term institutional investors. InvITs and securitisation can bring long-term investors into operating assets with cash flows and seasoned loans. AIFs, private credit and hybrid structures can bring in global capital where conventional lending or bonds are less suited. NaBFID's planned USD 500 million Category II equity AIF in GIFT City illustrates how AIFs can mobilise domestic and foreign equity for infrastructure projects.

3. Develop viable commercial models and payment structures, particularly for urban infrastructure

Only 34–36% of India's future infrastructure requirement sits in sectors with proven bankable financing models today. The remaining 65% requires either new financing structures or changes in project economics before private capital can participate. This challenge is particularly significant for urban infrastructure, which accounts for almost half the requirement through 2047 but consists of smaller, dispersed projects across multiple municipal bodies, with lesser established revenue and financing structures compared to sectors such as roads. There is scope to develop sector-specific models with credible counterparties and enforceable payment obligations, backed by reliable revenue from user charges, annuities or offtake, with viability gap funding where project economics do not support private capital on their own. Some examples include Andhra Pradesh's waste-to-energy project which pooled municipal payment obligations and secured long-term power offtake, and Maharashtra's sewage-reuse project which linked a municipal asset to industrial offtake and secured debt against 30 years of contracted revenue. Scaling such sector-specific models can help bring more projects to a financeable state.

4. Improve market efficiency through standardisation, stronger underwriting and better information

Newer sectors are harder to underwrite because lenders have fewer comparable operating histories, standard contracts and agreed risk metrics. Standard contracts, clearer risk allocation and common performance benchmarks can give lenders a firmer basis to assess and price projects. More consistent project structures can also make assets easier to compare and pool, supporting structures such as securitisation. Separately, a common infrastructure data platform can reduce information asymmetry by bringing fragmented project, financing and operating-performance data together under common definitions, benchmarking new proposals against comparable assets and flagging deviations in operating projects early.

5. Align government and regulatory enablers to widen domestic and global capital participation

Government and regulators are already taking steps to widen the routes through which institutional capital can invest in infrastructure, including new operational-SPV debt routes for insurers, expanded eligible investment routes for pension investors and expanded credit-enhancement frameworks. Around INR 2–3 trillion of domestic institutional investible capacity permitted under existing regulatory limits is currently undeployed. This leaves scope to make fuller use of existing headroom while widening participation across eligible infrastructure instruments. There is further scope to widen eligible investment routes where appropriate, improve the treatment of credit-enhanced and securitised infrastructure assets, and build the credit-assessment capability needed to use existing headroom. For global pools, continued progress on project readiness, long-tenor currency hedging capacity and credible exit pathways can support greater deployment into Indian infrastructure.

Unlocking capital at scale will require coordinated action across the financing ecosystem

India's infrastructure financing opportunity is not simply about mobilizing more capital, but about matching the right projects with the right pools of capital at the right stage. The priority now is to convert more of the infrastructure requirement into investible projects, scale financing mechanisms that can widen participation, and build the regulatory, data and market infrastructure around them. As India advances towards Viksit Bharat 2047, this will require a financing system that can mobilize domestic and global capital more effectively, recycle capital from mature assets and continue to adapt as market needs evolve. The result can be a deeper, more resilient and scalable infrastructure-financing ecosystem capable of supporting India's next phase of growth.

Bibliography

- Agência Nacional de Transportes Terrestres (ANTT), Brazil, Five Railway Authorisations, October 2022.
-
- Airports Economic Regulatory Authority (AERA), Delhi Airport OMDA, 2006.
-
- Asian Development Bank (ADB), “ADB Approves USD 240 Million Loan for Chennai Metro Expansion in India”, 13 December 2025.
-
- Asian Development Bank (ADB), Annual Report 2025.
-
- Asian Development Bank (ADB), Procurement Regulations for ADB Borrowers; Standard Bidding Documents.
-
- Asian Infrastructure Investment Bank (AIIB), India project database.
-
- Association of Mutual Funds in India (AMFI), Monthly Report, March 2026.
-
- Banco Nacional de Desenvolvimento Econômico e Social (BNDES), Brazil, Water and Sanitation Concession Project documentation.
-
- BCG Global Asset Management Market Sizing Database, 2026.
-
- Central Electricity Authority (CEA), Monthly Installed Capacity Report, November 2025.
-
- CPP Investments, “Anchor Investors in First Private Infrastructure Investment Trust in India,” May 2018.
-
- CPP Investments, “CPP Investments Announces Third Follow-on Investment in India’s National Highways Infra Trust,” March 2025.
-
- CRISIL, “India Outlook 2026: Wading Through Squally Waters”, March 2026.
-
- CRISIL, Roads & Highways Sector Report, May 2026.
-
- Department of Atomic Energy, Nuclear Energy Mission, 2025.
-
- Department of Atomic Energy, Public Consultation on Draft SHANTI Rules and Draft SHANTI Regulations, 2026.
-
- Department of Economic Affairs (DEA), Ministry of Finance, PPP Risk Allocation Guide, 2025.
-
- Department of Economic Affairs (DEA), Ministry of Finance, Reference Guide for Concession Principles, 2026.
-
- Department of Economic Affairs (DEA), Ministry of Finance, Report of the Committee on “Revisiting and Revitalising the PPP Model of Infrastructure Development”, (Kelkar Committee), November 2015.
-
- Department of Economic Affairs (DEA), Ministry of Finance, Report of the Task Force on National Infrastructure Pipeline, 2020.
-
- Department of Economic Affairs (DEA), Ministry of Finance, Viability Gap Funding Scheme, 2006; revamped scheme guidelines, 2020.
-
- Department of Mineral Resources and Energy, standard Power Purchase Agreement and Implementation Agreement documentation.
-
- Development Monitoring and Evaluation Office (DMEO), Evaluation of Centrally Sponsored Schemes – Urban Transformation, 2021.
-
- Employees’ Provident Fund Organisation (EPFO), Minutes of the 236th Central Board of Trustees Meeting, November 2024.
-
- GlobalData PLC, infrastructure project database.
-
- Government of Brazil, New Legal Framework for Basic Sanitation, 2020.
-
- Government of India, Economic Survey 2025–26.

Government of India, Finance Act, 2023.
Government of India, Union Budget 2026–27.
Hong Kong Government, Rail-plus-Property funding model (Mass Transit Railway Corporation).
ICRA, market and sector data.
ICRA, Rating Methodology – Infrastructure Investment Trusts, August 2025.
Income-tax Act, 1961, Sections 115UA and 194LBA; Income Tax Department, capital-gains guidance.
Insurance Regulatory and Development Authority of India (IRDAI), Annual Reports, 2020–21 to 2024–25.
Insurance Regulatory and Development Authority of India (IRDAI), Handbook on Indian Insurance Statistics.
Insurance Regulatory and Development Authority of India (IRDAI), Master Circular on Actuarial, Finance and Investment Functions, May 2024.
IRDAI (Actuarial, Finance and Investment Functions of Insurers) (Second Amendment) Regulations, 2026.
Japan International Cooperation Agency (JICA), ODA Loan Agreements for the Mumbai–Ahmedabad High-Speed Rail Project (Tranches I–V), 2018–2023; National High Speed Rail Corporation Limited (NHSRCL).
Knight Frank, Infrastructure Investment Trusts (InvITs) in India: Mapping Future Potential, 2025.
Ministry of Environment, Forest and Climate Change (MoEFCC), Annual Report 2023–24.
Ministry of Housing and Urban Affairs (MoHUA), CityFinance portal.
Ministry of Housing and Urban Affairs (MoHUA), PIB Press Release, February 2026.
Ministry of Ports, Shipping and Waterways (MoPSW), Annual Report 2025–26.
Ministry of Ports, Shipping and Waterways (MoPSW), PIB Press Release, Maritime India Vision 2030, July 2026.
Ministry of Power, National Electricity Plan (Transmission), October 2024.
Ministry of Railways, Annual Report 2024–25.
Ministry of Road Transport and Highways (MoRTH), Annual Report, FY2024.
Ministry of Road Transport and Highways (MoRTH), Circular No. NH-24028/02/2024-H, 6 May 2025.
Ministry of Road Transport and Highways (MoRTH), PIB Press Release, Multi-Modal Logistics Parks, April 2025.
Ministry of Road Transport and Highways (MoRTH), PIB Press Release, November 2018.
Ministry of Statistics and Programme Implementation (MoSPI), PAIMANA (Project Assessment, Infrastructure Monitoring and Analytics) project-tracking database.
Ministry of Statistics and Programme Implementation (MoSPI), PIB Press Release, Provisional Estimates (PE) of Annual Gross Domestic Product (GDP) for the Financial Year (2025-26) and Quarterly Estimates of GDP for the Fourth Quarter (Q4, January-March) of FY 2025-26, June 2026.
NaBFID-CRISIL Intelligence, Partial Credit Enhancement: New Paradigm for Infrastructure Finance, September 2025.
NaBFID-ICRA Research, Catalysing Infrastructure Investment & Innovation: Towards Viksit Bharat 2047, September 2025.
National Highways Authority of India (NHAI), Annual Report 2024–25.
National Highways Authority of India (NHAI), Asset Monetization Strategy for Roads Sector.
National Infrastructure Pipeline (NIP), Government of India, 2019.
Neuberger Berman, Constructing the Future: Building Resilient Portfolios with Infrastructure, 2025.
NIDB investor presentation.

NITI Aayog, Deepening the Corporate Bond Market in India, December 2025.

NITI Aayog, National Monetization Pipeline: Monetization Guidebook, 2021.

NITI Aayog, Reforms in Urban Planning Capacity in India, September 2021.

Pengurusan Aset Air Berhad (PAAB), Sustainability Statement, 2024.

Pension Fund Regulatory and Development Authority (PFRDA), Master Circular on Investment Guidelines for Government Sector, December 2025.

Preqin, Infrastructure Global Report 2025.

Preqin, market data.

Press Information Bureau (PIB) / National Highways Authority of India (NHAI), National Highways Infra Trust (NHIT) fund raise, 2025.

Press Information Bureau (PIB), "A New Chapter in India's Nuclear Journey", 2026

Press Information Bureau (PIB), National Monetization Pipeline 2.0, 2026.

Press Information Bureau (PIB), "Gati-Shakti Vision for Telecom Infrastructure – Right of Way Rules Amended for Faster 5G Roll-out", Aug 2022

Public and Private Infrastructure Investment Management Center (PIMAC), South Korea, Risk-Sharing BTO and Risk-Adjusted BTO frameworks.

Public–Private Partrillionership (PPP) Center, Philippines, Bohol–Panglao International Airport PPP Project, 2024.

REDD Intelligence, India Private Credit Report, 2024.

Reserve Bank of India (RBI), Current Rates and Banking Statistics.

Reserve Bank of India (RBI), Master Direction – Securitisation of Standard Assets Directions, 2021.

Reserve Bank of India (RBI), (Project Finance) Directions, 2025.

Reserve Bank of India (RBI), Report on Municipal Finances, November 2024.

Reserve Bank of India (RBI), Sectoral Deployment of Bank Credit, June 2026.

Reserve Bank of India (RBI), State Finances 2025–26.

S&P Global, India's Private Credit Market Is Coming of Age, 2025.

Securities and Exchange Board of India (SEBI), AIF Regulations, 2012.

Securities and Exchange Board of India (SEBI), Annual Report 2025–26.

Securities and Exchange Board of India (SEBI), Categorization and Rationalization of Mutual Fund Schemes, February 2026.

Securities and Exchange Board of India (SEBI), Data Relating to Activities of Alternative Investment Funds (AIFs).

Securities and Exchange Board of India (SEBI), Debt Denomination Circular, 3 July 2024.

Securities and Exchange Board of India (SEBI), Master Circular for Mutual Funds, 20 March 2026.

Securities and Exchange Board of India (SEBI), National Conclave on REITs and InvITs, 2025.

Securities and Exchange Board of India (SEBI), Reclassification of Real Estate Investment Trusts (REITs) as Equity Related Instruments for Facilitating Enhanced Participation by Mutual Funds and Specialized Investment Funds (SIFs), November 2025.

Securities and Exchange Board of India (SEBI), Registered Infrastructure Investment Trusts, September 2026.

Securities and Exchange Board of India (SEBI), REITs and InvITs – From Niche to Mainstream, November 2025.

SIFMA, U.S. Municipal Bonds Statistics, 2025.

Solar Energy Corporation of India (SECI), Request for Selection for Pumped Storage Plants (PSP-I), December 2025.

World Bank Group, Amaravati Sustainable Infrastructure and Institutional Development Project documentation, 2016-19.

World Bank Group and Asian Development Bank (ADB), project documents, 2025.

World Bank Group, Annual Report 2025.

World Bank Group, Country Partrillionership Framework for India, FY18–FY22, 2018.

World Bank Group, Environmental and Social Framework; Environmental and Social Standards (ESS1–ESS10); Procurement Regulations for IPF Borrowers, 2023.

World Bank Group, Gearing Up for India's Rapid Urban Transformation, 2024.

World Bank Group, Infrastructure Monitor 2024, 2025.

World Bank Group, Thailand Future Fund (TFFIF), 2018.

List of Abbreviations

Acronym	Definition
AAI	Airports Authority of India
ADB	Asian Development Bank
AERA	Airports Economic Regulatory Authority of India
AIF	Alternative Investment Fund
AIIB	Asian Infrastructure Investment Bank
AMC	Asset Management Company
AMFI	Association of Mutual Funds in India
ANTT	Agência Nacional de Transportes Terrestres (Brazil)
APY	Atal Pension Yojana
AUM	Assets Under Management
BLT	Build-Lease-Transfer
BNDES	Banco Nacional de Desenvolvimento Econômico e Social (Brazil)
BOOT	Build-Own-Operate-Transfer
BOT	Build-Operate-Transfer
BRL	Brazilian real
BTO	Build-Transfer-Operate
CAGR	Compound Annual Growth Rate
CDS	Credit Default Swap
CEA	Central Electricity Authority
DA	Direct Assignment
DBFOT	Design, Build, Finance, Operate and Transfer
DEA	Department of Economic Affairs, Ministry of Finance
DFCCIL	Dedicated Freight Corridor Corporation of India Limited
DMEO	Development Monitoring and Evaluation Office, NITI Aayog
DPIIT	Department for Promotion of Industry and Internal Trade
DSCR	Debt Service Coverage Ratio
ECB	External Commercial Borrowing
EIRR	Economic Internal Rate of Return
EPC	Engineering, Procurement and Construction
EPFO	Employees' Provident Fund Organisation
ESG	Environmental, Social and Governance
EV	Electric Vehicle
FY	Financial Year
GDP	Gross Domestic Product
GFCF	Gross Fixed Capital Formation
GIFT City	Gujarat International Finance Tec-City
GRI	Global Reporting Initiative
GSDP	Gross State Domestic Product
HAM	Hybrid Annuity Model

Acronym	Definition
IBRD	International Bank for Reconstruction and Development
INR	Indian rupee
InvIT	Infrastructure Investment Trust
IPO	Initial Public Offering
IPP	Independent Power Producer
IRDAI	Insurance Regulatory and Development Authority of India
IRFC	Indian Railway Finance Corporation
IRGF	Infrastructure Risk Guarantee Fund
JICA	Japan International Cooperation Agency
JNPA	Jawaharlal Nehru Port Authority
JPY	Japanese yen
LIC	Life Insurance Corporation of India
MCA	Model Concession Agreement
MDB	Multilateral Development Bank
MNRE	Ministry of New and Renewable Energy
MoSPI	Ministry of Statistics and Programme Implementation
MSME	Micro, Small and Medium Enterprises
NaBFID	National Bank for Financing Infrastructure and Development
NAV	Net Asset Value
NBFC	Non-Banking Financial Company
NBFC-IFC	Non-Banking Financial Company – Infrastructure Finance Company
NCD	Non-Convertible Debenture
NH	National Highway
NHAI	National Highways Authority of India
NHIT	National Highways Infra Trust
NHSRCL	National High-Speed Rail Corporation Limited
NIP	National Infrastructure Pipeline
NITI Aayog	National Institution for Transforming India
NMP	National Monetisation Pipeline
NPS	National Pension System
NTPC	National Thermal Power Corporation
ODA	Official Development Assistance
OMDA	Operation, Management and Development Agreement
PAAB	Pengurusan Aset Air Berhad (Malaysia)
PAIMANA	Project Assessment, Infrastructure Monitoring and Analytics
PCE	Partial Credit Enhancement
PFRDA	Pension Fund Regulatory and Development Authority
PIB	Press Information Bureau
PIMAC	Public and Private Infrastructure Investment Management Center (Korea)
PNGRB	Petroleum and Natural Gas Regulatory Board
PPA	Power Purchase Agreement

Acronym	Definition
PPP	Public-Private Partnership
PRAGATI	Pro-Active Governance and Timely Implementation
PSU	Public Sector Undertaking
PTC	Pass-Through Certificate
RBI	Reserve Bank of India
RCS-UDAN	Regional Connectivity Scheme – Ude Desh Ka Aam Nagrik
REIT	Real Estate Investment Trust
SEBI	Securities and Exchange Board of India
SECI	Solar Energy Corporation of India
SIF	Specialised Investment Fund
SIFMA	Securities Industry and Financial Markets Association
SPV	Special Purpose Vehicle
STC	Simple, Transparent and Comparable
SWF	Sovereign Wealth Fund
TAC	Track Access Charge
TCFD	Task Force on Climate-related Financial Disclosures
TOT	Toll-Operate-Transfer
TSA	Transmission Service Agreement
ULB	Urban Local Body
USD	United States dollar
VGF	Viability Gap Funding

Appendix 1

Methodology for classification of the FY26–31 project pipeline by funding stage

Basis of the disaggregation

The funding-stage disaggregation is built on NaBFID-ICRA's sectoral requirement modeling for the FY26–31 period, cross-referenced against PAIMANA (Project Assessment Infrastructure Monitoring and Analytics), the Ministry of Statistics and Programme Implementation's project-tracking database, and against the India infrastructure pipeline maintained by GlobalData PLC, which records public and private projects across lifecycle stages. Additional analysis is layered on top to move from project-level records to a capital funnel expressed in aggregate terms.

Scope definition

The Harmonised Master List of Infrastructure Sub-sectors is used as the scope boundary. Each sector category in the project-level data is mapped to the Harmonised Master List and retained only where it corresponds to a listed sub-sector, which excludes manufacturing, and commercial and residential real-estate categories that sit outside the infrastructure definition.

Classification by funding stage

In-scope projects are classified by status using the lifecycle stage recorded against each project. Projects in execution are classified as under implementation and currently financed, since construction has begun and funding is committed and drawn. Projects awaiting financial closure are announced since 2023, but have not reached financial closure. Stalled projects are those formally on hold, together with projects that have been announced pre-2023 but are yet to reach the bid stage. Projects yet to be

announced are implied by the sectoral demand but not yet listed in any pipeline, and are derived as the balance between the aggregate FY26–31 infrastructure capex requirement and the announced pipeline.

Sizing and extrapolation

PAIMANA covers central-sector projects, and its aggregate project cost is taken as the Centre's announced pipeline. Because state and private projects are not captured in that database, the announced pipeline is extended using the capex shares across Centre, state and private sector referenced from National Infrastructure Pipeline projections, holding those shares constant over the forecast period. The stage distribution observed in the project-level data is then applied to the resulting announced pipeline to size each funding stage, with the unannounced component taken as the residual against the sectoral requirement.

Interpretation and limitations

The funnel is intended as an indicative view of how the FY26–31 requirement is distributed across funding stages rather than a precise measurement. Project stage shares are observed on project counts and applied to capital value, on the assumption of broadly comparable project sizes across stages. Capex shares across Centre, state and private sector are held at their National Infrastructure Pipeline levels over the forecast period. Project costs are taken as originally sanctioned, which gives a consistent basis across the pipeline. The two project datasets are used for distinct purposes, stage distribution and pipeline value respectively, and are applied at an aggregate rather than project level. The unannounced component is derived as a residual against the modelled requirement. Figures in exhibit 1.4 are presented as ranges on this basis.

Authors

National Bank for Financing Infrastructure and Development

Himanshu Gulliani

Executive Vice President & Head - Strategy
& Partnerships
himanshu.gulliani@nabfid.org

Mayank Thukral

Vice President - Strategy & Partnerships
mayank.thukral@nabfid.org

Boston Consulting Group

Ashish Garg

Managing Director and Senior Partner
garg.ashish@bcg.com

Aniruddha Marathe

Managing Director and Partner
marathe.aniruddha@bcg.com

Ayush Kanwar

Partner
kanwar.ayush@bcg.com

Navneet Kaur

Project Leader
kaur.navneet@bcg.com

Aditya Vaidya

Consultant
vaidya.aditya@bcg.com

Muskan Mundra

Senior Associate
Mundra.muskan@bcg.com

Acknowledgements

We would like to thank Advika Gupta and Shruti Dash for her contribution to the research, analysis and preparation of the report. We thank Nidhi Yadav, Jasmin Pithawala, Bhumika Gupta, Simran Wadhwa for their support on the marketing and publicity of the report. We also thank Anshul Patria, Amit Singh for their contributions to the design and production of the report.

About National Bank for Financing Infrastructure and Development:

National Bank for Financing Infrastructure and Development is a Development Financial Institution (DFI) established in April 2021. The institution is dedicated to accelerating the development of India's infrastructure ecosystem by addressing the long-term financing needs of the sector.

The institution plays a pivotal role in driving the nation's economic growth and fostering sustainable development. It is committed towards its vision of becoming a strong provider of impact investment, catalysing infrastructure financing for transformative growth of India.

The institution aims to be a key partner in helping India achieve its ambitious infrastructure development objectives - responsibly and sustainably. Additionally, the institution will work towards developing a deep and liquid market for bonds, loans, and derivatives for infrastructure financing.

Website: <https://nabfid.org/>

LinkedIn: <https://www.linkedin.com/company/national-bank-for-financing-infrastructure-and-development/>

X (formerly Twitter): https://x.com/NaBFID_official

Contact

Himanshu Gulliani

Executive Vice President & Head - Strategy and Partnerships

Himanshu.Gulliani@nabfid.org

Mayank Thukral

Vice President - Business Strategy and Partnerships

Mayank.Thukral@nabfid.org

About Boston Consulting Group

Boston Consulting Group bridges the gap between ambition and outcomes for the world's leading companies and organizations. We are built for this era of unprecedented change, bringing strategic clarity rooted in over 60 years of deep domain knowledge, combined with applied AI shaped by our practitioners. BCG works shoulder-to-shoulder with CEOs across industries and geographies to deliver transformative impact at scale: stronger returns, transferred capabilities, and change that sticks.

For more information, visit [bcg.com](https://www.bcg.com).

Disclaimer

This document has been prepared in good faith on the basis of information available at the date of publication without any independent verification. BCG / NaBFID does not guarantee or make any representation or warranty as to the accuracy, reliability, completeness, or currency of the information in this document nor its usefulness in achieving any purpose. Readers are responsible for assessing the relevance and accuracy of the content of this document. It is unreasonable for any party to rely on this document for any purpose and BCG / NaBFID will not be liable for any loss, damage, cost, or expense incurred or arising by reason of any person or entity using or relying on information in this document. To the fullest extent permitted by law, BCG / NaBFID shall have no liability whatsoever to any party, and any person using this document hereby waives any rights and claims it may have at any time against BCG / NaBFID with regard to the document. Receipt and review of this document shall be deemed agreement with and consideration for the foregoing. This document is based on a primary qualitative and quantitative research executed by BCG / NaBFID. BCG / NaBFID does not provide legal, accounting, or tax advice. Parties responsible for obtaining independent advice concerning these matters. This advice may affect the guidance in the document. Further, BCG / NaBFID has

made no undertaking to update the document after the date hereof, notwithstanding that such information may become outdated or inaccurate. BCG / NaBFID does not provide fairness opinions or valuations of market transactions, and this document should not be relied on or construed as such. Further, any financial evaluations, projected market and financial information, and conclusions contained in this document are based upon standard valuation methodologies, are not definitive forecasts, and are not guaranteed by BCG / NaBFID. BCG / NaBFID has used data from various sources and assumptions provided to BCG / NaBFID from other sources. BCG / NaBFID has not independently verified the data and assumptions from these sources used in these analyses. Changes in the underlying data or operating assumptions will clearly impact the analyses and conclusions. This document does not purport to represent the views of the companies mentioned in the document. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by BCG / NaBFID. Apart from any use as permitted under the Copyright Act, 1975 and Copyright Act 1957, no part may be reproduced in any form.

