

India Infrastructure Reviving Private Investments



December 2024

This report provides a comprehensive analysis of investments in infrastructure development in India. The focus of the report is to identify the challenges for the private sector participation and provide advocacies to revive the same.

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Foreword



Shishir Bajjal
Chairman & Managing Director
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In recent years, the Central Government has embarked on a journey to transform the nation's infrastructure landscape. Recognizing the pivotal role that robust infrastructure plays in economic growth and societal well-being, the government has significantly accelerated its investments in this sector. This strategic thrust is not merely about building roads, bridges, and railways; it is about laying the foundation for a more connected, efficient, and resilient India.

The renewed focus on infrastructure is expected to catalyse job creation, enhance productivity, and improve the quality of life for the citizens. By prioritizing sustainable and inclusive development, the government aims to bridge the urban-rural divide, ensuring that the benefits of progress reach every corner of the country.

While government participation has improved significantly, there is a critical need to expand private sector involvement. Private developers and investors will play a crucial role in accelerating infrastructure development in India. Increased private sector participation is essential for several reasons such as capital mobilisation, innovation and efficiency, risk sharing and global expertise.

The report emphasises the necessity for streamlined approval processes, and innovative financing solutions to attract both private domestic and international investments. It also underscores the potential of emerging infrastructure technologies, efficient urban transport systems, and targeted policy reforms to enhance project execution and mitigate risks.

Comparisons with countries like China reveal significant gaps in advanced infrastructure, such as expressways and high-speed rail. Addressing these gaps is crucial for improving India's logistics efficiency, reducing costs, and boosting global competitiveness.

In conclusion, the report calls for strengthened collaboration between the public and private sectors. It positions infrastructure as a cornerstone of India's economic aspirations, essential for fostering long-term growth and enabling sustainable urbanization.

Growth in The Last Decade

In the last one decade, infrastructure development in India has expanded significantly supported by the investment thrust by the central government. The burgeoning public investment has been complemented by a host of institutional and procedural reforms that facilitated project execution and timely issue resolutions. These include initiatives to enhance private sector participation through PPPs, facilitative measures like National Infrastructure Pipeline and Project Monitoring Group, debottlenecking procedures PM-GatiShakti, and novel instruments such as REITs and InvITs to ease the constraints on long-term finances required for infrastructure investments.

Key policy initiatives such as Bharatmala Pariyojana, Sagarmal etc and initiatives pertaining to green energy corridors, industrial corridors, freight corridors etc has significantly supported the scope of infrastructure development in India, details of which are provided in the exhibit xx. Large scale initiatives such as National Infrastructure Pipeline (NIP) envisages to build infrastructure projects with an investment of INR 111 tn between 2020-2025 is expected to significantly expand the scope of economic development in India.

With an objective to amplify the infrastructure development, the central government push towards the same has increased multifold in the last decade. The central government capital expenditure towards core/physical¹ infrastructure has increased from 0.5% of the GDP, amounting to USD 9.9 bn to USD 75 bn in 2023, equivalent to 2.2% of the GDP. In terms of development, the length of national highways has expanded by 1.5x, with an addition of ~48,154 kms of national highways in India. In addition to expansion of the infrastructure, the productivity as well has increased as witnessed in the construction of national highways. In 2013, an average of 12kms of national highways was constructed per day, which has now increased to 34 Kms per day. Similar expansion has been witnessed in other segments of infrastructure. Additionally, there has been a significant upgrade and transformation or the modernisation of infrastructure with Vande Bharat trains, growing expressways, progress in renewable energy, telecom infrastructure etc. These highlight the significant improvement in infrastructure development in India in the last few years.

As a result of expanding infrastructure developments, the performance of India on various metrics such as logistics has significantly improved. India's ranking in the logistics performance Index (LPI) has increased from 54 in 2014 to 38 in 2023. Improvement in logistics and ease of mobility of goods and services plays a pivotal role in reducing logistics cost of India, which remains the key objective of the central policy makers. As per economic survey logistics cost in India range between 14-18% of the GDP (economic survey 2022-23), higher than the global benchmark of 8%. The central government aims to reduce the logistics cost to below 9% of the GDP by 2025. With the ongoing thrust on infrastructure investments, and the development of infrastructure projects, it is imminent that India's logistics cost will reduce significantly in the next few years. However, this requires a significant number of investments, from central, state as well as private participants.

¹ Includes- Roads and highways, railways, petroleum and natural gas, housing and urban infra, telecommunications, power, atomic energy, water resources, new and renewable energy, civil aviation, ports, shipping and waterways.



Table 1

Expansion of Key Infrastructure in India Over the Last Decade and Target for 2030

Indicator	2013	2023	2030 Target
Central govt capex allocation to core infrastructure (% of GDP)	0.5	2.2%	
Length of national highways (kms)	97,991	1,46,145	~ 2,00,000
National highways, construction per day (kms/day)	12	34	
Modernisation of railways: Operational Vande Bharat trains		100+	800
Length of operational metro (kms)	248	945	1595
% of cargo transshipment handled by Indian ports		25%	> 75%
Power Generation (Gigawatt)	243	442	1100
Renewable Power (Gigawatt)	30	175	500
Tele density (% of population)	75.23	85.69	NA
Electric Vehicle Charging Stations (Units)	-	12,146	3.9 mn

Source: Government documents, Knight Frank Research

Table 2

Table on key policy initiatives

Policy Initiative	Sector Focus	Key Features	Timeline	Investment Envisaged (Rs Lakh Crore)
National Infrastructure Pipeline (NIP)	Multi-sector (Transport, Energy, Water, etc.)	Aims to invest in infrastructure projects across various sectors.	2020-2025	111
PM Gati Shakti National Master Plan	Transport and Logistics	Enhances multimodal connectivity and integrates infrastructure schemes.	Launched in 2021	100
Bharatmala Pariyojana	Roads and Highways	Develop 34,800 km of highways, including economic corridors, border roads, and coastal roads.	Phase I: 2017-2022	5.35
Sagarmala Programme	Ports and Coastal Infrastructure	Focuses on port modernization, new port development, and enhancing port connectivity.	2015-2035	5.5
UDAN (Ude Desh ka Aam Nagrik)	Aviation	Aims to make air travel affordable and enhance regional connectivity by developing underserved airports.	Launched in 2016	0.18
Smart Cities Mission	Urban Development	Develops 100 smart cities with improved infrastructure, technology, and governance.	2015-2025	0.48
Pradhan Mantri Gram Sadak Yojana (PMGSY)	Rural Roads	Enhances rural connectivity by constructing all-weather roads to unconnected habitations.	Launched in 2000	0.70
National Logistics Policy	Logistics	Aims to improve logistics efficiency and reduce costs through integrated infrastructure and regulatory frameworks.	Launched in 2022	NA
National Monetisation Pipeline (NMP)	Asset Monetisation	Monetises core assets of the central government to generate revenue for new infrastructure projects.	2021-2025	6
Atal Mission for Rejuvenation and Urban Transformation (AMRUT)	Urban Infrastructure	Focuses on water supply, sewerage, urban transport, and green spaces in 500 cities.	Launched in 2015	0.50

Source: Various Gol documents, Knight Frank Research

Cross Country Comparison of India's Physical Infrastructure with China

As noted above, infrastructure in India has expanded significantly witnessing a rapid pace of growth. For a global comparison, we have measured India's infrastructure with that of China, which is often considered as a benchmark for large scale infrastructure development and as well as economic growth.

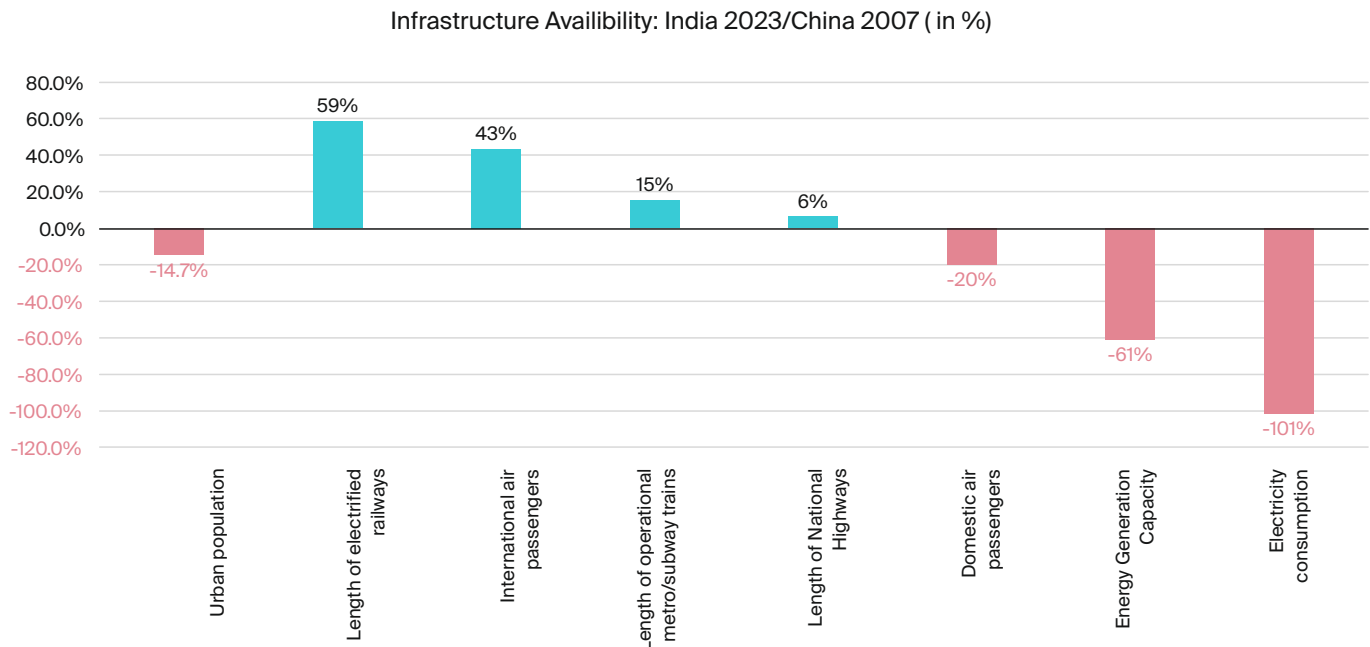
Over the last few decades, China has made a significant investment into enhancing the scale and infrastructure development in the country. Pre-Covid, the average expenditure made by the China's government into infrastructure development was equivalent to 8-10% of the GDP. Additionally, China's has also remained attractive for the private investment to participate in its infrastructure projects. Between 2013-2023, China's attracted private investments of USD 207 bn, wherein, India has been able to attract merely one third of it amounting to USD 76 bn².

However, despite relatively lesser quantum of infrastructure investments in India, in some of the key metrics, the availability of infrastructure in India exceeds that of China when compared to the equitable growth period. India's economic size in 2023 stood at USD 3.7 trn which is equivalent and comparable to China's economic size in 2007. When we compare infrastructure development in India 2023 vs. in China 2007, we notice that the scale of development in infrastructure indicators such as length of national highways, electrification of railways, length of operational metro etc is ahead of China during the comparable period. However, in some key indicators such as – expressways, high speed rails, energy generation, etc India trailing behind China. While the traditional development of roads, and railways eases the movement of goods and services, the enhancement of the same in the form of expressways, high speed rail etc. improves efficiency. Thus, focus on developing this advanced infrastructure will play a pivotal role in improving the movement of goods and services, reducing the logistics cost and improving investment attractiveness of India.

Since early 2000s, China has significantly increased the scale of infrastructure development. This amplified their economic growth, which grew at a CAGR of 10.2% between 2000-10. Thus, indicating a stronger role of infrastructure development in propelling China's economic growth in the last 16 years. Hence, for India, to attain its ambitious economic growth target of USD 7 trn by 2030 and attain a developed economy status by 2047, it is crucial that infrastructure gaps are plugged and strengthen the same with a focus on efficiency and long-term durability.

Figure 1

Infrastructure availability in India 2023 ahead of China 2007 in some and lags in others



Source: RBI, Various India ministries documents, National bureau of statistics of China, Knight Frank Research

² Private Participation In Infrastructure (PPI) Database, 2023

Table 3

Infrastructure Availability – India Vs China

Indicator	Unit	India		India CAGR	China		China CAGR
		(FY 2014) 2013	(FY 2024) 2023	(2013 - 2023)	2007	2023	(2007-2023)
GDP	USD trn	1.9	3.7	7.1%	3.6	17.8	10.6%
Population	Bn	1.29	1.43	1.0%	1.32	1.41	0.4%
Area	Mn Km Sq	3.3	3.3		10	10	
Roads							
National Highways	Km	97,991	1,46,145	4.1%	1,43,320	47,92,800	24.5%
Expressway	Km		5,930		53,900	1,84,000	8.0%
Railways and Metro							
Length of Operational Railways	Km	65,808	68,584	0.4%	63,600	1,54,900	5.7%
Electrified Railways	Km	21,614	58,074	10.4%	24,000	1,14,500	10.3%
% of Electrified Railways		33%	85%		38%	74%	
Freight Transport	Mn tonnes	1051.6	1580.0	4.2%	3,142.4	5,035	3%
Passengers Movement	Mn	8397	6844	-2.0%	1357	3854	6.7%
High-speed rails	Km	0.0	0.0		423	43,700	33.6%
Operational subway/metro rail	Km	229.0	902.0	14.7%	763	9,555	17.1%
Airport							
Number of airports	Nos	74.0	148.0	4.6%	148	257	3.5%
International Air passengers	Mn	16.7	29.7	3.1%	17	74	8.6%
Domestic air passengers	Mn	139.0	307.0	8.2%	185	548	7.0%
Energy							
Energy generation capacity	GW	243.0	442.0	6.2%	713	2811	9.0%
Electricity consumption	BU	1022.0	1616.0	4.7%	3256	9264	6.8%

Source: RBI, Various India ministries documents, National bureau of statistics of China, Knight Frank Research

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The airport development sector in India is brimming with potential and excitement. The government's focus on enhancing aviation infrastructure through initiatives like the UDAN scheme and the development of new greenfield airports presents significant opportunities. Despite challenges such as regulatory approvals and land acquisition, the scope for innovation and growth is immense. By incorporating state-of-the-art technology and sustainable practices, we aim to create world-class airports that not only boost connectivity but also drive economic growth. The enthusiasm within the industry is palpable, as we work towards transforming India's aviation landscape and contributing to its global standing. Government's support for long-term financing will be instrumental in encouraging developer participation, ensuring the sustainability and success of these projects.

G R K Babu
Chief Financial Officer
GMR Airports Limited

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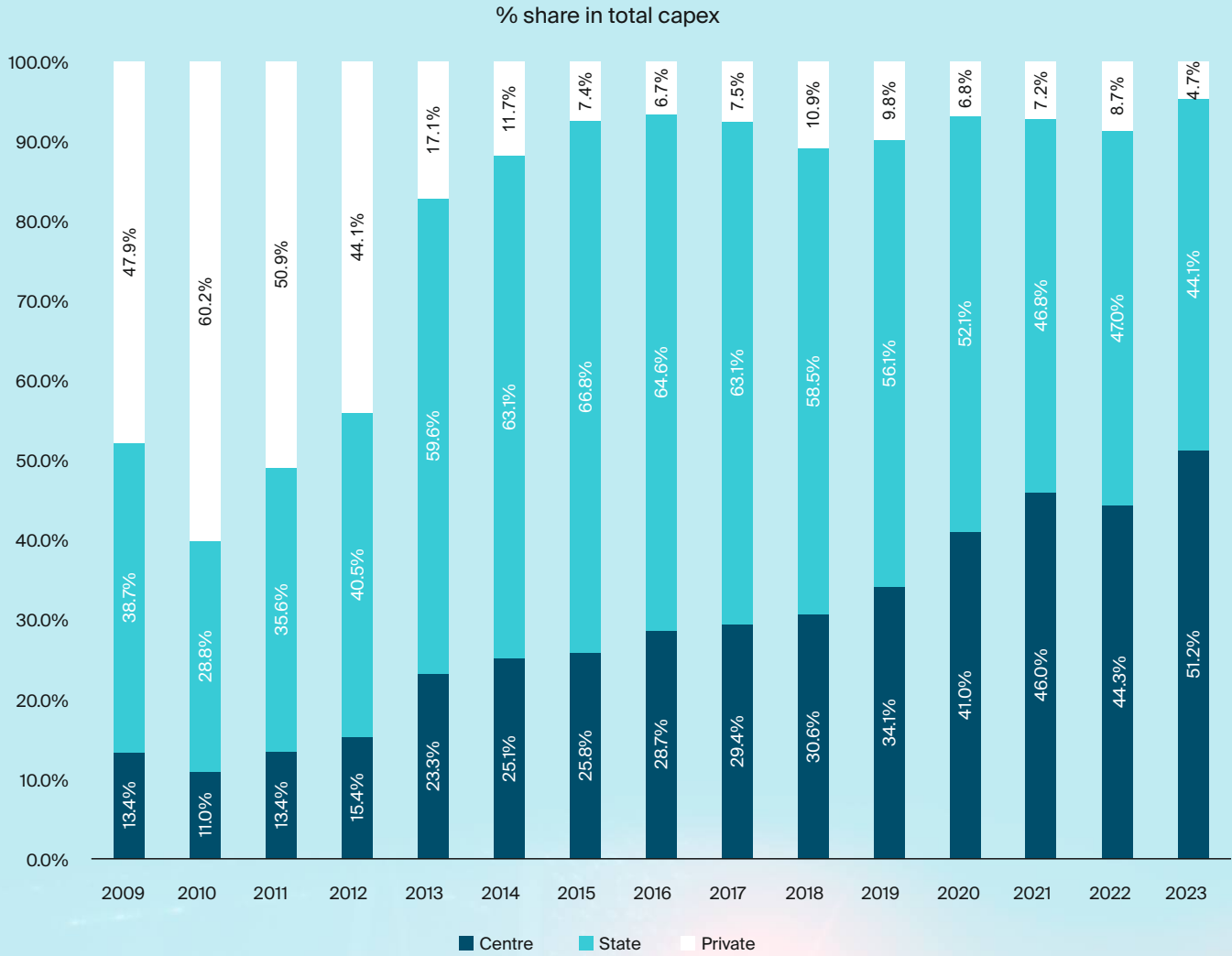
Shifting Trends in Infrastructure Investments in India

Infrastructure projects are capital intensive and have long gestation periods. Hence, the central and the state government budgetary sources are the key avenues of funding for infrastructure development in India. In 2023, India's total investments into infrastructure stood at USD 151 bn, a 3x growth from USD 50 bn in 2013. Investments in infrastructure primarily arising from the public sector includes – central government budgetary allocation and gross budgetary support, state government allocations etc. Historically, the share of state government expenditure towards infrastructure development has exceeded that of central. However, in recent years, though, the larger volume of funding infrastructure projects is still from the states, the share of the centre has significantly increased owing to an aggressive impetus by the central government towards infrastructure development. The share of central government expenditure towards infrastructure development increased from 15% during 2009-13 to 45% between 2019-23. Between 2019-2023, the central government expenditure towards infrastructure development is estimated to be USD 244 bn, and the states expenditure is estimated at USD 263 bn.

While the centre and state expenditure continue to remain the key funding sources for infrastructure development, private players also have played a pivotal role. However, in the last few years, the participation of the private sector into infrastructure development in India, has remained subdued. In the early years, policy focus on strengthening of public private participation initiatives, the participation of private investments into infrastructure was aggressive, especially in sectors such as roads, power, energy etc. Between 2009-2013, private investments in infrastructure stood at USD 160 bn, equivalent to 46.4% of the total infrastructure investments during this period. However, due to multiple factors such as – delays in project initiation, cost overruns, delays in approvals, under performance of the infrastructure assets, low generation of revenues, etc hindered the uptake of private investments in infrastructure development in India.

Figure 2

Growing share of central government investments; share of private participation dims



Source: Government budgetary documents, World Bank, Knight Frank Research



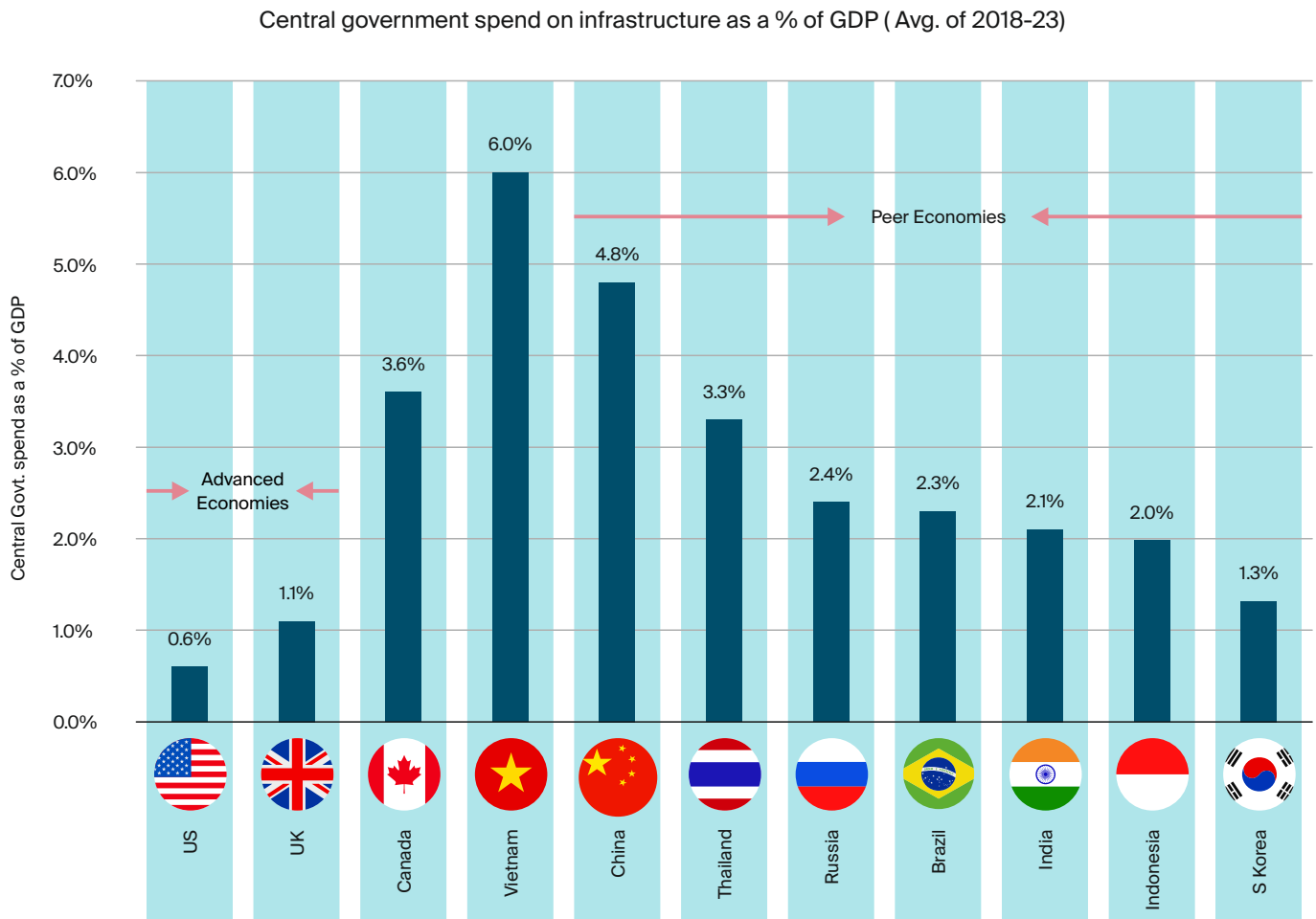
India's Infrastructure Spend Is Significantly Lower Than Its Key Global Peers

As noted above, the central government spend on infrastructure has increased from 0.5% of the GDP in 2013 to 2.2% of the GDP in 2023. However, on a global scale it is relatively less in comparison to peer economies such as China, Vietnam, Thailand etc. Amongst the peer economies, central government spend on infrastructure development in Vietnam is about 6% of its GDP. The Government of People's Republic of China has spent an average of 4.8% of its GDP towards infrastructure development between 2018-2023. Noticeably, before the COVID-19 pandemic, the government spend on infrastructure in China ranged between 8-10% of the GDP.

In developed economies such as the US and the UK, even though the central government spend on infrastructure seems to be miniscule of about 0.6% and 1.1% of the GDP respectively between 2018-2023, it is still very significant in absolute terms, equivalent to an average annual expenditure of USD 162 bn and USD 55 bn respectively. However, the comparison of the developed economies will be a deviation as these economies had made significant investments during their economic expansion phase decades ago.

Figure 3

India's spend on infrastructure relatively lesser than the peer economies



Source: Budget documents, Knight Frank Research.

Note: Prior to the COVID-19 pandemic, infrastructure spend in China ranged from 8-10% of the GDP

Trends In Private Sector Participation In Infrastructure Development In The Last 15 Years



2009-2013: Private sector dominates infrastructure investments

During this period, a total of USD 345 bn of investments were made into the infrastructure sector in India, of which a staggering 46.4% was contributed by the private participants. The success of private participation into infrastructure sector during this period was attributed to well-crafted policy reforms designed by the government and ably executed by the private sector, banks and financial institutions. In the early years, post liberalisation, the policy makers in India had created enabling environment for the private participants through several sector specific initiatives such as – relaxing entry norms, tax concessions, independent regulations sectors such as power and telecom, establishment of viability gap funding mechanisms, India infrastructure finance company ltd etc.

The PPP model in key segments especially road construction and development acted as a catalyst and provided an impetus to private participation in infrastructure development in India. For instance, Between 2009-13, of the total 10,600 km of national highways completed under the National Highways Development Programme, 50% was funded through the BOT (build-operate-transfer)-toll model and 10% through the BOT-annuity model.

2014-2018: Declining private investments

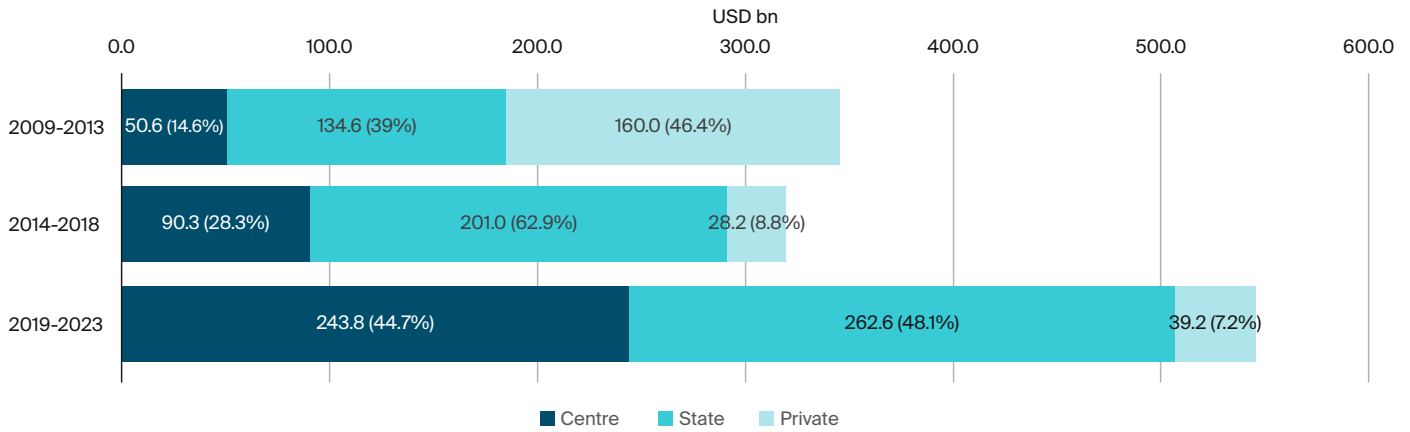
The issue of declining private investments into infrastructure was aggravated by emerging challenges leading to new investments demand. Primarily the private developers faced viability issues with the projects. Issues pertaining to approvals, execution risks, subdued financing, lower traffic, high gearing ratio and delayed execution stressed their balance sheets. Bidders for PPP toll projects became limited on account of these challenges. This led to rise in EPC contracts and the HAM models, wherein the revenue risks were taken by the government and the development was done by the developer. However, in the EPC model the quality of roads constructed has been usually poor as the contractor has no stake in the roads once these are constructed and handed over to the government. Further, maintenance of the roads has been poor after handover to the government, since there is no proper accountability on quality in the case of state-owned roads. In case of typical PPP projects especially those under BOT, the developer ensures that the roads are in a good condition for a longer period, i.e., the concession period.

2019-2023: Muted private participation despite burgeoning opportunities

In the recent years, the central government has aggressively increased the capital expenditure on infrastructure development with an objective to improve connectivity and reduce logistics cost to aid the business and manufacturing capacity of the country which can eventually generate higher economic output. 48% of all the investments made during this period was led by the state government, 45% was by the central government and merely 7.2% was invested by the private sector. Various flagship initiative such as Bharatmala Pariyojana, NIP, Sagarmala etc was introduced during this period, which provided an impetus to the private sector. However, the active participation of the private developers in infra projects in India is yet to witness an uptick. Nevertheless, the private participation in the recent years has revived in some sectors such as roads, with the introduction of HAM model in 2016 and subsequent favourable changes to the concession agreements in 2020 for the HAM and BOT model.

Figure 4

Trends in infrastructure investments over five-year period



Source: Central and states budget document, World Bank, Knight frank Research

Uneven Sectoral Participation of Private Players

The participation of the private investors in infrastructure development has been uneven across the sectors. The liberalisation, privatisation and globalisation (LPG) reforms of 1990-91, opened gateway for the private participation into infrastructure projects into India. Between 1990-2023, India attracted USD 303 bn of private investments in infrastructure development. Of this, the renewable energy sector followed by roads has been the most attractive sector for the private participant comprising a share of 53% and 33% respectively of the total investments. In terms of ownership telecom sector is predominantly owned by the private sector, wherein 91% of the wireless telecom sector ownership is led by private players. However, the cumulative investments over the last three decades have been predominant in energy segments, especially in the power generation wherein ~39% of the power generation plants are owned by the private players in addition to their growing presence in power distribution.

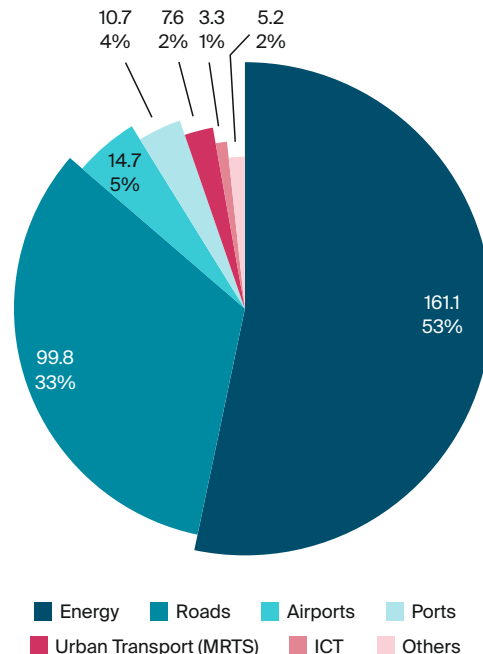
The uneven sectoral participation is primarily due to variations in risks and revenue and regulatory challenges in each of the sectors. Sectors such as renewable energy, roads & highways, airports etc has high growth potential wherein the revenue estimates are more predictable and has wider policy support attract private participation.

Whereas sectors such as power distribution, urban infrastructure specifically water supply and sanitation, waste management etc which involve regulatory challenges, high and upfront capital investments, slower demand offtake, lower returns to scale etc are facing challenges in attracting private investments.

Figure 5

Energy and Road sectors leads private investments

Private Investments In Infrastructure In India, 1990-2023 (USD Bn)



Source: World Bank, Knight Frank Research

Note: Others include – Railways, Water and sewerage, natural gas, Integrated MSW, Treatment and Disposal plants etc

Table 4

Private sector participation and scope of investment

Sector	Investments 1990 - 2023 (USD bn)	Investment Level	Reasons for Investment Levels	Examples	Ongoing Government Programs	Investment Potential
Renewable Energy	138.6	High	Government incentives, supportive policies, high growth potential	Solar power projects, wind energy initiatives	National Solar Mission, Wind Energy Mission, Green Energy Corridors, Production Linked Incentive (PLI) Scheme	High: Significant growth opportunities due to increasing energy demand and favorable policies.
Roads and Highways	99.8	High	PPP models, predictable revenue from tolls, growing demand for connectivity	Toll roads, expressways		High: Ongoing urbanization and expansion create robust investment opportunities.
Power Transmission and Distribution	22.6	Medium	Regulatory challenges, low return on investment, existing public sector dominance	Transmission networks, rural electrification projects	UDAY (Ujwal DISCOM Assurance Yojana), Power Sector Reform Programs, Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY)	Moderate: Investment potential limited by regulatory and financial challenges.
Airports	14.7	Medium	Growing air travel demand, revenue from landing fees and retail, opportunities for expansion and modernization	Airport terminals, runway expansions	National Civil Aviation Policy, UDAN (Ude Desh Ka Aam Nagrik), Airport Infrastructure Development Scheme	High: Expanding air travel and modernization efforts offer significant investment opportunities.
Ports and Shipping	10.7	Medium	Strategic importance for trade, modernization initiatives, investment in port infrastructure	Port terminals, cargo handling facilities	Sagarmala Project, National Perspective Plan for Ports, Port-Led Development Scheme	High: Increasing trade volumes and modernization needs drive investment.
Urban Transport (MRTS)	7.6	Low	Rapid urbanization, smart city initiatives, development of metro rail systems	Metro rail projects, urban transport systems	Smart Cities Mission, AMRUT (Atal Mission for Rejuvenation and Urban Transformation), National Urban Transport Policy	High: Urban growth and smart city projects create strong investment potential.

Sector	Investments 1990 - 2023 (USD bn)	Investment Level	Reasons for Investment Levels	Examples	Ongoing Government Programs	Investment Potential
Tele-communications	3.3	Low	High demand for connectivity, technological advancements, competitive opportunities	Mobile network expansions, broadband infrastructure	Digital India Initiative, National Broadband Mission, BharatNet	High: Continuous demand for improved connectivity and technological advancements drive investment.
Water Supply and Sanitation	1.6	Low	High initial capital investment, high public sector management, lower revenue generation	Rural water supply projects, sewage treatment facilities	Jal Jeevan Mission, Swachh Bharat Mission (Urban), AMRUT (Atal Mission for Rejuvenation and Urban Transformation)	Moderate: Investment potential is constrained by high costs and public sector dominance.
Waste Management	1.3	Low	Limited revenue generation models, high operational costs, inconsistent regulatory frameworks	Municipal solid waste management, landfill operations	Swachh Bharat Mission (Urban), National Clean Air Programme, Waste to Wealth Mission	Low to Moderate: Investment is constrained by revenue models and operational challenges.
Railways	0.02	Low	Predominantly public sector managed, high capital requirements, complex regulatory environment	Railway station redevelopment, freight rail	Dedicated Freight Corridor, National Rail Plan, PM-Gati Shakti	Moderate: Potential for growth with improved regulatory and financial frameworks.

Source: World Bank, Knight Frank Research

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Infrastructure investments in India represent a cornerstone for the nation's economic growth and development. With the government's proactive initiatives there is a robust framework in place to support and attract investment. These projects not only aim to modernize urban and rural infrastructure but also focus on sustainability and resilience. We see this as a golden opportunity to be part of India's transformative journey, contributing to critical sectors such as telecom, energy, digital infrastructure etc. We are keen to explore opportunities in the other sectors as well. The potential for healthy returns, coupled with the positive impact on the country's development, makes infrastructure investment in India an exciting venture.

Arpit Agarwal
Managing Partner – Infrastructure
Brookfield Asset Management Ltd

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Challenges for Private Participation in Infrastructure Investments in India

Even though some sectors, such as roads, renewable energy, telecom etc have attracted a significant volume of private investments, on an overall scale it remains inadequate. Between 2019-2023, the share private investments averaged at 7.5% despite aggressive policy support by the government. While the investment opportunity is significant and looks attractive, there are certain challenges impeding private participation in infrastructure development. Challenges pertaining to project clearance, execution, cost overruns etc have hindered private participation. Due to subdued private investments, the dependency on the government budget increases, which when not balanced could lead to fiscal stress. Hence, for the long-term sustainable growth of the economy it is imperative that these challenges are addressed. Some of the key challenges are discussed below:



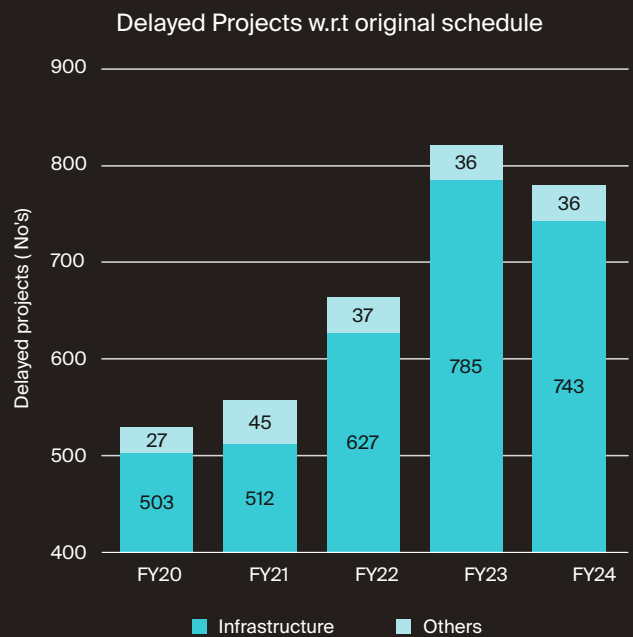
Project execution risks

Delays in project executions resulting in cost overruns has been one of the major hurdles for private participation especially in the road sector. The delay in project execution, increases the project cost which in turn impacts the investment returns of the private developer or the investor. Thus, this impairs the ability and the willingness of the private investor to participate in infrastructure development in India. Numerous factors can cause delay in projects execution and completion such as: changing governments, challenges in land acquisition, forest and environmental clearances, project financing, procurement of raw materials, shifting utilities, excessive local stakeholders' management etc.

Amongst all the industries, the occurrence of project delays are more predominant in the infrastructure segment, comprising a humongous share of 95%. As of FY24, 779 projects are delayed, out of which infrastructure comprises 743 projects.

Figure 6

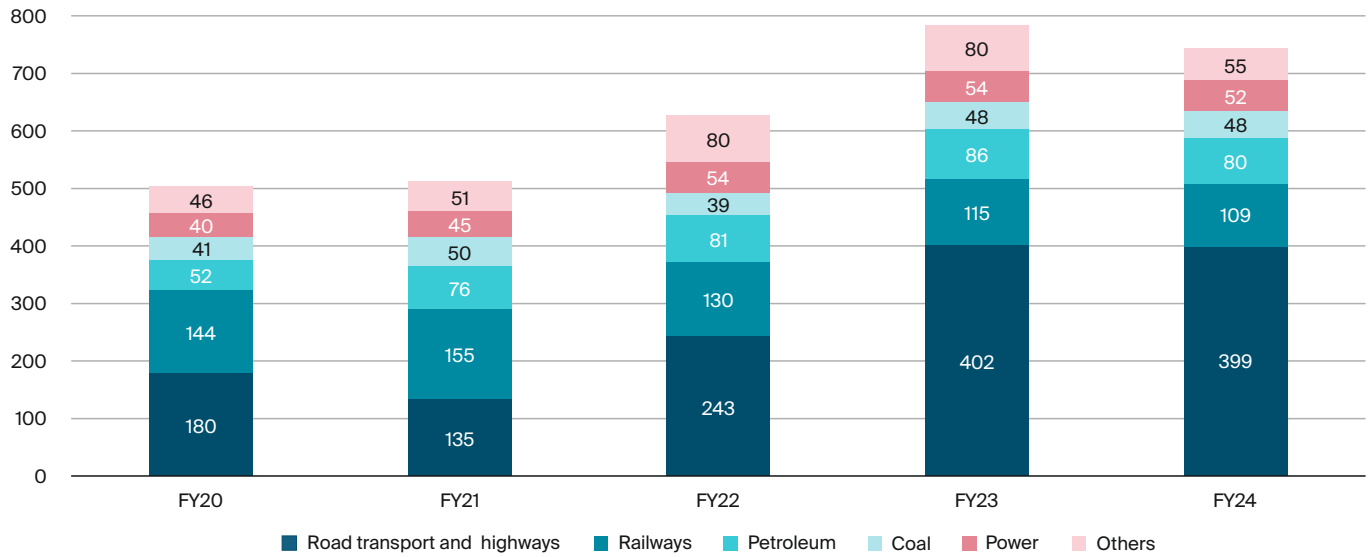
Infrastructure projects comprise nearly 95% of all delayed projects



Source: MOSPI, Knight Frank Research

Table 7

Number of project delays across infrastructure sectors

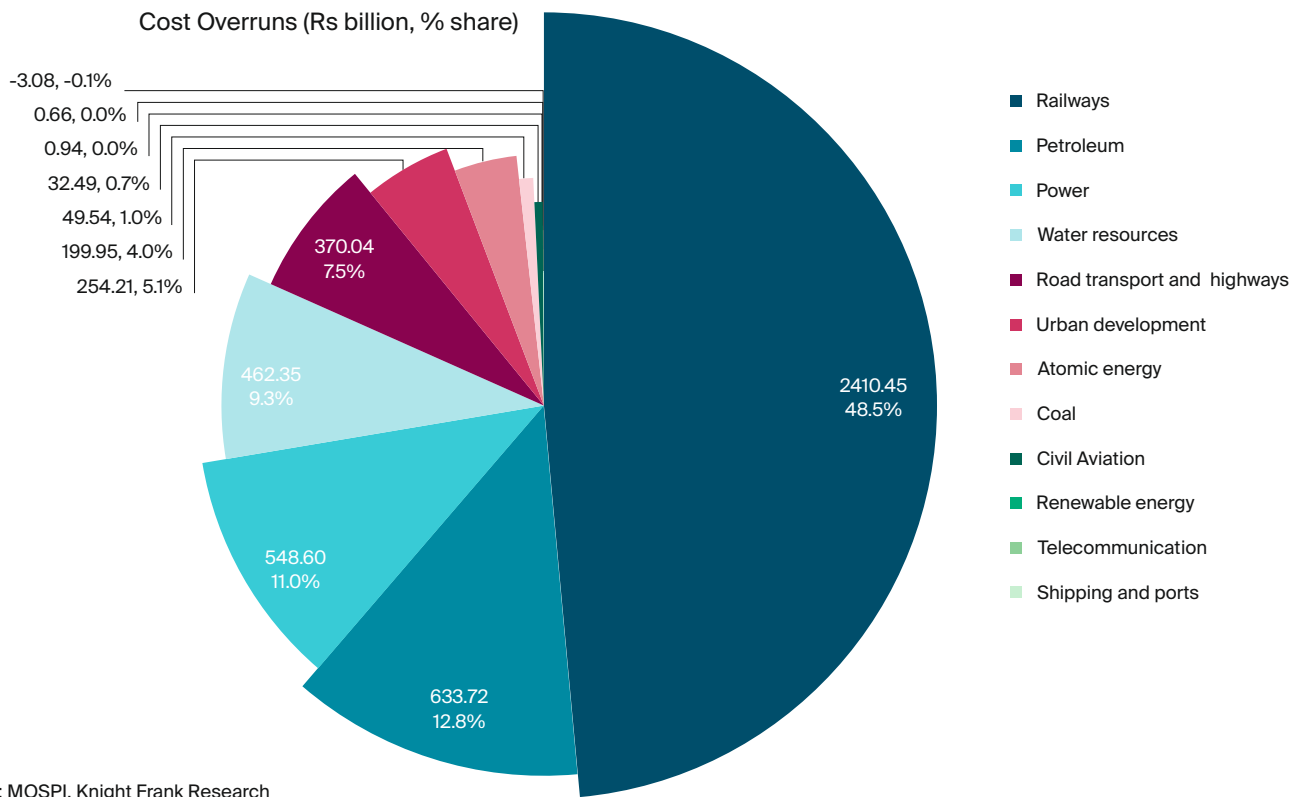


Source: MOSPI, Knight Frank Research

Note: Others include- Water resources, Civil aviation, Urban development, Telecommunication, Atomic energy, Shipping and ports, renewable energy, rural development etc.

Figure 8

Cost overruns by various sectors



Source: MOSPI, Knight Frank Research

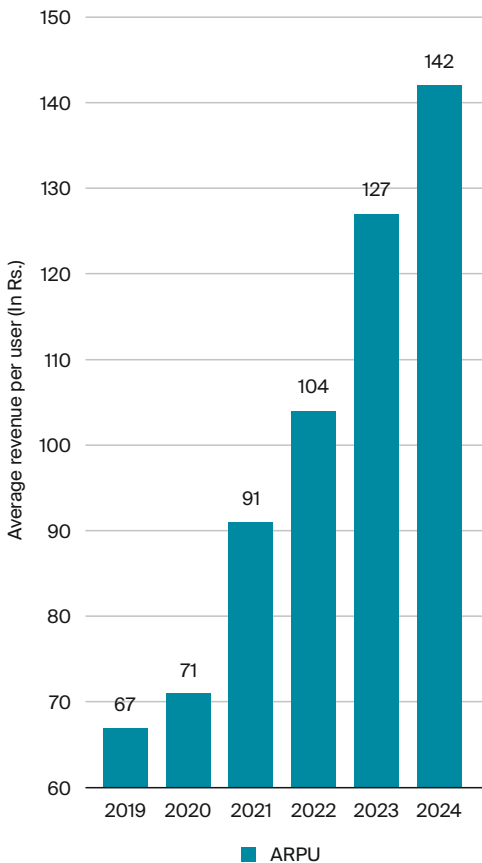
Revenue risks or underperformance of the project

Infrastructure projects are capital intensive and when a private player invests in the same, it is expected that the project generate adequate revenue generating profitability. However, infrastructure projects in India face risks of underperformance when they fail to generate adequate expected returns leading to financial losses. This erodes investor confidence impairing future investments. Such revenue risks deter private participation into infrastructure development. Some of the causes of underperformance of infrastructure project include – cost overruns due to delay in the project execution and completion, planning inefficiency, faulty detailed project report (DPR) with over-estimated demand, economic challenges such as inflation and currency fluctuations etc. Sectors such as telecom has massive private participation with 91% of the ownership as their revenue generation measured as average revenue per user (ARPU) is growing at a favourable pace. However, sectors such as MRTS etc face challenges in generating adequate revenue owing to lower fares and poor/ inadequate ridership. MRTS, the metro rail development in India has been growing at a faster rate due to increasing urbanisation and the need for rapid urban transport. Currently, India has 945 kms of operational metro lines across 18 cities and about 1040 Kms is under construction across 27 cities. However, despite such widening scope, the participation of private players in MRTS is inadequate.

The performance of metro projects in India has been very tepid, with ridership way below estimates. As per standing committee on housing and urban affairs 2021-22, half of the PPP attempts in existing operational metro projects have failed.

Figure 9

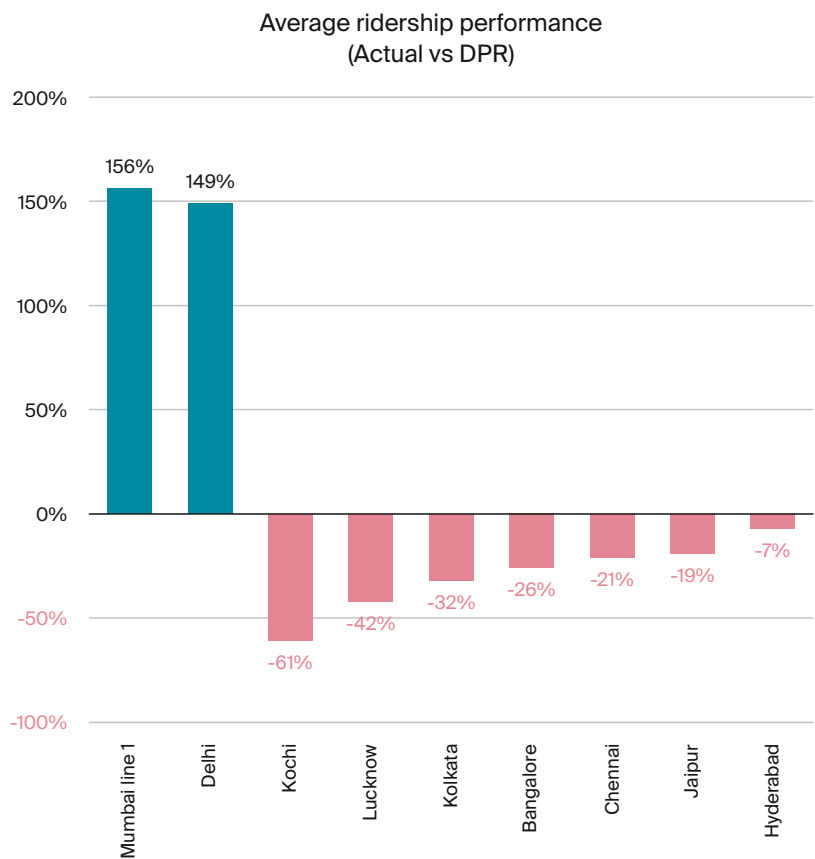
ARPU increased two-fold between FY 2019-24



Source: TRAI, Knight Frank Research

Figure 10

Subpar ridership performance of various metros in India



Source: TRAI, Knight Frank Research

Financing challenges

Infrastructure projects require long term financing and in the case of private developers, the financing requirement is largely catered by banks and NBFCs. However, owing to its long-term working capital cycle and risks of project uncertainties, banks have limited appetite for providing credit to infrastructure projects. Infrastructure projects are complex in nature and involve large capital outlays and significant gestations periods. Hence, they are susceptible to various risks such as – project specific risk (delays, cost overruns etc), macroeconomic risks (exchange rate fluctuations, inflation, interest rate risks etc), political or regulatory risks (cancellation of permits, changes in regulatory measures etc), etc. which can increase the NPAs and have a cascading effect on the banks balance sheets.

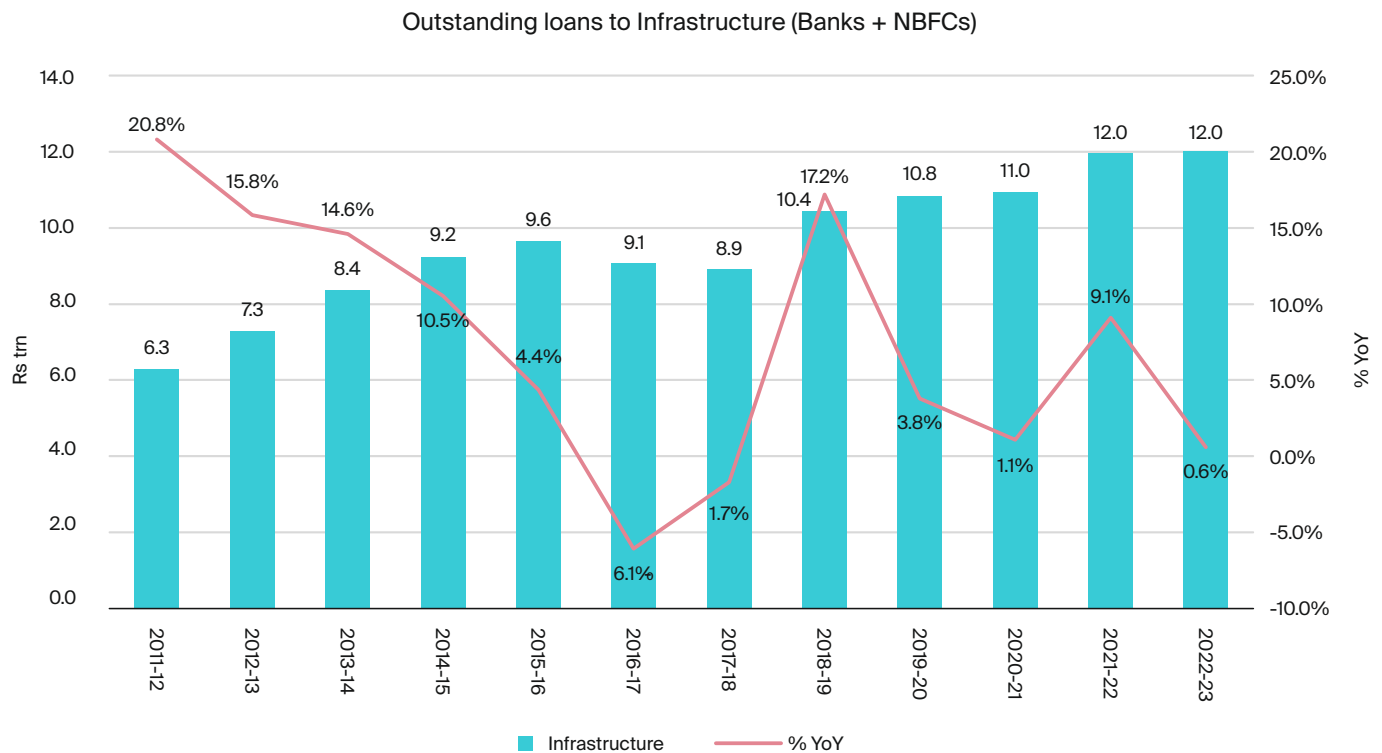
Moreover, most of the bank credit is short term in nature, lending for long term loans creates asset liability mismatch for the banks. The current practice of financing large infrastructure projects based on revenue streams spread over 20 to 30 years, but with project debt having tenure of 10 to 15 years, is unsustainable. In the absence of long-term financing instruments, it is becoming increasingly difficult to finance the growing requirements of infrastructure

Banks ideally seek to fund projects which are financially viable and have all clearances. Hence, their norms to lending are stringent, which can limit the credit access to infrastructure projects. For instance, delay in land acquisition is one of the key reasons for a delay in commencement of an infrastructure project. To ensure delays on account of land acquisition do not hinder the progress of a project, banks demand 90-100% of the land to be available with the developer at the time the project is awarded.

Hence, owing to these limitations, the lending of financial institutions towards infrastructure projects have remained muted. Between FY 2018-19 and FY 2022-23, despite aggressive infrastructure push and widened scope of projects, the outstanding loan of scheduled commercial banks (SCBs) and NBFCs towards infrastructure projects has merely grown by a CAGR 2.9%.

Figure 11

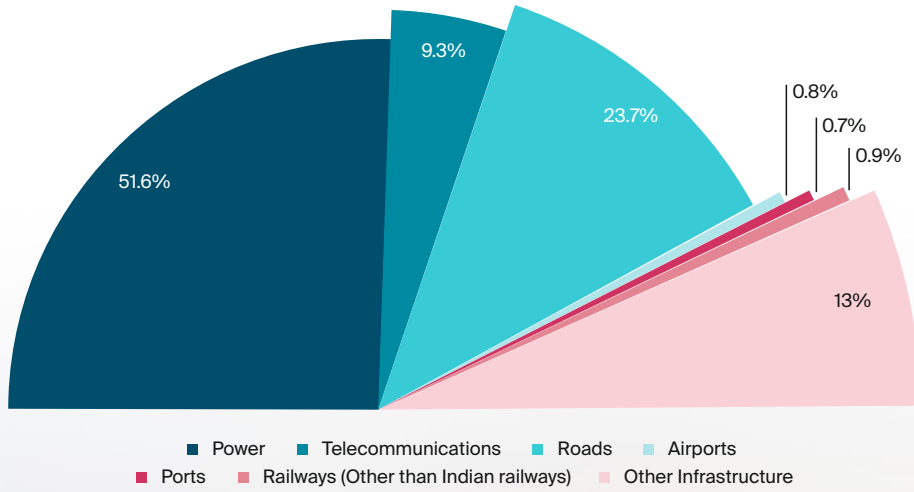
SCBs and NBFCs lending to infrastructure



Source: RBI, Knight Frank Research

Figure 12

Sectoral exposure of loans, 2022-23 (in % share)



Source: RBI, Knight Frank Research



Limited funding mechanisms

Funding of infrastructure projects is routed through – external commercial borrowings (ECBs), FDI, private equity and alternative mechanisms such as InvITs etc.

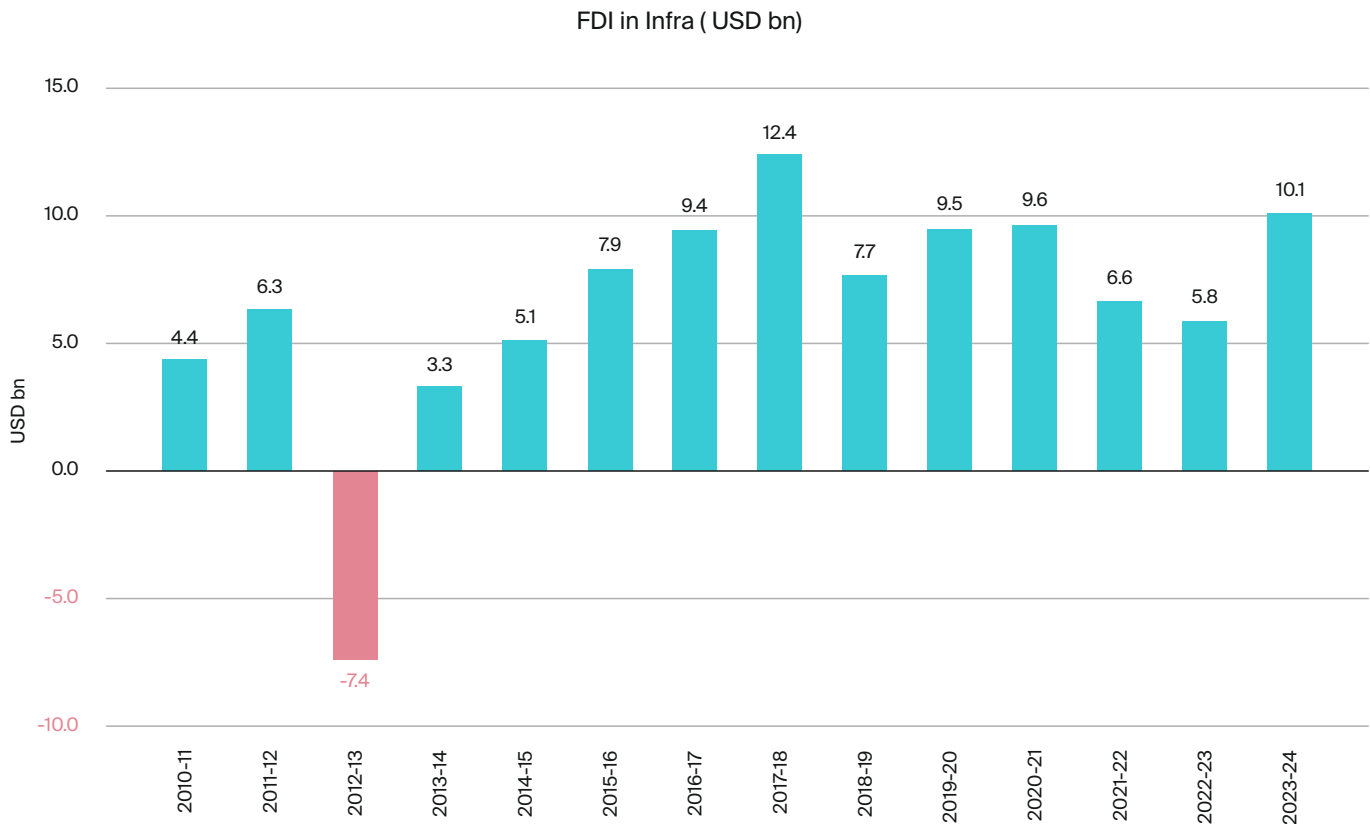
Despite sectors such as roads, railways, ports and construction permitting 100 per cent FDI under the automatic route, the FDI in India's infrastructure sector has remained muted amounting to USD 84 bn between FY 2014 – 24. However, the exposure of these funding instruments into infrastructure is minimal in comparison to the peer economies. In China, despite the limited allowance of foreign participation into infrastructure development the FDI into infrastructure in China stood at USD 164 bn in 2023 significantly higher than USD 10 bn FDI received in Infrastructure in India.

In the absence of adequate foreign funds for infrastructure projects owing to factors such as long gestation period and delayed completion contributing to lower returns on investments, the government is focusing more on other routes such as asset monetization and disinvestment.

Other sources of funding such as – private equity, debt fund, funding through external commercial borrowings ECBs as well has remained sub-optimal into infrastructure segment. New mechanisms such as InvITs have become popular source of funding. However are yet to gain traction.

Figure 13

USD 87 bn FDI Inflow in India's Infrastructure Between FY 2014-24



³ As per China FDI policy, China limits foreign participation in certain sectors, including infrastructure projects like airports, railways, and nuclear power plants. In these sectors, Chinese partners must play a leading role or have a majority share, or wholly foreign-owned enterprises are not permitted.

⁴ Excluding investments into China Belts and Roads Initiatives



Growing Infra Focused Development: An Impetus for Private Participation

Currently, to propel the growth of the economy, the policy makers in India are aggressively focusing on infrastructure development. This has been witnessed by the multi fold increase in government expenditure. For instance, the central government capital expenditure towards physical infrastructure has increased from USD 9.9 bn in 2013 to USD 75 bn in 2023. Additionally a significant investment is incurred by the state government as well. Various economic objectives such as – achieving a USD 7trn economy by 2030, widening manufacturing sector, reducing logistics cost etc have significant linkages to infrastructure development in India. Hence, to attain the same, the central and the state government will continue to increase infrastructure spending and efficiency.

India is largely an infrastructure deficit country. Despite the growing investments and initiatives to scale up infrastructure, India is the second largest infrastructure deficit country after Brazil⁵. The combination of infrastructure deficit and the government objective to narrow the same, through propelling investments and introducing supportive policy measures increases the opportunities in infrastructure development of the country, which, adds as an impetus to private participation.

Various long term policy measures and initiatives have been introduced in recent years, which can play a significant role in accelerating infrastructure development of the economy.

⁵ Infrastructure Deficit in Land Transport Infrastructure in India, Institute for Competitiveness, March 2024

Infrastructure Investment Requirement for USD 7 trn Economy by 2030

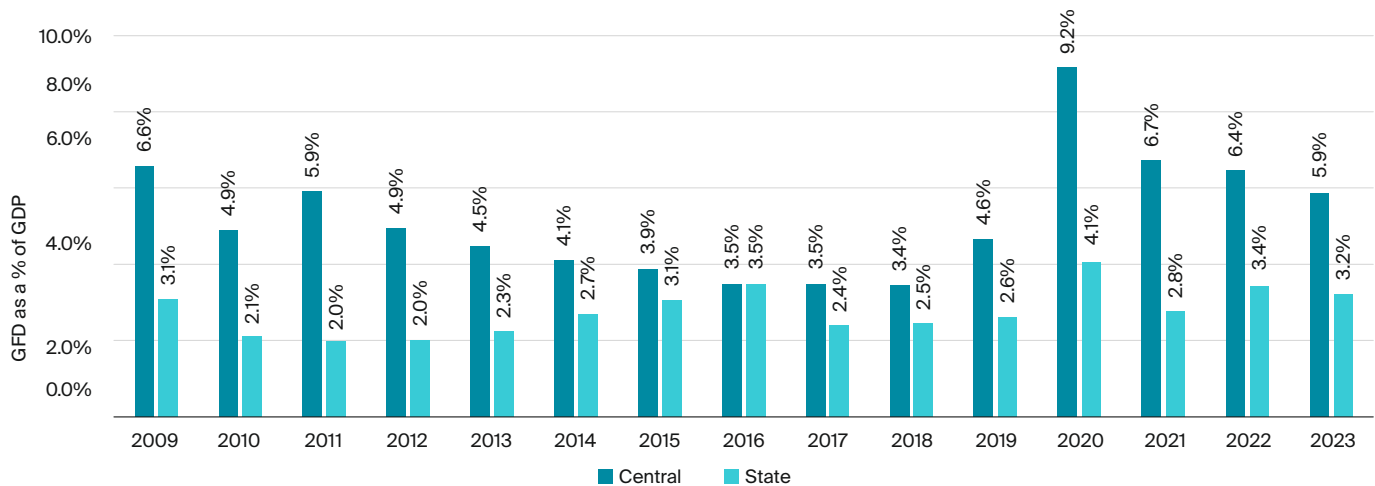
By 2030, India's economy is expected to expand to USD 7 trn from existing USD 3.9 trn. This is equivalent to nearly 2x expansion in the next 6 years. Infrastructure investments will play a pivotal role in enabling economic growth, as statistically, they are highly correlated. As per our analysis, 1% increase in infrastructure investment increases the economy's GDP by 0.60%.

To achieve an economic size of USD 7trn by 2030, India's economy is required to grow at a CAGR of 10.1% between 2024-2030. Notably, this is the average annual growth China witnessed between 2000-10. As per our analysis, to achieve a USD 7 trn economy, the required infrastructure investment is USD 2.2 trn until 2030.

While the central and state governments have increased their investment thrust in infrastructure multi-fold, there is a need to increase private participation in the same. The larger dependency on central and state government on infrastructure investments incurred through capital expenditure in the budget, can lead to a ballooning of debt, straining the fiscal deficit targets. Currently, the central government in India, aims to achieve fiscal consolidation by reducing its fiscal deficit to below 4.5% by 2025.; the states also have similar targets as it would improve their balance sheets and control or reduce the debt burden.

Figure 14

Gross Fiscal Deficit as a % of GDP



Source: Government Budget Documents, Knight Frank Research

Widening the share of private sector participation into infrastructure development would be beneficial for the central as well as the state governments in balancing their fiscal deficit targets. A controlled fiscal deficit is crucial to maintain long term economic stability and effective management of the government debt. As infrastructure investments has wide scope for private participation, encouraging the same will potentially narrow the central and the state's fiscal deficit. Moreover, it will enable the redirection of expenditure towards other key segments of economic growth such as – public healthcare, strengthening human capital, debt payments, etc which will support long term growth of the economy.

Under the existing compositions, where in the share of private investments in infrastructure development in India is negligible at 4.7%, the cumulative investment opportunity for private investment amounts to USD 103 bn until 2030 as depicted in scenario 1. However, the ongoing infrastructure development scope and the targets of the policy makers enables the scope for wider participation of private investors.

Even by increasing the private participation by 10%, the opportunity for private investment in infrastructure widens to USD 324 bn, amounting to an annual average of USD 54 bn until 2030, as depicted in scenario 2. While this volume may seem formidable, similar large-scale investments are already being undertaken in peer economies. It is still lesser than an annual average of private investments received by China prior to the COVID-19 pandemic, wherein the annual average of private investments in infrastructure projects amounted to USD 118 bn.

Table 5

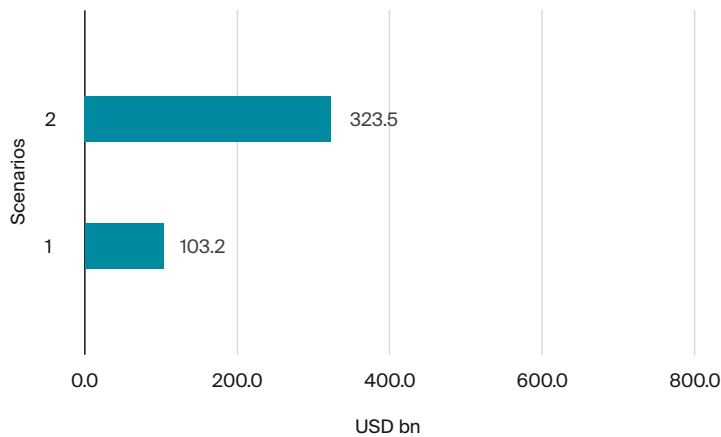
Scenario	Composition	Share	Investment Opportunity for Private Participation (USD bn)
Scenario 1	Existing Composition	Centre (51.2%), state (44.1%), Private (4.7%)	103
Scenario 2	10% adjustment	Centre (46.2%), states (39.1%), Private (14.7%)	323.5

Source: Knight Frank Research

These shifts will support the central and the state governments in managing their fiscal balances. Additionally, an increased private sector participation is essential for several reasons such as capital mobilisation, innovation and efficiency, risk sharing and global expertise. With adequate policy support, a large volume of private investments can be channelized into infrastructure development in India.

Figure 15

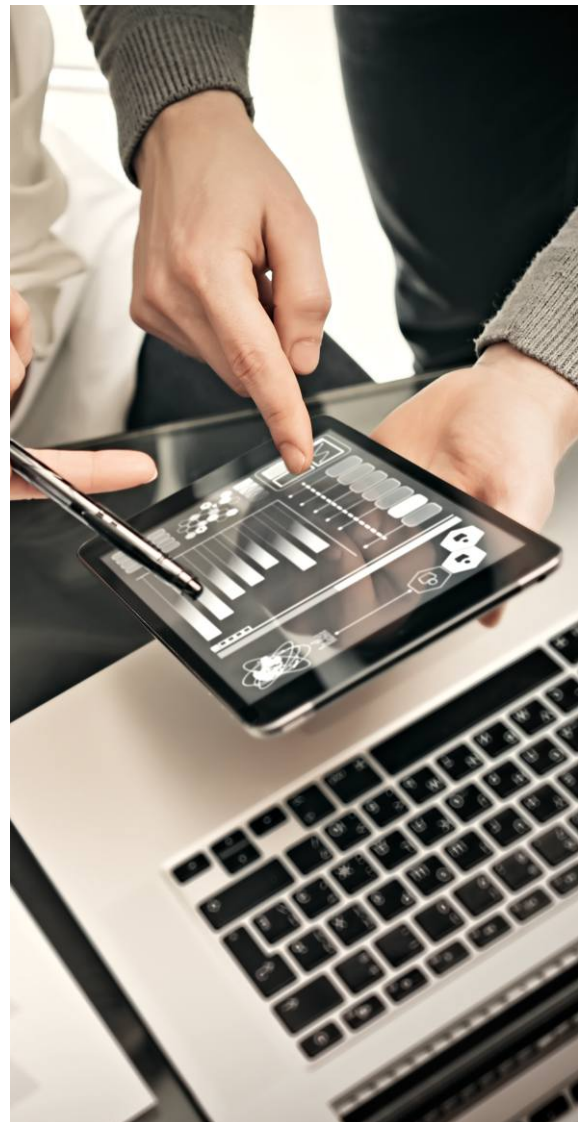
Potential Private Investments in Infrastructure (2024-2030), USD Bn



Source: Government Budget Documents, Knight Frank Research

⁶ Source: American Society of Civil Engineers

The policy makers in India have encouraged private participation, both domestic and international, through various public private partnerships (PPP) initiatives across various categories/sectors of infrastructure. However, as mentioned earlier, the participation of private investments is uneven, with sectors such as telecom, power, roads etc garnering more private participation, whereas other sectors such as urban transit, utilities etc has limited private participation. The limited private participation is primarily due to various challenges faced by the private investors and participants as described in the above section. Hence, to gain the interest of private players, it is crucial that these challenges are adequately addressed.



Need for Efficient Urban Mass Transport Infrastructure for Sustainable Growth of the Cities

Economic prosperity and urbanization are closely linked, with cities often becoming hubs of economic growth, innovation, and job opportunities. As economies grow, more people migrate to urban areas in search of better employment prospects, improved living standards, and access to services like education and healthcare. This rapid influx of people drives urban expansion, transforming cities into bustling metropolises. However, this growth also brings challenges, particularly in terms of transportation. As the population increases and more people own personal vehicles, road networks become congested, leading to traffic bottlenecks, longer commute times, and increased pollution. The rise in vehicular traffic in urban areas is a direct consequence of economic development, where the demand for mobility surpasses the available infrastructure, resulting in severe congestion and exacerbating air quality issues.

Vehicular traffic is a significant contributor to urban air pollution, impacting the quality of air in cities worldwide. The exhaust from vehicles, particularly those powered by fossil fuels, releases harmful pollutants like nitrogen oxides (NOx), particulate matter (PM), carbon monoxide (CO), volatile organic compounds (VOCs), and carbon dioxide (CO₂). These pollutants can deteriorate the air quality, leading to an increase in the Air Quality Index (AQI).

In cities with heavy vehicular traffic, the AQI often spikes during rush hours, when vehicle emissions are at their peak. Prolonged exposure to poor air quality can have serious long-term health impacts. To mitigate this, cities are increasingly adopting measures like improving public transportation, encouraging the use of electric vehicles, and implementing emission standards to reduce the negative effects of traffic on air quality.

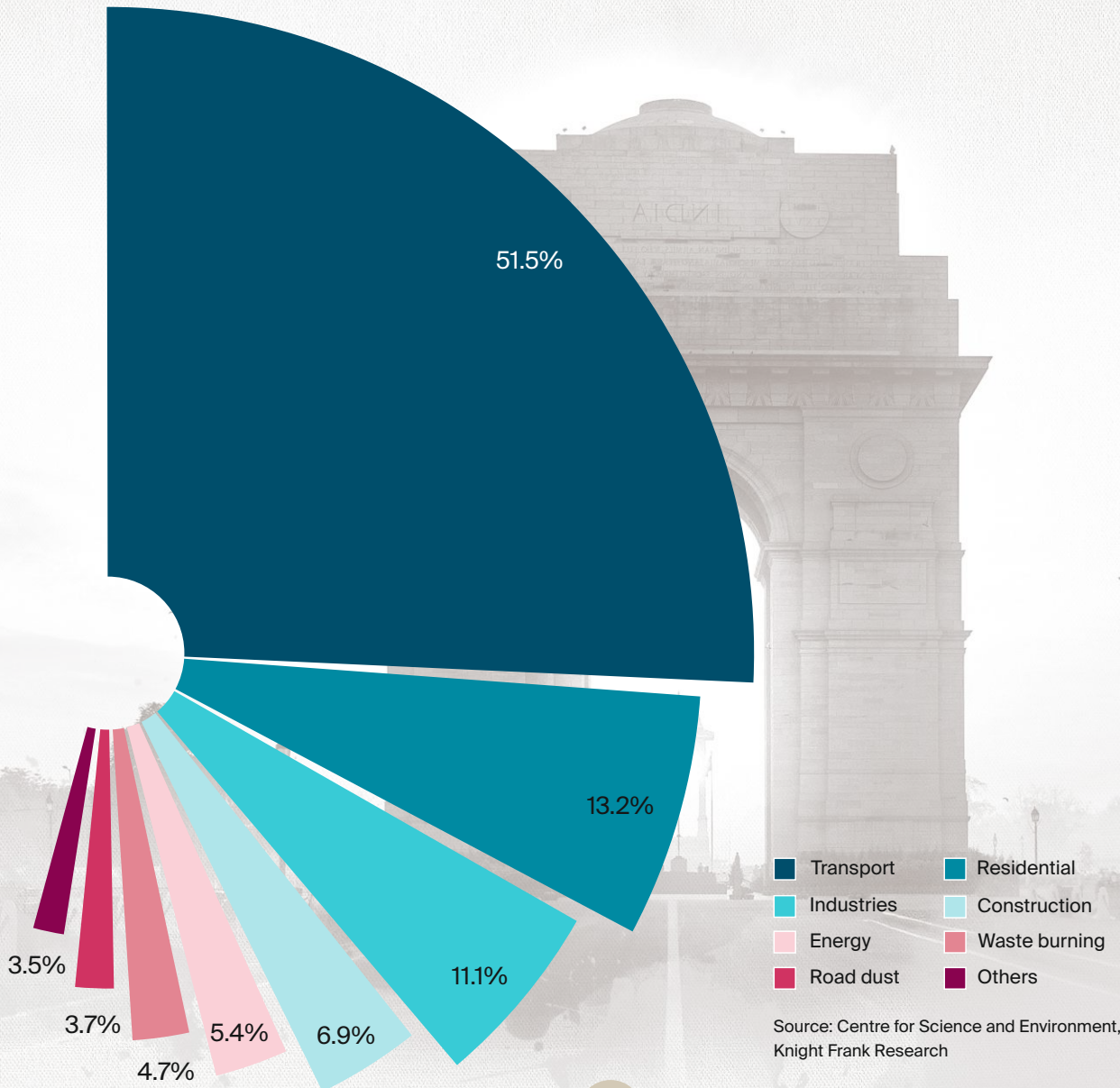
Currently, large cities in India such as – Delhi, Mumbai, Kolkata etc are grappling with higher level of AQI which impacts the quality of life.

As per various sources, vehicular traffic is the largest contributor of pollution levels in the city. For instance, vehicular traffic contributes to 51.5% of pollution in the Delhi⁷. Going forward, as India's economic prosperity grows, the consumption including the purchase of private vehicles as well will continue.

⁷Centre for science and environment

Figure 16

Share of various contributors of pollution in Delhi



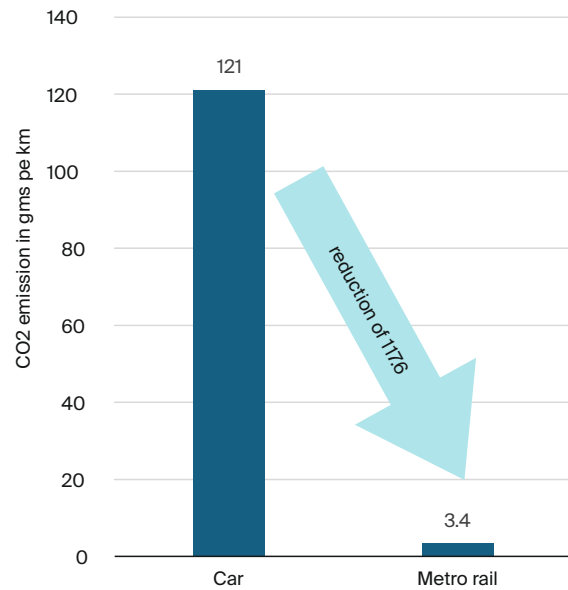
Hence, for the long-term sustainable growth of the cities, it is important combat pollution levels. The government of India has set ambitious targets to reduce its carbon dioxide (CO2) emissions. India aims to cut carbon emissions by 1 bn tonnes by 2030 and aims to achieve net zero emissions by 2070. For such, there needs to be active measure, which can reduce the emissions arising from key segments. From an infrastructure perspective, augmenting mass public transport system will be a key enabler in reducing carbon emissions arising from road transport, especially the private vehicles.

One effective way would be through increasing the capacity building of urban mass transport system including – buses, metro rails and high-speed rails. Increasing the quality, frequency and the passenger capacity of mass transport system along with improved connectivity, especially the last mile connectivity in addition to cost efficiency will potentially enable the transition of individuals from private vehicles to mass transport.

Segments such as EV buses, metro rails, high speed rails have the maximum potential which can cater to the carbon emission targets of the policy makers. On an average, the shift of a passenger from a private car to a metro rail can potentially reduce the carbon emission by 1176 gms per trip⁸. As of 2020, carbon emission from road transport in India is estimated to be 274 mn tonnes⁹. In the next few years, even to reduce 10% of this carbon emission, the daily ridership of passengers via metro rails must be increased to nearly 64 mn. This means 10% of India’s urban population as of 2030 will have to be travelling by metro rails. This is significantly higher that the current average daily ridership of 10 mn passengers. Hence, the need to increase the ridership, increases the opportunity for widening the mass transport infrastructure in the metro rails.

Figure 17

CO2 emission reduction from a car to metro train shift



Source: Knight Frank Research



⁸ Length of the trip = 10 kms

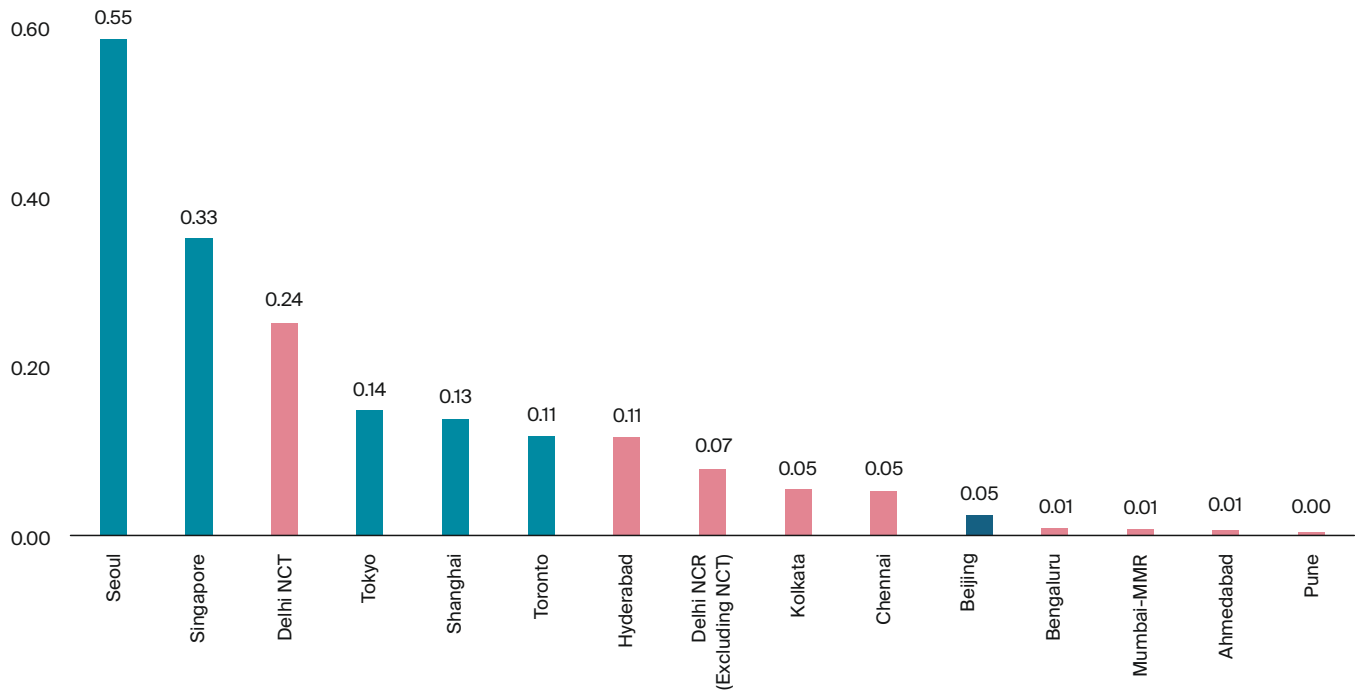
⁹ Emission Inventory of road transport in India 2020. Note: 2020 was a COVID pandemic year, however, we continue with this assumption for conservative estimates.



Currently, the top 8 cities have 848 km of operational metro, but the proportion of metro rail to metropolitan area is 0.03, below the Asia average of 0.25. While Delhi has metro connectivity on par with global standards, other cities like Gurgaon, Bengaluru, and Hyderabad etc need similar development.

Figure 18

Ratio of operational metro length to the city area





Recommendations to Revive Private Participation

Speedy implementation of the projects

An effective way to reduce the project cost and widen its appeal to the private participation is to be speeding of implementation of the projects. Infrastructure projects are larger in scale and would need approvals from various authorities for clearances. For the private participants factors such as land acquisition, environmental clearances, multiple agency involvement etc remain the key challenge delays the project clearance and implementation of the projects. As a result, the projects incur heavy cost overruns which in turn impact the profitability of the project. Hence, this has been deterring the private players participation in infrastructure projects in India. Empirical evidence suggests that a 10% delay in project approvals increased the project cost by 15-25% depending on the scale of the project. Hence, there is a need to prioritise speedy project approvals. One key mechanism through which this can be done is through strengthening single window clearance in India. In 2021, India introduced National Single Window System (NSWS) which integrates various clearance systems from central and the state government into a unified digital platform. This system aims to provide end-to-end facilitation, including pre-investment advisory, information on land banks, and the necessary clearances at both central and state levels. The NSWS has seen significant success, with over 75,000 approvals granted since its inception.

Despite its successes, the single window clearance system faces several challenges. Delays in project completion remain a significant issue, often due to delays in land acquisitions, contractual failures, and technical or natural factors. For instance, the complexity of infrastructure projects can lead to unforeseen requirements and cost overruns, which are not always adequately addressed in initial contracts.

Additionally, there are instances where the system's integration with state-level platforms is not seamless, causing further delays. In India, it takes about 6-12 months for smaller projects, and about 12-36 months for larger projects depending on the number of the stake holder's involvement. Although attempts to make this narrow these timelines are in place, it still poses a significant challenge in India.

Hence, to scale down these timelines and improve the project efficiency, India can adopt to some of the strategies implemented by countries such as Singapore. Some of the strategies include:

- a) **Clear and Predictable Timelines:** Singapore's approach to setting clear deadlines for various agencies and requiring them to justify delays has resulted in fast project approvals. Most approvals are processed within 2 to 3 months. India has seen frequent delays in approvals due to vague timelines and lack of accountability. For example, environmental clearances and forest clearances take on average 1 to 3 years for large-scale projects. Hence, setting legally binding deadlines and penalizing agencies for delays would help improve predictability and reduce clearance times in India.
- b) **Fast-Track Environmental Approvals:** The National Environment Agency (NEA) oversees environmental matters, and clear guidelines ensure swift processing. For smaller or low-impact projects, the process can be completed in 3 to 6 months, while large-scale projects requiring more in-depth environmental studies are fast-tracked and approved within a year.
- c) **Effective Land Acquisition Process:** In Singapore, the Singapore Land Authority (SLA) handles land acquisition, and the process is efficient, transparent, and quick. The government compensates fairly, and

there is minimal opposition due to the government's proactive approach. In India, land acquisition remains a major bottleneck for infrastructure projects, often resulting in delays of 6 months to 2 years. The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation, and Resettlement Act, 2013 has streamlined the process but still causes significant delays, particularly in rural areas. Thus, India could focus on creating a more transparent and efficient land acquisition framework by reducing litigation time and compensating quickly to expedite the process.

d) Coordination Between Government Agencies:

Singapore's agencies work closely through integrated planning platforms, ensuring inter-agency coordination for smoother project execution. For example, the Building and Construction Authority (BCA), Urban Redevelopment Authority (URA), and Land Transport Authority (LTA) all work together to plan and approve transportation and urban infrastructure. In India, inter-agency coordination is often inefficient, with bureaucratic hurdles and overlapping responsibilities. Projects requiring approval from multiple ministries can face delays due to lack of coordination. The Ministry of Road Transport and Highways (MoRTH) reported that 20-30% of road and highway projects face delays due to poor coordination between central and state agencies. Similarly, a report by NITI Aayog states that coordination delays between agencies such as MoEFCC, NHAI, and state authorities etc are responsible for an average delay of 1 to 2 years in large infrastructure projects¹⁰.

- e) Use of Technology in Project Management:** Singapore has embraced Building Information Modeling (BIM) and other digital tools to streamline the design and approval process. BIM enables coordination between agencies and minimizes delays caused by rework or conflicting requirements. In India, the adoption of BIM, GIS (Geographical Information Systems), and drones for monitoring infrastructure projects is still in its early stages. According to a report by NITI Aayog, 80% of projects in India do not fully utilize modern technology for project management, leading to inefficiencies. However, India's National Highways Authority (NHAI) has started using GIS-based systems for land acquisition, which has resulted in quicker land identification and fewer disputes. India should invest in digital infrastructure, BIM, and GIS to enhance project monitoring, reduce errors, and streamline approvals.

Provision of sovereign guarantees

Sovereign guarantees can significantly boost private participation in infrastructure development by mitigating various risks and enhancing investor confidence. These guarantees protect private investors against political, regulatory, revenue, and demand risks, ensuring a minimum return on their investments. This risk mitigation leads to improved financing terms, such as lower interest rates and longer tenures, and attracts institutional investors who might otherwise be hesitant. The assurance of government backing boosts investor confidence, encouraging long-term investments and increased private sector participation. With this type of guarantee, the government commits to making the contractual obligor fulfil its obligations under specific project agreements, such as concession agreements, supply agreements, or output purchase agreements. The primary focus is on performance, although it may include financial implications to eventually make the beneficiary whole.

Peer economies such as Indonesia have successfully used sovereign guarantees to attract private investments into infrastructure through mechanisms such as **Indonesia Infrastructure Guarantee Fund (IIGF)**. The primary objective of IIGF is to facilitate private investments in the country's infrastructure through a conducive regulatory framework. The fund provides guarantees for various regulatory risks such as contract risks, changes in laws and regulations, delays in project clearance and approvals etc.



¹⁰ Strategies for New India @75, Niti Aayog, 2019



Case Study

Indonesia Infrastructure Guarantee Fund

The Indonesia Infrastructure Guarantee Fund (IIGF) was created in 2009 by the Indonesian Ministry of Finance as a state-owned enterprise with support of the World Bank to improve the creditworthiness and quality of public-private partnerships (PPP) for infrastructure projects in Indonesia. IIGF was established as a single window for appraising, structuring, processing claim payment and providing government guarantees for Public-Private Partnership (PPP) infrastructure projects in Indonesia. The fund supports projects across the segments such as, transport infrastructure, energy, telecommunications, water & sanitation, irrigation, oil and natural gas etc. Since its inception, IIGF has appraised and provided guarantees for 30 projects across sectors such as – energy, transportation, water infrastructure etc with a total value of an estimated USD 14.6 bn.

The primary objectives of the IIGF are:

- 1. Facilitate PPP Deal Flow:**
By providing guarantees, the IIGF aims to facilitate the flow of Public-Private Partnership (PPP) deals.
- 2. Improve PPP Quality:**
The IIGF acts as a single window for appraising PPP projects requiring government guarantees, ensuring that these projects are well-prepared and bankable.
- 3. Clear and Consistent Rules:**
The IIGF provides clear guidelines for contracting agencies on how to prepare and utilize guarantees for PPP projects.

Table 6

Project Debt Risk Coverage under the IGF Framework

	Risks Covered	IGF Guarantees World Bank Funds	IGF Guarantees using (MoF) guarantees	Ministry of Finance
1	Breach of contract risk, including inter alia; a) Failure of the CA to comply with financial payments contractually agreed to concessionaire b) Failure by CA to adjust, in a timely manner, contractually agreed services tariffs, or unilateral changes in tariffs by government or CA that were not contractually specified c) Failure to integrate with network, when it was agreed in the contract	Yes Yes	Yes Yes	Yes Yes
2	Changes in laws and regulations	Yes	Yes	Yes
3	Delays/Failures relating to land acquisitions	Yes	Yes	Yes
4	Delays/Failures relating to approvals of licenses and permits	Yes		Yes
5	Delays/Failures relating to financial close	Yes		Yes
6	Failure to enforce against illegal activity	Yes		Yes
7	Termination risk	Yes		Yes

Source: World Bank¹¹**Project example:**

Amongst the notable projects supported by the IIGF is the Central Java Power Plant PPP project, with an aim to construct a 2000 MW coal-fired power plant. The project was valued at approximately USD 4 bn, of which, USD 3.4 bn was financed through debt from Japan Bank for International Cooperation (JBIC) and other banks, and USD 897 mn was raised through equity from Adaro Energy, Itochu and J-Power. At its inception, the project faced challenges such as – land acquisition, regulatory

approvals, and financial risks wherein high capital costs and long gestation period made it less attractive for the private investors to participate. To support the project, IIGF provided guarantees to cover risks related to land acquisition, regulatory changes, and financial viability with the support of the World Bank amounting to USD 33.9 mn. This significantly boosted investors' confidence, leading to timely execution and commencement of the project.

¹¹Indonesia Infrastructure Guarantee Fund, "Executive summary of the framework, World Bank

Table 7

Other Projects in Indonesia Supported by IIGF

Government Guarantees	Provision	Project Example	Details	Cost	Funding & Financing
Revenue Guarantees	Revenue guarantees ensure minimum revenue levels to attract and secure private investment.	Jakarta MRT (Mass Rapid Transit)	The Jakarta MRT North-South Line is vital for reducing congestion in Jakarta.	\$1.1 bn	Funded through a mix of government funds, loans from international institutions (e.g., JICA), and private investment.
Political Risk Guarantees	Political risk guarantees cover potential losses due to political changes or instability.	Kertajati International Airport	This airport in West Java aims to enhance regional connectivity and alleviate congestion at Soekarno-Hatta International Airport.	\$1.3 bn	Financed by a combination of government funds and private investments. Political risk guarantees mitigate risks related to political instability.
Credit Guarantees	Credit guarantees cover potential default risks and facilitate financing.	Suramadu Bridge	The Suramadu Bridge connects Java and Madura Islands and is crucial for regional economic integration.	\$500 mn	Funded through a combination of government funds and loans from international financial institutions. Credit guarantees help secure financing by mitigating default risks.

Source: World Bank

Provision of financial guarantees to private participants

Credit or financial guarantees can act as a powerful lever to build investors' confidence and provide adequate cushioning to the lending institutions to make them feel secure about the project. It reduces the potential loan default risk for the lenders by ensuring that a portion of the loan and/or the interest payment is repaid even if the borrower defaults. Hence, it eases the challenge of accessing credit for the private investor or a developer. Globally, South Korea has one of the largest provisions of credit guarantees issued under Infrastructure Credit

Guarantee Fund. The Korea Infrastructure Credit Guarantee Fund (KICGF) was established to support the financing of infrastructure projects in South Korea. Managed by the Korea Credit Guarantee Fund (KODIT), KICGF provides credit guarantees to facilitate the development of essential infrastructure, such as transportation, energy, and telecommunications. By offering these guarantees, KICGF helps mitigate the financial risks associated with large-scale infrastructure projects, making it easier for developers to secure funding.





Case Study

South Korea Infrastructure Credit Guarantee Fund

Incheon International Airport Expressway

The Incheon International Airport Expressway is a prime example of a successful Public-Private Partnership (PPP) project in South Korea. This expressway connects Incheon International Airport, one of the busiest airports in the world, to the capital city, Seoul. The project aimed to improve accessibility and reduce travel time between these two critical points.

Key Details:

- Length: Approximately 40.2 Kms
- Construction Period: 1995 - 2000
- Total Cost: Around USD 1.9 billion

Role of KICGF: The Korea Infrastructure Credit Guarantee Fund (KICGF) played a pivotal role in this project by providing credit guarantees to private investors. KICGF provided a guarantee equivalent to 80% of the projects estimated revenue. This support was crucial in securing the necessary funding for the construction of the expressway. The guarantees helped mitigate the financial risks associated with such a large-scale infrastructure project, making it more attractive to private investors.

Impact:

- **Economic Growth:** The expressway has significantly boosted economic activities by improving logistics and transportation efficiency.
- **Travel Time Reduction:** It has reduced travel time between Incheon International Airport and Seoul from over an hour to approximately 30 minutes.
- **Enhanced Connectivity:** The project has enhanced connectivity, benefiting both local commuters and international travellers.

Source: Asian Development Bank, Knight Frank

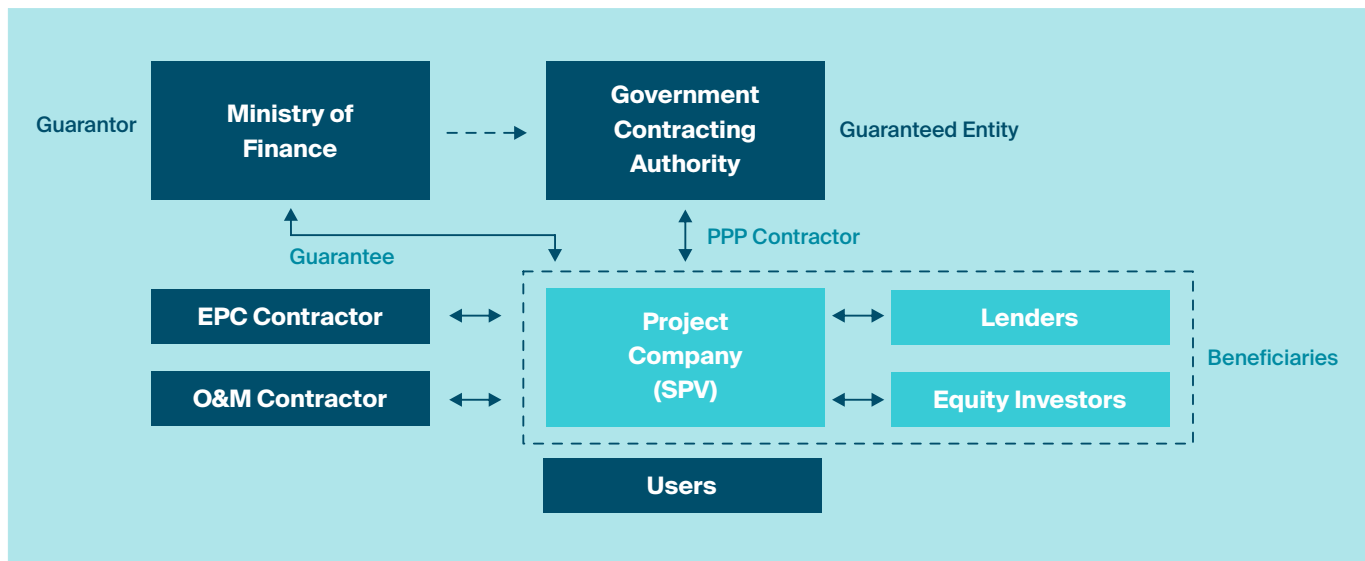
The success of such guarantees can be provided as a benchmark of policy measures to revive private participation in infrastructure projects in India. India can adopt measures such as:

1. **Establishing a Dedicated Guarantee Fund:** Similar to the IIGF, India can create a dedicated fund to provide guarantees for infrastructure projects, thereby reducing perceived risks for private investors.
2. **Streamlining Project Appraisal:** Implementing a single-window system for appraising and approving PPP projects can improve project quality and attract more private investment.
3. **Clear Guidelines and Risk Management:** Providing clear guidelines and robust risk management frameworks can streamline and improve the investor confidence and ensure the successful execution of infrastructure projects.

Currently, the central government in India, provides sovereign guarantee not exceeding 0.5% of the GDP during the financial year. However, the provision of sovereign guarantees is extended only to the Central Public Sector Enterprises (CPSEs). Similar sovereign guarantees are not provided to the private sector¹². By providing stability and predictability, sovereign guarantees create a more favourable environment for private investment, facilitating the development of critical infrastructure projects. Hence, there is a need for its provision.

Figure 19

Typical PPP structure with government guarantee



Source: Global Infrastructure Facility, Knight Frank Research

Support through loan guarantees: Loan guarantees for infrastructure projects are financial commitments made by a government or financial institution to cover a borrower's debt in case of default. These guarantees are crucial for large-scale infrastructure projects, as they help mitigate the financial risks involved and make it easier to secure funding and access to capital. This provides adequate cushioning for the private participation in infrastructure development. Developed economies such as the US, Canada etc actively provide loan guarantees for large scale infrastructure projects. For example, the U.S. Department of Energy's Loan Programs Office (LPO) offers loan guarantees for high-impact energy infrastructure projects. These guarantees cover up to 80% of the eligible project costs. The Energy Infrastructure Reinvestment (EIR) program, created under the Inflation Reduction Act of 2022, as well provides loan guarantees for projects that retool, repower, repurpose or replace energy infrastructure¹³.

Similarly, countries such as Canada provide loan guarantees and equity investments for infrastructure projects through Canadian Infrastructure Bank (CIB). India also has NIIF and IIFCL. Have to explore how different are these.

¹² Government Guarantee Policy, 2022, Ministry of Finance, Government of India

¹³ LPO's Loans and Loan Guarantees: Overview and Characteristics of its Financing Options, 2024, EnergyGov

Innovative mechanisms of financing

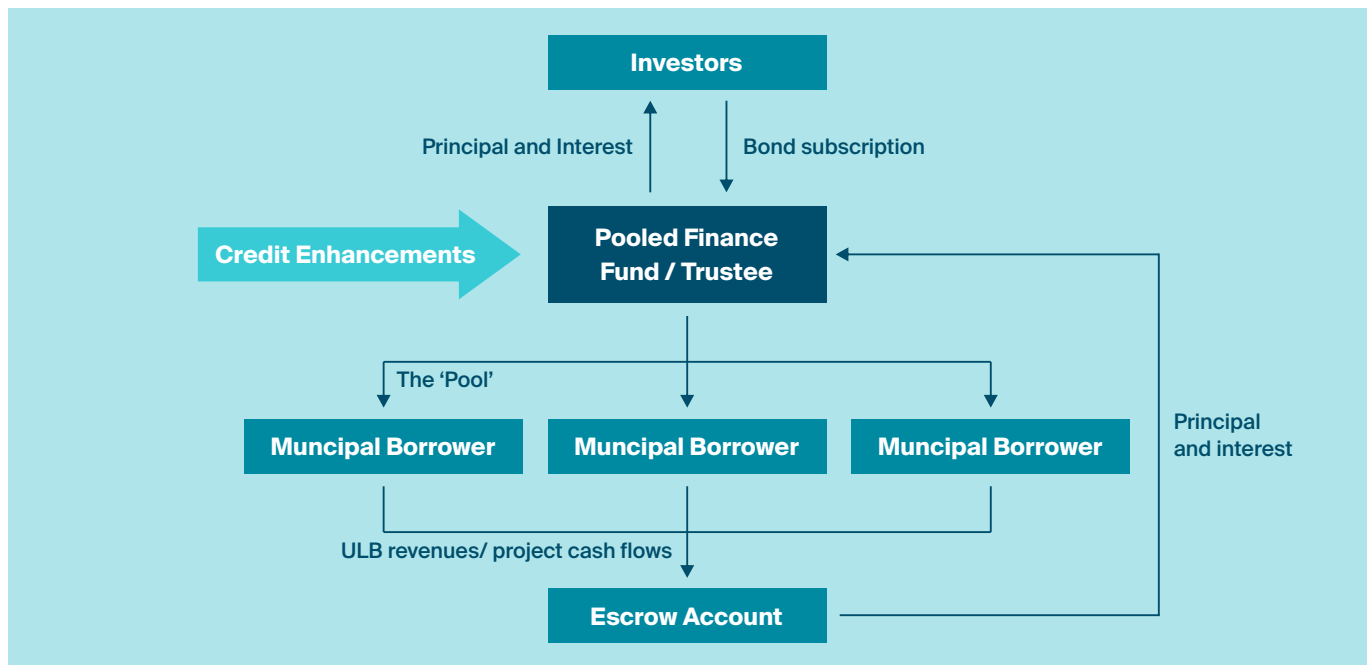
For India to continue down the path of building quality infrastructure, a higher level of private sector financing and resource mobilisation from new sources will be crucial. Facilitating this would require policy and institutional support from the central, state and local Governments. Such mechanisms are more crucial in urban infrastructure projects wherein the private participation is very minimal. Urbanisation in India is growing at a faster pace, and it is expected that by 2030, 40% of the country's population will be urbanised. Hence, it is crucial that, the infrastructure needs of the growing urban population such as – water, sanitation, sewerage, electricity etc are adequately catered to. Financial resource mobilisation for this can be provided through central, state, as well as local government bodies such as the Urban Local Bodies (ULBs).

International experience shows us how initiatives at the state and local levels can facilitate resource mobilisation for infrastructure development. Some successful examples include pooled finance mechanisms for municipal projects as adopted by various states in the United States. Some countries have adopted approaches such as tax increment financing, land sales and development rights etc. (Described in the case studies below). Each of these measures have witnessed broad – based implementation, succeeding in mobilising financed for critical infrastructure projects.

- a. **Pooled finance mechanism:** Maine, the second most rural state in the U.S. has 850 local governments serving 1.3 mn people. These governments need capital for essential services like roads, waste disposal, and public safety. The Maine Municipal Bond Bank, established in 1972, helps these small municipalities access capital markets and reduce borrowing costs by issuing tax-exempt bonds. As of 2017, it issued \$4.9 billion in bonds without any defaults. The Bank operates efficiently with 11 staff members and funds its operations through interest surcharges and investment earnings. It offers various loan programs, including general purpose loans and state revolving funds for water and waste treatment. The Bank maintains high credit ratings (AA+ from S&P and Aa2 from Moody's) through active administration, pool diversification, and credit enhancements. It requires annual audited financial statements from borrowers and monitors loan payments closely. The success of the Bank is due to strong regulations, conservative fiscal management, and a credible debt repayment system, making its loans attractive to investors¹⁴.

Figure 20

Pooled finance model



Source: The commonwealth library, Knight Frank Research

¹⁴ Municipal Pooled Financing of Infrastructure in the United States: Experience and Lessons, the World Bank Group, June 2017.

A municipal bond bank allows smaller municipalities to collectively access the financial markets, thus lowering cost of funds borrowed.

- b. **Specialised municipal intermediaries:** Vietnam's Local Development Investment Funds (LDIFs) are specialized financial institutions established to support infrastructure and socio-economic development projects. These funds are designed to mobilize and allocate resources for projects that can drive local development, such as transportation, energy, water supply, and urban development. The primary objective of this fund is to improve effectiveness of local development projects through provision of financial support. LDIFs typically receive funding from a mix of sources including government budget, international loans; and engages with PPPs wherein private investors can collaborate with public entities to finance, build and operate infrastructure projects. Private investors are provided with financial incentives such as tax breaks and subsidies which encourages their participation. LDIFs provide mechanism to reduce investment risks such as guarantees and co-financing options, making it attractive for private participants. The fund also provides transparency as it enables private investors gain access to a pipeline of viable projects, ensuring that their investments are directed towards impactful and sustainable initiatives. One notable example is the **GLP Vietnam Development Fund**, which was launched in 2022 with an initial investment of USD 1.1 bn, a largest logistics development fund in Southeast Asia. This fund focuses on developing modern and environmentally friendly logistics facilities in Greater Hanoi and Greater Ho Chi Minh City. The fund received commitments from a well-diversified investor group across Asia, Europe, North America and the Middle East representing pension funds, sovereign wealth funds and insurance companies.

Provision of long-term capital for infrastructure projects

The critical element in achieving economic and financial benefits is the appropriate mix of financial products to ensure project viability and bankability. While India's financial sector is dominated by banks that play a major role in financing infrastructure, non-bank financial intermediaries also play a role in infrastructure finance.

Currently, domestic lending institutions which includes commercial banks and NBFCs are as well the key sources of financing infrastructure projects in India. As of FY 2022-23, the outstanding loan of banks and NBFCs in India towards infrastructure sector stood at Rs 12 trn (USD 150 bn), having grown at a CAGR of 5.1% over the decade. In the decade between FY 2013-14 to FY 2022-23, merely USD 16 bn of financing has been raised by SCB and NBFCs in India, which is just, 1.8% of the total investments (public + private) into infrastructure development. Hence, this indicates a lower exposure of banks and NBFCs towards the sector. Owing to the economic characteristics of the infrastructure asset in comparison to the other asset classes, banks and NBFCs appetite towards this sector is very minimal.

Infrastructure projects are capital intensive and have long gestation periods, thus, are prone to varieties of risks such as delays in project clearances, changes in policies. Any delay in the project implementation leads to cost and time overruns that further increase the price or cost dynamics of the project. Project delays and subsequent cost overruns, impact the revenue of the project, risking its capacity of repayment of loans and interest rates. As of FY 2024, 95% of the project delays are concentrated in the infrastructure sector with an estimated cost overrun of USD 60 bn.

As a result of these risks, banks and NBFCs are at a risk of accumulating NPAs which can impact their overall balance sheet. As a result, debt financing infrastructure projects through banks and NBFCs is a challenge. However, given the critical importance of the infrastructure development towards economic development, it is essential to introduce or promote policy measures to facilitate the flow of funds through various mechanisms into infrastructure development. Beyond the traditional lending from banks and NBFCs, various other mechanisms needs to be tapped in to its full potential to generate financing for infrastructure developments in India. Some of them are as below:

- a. **Deepening infrastructure bond market:** A diversification from banks into a developed bond market, especially those focused on the long term can reduce the burden on government finances by attracting private investments. Expanding the bond market can improve liquidity and attract a broader range of investors, including institutional and retail investors. As infrastructure projects often come with high risks, a deeper bond market can facilitate better risk management through structured financial products and risk-sharing mechanisms between the government and private sector. As of 2023, INR 2.2 tn (USD 26 bn) worth of infrastructure bonds have been issued, a positive sign but still far below the required scale. In the developed markets such as the US, the value of infrastructure bonds is estimated to be about USD 4tn, i.e. equivalent to 15% of the GDP. To attain the similar volume, for a USD 7 tn economy, the required infrastructure bond market in India is estimated to be USD 1 tn.

- b. Widening Infrastructure Investment Trusts (InvITs):** Infrastructure Investment trust (InvIT) regulations was introduced by Securities Exchange Board of India (SEBI) in 2014, to stimulate investments in infrastructure. InvITs are trust that hold infrastructure assets, generating steady cash flow through long term concession. The structure of InvIT in India is similar to Master Business Trusts (MBTs) instruments that are prevalent in developed countries such as the UK, USA, Singapore, Hong Kong etc. In these economies, MBTs are listed on their respective stock exchanges by issuing their units to the investors.

In India, 26 Invits are registered with SEBI concentrated across multiple asset classes such as roads, power, pipeline, renewable energy, logistics and warehousing etc, with an asset under management (AUM) of USD 60 bn (Rs 5000 bn). Of these, four InvITs are publicly listed with a market cap exceeding USD 3.2 bn (Rs 267 bn). Sectoral, roads account for highest number of InvITs comprising more than 50% of the AUM. While InvITs are primarily dominated by private developers, government entities such as NHAI, PGCIL etc as well has set of InvITs for their operational assets.

Currently, InvITs in India are in its nascent stage, having raised USD 13.25 bn (Rs 1100 bn) via equity. Fundamental features of InvITs such as cap on leverage, mandatory distribution of 90% cash flow and limit on proportion of under construction assets benefits both investors and financiers. These favourable features enable InvITs to potentially become a new standard for infrastructure financing. Additionally, financial instruments such as pensions and insurance funds, as well as domestic savings can be potentially routed as investments into infrastructure development. Supported by policy push, the scope of infrastructure development in India is significant with new asset types such as HAM highways, renewable energy, logistics etc. expected to grow. As per various studies, total market opportunity for InvITs is estimated to be Rs 21 trn between 2024-30¹⁵.

- c. Strengthening infrastructure financing institutions:** This would enable the credit enhancement specific to infrastructure projects. Some of the existing agencies which provide long term financing for infrastructure projects in India include: India Infrastructure Finance Company Limited (IIFCL), National Bank for Financing Infrastructure and Development (NaBFID), National Investment and Infrastructure Fund (NIIF), Infrastructure Development Finance Company (IDFC) etc. While these institutions have been instrumental in providing long term capital for infrastructure projects, they are still at a nascent stage and there is a need to expand their financing potential. As of March 31, 2023, the outstanding loan book of IIFCL stood at Rs 423 bn. Similarly, since its inception in 2021, NaBFID has sanctioned a capital of Rs 1 trn, across varied infrastructure segments such as roads, energy, communication etc. As these institutions are supported by the sovereign, they provide long term capital at competitive interest rates which can be attractive for a private participant. Currently, the loan portfolio of these institutions is concentrated only in few sectors. For instance, the exposure of NaBFID is currently limited to power generation, roads, railways, city gas distribution etc. However, the capital support from these institutions should be widened to projects with long term gestation period of 20-30 years such as airports, metro rail, high speed rails etc. Such provisions will enable the ease of long-term capital for project developers which will encourage their participation.
- d. Leveraging untapped financial products:** While various financial vehicles can raise funds for infrastructure projects, many large capital holders, such as insurance and pension funds, are not significantly routed into infrastructure development in India. This underutilization represents a missed opportunity for leveraging substantial capital for essential infrastructure growth.

Unlike global counterparts, the use of pension funds for financing infrastructure projects is very limited in India. Currently, investments from domestic pension funds continue to be skewed towards government securities, with around 50 per cent of investments being in this category. Domestic pension fund corpus under National Pension System Trust is Rs 12.96 trn as on Sep 30, 2024 and an additional corpus of Rs 21.3 trn (FY 23) with EPFO provides adequate alternative funding opportunity for infrastructure investments in India. The long-term investment horizon of the pension funds matches with the long concession period of the infrastructure projects, thus providing a long-term investment opportunity. With clear regulations, and return guarantees, pension funds in India have massive potential to be routed into infrastructure development.

¹⁵ Indian REIT association, Primer on REITs and InvITs, June 2024, CRISIL estimates

In the developed countries, a significant share of pension funds are investment into infrastructure projects globally. Global Sovereign wealth and pension funds such as the Qatar Investment Authority, Singapore-based GIC, Canadian pension fund etc among others have invested in India's infrastructure assets.

- e. **Alternative Investment Funds (AIFs):** AIFs are a category of investment vehicles that differ from traditional mutual funds and stocks. AIFs provide investors with opportunities for diversification, potentially higher returns, and access to asset classes that may not be readily available through traditional investments. They encompass various assets and strategies, including private equity, hedge funds, real estate, venture capital, and more. AIFs expose investors to assets that are not readily available in conventional investment options. Compared to traditional mutual funds, volatility in AIFs is very less hence alluring as an attractive investment option for risk averse investors. In the recent years, AIFs have emerged as an alternative source of funding infrastructure projects in India. Infrastructure AIFs are well diversified with investments across roads, railways, airports, utilities, power sector etc. Since its inception in 2012, USD 991 mn (Rs 82.26 bn) of funds have been raised through AIFs for various infrastructure projects. Despite its attractiveness, the AIFs in India are yet to reach its full potential. Factors such as high entry barriers, wherein the minimum investment is of USD 0.12 mn (Rs 10 mn), stringent regulations, lack of awareness etc has limited the scope of AIFs to attain its full potential.

Conclusion

As India embarks on developed economy status, infrastructure development will play a pivotal role, thus providing ample investment and financing opportunities. As of 2023, merely 4.5% of overall investment into infrastructure in India was done by the private sector which is very minimal in comparison to its global peers. Hence, there is a need to revive the same. By 2030, India aims to achieve a GDP size of USD 7 tn, to attain the same, an estimated investment of USD 2.2 tn is required into infrastructure development. Currently, the public sector which included central and state governments are the largest investors of infrastructure development in India. However, for the long-term growth of the economy, without impeding the country's balance sheet, the involvement of private sector participation in infrastructure development in India is crucial. Hence, the policy reforms in India should be aimed at reviving private investments and attract foreign capital in India's infrastructure development. While there is adequate existing support by the government, there is a still a need to augment key processes of infrastructure projects such as – speedy approvals, enhancement of long-term capital, mitigate the project risks through government support etc.to attract private participation in infrastructure development in India.

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