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Industry Research Report on Indian Infrastructure Industry

July 2024

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Table of Contents

1. Economic Outlook 7
1.1 Global Economy 7
1.1. Indian Economic Outlook 9
1.1.1 GDP Growth and Outlook 9
1.1.2 Gross Value Added (GVA) 10
1.1.3 Investment Trend in Infrastructure 12
1.1.4 Industrial Growth 13
1.1.5 Consumer Price Index 14
1.1.6 Overview on Key Demographic Parameters 16
1.1.7 Concluding Remarks 19

2. Overview of Infrastructure Industry in India 21
2.1. Budgetary Outlay Toward Infrastructure and Governmental Infra-Projects 22
2.2. Growth Drivers and Risk Factors in Infrastructure Investments 23
2.3. Major Infrastructure Development Plans 24
2.4. Review and Break-up of Investments in Key Infrastructure Sectors 26

3. Road Infrastructure in India 29
3.1. Total Length and Break-Up into National, State, and Rural Roads 29
3.2. Maintenance of Roads in India 30
3.3. Key Growth Drivers and Emerging Trends for the Road Sector 30
3.4. Challenges Faced by the Roads Sector 32
3.5. Policy Framework at the Central Level 33
3.6. Overview of PPP Framework and Models in Operation 33
3.7. Key Parameters of Existing BOT MCA and Bidding Process 36
3.8. Key Initiatives and Overview of HAM 37
3.9. Overview of Recent Changes in the Model Concession Agreement for HAM Projects 37
3.10. Overview of the TOT Model, its Advantages to the Government, and its Impact on the Road Sector and its Current Status 38
3.11. Key Budget Announcements for the Roads Sector 38
3.12. Outlook on investments in national highways 39
3.13. Qualitative views on overview of InvITs as an instrument for asset monetization 40
3.14. Qualitative views on asset monetisation of HAM projects by EPC players to aid in deleveraging balance sheet . 41
3.15. Overview of upcoming projects 42
3.16. Overview of Tunneling Projects in India and Recent Upcoming Projects 42
3.17. Overview of Cable Stayed Bridge 44
3.18. Overview of Elevated roads 44

4. State Road Segment 45
4.1. Review of Investments 45
4.2. Central Assistance for State Roads 46

5. Raw Materials for Road Construction 47
5.1. Overview of the Bitumen Derivatives Market in India 47
5.2. Prices of Bitumen 48
5.3. Other Raw Materials 48

5.4. Technological Shift in Raw Materials 49

6. Indian Railway Sector 50
6.1. Railway Infrastructure 50
6.2. Overview on Indian Rail Track Length 50
6.3. Freight and Passengers Carried by Indian Railways 51
6.4. Government Policies for Railway freight Industry 52
6.5. Budgetary Support 52
6.6. National Rail Plan 2030 53

7. Indian Airports Infrastructure 54
7.1. Overview 54
7.1.1. Split of Airports into PPP & Non-PPP Categories 55
7.2. Investments across Major Airports in India 56
7.3. Major Upcoming Airports in India 58

8. Urban Infrastructure Sector 59
8.1. Water Supply and Sanitation (WSS) 59
8.2. Urban Waste Generation and Treatment 60
8.3. Key Drivers for Water Supply Management 61
8.4. Metro Rail Segment 62
8.5. Progress of Key Metro Projects Across the Country 64

9. Brief Profile of Ceigall India Limited (Ceigall India) 65
9.1. Background 65
9.2. Threats and Challenges to Ceigall India Limited and its services 67

10. Competitive Landscape 68
10.1. Benchmarking Based on Operational Parameters 68
10.2. Benchmarking Based on Financial Parameters (Standalone Performance) 72

11. Key Performance Indicators (Consolidated Performance) 76

12. Abbreviations 80

List of Charts

Chart 1: Global Growth Outlook Projections (Real GDP, Y-o-Y change in %) 7

Chart 2: Gross Fixed Capital Formation (GFCF) as % of GDP (At constant prices): 13

Chart 3: Y-o-Y growth in IIP (in %) 14

Chart 4: Retail Price Inflation in terms of index and Y-o-Y Growth in % (Base: 2011-12=100) 15

Chart 5: RBI historical Repo Rate 15

Chart 6: Trend of India Population vis-à-vis dependency ratio 16

Chart 7: Age-Wise Break Up of Indian population 17

Chart 8: Yearly Trend - Young Population as % of Total Population 17

Chart 9: Urbanization Trend in India 18

Chart 10: Trend of Per Capita Gross National Disposable Income (Current Price) 18
Chart 11: Trend of Per Capita Private Final Consumption Expenditure (Current Price) 19
Chart 12: Continued High Investment Momentum in Indian Key Infrastructure Sectors 21
Chart 13: Gross Fixed Capital Formation (GFCF) as % of GDP (At constant prices): 22
Chart 14: Key Infrastructure Sectors for Capital Expenditure in Budget 2024-25 22
Chart 15: Sector-Wise Break-Up of Capital Expenditure of Rs. 111 Trillion during Fiscal FY20- FY25 25
Chart 16: National Infrastructure Pipeline Yearly Split (Rs. Billion) 27
Chart 17: Road Projects Awarded and Constructed 30
Chart 18: Pace of Construction (Km/Day) 31
Chart 19: Budget Allocation for the Ministry of Road Transport and Highways 32
Chart 20: Projects Awarded by NHAI 39
Chart 21: Breakup Of CapEx Mix of NHAI 39
Chart 22: Investments in Roads sector 40
Chart 23: Total CapEx in State Road (FY19-FY23) and Projected Investments (FY24- FY28) 45
Chart 24: State Wise CapEx (FY23) 46
Chart 25: Allocation and Release under CRIF for State Roads 47
Chart 26: Bitumen Prices (VG30) 48
Chart 27: Trend in Cement Prices 48
Chart 28: Trend in Average Finished Steel Prices 49
Chart 29: Indian Railway Route Length 51
Chart 30: No of Passengers Over the Years 51
Chart 31: Tonnage Carried Over the Years 51
Chart 32: Budgetary Outlay towards Indian Railway 52
Chart 33: Investments in Railway Sector 53
Chart 34: Trend in Investments in Water Supply & Sanitation 60
Chart 35: Trend in Investments in Metro and Smart Cities Projects 63

List of Tables

Table 1: GDP growth trend comparison - India v/s Other Economies (Real GDP, Y-o-Y change in %) 7
Table 2: RBI's GDP Growth Outlook (Y-o-Y %) 10
Table 3: Sectoral Growth (Y-o-Y % Growth) - at Constant Prices 12
Table 4: Scheme-Wise Allocation Towards Infrastructure in FY24 (Rs Billion) 26
Table 5: National Infrastructure Pipeline Sectoral Split (Rs. Billion) 27
Table 6: Gross Value Added at Constant (2011-12) Basic Prices 29

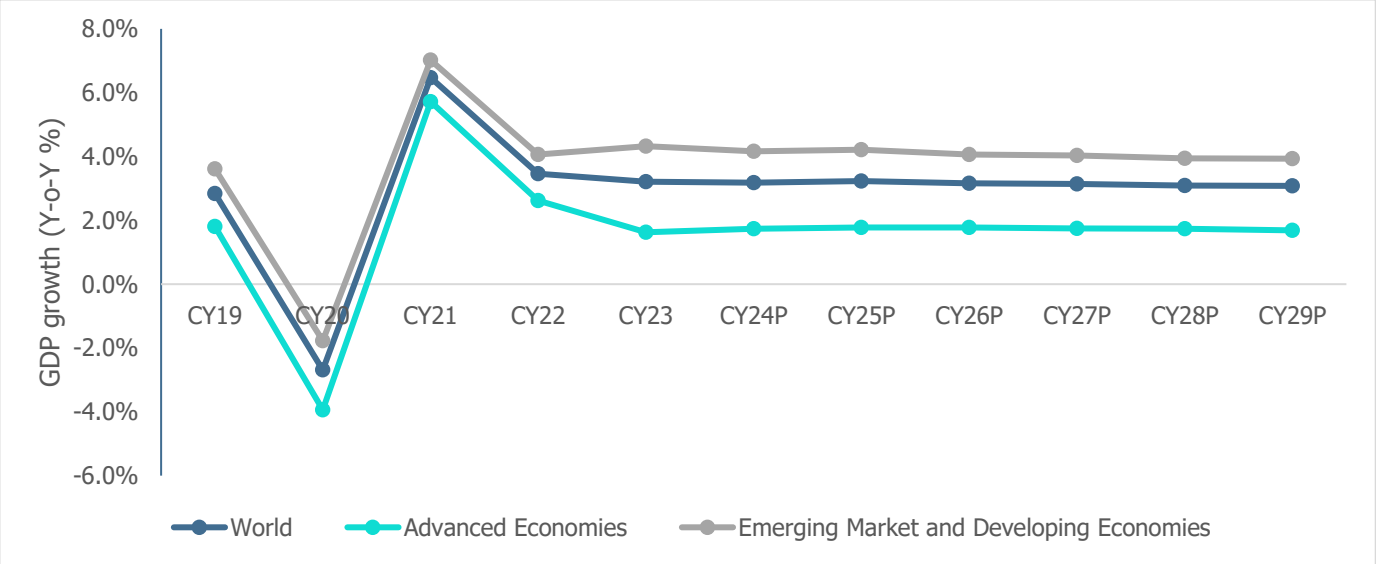
Table 7: Road Network of Past 5 Years (In Km) 29
Table 8: Percentage Share in Total Road Length Across Various Categories 29
Table 9: Key Features 35
Table 10: Market Activity – InvITs 41
Table 11: Balance for award of specialized structure by NHAI 42
Table 12: Under Construction Tunnels: 43
Table 13: Budgetary Outlay toward Railway Projects 52
Table 14: Proposed Expenditure under NRP (Rs. Trillion) 53
Table 15:Total Airports in India 55
Table 16: Private Operational Airport List in India 55
Table 17: Segment Wise Investments across Key Segments for Major Airports 56
Table 18: Market Size for Water Requirement for Different Uses (in Billion Cubic Meters) in Coming Years: 59
Table 19: Metro Rail Network Under Construction 64
Table 20: Metro Rail Network Under Appraisal/Approval 64
Table 21: Key Construction Peers 68
Table 22: Comparison of Order Book (In Million) 70
Table 23: Comparison of New Orders Received (In Million) 71
Table 24: KPIs Comparison 72
Table 25: KPIs Comparison 76
Table 26: KPI Formulas 78
Table 27: KPI Explanation 79

1. Economic Outlook

1.1 Global Economy

Global growth, which stood at 3.2% in CY23, is anticipated to maintain this rate throughout CY24 and CY25. The CY24 forecast has been adjusted upwards by 0.1 percentage point compared to the January 2024 World Economic Outlook (WEO) Update, and by 0.3 percentage point compared to the October 2023 WEO. Despite this, the expansion remains historically low, attributed to factors including sustained high borrowing costs, reduced fiscal support, lingering effects of the COVID-19 pandemic and Russia's Ukraine invasion, Iran–Israel Cold War, sluggish productivity growth, and heightened geo-economic fragmentation.

Chart 1: Global Growth Outlook Projections (Real GDP, Y-o-Y change in %)



Notes: P-Projection; Source: IMF – World Economic Outlook, April 2024

Table 1: GDP growth trend comparison - India v/s Other Economies (Real GDP, Y-o-Y change in %)

	Real GDP (Y-o-Y change in %)									
	CY20	CY21	CY22	CY23	CY24P	CY25P	CY26P	CY27P	CY28P	CY29P
India	-5.8	9.7	7.0	7.8	6.8	6.5	6.5	6.5	6.5	6.5
China	2.2	8.5	3.0	5.2	4.6	4.1	3.8	3.6	3.4	3.3
Indonesia	-2.1	3.7	5.3	5.0	5.0	5.1	5.1	5.1	5.1	5.1
Saudi Arabia	-3.6	5.1	7.5	-0.8	2.6	6.0	4.0	3.5	3.0	3.5
Brazil	-3.3	4.8	3.0	2.9	2.2	2.1	2.1	2.0	2.0	2.0
Euro Area	-6.1	5.9	3.4	0.4	0.8	1.5	1.4	1.3	1.3	1.2
United States	-2.2	5.8	1.9	2.5	2.7	1.9	2.0	2.1	2.1	2.1

P- Projections; Source: IMF- World Economic Outlook Database (April 2024)

Advanced Economies Group

Advanced economies are expected to experience a gradual increase in growth, climbing from 1.6 % in CY23 to 1.7% in CY24 and further to 1.8% in CY25. The projection for CY24 has been adjusted upwards by 0.2 percentage points compared to the January CY24 WEO Update, while the forecast for CY25 remains unchanged. This adjustment primarily reflects a revision in US growth, compensating for a slight downward revision in the euro area for CY25.

The **United States** is expected to see growth rise to 2.7% in CY24, followed by a slight slowdown to 1.9% in CY25. This deceleration is attributed to gradual fiscal tightening and labor market softening, which dampen aggregate demand. The CY24 projection has been revised upward by 0.6 percentage points since the January CY24 WEO Update. This revision primarily reflects carryover effects from stronger-than-expected growth in the fourth quarter of CY23, with some of this momentum expected to continue into CY24.

The **Euro Area's** growth is anticipated to rebound from its sluggish rate of 0.4% in CY23, mainly influenced by significant exposure to the conflict in Ukraine. Projections indicate an increase to 0.8% in CY24 and further to 1.5% in CY25. This recovery is driven by stronger household consumption, as the impact of elevated energy prices diminishes and declining inflation bolsters real income growth. Despite a downward revision of 0.3 percentage points for Germany in both CY24 and CY25 due to persistent weak consumer sentiment, this adjustment is largely balanced by upgrades for several smaller economies, including Belgium and Portugal.

Emerging Market and Developing Economies Group

Emerging market and developing economies are forecasted to maintain stable growth at 4.2% in both CY24 and CY25. While there's a slowdown expected in emerging and developing Asia, this is counterbalanced by increasing growth in economies across the Middle East, Central Asia, and sub-Saharan Africa. Low-income developing countries are anticipated to experience a gradual growth uptick, starting at 4.0% in CY23 and climbing to 4.7% in CY24 and 5.2% in CY25, as certain constraints on near-term growth begin to ease.

The economic forecast for emerging and developing Asia reveals a modest deceleration in growth, with projections indicating a decline from 5.6% in CY23 to 5.2% in CY24 and 4.9% in CY25. **China's** trajectory reflects a slowdown, transitioning from 5.2% in CY23 to 4.6% in CY24 and 4.1% in CY25 due to fading post-pandemic stimuli and ongoing property sector challenges. In contrast, **India's** growth remains robust, with anticipated rates of 6.8% in CY24 and 6.5% in CY25, bolstered by resilient domestic demand and a burgeoning working-age populace.

The **Indonesian** economy is expected to register growth of 5.0% in CY24 and 5.1% in CY25 with a strong domestic demand, a healthy export performance, policy measures, and normalization in commodity prices. In CY22, **Saudi Arabia's** growth slowed at -0.8% in CY23 attributed to lower oil production. CY24 is predicted to see a revamp in the growth rates to 2.6% on account of Vision 2030 reforms that helped advance the country's economic diversification agenda, including through reduced reliance on oil. Going forward, GDP is expected to grow at 6.0% and 4.0% in CY25 and CY26, respectively. On the other hand, **Brazil's** growth is projected to ease to 2.2% in CY24, driven by fiscal consolidation, the lingering impact of tight monetary policies, and reduced contributions from the agricultural sector.

Despite the turmoil in the last 2-3 years, India bears good tidings to become a USD 5 trillion economy by CY27. According to the IMF dataset on Gross Domestic Product (GDP) at current prices, the nominal GDP has been estimated to be at USD 3.6 trillion for CY23 and is projected to reach USD 5.3 trillion by CY27 and USD 6.4 trillion by CY29. India's expected GDP growth rate for coming years is almost double compared to the world economy.

Besides, India stands out as the fastest-growing economy among the major economies. The country is expected to grow at more than 6.5% in the period of CY24-CY29, outshining China's growth rate. By CY27, the Indian economy is estimated to emerge as the third-largest economy globally, hopping over Japan and Germany. Currently, it is the third-largest economy globally in terms of Purchasing Power Parity (PPP) with a ~7.6% share in the global economy, with China [~18.7%] on the top followed by the United States [~15.6%]. Purchasing Power Parity is an economic performance indicator denoting the relative price of an average basket of goods and services that a household needs for livelihood in each country.

Despite Covid-19's impact, high inflationary environment and interest rates globally, and the geopolitical tensions in Europe, India has been a major contributor to world economic growth. India is increasingly becoming an open economy as well through growing foreign trade. Despite the global inflation and uncertainties, Indian economy continues to show resilience. This resilience is mainly supported stable financial sector backed by well-capitalized banks and export of services in trade balance. With this, the growth of Indian economy is expected to fare better than other economies majorly on account of strong investment activity bolstered by the government's capex push and buoyant private consumption, particularly among higher income earners.

1.1. Indian Economic Outlook

1.1.1 GDP Growth and Outlook

Resilience to External Shocks remains Critical for Near-Term Outlook

India's real GDP grew by 7.0% in FY23 and stood at ~Rs. 161 trillion, as per the First Revised Estimate, despite the pandemic in previous years and geopolitical Russia-Ukraine spillovers. In Q1FY24, the economic growth accelerated to 8.2%. The manufacturing sector maintained an encouraging pace of growth, given the favorable demand conditions and lower input prices. The growth was supplemented by a supportive base alongside robust services and construction activities. This momentum remained in the range in the Q2FY24 with GDP growth at 8.1%, mainly supported by acceleration in investments. However, private consumption growth was muted due to weak rural demand and some moderation in urban demand amid elevated inflationary pressures in Q2FY24. The GDP growth number improved for Q3FY24 at 8.6%.

India's GDP at constant prices surged to Rs. 47.24 trillion in Q4FY24 from Rs. 43.84 trillion in Q4FY23, marking a 7.8% growth rate. This upswing was fueled by robust performances in construction, mining & quarrying, utility services, and manufacturing sectors and investment drove the GDP growth, while both private and government consumption remained subdued.

Real GDP in the year FY24 is estimated to grow at 8.2% at Rs. 173.82 trillion as per provisional estimate of the Ministry of Statistics and Programme Implementation. It is expected that domestic demand, especially investment, to be the main driver of growth in India, amid sustained levels of business and consumer confidence.

GDP Growth Outlook

- Driven by fixed investment and improving global environment, domestic economic activity continues to expand. The provisional estimates (SAE) placed real GDP growth at 8.2% for FY24.

- Industrial activity led by manufacturing continues its momentum on the back of strengthening domestic demand. The eight core industries also show healthy growth. Moreover, services sector shows exhibit broad based buoyancy. The purchasing managers' index for both manufacturing and services continues to exhibit a sustained and healthy expansion.

- The outlook for agriculture and rural activity appears bright owing to good rabi wheat crop and expected improvements in kharif crop due to expected normal south-west monsoon. This combined with increasing rural demand on the back of improving farm activity, improvement in informal activity, improving employment condition, and alleviating inflationary pressures are expected to boost private investment. Additionally, consumption is expected to support economic growth in FY25 owing to strengthening rural demand.

- Investment activity is also expected to be further supported by sustained and robust government spending, strong financial positions of banks and corporations, increasing capacity utilization, and rising business confidence as indicated by surveys. Additionally, improving global economic growth and trade prospects are expected to boost external demand for goods and services.

Persistent geopolitical tensions and volatility in international commodity prices do pose risk to this outlook. Based on these considerations, the RBI, in its June 2024 monetary policy, has projected real GDP growth at 7.2% y-o-y for FY25.

Table 2: RBI's GDP Growth Outlook (Y-o-Y %)

FY25P	Q1FY25P	Q2FY25P	Q3FY25P	Q4FY25P
7.2%	7.3%	7.2%	7.3%	7.2%

Note: P-Projected; Source: Reserve Bank of India

1.1.2 Gross Value Added (GVA)

Gross Value Added (GVA) is the measure of the value of goods and services produced in an economy. GVA gives a picture of the supply side whereas GDP represents consumption.

Industry and Services sector leading the recovery charge

• The gap between GDP and GVA growth turned positive in FY22 (after a gap of two years) due to robust tax collections. Of the three major sector heads, the service sector has been the fastest-growing sector in the last 5 years.

• The **agriculture sector** was holding growth momentum till FY18. In FY19, the acreage for the rabi crop was marginally lower than the previous year which affected the agricultural performance. Whereas FY20 witnessed growth on account of improved production. During the pandemic-impacted period of FY21, the agriculture sector was largely insulated as timely and proactive exemptions from COVID-induced lockdowns to the sector facilitated uninterrupted

harvesting of rabi crops and sowing of kharif crops. However, supply chain disruptions impacted the flow of agricultural goods leading to high food inflation and adverse initial impact on some major agricultural exports. However, performance remained steady in FY22.

In FY23, the agriculture sector performed well despite weather-related disruptions, such as uneven monsoon and unseasonal rainfall, impacting yields of some major crops and clocked a growth of 4% y-o-y, garnering Rs. 22.3 trillion.

In Q1FY24, this sector expanded at a slower pace of 3.7% y-o-y growth compared to y-o-y growth a quarter ago. This further stumbled to 1.7% in Q2FY24.Further, it experienced y-o-y growth of 0.4% in Q3 and 0.6% in Q4. leading to expectations of a modest 1.4% rise for the full year, contrasting sharply with the 4.7% growth recorded in FY23. In the Interim Budget 2024-25, the government plans to boost private and public investment in post-harvest activities and expand the application of Nano-DAP across agro-climatic zones. Strategies for self-reliance in oilseeds and dairy development are to be formulated, alongside ramping up the Pradhan Mantri Matsaya Sampada Yojana and establishing Integrated Aquaparks. Allocation for PM-Formalisation of Micro Food Processing Enterprises scheme has increased from Rs. 639 in FY24 to Rs. 880 crores in FY25.

Going forward, rising bank credit to the sector and increased exports will be the drivers for the agriculture sector. However, a deficient rainfall may have impact on the reservoir level, weighing on prospects of Kharif sowing. Considering these factors, the agriculture sector is estimated to attain Rs. 23.7 trillion and mark 1.4% y-o-y growth for complete FY24.

• From March 2020 onwards, the nationwide lockdown due to the pandemic significantly impacted the **industrial sector**. In FY20 and FY21, this sector felt turbulence due to the pandemic and recorded a decline of 1.4% and 0.9%, respectively, on a y-o-y basis. With the opening up of the economy and resumption of industrial activities, it registered 11.6% y-o-y growth in FY22, albeit on a lower base.

The industrial output in FY23 grew by only 2.1% with estimated value Rs. 44.74 trillion owing to decline in manufacturing activities.

The industrial sector grew by 6.0% in Q1FY24, while Q2FY24 growth was up by 13.6% owing to positive business optimism and strong growth in new orders supported manufacturing output. The industrial growth was mainly supported by sustained momentum in the manufacturing and construction sectors. Within manufacturing, industries such as pharma, motor vehicles, metals, petroleum and pharma witnessed higher production growth during the quarter. The construction sector (13.6% growth in Q2FY24) benefited from poor rainfall during August and September and higher implementation of infrastructure projects. This was reflected in robust cement and steel production and power demand in Q2FY24. Overall, H1FY24 picked up by 9.3% with manufacturing and construction activities witnessing significant acceleration. In Q3FY24, growth rate slowed down to 10.5%. It further fell down to 8.4% in Q4FY24.

India's industrial sector is experiencing strong growth, driven by significant expansion in manufacturing, mining, and construction. This growth is supported by positive business sentiment, declining commodity prices, beneficial government policies like production-linked incentive schemes, and efforts to boost infrastructure development. These factors collectively contribute to the sustained buoyancy in industrial growth due to which the industrial growth is estimated at 9.5% on y-o-y basis registering the value of Rs. 48.9 trillion in FY24.

• The **Services sector** was the hardest hit by the pandemic and registered an 8.2% y-o-y decline in FY21. The easing of restrictions aided a fast rebound in this sector, with 8.8% y-o-y growth witnessed in FY22.

Overall, in FY23, benefitting from the pent-up demand, the service sector was valued at Rs. 80.6 trillion and registered growth of 10.0% y-o-y.

In Q1FY24, the services sector growth jumped to 10.7%. Within services, there was a broad-based improvement in growth across different sub-sectors. However, the sharpest jump was seen in financial, real estate, and professional services. Trade, hotels, and transport sub-sectors expanded at a healthy pace gaining from strength in discretionary demand. The service sector growth in Q2FY24 moderated to 6.0% partly due to the normalization of base effect and some possible dilution in discretionary demand. Considering these factors, service sector marked 8.3% growth in H1FY24. In Q3FY24 growth increased to 7.1% compared to 7.2% last year in the same quarter. In Q4FY24, growth declined to 6.7% compared to 7.2% last year in the same quarter.

With this performance, steady growth in various service sector indicators like air passenger traffic, port cargo traffic, GST collections, and retail credit are expected to support the services sector. With this, the growth of service sector is estimated at Rs. 86.7 trillion registering 7.6% growth in FY24 overall.

Table 3: Sectoral Growth (Y-o-Y % Growth) - at Constant Prices

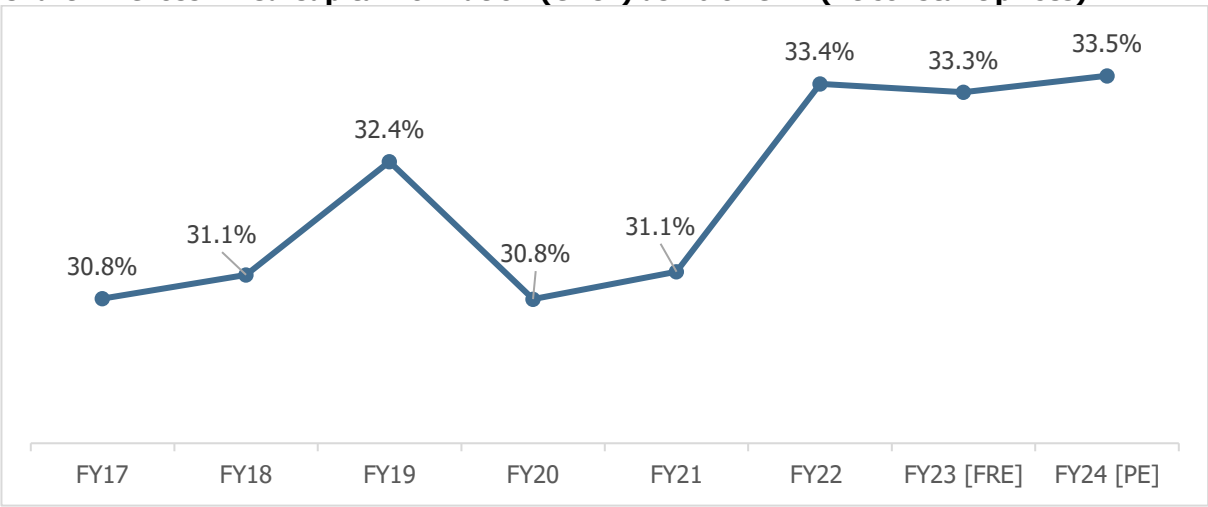
At constant Prices	FY19	FY20	FY21	FY22	FY23 (FRE)	FY24 (PE)
Agriculture, Forestry & Fishing	**2.1**	**6.2**	**4.1**	**3.5**	**4.7**	**1.4**
Industry	**5.3**	**-1.4**	**-0.9**	**11.6**	**2.1**	**9.5**
Mining & Quarrying	-0.9	-3.0	-8.6	7.1	1.9	7.1
Manufacturing	5.4	-3.0	2.9	11.1	-2.2	9.9
Electricity, Gas, Water Supply & Other Utility Services	7.9	2.3	-4.3	9.9	9.4	7.5
Construction	6.5	1.6	-5.7	14.8	9.4	9.9
Services	**7.2**	**6.4**	**-8.2**	**8.8**	**10.0**	**7.6**
Trade, Hotels, Transport, Communication & Broadcasting	7.2	6.0	-19.7	13.8	12.0	6.4
Financial, Real Estate & Professional Services	7.0	6.8	2.1	4.7	9.1	8.4
Public Administration, Defence and Other Services	7.5	6.6	-7.6	9.7	8.9	7.8
GVA at Basic Price	**5.8**	**3.9**	**-4.2**	**8.8**	**6.7**	**7.2**

Note: FRE – First Revised Estimates, PE – Provisional Estimate; Source: MOSPI

1.1.3 Investment Trend in Infrastructure

Gross Fixed Capital Formation (GFCF), which is a measure of the net increase in physical assets, witnessed an improvement in FY22. As a proportion of GDP, it is estimated to be at 33.4%, which is the highest level in 5 years (since FY17). In FY23, the ratio of investment (GFCF) to GDP remained flat at 33.3%. Continuing in its growth trend, this ratio has reached 33.5% in FY24.

Chart 2: Gross Fixed Capital Formation (GFCF) as % of GDP (At constant prices):



Note: 3RE – Third Revised Estimate, 2RE – Second Revised Estimates, 1RE – First Revised Estimates, PE – Provisional Estimate, FAE-First Advance Estimate; Source: MOSPI

Overall, the support of public investment in infrastructure is likely to gain traction due to initiatives such as Atmanirbhar Bharat, Make in India, and Production-linked Incentive (PLI) scheme announced across various sectors.

1.1.4 Industrial Growth

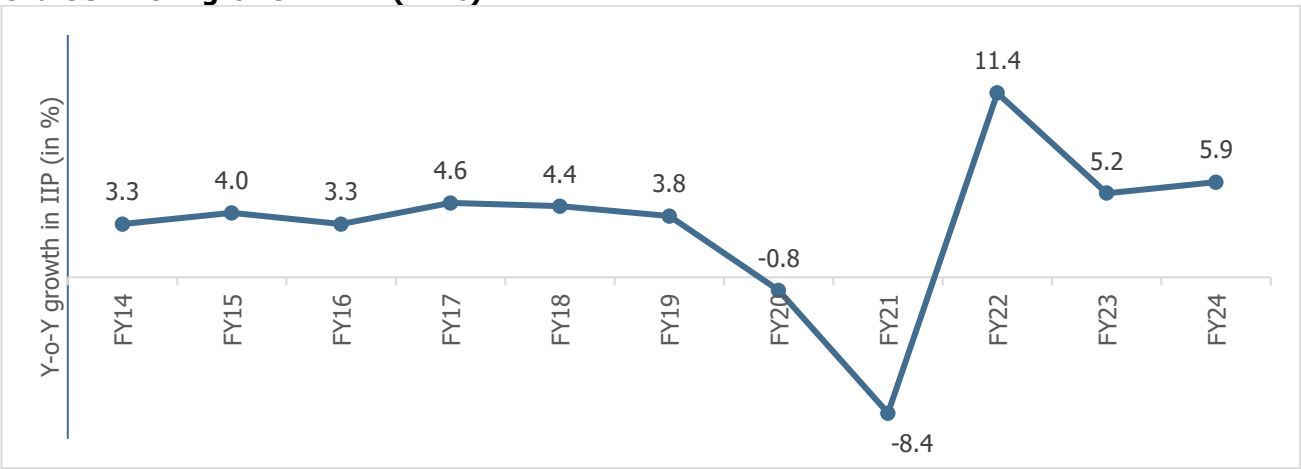
Improved Core and Capital Goods Sectors helped IIP Growth Momentum

The Index of Industrial Production (IIP) is an index to track manufacturing activity in an economy. On a cumulative basis, IIP grew by 11.4% y-o-y in FY22 post declining by 0.8% y-o-y and 8.4% y-o-y, respectively, in FY20 and FY21. This high growth was mainly backed by a low base of FY21. FY22 IIP was higher when compared with the pre-pandemic level of FY20, indicating that while economic recovery was underway.

During FY23, the industrial output recorded a growth of 5.2% y-o-y supported by a favorable base and a rebound in economic activities. The period April 2023 – March 2024, industrial output grew by 5.9% compared to the 5.2% growth in the corresponding period last year. For the month of April 2024, the IIP growth increased to 5.0% compared to the last year's 4.6%, on account of growth in mining and electricity. The manufacturing sector grew modestly with the top three contributors being Manufacture of basic metals, Manufacture of coke and refined petroleum products, and Manufacture of motor vehicles, trailers and semi-trailers.

So far in the current fiscal, the government's spending on infrastructure has been strong, but private investment hasn't picked up significantly yet. Consumer durables production increased due to favorable conditions, while non-durables saw a slight decline. Urban demand is driving consumption, while rural demand is still recovering. Good monsoon forecasts are positive, but high unemployment and food inflation pose challenges. Infrastructure/construction output is growing well due to government spending. Private investment and manufacturing capacity utilization are increasing, supporting hopes for private sector growth. Good monsoon could boost rural demand, but food inflation remains a concern. Overall, sustained improvements in consumption and private investment are crucial for industrial performance.

Chart 3: Y-o-Y growth in IIP (in %)



Source: MOSPI

1.1.5 Consumer Price Index

India's consumer price index (CPI), which tracks retail price inflation, stood at an average of 5.5% in FY22 which was within RBI's targeted tolerance band of 6%. However, consumer inflation started to upswing from October 2021 onwards and reached a tolerance level of 6% in January 2022. Following this, CPI reached 6.9% in March 2022.

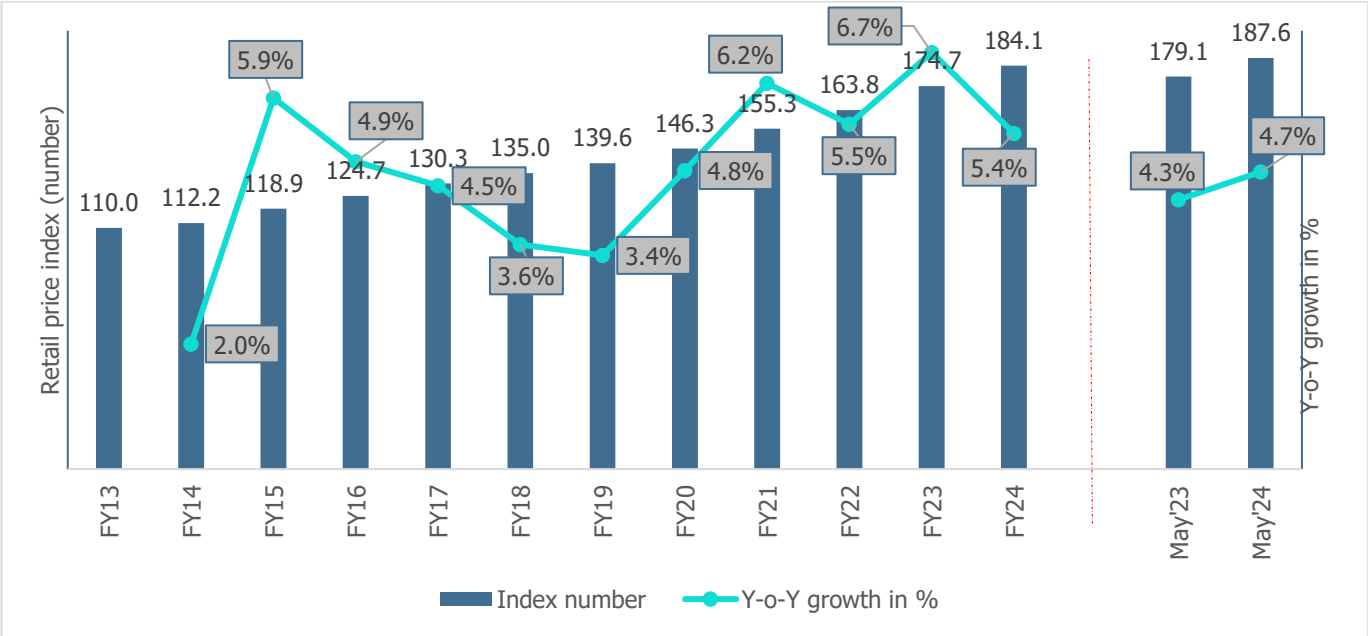
CPI remained elevated at an average of 6.7% in FY23, above the RBI's tolerance level. However, there was some respite toward the end of the fiscal wherein the retail inflation stood at 5.7% in March 2023, tracing back to the RBI's tolerance band. Apart from a favorable base effect, the relief in retail inflation came from a moderation in food inflation.

In FY24, the CPI moderated for two consecutive months to 4.7% in April 2023 and 4.3% in May 2023. This trend snapped in June 2023 with CPI rising to 4.9%. In July 2023, the CPI had reached its highest point at 7.4%, this was largely due to increase in food prices. The notable surge in vegetable prices and in other food categories such as cereals, pulses, spices, and milk have driven this increase. In August 2023, the food inflation witnessed some moderation owing to government's active intervention. This was further moderated for second consecutive month in September 2023 to 5%, led by a sharp correction in vegetables prices and lower LPG prices. Helped by deflation in the fuel and light category, the retail inflation in October 2023 softened at 4.9%. This trend revsered in November 2023 due to spike in certain vegetable prices as well as sticky inflation in non-perishable food items such as cereals, pulses and spices and the CPI rose to 5.6%. In the month of December 2023, elevated food prices and an unfavourable base drove headline inflation to a four-month peak of 5.7%. However in the month of January and February, food prices softened and the inflation was reported at 5.1% for both the months. March witnessed furthur softning of prices registering 4.9% growth. For FY24 inflation moderated to 5.4% which are within the boundaries set of 2% to 6% by the RBI.

High inflation in specific food items poses inflation risk, even though normal monsoon forecasts are improving the food inflation outlook. This makes it crucial to monitor monsoon distribution. Government measures like the Open Market Sale Scheme (OMSS) and export restrictions aim to stabilize food prices. Additionally, recent move to cut LPG cylinder prices have sustained deflation in fuel and light category. While government initiatives are expected to mitigate upward price pressure, external risks from geopolitical tensions may affect supply chains and commodity prices. The numbers

for May FY25 show an increase in inflation growth y-o-y to 4.7% as compared to inflation growth y-o-y of 4.3% in May FY24.

Chart 4: Retail Price Inflation in terms of index and Y-o-Y Growth in % (Base: 2011-12=100)

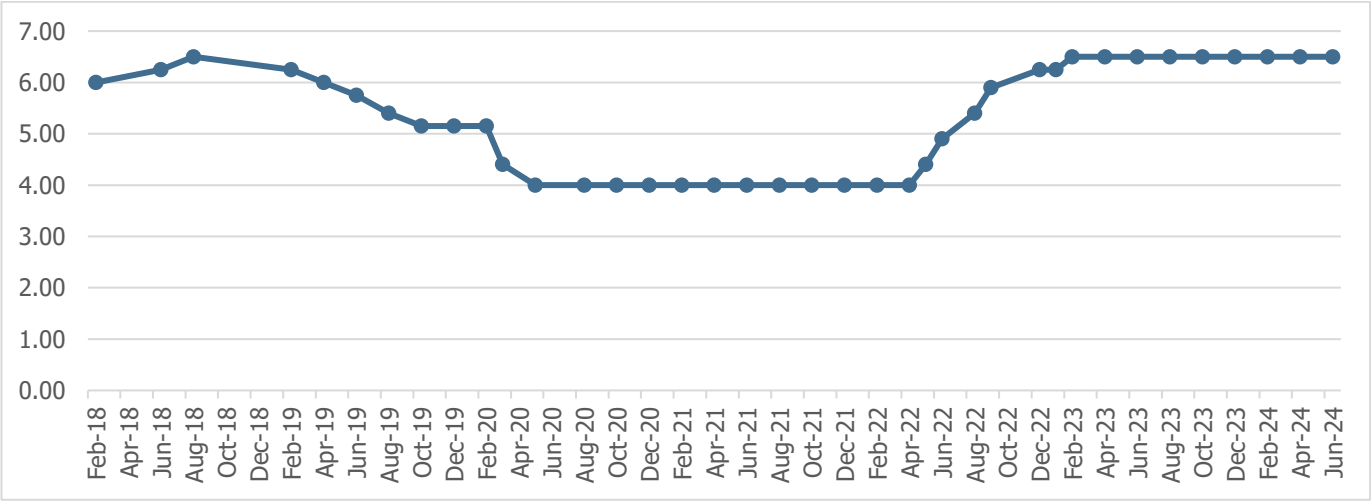


Source: MOSPI

The CPI is primarily factored in by RBI while preparing their bi-monthly monetory policy. At the bi-monthly meeting held in June 2024, RBI projected inflation at 4.5% for FY25 with inflation during Q1FY25 at 4.9%, Q2FY25 at 3.8%, Q3FY25 at 4.6% and Q4FY25 at 4.5%.

Considering the current inflation situation, RBI has kept the repo rate unchanged at 6.5% again in the June 2024 meeting of the Monetary Policy Committee.

Chart 5: RBI historical Repo Rate



Source: RBI

In a meeting held in June 2024, RBI also maintained the liquidity adjustment facility (LAF) corridor by adjusting the standing deposit facility (SDF) rate of 6.25% as the floor and the marginal standing facility (MSF) at the upper end of the band at 6.75%.

Further, the central bank continued to remain focused on the withdrawal of its accommodative stance. While headline inflation has started easing due to softening in core component and economic activity has been resilient supported by domestic and investment demand, volatility in food proces due to adverse weather conditions pose a risk to the path of disinflation. Given the uncertainities in food prices that might derail the path to bring down inflation, the Central Bank has decided to be vigilant and maintain an active disinflationary stance to ensure complete transmission of past rate cuts and anchoring of inflation expectations until a better alignment of the headline CPI inflation with the target is achieved.s

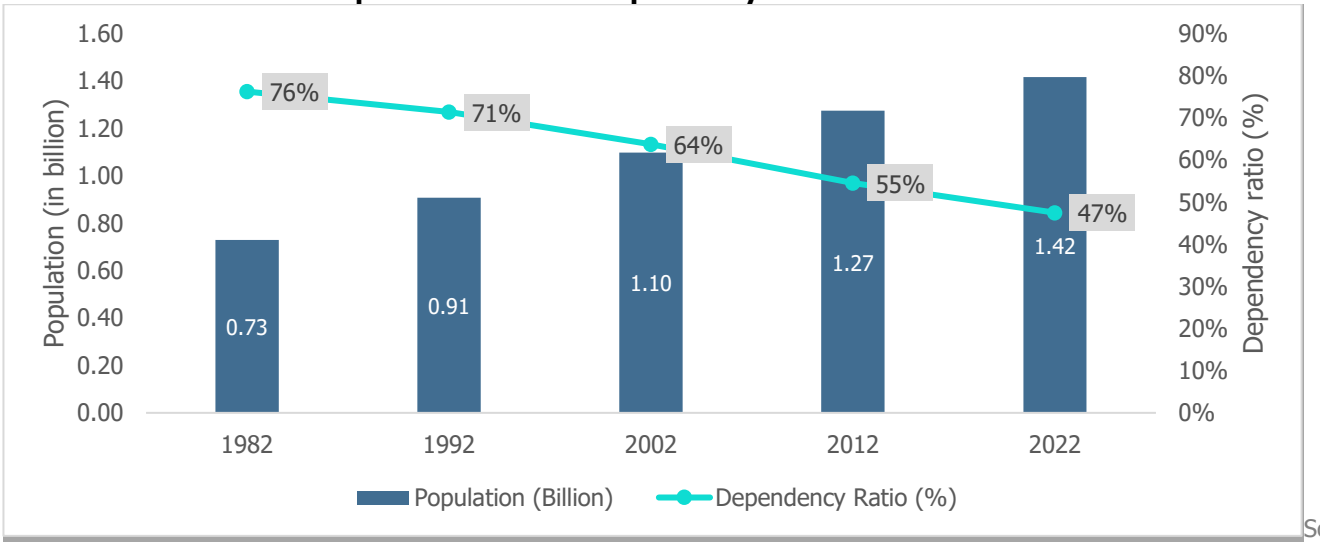
1.1.6 Overview on Key Demographic Parameters

- **Population growth and Urbanization**

The trajectory of economic growth of India and private consumption is driven by socio-economic factors such as demographics and urbanization. According to the world bank, India's population in 2022 surpassed 1.42 billion slightly higher than China's population 1.41 billion and became the most populous country in the world.

Age Dependency Ratio is the ratio of dependents to the working age population, i.e., 15 to 64 years, wherein dependents are population younger than 15 and older than 64. This ratio has been on a declining trend. It was as high as 76% in 1982, which has reduced to 47% in 2022. Declining dependency means the country has an improving share of working-age population generating income, which is a good sign for the economy.

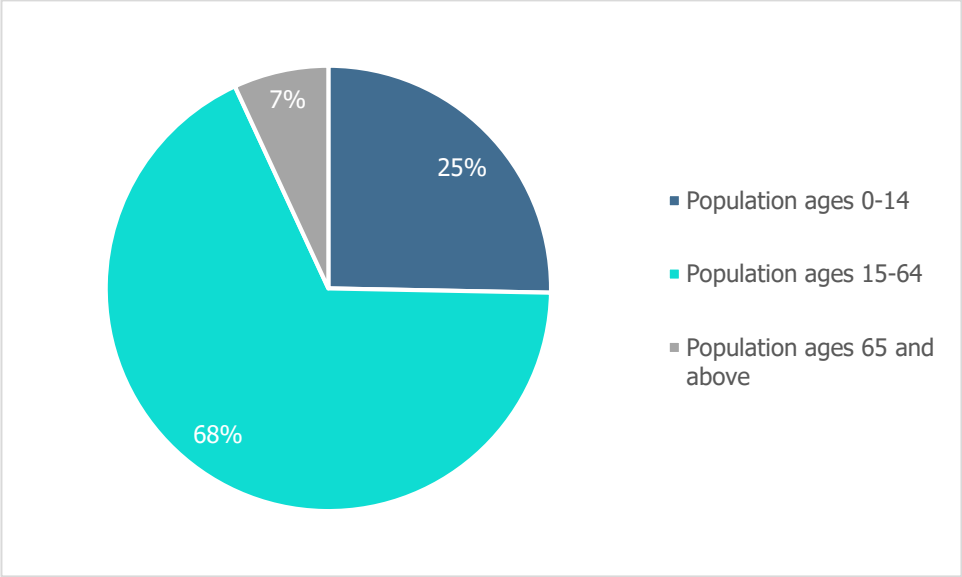
Chart 6: Trend of India Population vis-à-vis dependency ratio



Source: World Bank Database

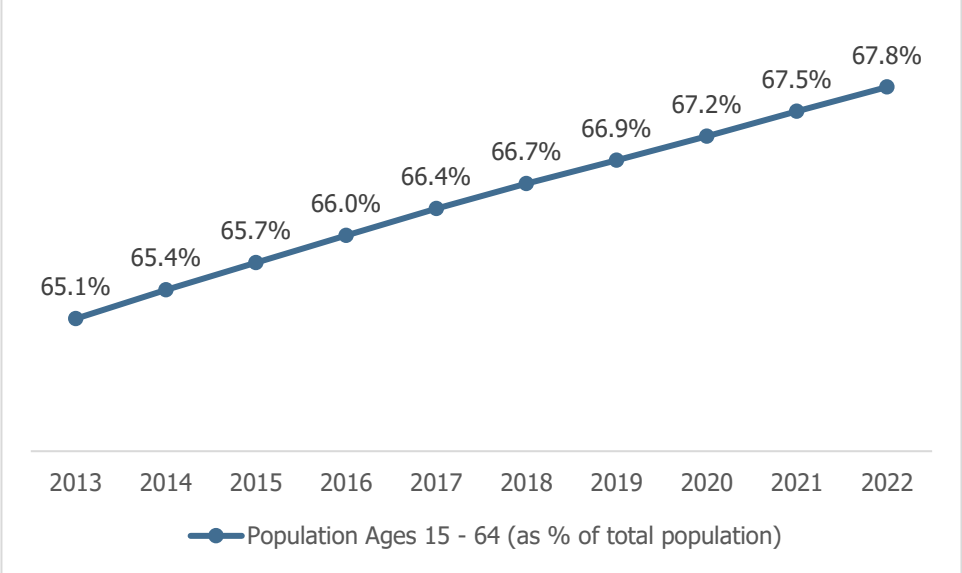
With an average age of 29, India has one of the youngest populations globally. With vast resources of young citizens entering the workforce every year, it is expected to create a 'demographic dividend'. India is home to a fifth of the world's youth demographic and this population advantage will play a critical role in economic growth.

Chart 7: Age-Wise Break Up of Indian population



Source: World Bank Database

Chart 8: Yearly Trend - Young Population as % of Total Population

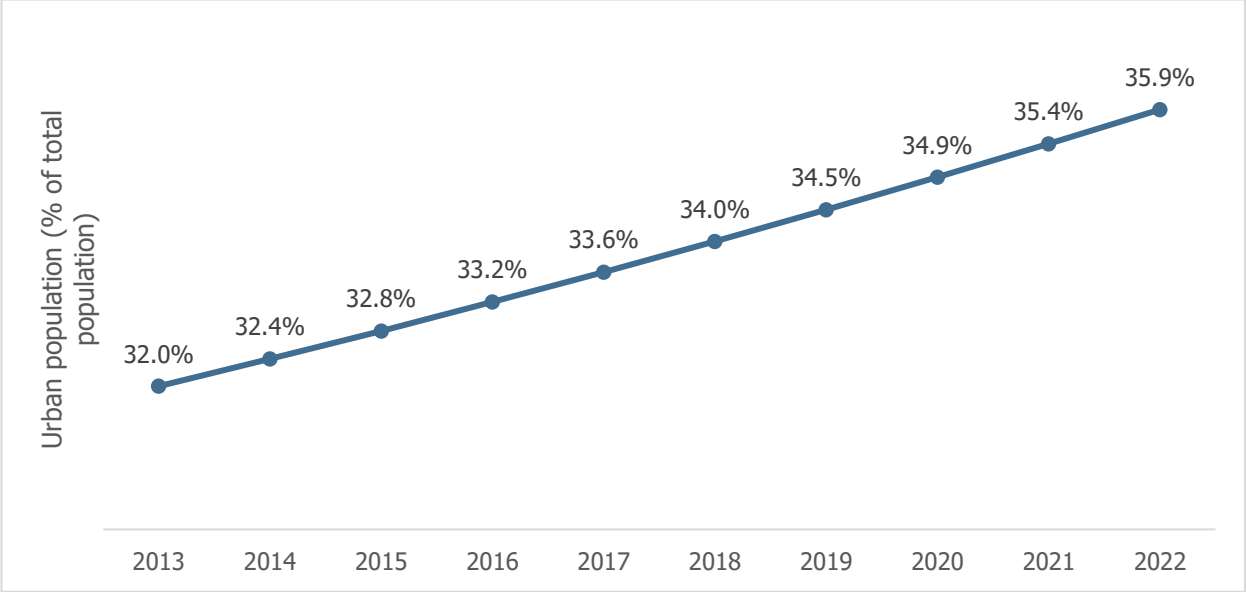


Source: World Bank database

- **Urbanization**

The urban population is significantly growing in India. The urban population in India is estimated to have increased from 403 million (31.6% of total population) in 2012 to 508 million (35.9% of total population) in the year 2022. People living in Tier-2 and Tier-3 cities have greater purchasing power.

Chart 9: Urbanization Trend in India



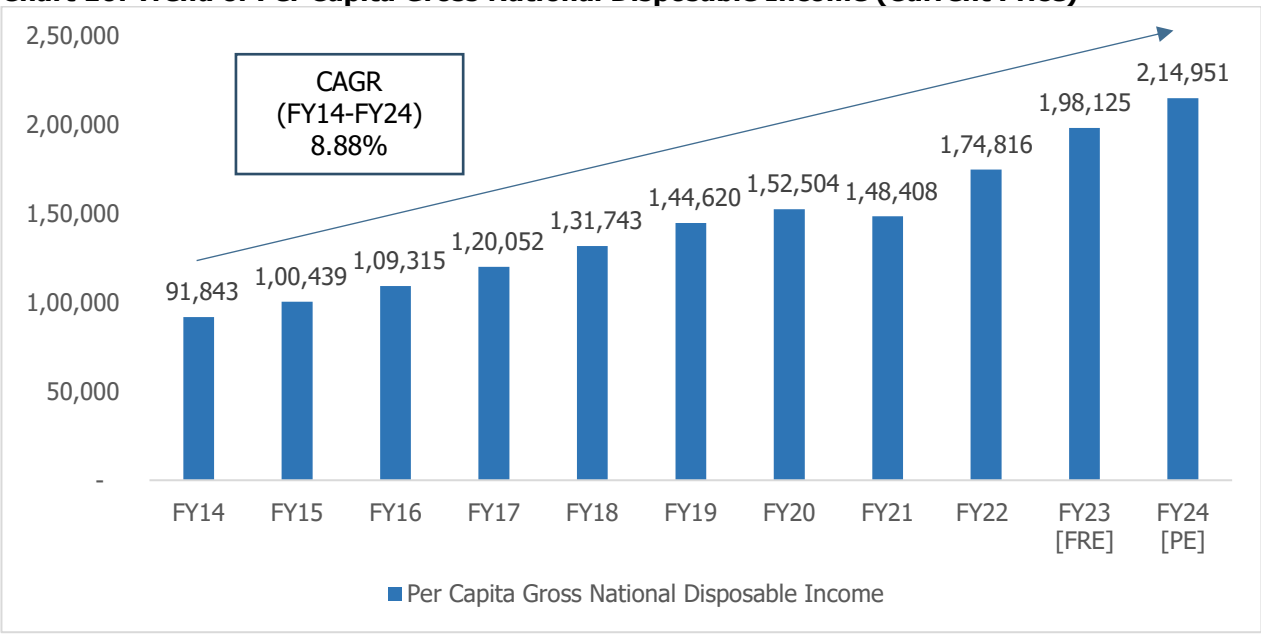
Source: World Bank Database

- **Increasing Per Capita Disposable Income**

Gross National Disposable Income (GNDI) is a measure of the income available to the nation for final consumption and gross savings. Between the period FY14 to FY24, per capita GNDI at current prices registered a CAGR of 8.88%. More disposable income drives more consumption, thereby driving economic growth.

The chart below depicts the trend of per capita GNDI in the past decade:

Chart 10: Trend of Per Capita Gross National Disposable Income (Current Price)

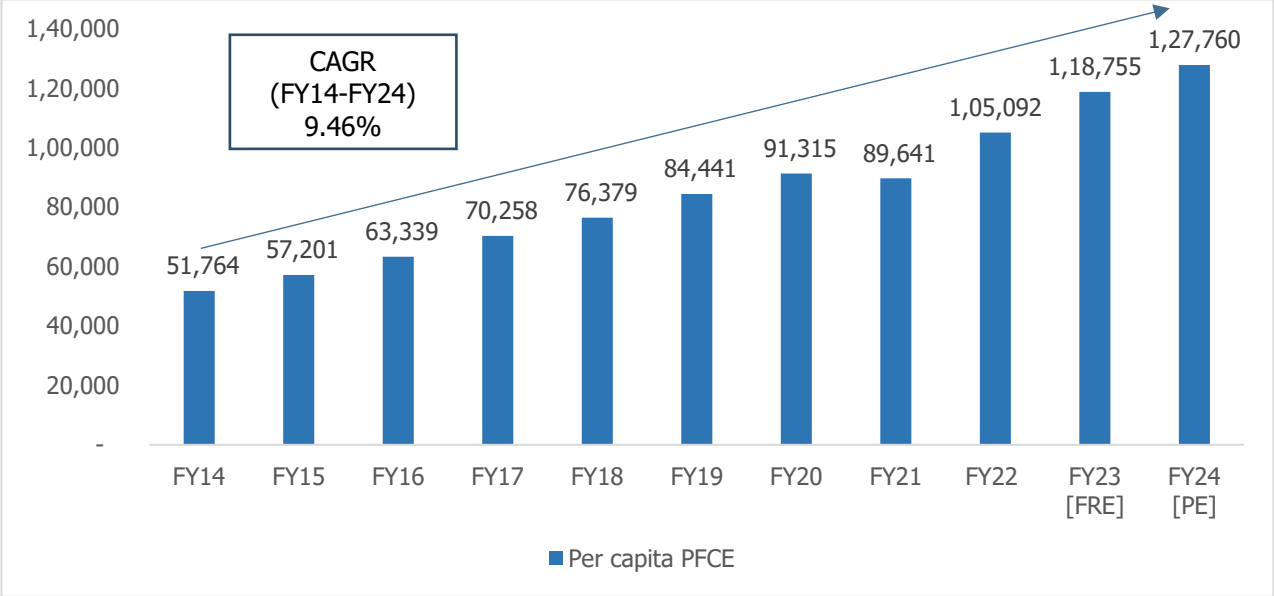


Note: 3RE – Third Revised Estimate, 2RE – Second Revised Estimates, 1RE – First Revised Estimates, PE – Provisional Estimate; Source: MOSPI

- **Increase in Consumer Spending**

With increase in disposable income, there has been a gradual change in consumer spending behaviour as well. Private Final Consumption Expenditure (PFCE) which is measure of consumer spending has also showcased significant growth in the past decade at a CAGR of 9.46%. Following chart depicts the trend of per capita PFCE at current prices:

Chart 11: Trend of Per Capita Private Final Consumption Expenditure (Current Price)



Source: MOSPI

1.1.7 Concluding Remarks

The major headwinds to global economic growth are escalating geopolitical tensions, volatile global commodity prices, and a shortage of key inputs. Despite the global economic growth uncertainties, the Indian economy is relatively better placed in terms of GDP growth compared to other emerging economies. According to IMF's forecast, it is expected to be 6.8% in CY24 compared to the world GDP growth projection of 3.2%. The bright spots for the economy are continued healthy domestic demand, support from the government towards capital expenditure, moderating inflation, investments in technology and improving business confidence.

Likewise, several high-frequency growth indicators including the purchasing managers index, auto sales, bank credit, and GST collections have shown improvement in FY23. Moreover, normalizing the employment situation after the opening up of the economy is expected to improve and provide support to consumption expenditure.

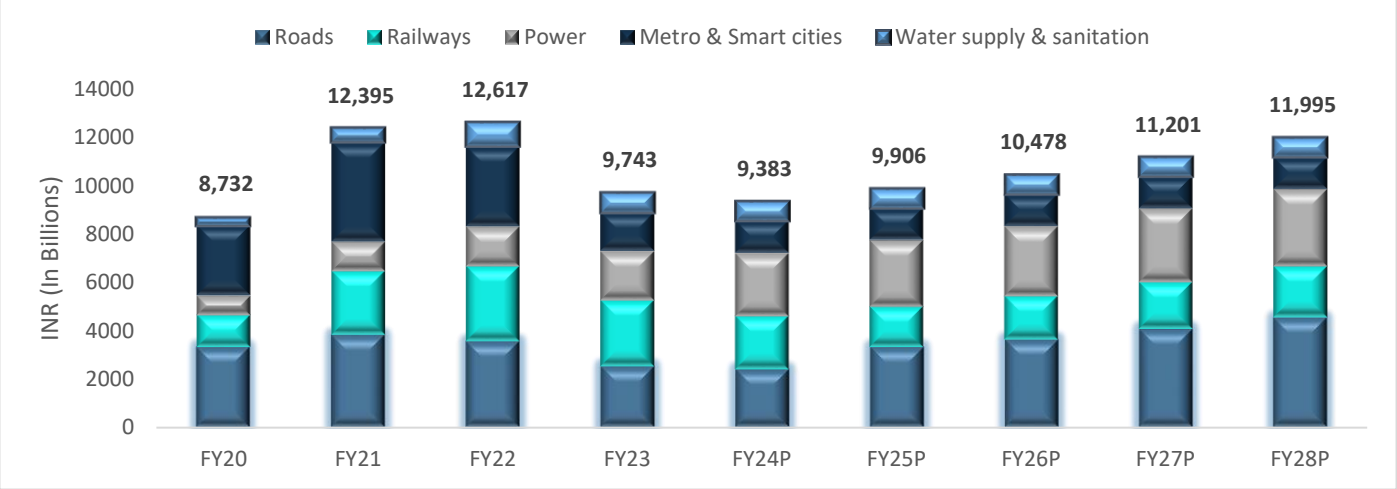
The India Meteorological Department (IMD) has made a significant forecast, predicting "above normal" rainfall for the upcoming monsoon season, marking the first time in a decade that such an optimistic outlook has been declared at the initial stage. This forecast, coupled with an anticipated eight-year-high rainfall, offers promising prospects for the agrarian economy and inflation. The weakening of El Nino to a neutral stage in the early monsoon season, followed by the likely development of La Nina conditions in the later part, adds to the positive outlook. El Nino typically leads to

suppressed rainfall during the Indian monsoon, whereas La Nina tends to enhance rainfall activity. IMD's more optimistic prediction is expected to bolster agricultural growth and incomes, while also potentially alleviating stubborn food inflation pressures.

At the same time, public investment is expected to exhibit healthy growth as the government has allocated a strong capital expenditure of about Rs. 11.11 lakh crores for FY25. The private sector's intent to invest is also showing improvement as per the data announced on new project investments and resilience shown by the import of capital goods. Additionally, improvement in rural demand owing to good rabi crop and an expected normal monsoon will aid the investment cycle in gaining further traction.

2. Overview of Infrastructure Industry in India

Chart 12: Continued High Investment Momentum in Indian Key Infrastructure Sectors



Source: CareEdge Research

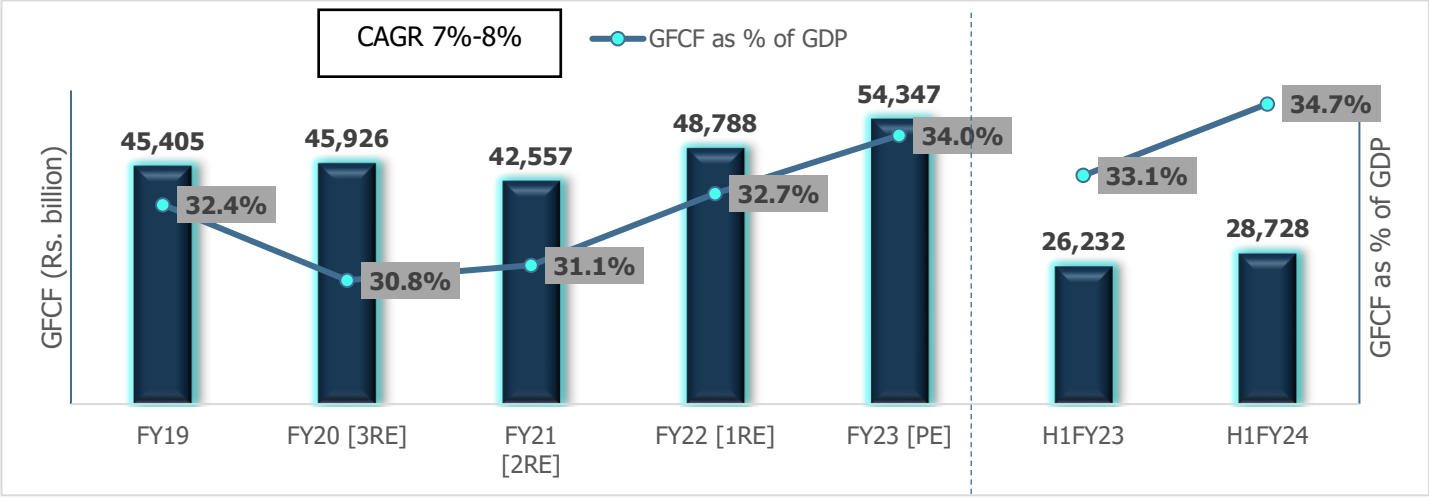
The Indian infrastructure to play major role with around 3% contribution to GDP as on FY23. CareEdge estimates India's infrastructure industry investments of Rs. 52,962 billion between FY24-FY28. India's economic growth is fueled by a diverse range of sectors, of which infrastructure is a vital sector. In recent years, the government has taken several steps to accelerate infrastructure development, wherein, the key focus areas are transportation, energy, smart cities, water, social infrastructure, and digital infrastructure. There have also been efforts to attract foreign investors in the infrastructure sector through policy reforms.

Infrastructure projects are often expensive and have a long gestation period. To address this issue, fundraising and generating returns, the government is continuously striving to create a favorable operating environment for its players. Accordingly, national and state-level agencies like the National Highways Authority of India (NHAI), state-level bodies, and private sector companies (both domestic and international), are actively participating in infrastructure development.

With the growing population, the long-term need for robust infrastructure is necessary for economic development. This generates the need for massive investments in the development and modernization of infrastructure facilities which will not only cater to the growing demand but will also ensure competitiveness in the global market.

Gross Fixed Capital Formation (GFCF), which is the measure of a country's investment in fixed assets witnessed significant improvements over the years. It is a key indicator considered to assess the trend in investments in an economy. In FY23, the ratio of investment (GFCF) to GDP climbed up to its highest in the last decade at 34%.

Chart 13: Gross Fixed Capital Formation (GFCF) as % of GDP (At constant prices):



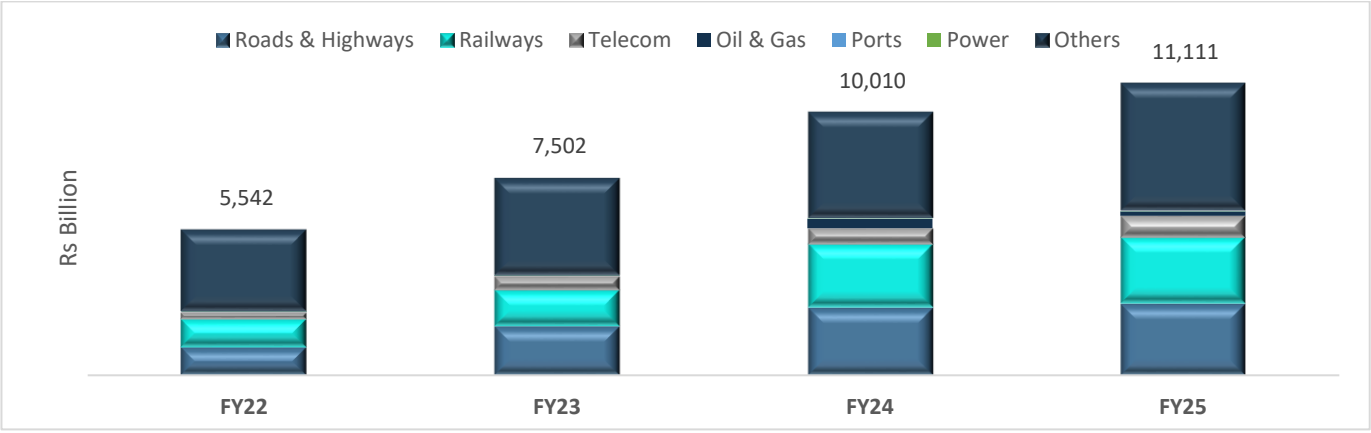
Note: 3RE – Third Revised Estimate, 2RE – Second Revised Estimates, 1RE – First Revised Estimates, PE – Provisional Estimate; Source: Ministry of Statistics and Program Implementation

In coming years, the support of public investment in infrastructure is likely to gain traction due to initiatives such as Atmanirbhar Bharat, Make in India, and Production-linked Incentive (PLI) scheme announced across various sectors. Considering all these factors, the GFCF is projected to increase at a CAGR of 7%-8% in the forecast period of FY24-FY28.

2.1. Budgetary Outlay Toward Infrastructure and Governmental Infra-Projects

One of the key drivers for economic growth is the increased infrastructure investment thrust by the government. In the Union Budget 2024-25, the government continued its focus on infrastructure development with budget estimates of capital expenditure toward the infrastructure sector of Rs. 11,111 Billion. Furthermore, continuous efforts by the Government of India to make the business environment convenient to operate and streamline the regulatory process will support the growth of investments in the infrastructure segment.

Chart 14: Key Infrastructure Sectors for Capital Expenditure in Budget 2024-25



Source: Union Budget 2024-25 Analysis

2.2. Growth Drivers and Risk Factors in Infrastructure Investments

There are several factors that contribute to infrastructure investment drive. They mainly include the following:

- The **increasing urbanization** rate and **population growth** create a demand for better urban infrastructure, including transportation, housing, water supply, and sanitation. As of 2022, the total population and urban population are 1.4 billion and 0.5 billion, respectively. According to United Nation's estimates, the Indian population is expected to reach ~1.6 billion by 2050 and will have added ~416 million urban dwellers. This is expected to generate more need for infrastructure investments.

- **Government-led initiatives** such as 'Make in India,' 'Smart Cities Mission,' and 'Atmanirbhar Bharat' focus on infrastructure development, attracting investments, and promoting economic growth. Such constant government support is likely to foster more investment in the infrastructural domain in the coming years.

- **Foreign investments** also play a crucial role in infrastructural development as they bring in innovation and foster value chains. For which, more liberalization in foreign direct investments attracts investors to participate in infrastructure projects, bringing in capital, technology, and expertise. This will also help in attracting more investments.

- Economies across the globe are now gradually putting more emphasis on **renewable energy and sustainability**. Compared to other countries, India has established a position as the third-largest host country for announced greenfield projects. Thus, with such an increasing focus on renewable energy and environmental concerns, investments in infrastructure are likely to grow further in the coming years. Such investments will help align with environmental goals and provide sustainable, long-term growth opportunities.

- India has actively embraced **Public-Private Partnerships (PPPs)** as a model for infrastructure development across various sectors. The government has recognized the potential of PPPs to leverage private sector efficiency, innovation, and investment in addressing the country's vast infrastructure needs. Private financing reduces the burden on the government's budget, leveraging private capital for public infrastructure development. Some of the notable PPP projects in India are Delhi Airport, Mumbai Metro, and several national and state highways. These projects have exhibited good potential to attract more private investment into the infrastructure segment which bodes well for the industry.

- Furthermore, continuous efforts by the government to make the business environment convenient to operate and streamline the regulatory process will support the growth of investments in the infrastructure segment.

On the other hand, some of the risk factors relating to infrastructure investments are:

- **Regulatory and policy risks** are significant considerations in infrastructure investments, as they can have a substantial impact on the feasibility, profitability, and success of projects. Moreover, investors in infrastructure projects face uncertainties related to changes in laws, regulations, and government policies. Thus, frequent changes in policies and regulatory uncertainties can deter investors and impact project viability.

- **Funding challenges** in infrastructure investments are common and can arise from various factors. Infrastructure projects often require significant upfront capital investment. The high initial costs can be a deterrent for both public and private investors. Also, these projects typically have long gestation periods and payback periods. Investors may be reluctant to commit funds to projects that take many years to generate returns, especially when compared to shorter-term investments with quicker returns. Furthermore, some infrastructure projects, especially those involving public-

private partnerships (PPPs), rely on user fees or government payments for revenue. The uncertainty associated with revenue generation, particularly if it depends on user demand, can make investors hesitant to commit funds.

- **Land acquisition and environmental clearances** are two critical challenges that often pose obstacles to infrastructure development. These issues can significantly impact project timelines, costs, and overall feasibility.
- Infrastructure maintenance is a critical aspect of sustainable and effective infrastructure development. However, it often poses challenges when it comes to raising investment for new projects. Governments and private entities may face **budget constraints**, leading to deferred maintenance of existing infrastructure. This backlog can create a negative perception among investors, as they may be concerned about the long-term viability and reliability of the infrastructure.

- While technological advancements bring numerous benefits to infrastructural development, they also pose challenges that need to be addressed. Adopting new technologies often requires significant upfront investments in research, development, and implementation. The initial costs can be a barrier for some infrastructure projects, especially for cash-strapped governments or smaller organizations. Hence, **rapid technological advancements** may render certain infrastructures obsolete, necessitating ongoing updates and investments.

2.3. Major Infrastructure Development Plans

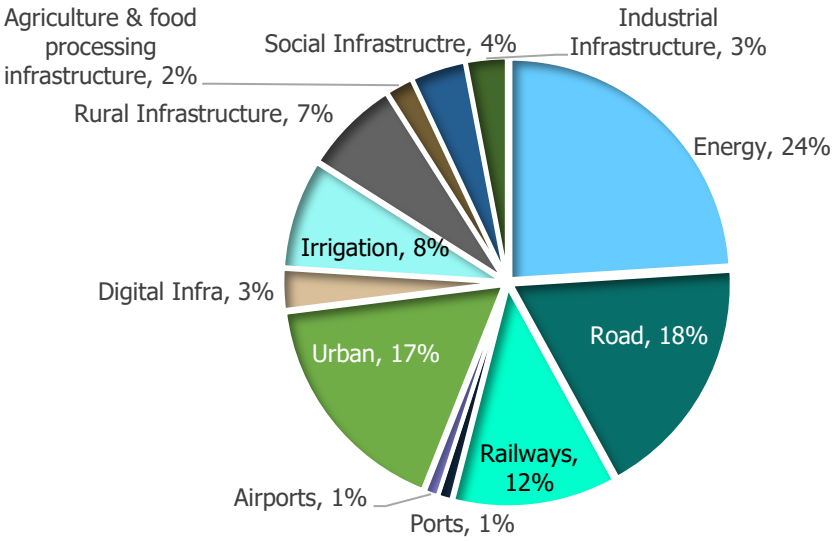
Some of the key government infrastructure schemes include:

- The 2023-24 budget by the government highlights the impetus for growth by focusing on big public investment for modern infrastructure, which will be guided by **PM Gati Shakti** and benefit from the synergy of a multi-modal approach. It is a step toward economic growth as well as sustainable development and is driven by seven engines, namely, roads, railways, airports, ports, mass transport, waterways, and logistics infrastructure. 100 critical transport infrastructure projects have been identified at an investment of Rs 750 Billion including Rs 150 Billion from private players. For the urban infrastructure in Tier–II and Tier–III cities, a corpus of Rs 100 Billion has been set aside via the establishment of the Urban Infrastructure Development Fund.

- The government has also announced plans for the **National Monetization Pipeline (NMP)** and **Development Finance Institution (DFI**) to improve the financing of infrastructure projects.

The Government of India had unveiled the National Infrastructure Policy (NIP) covering various sectors and regions indicating that it is relying on an 'infrastructure creation-' led revival of the country's economy. The NIP, which covered rural and urban infrastructure, entailed investments to the tune of Rs.111 trillion to be undertaken by the central government, state governments, and the private sector during FY20-25. The chart below depicts a sector-wise break up of capex of Rs. 111 trillion:

Chart 15: Sector-Wise Break-Up of Capital Expenditure of Rs. 111 Trillion during Fiscal FY20- FY25



Source: NITI Aayog's report on National Infrastructure Pipeline

• The government has helped the growth of urbanization through a number of schemes and projects, including the **Smart Cities Mission,** the **Atal Mission for Rejuvenation and Urban Transformation (AMRUT),** and the **Pradhan Mantri Awas Yojana (Urban)**.

Smart Cities Mission: The Smart Cities Mission, launched on 25 June 2015, is aimed at providing core infrastructure, a clean and sustainable environment, and a decent quality of life to their citizens through the application of 'smart solutions'. It is a transformational mission aimed to bring about a paradigm shift in the practice of urban development in the country. Under this mission, 100 smart cities have taken up projects across diverse sectors related to mobility, energy, water, sanitation, solid waste management, vibrant public spaces, social infrastructure, smart governance, etc. As of September 2023, about 6,000+ projects worth more than Rs. 1.1 Trillion have been completed and the remaining projects will be completed by 30 June 2024.

AMRUT: The Atal Mission for Rejuvenation and Urban Transformation (AMRUT) was launched on 25th June 2015 in selected 500 cities and towns across the country. The mission focuses on the development of basic infrastructure, in the selected cities and towns, in the sectors of water supply, sewerage and septage management, stormwater drainage, green spaces and parks, and non-motorized urban transport. A set of Urban Reforms and Capacity Building have been included in the mission.

This mission has been subsumed under AMRUT 2.0, which was launched on 01st October 2021 for a period of five years, i.e., from the financial year 2021-22 to the financial year 2025-26. It is designed to provide universal coverage of water supply through functional taps to all households in all the statutory towns in the country and coverage of sewerage/septage management in 500 cities covered in the first phase of the AMRUT scheme.

PMAY: There is a significant thrust on providing housing for all under the Pradhan Mantri Awaas Yojna (PMAY) by the government and the scheme has been getting steady allocation under the union budget. Further, the sustained efforts in sanctioning and completing a substantial number of houses under both PMAY-Urban and PMAY-Gramin schemes demonstrate the government's commitment toward promoting affordable housing and improving living conditions for individuals and families across the country.

The below table shows the budgetary allocation trend:

Table 4: Scheme-Wise Allocation Towards Infrastructure in FY24 (Rs Billion)

Description	FY22	FY23	FY24	FY 25[BE]
Pradhan Mantri Awas Yojna (PMAY)	900	771	796	807
Urban Rejuvenation Mission: AMRUT and Smart Cities	139	153	160	104

Source: Union Budget 2023-24 Analysis

• **Bharatmala** and **Sagarmala** projects were introduced in 2017 by the Government of India.

Bharatmala is a flagship highway development program. The project is part of a larger initiative to enhance road infrastructure across the country. It aims to optimize the efficiency of freight and passenger movement by developing and expanding the national highway network. It focuses on improving connectivity, reducing travel time, and promoting economic growth. The project is expected to reduce logistics costs, improve transportation efficiency, and boost economic development by providing better connectivity between key economic areas. As on October 2023, about 26,350 km length of projects are awarded and 14,783 kms are constructed.

Whereas the Sagarmala Programme is a comprehensive initiative aimed at transforming India's maritime sector and harnessing the potential of its coastline. It was launched to promote port-led development and unlock the economic benefits of the maritime industry. Sagarmala focuses on modernizing existing ports, building new ports, and improving connectivity between ports and the hinterland. The project aims to enhance efficiency in cargo and passenger movement through coastal and inland water transport. This project further seeks to reduce logistics costs, create employment opportunities, attract investments, and stimulate economic development in coastal regions. Moreover, it aims to make maritime logistics more efficient and environmentally sustainable.

• **National High-Speed Rail Corporation Limited (NHSRCL)** is a government-owned company in India responsible for the implementation of high-speed rail projects. The most prominent project undertaken by NHSRCL is the **Mumbai-Ahmedabad High-Speed Rail (MAHSR) corridor**, commonly known as the Bullet Train project. It was incorporated on February 12, 2016. The project involves collaboration with Japan as it utilizes the Shinkansen technology, known for its safety and efficiency, through a loan agreement with the Japan International Cooperation Agency (JICA). The high-speed rail corridor is expected to boost economic development along the route, create job opportunities, and improve connectivity between major cities.

2.4. Review and Break-up of Investments in Key Infrastructure Sectors

The government has from time to time announced schemes with regards to infrastructure development. The central government continues to focus on increasing capex outlay to spur growth in light of the 2024 general elections. The infrastructure capex for FY2023-24 (Budget Estimate) at Rs. 10 trillion is almost three times of the capital expenditure in FY2019-20. The Government also increased outlay on railways and included plans for 50 new airports in the Union Budget 2023-24.

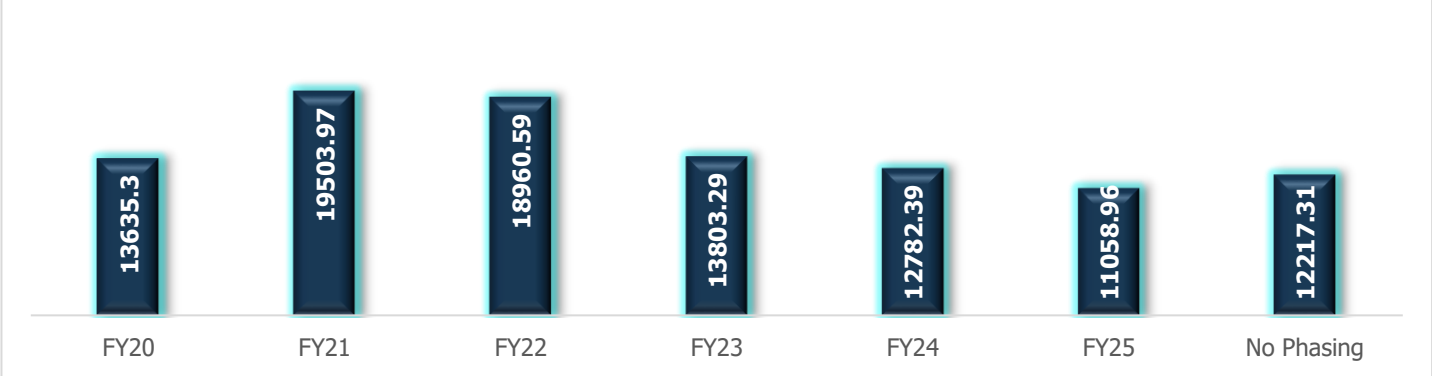
The capex increase is in line with the central government's aim to make growth more inclusive as investment in infrastructure and productive capacity have a multiplier effect on economic growth. The public sector capex has focused on improving the connectivity within the country, with the allocation towards highways and railways surging from 35% of total infrastructure capex in FY18 to 64% in FY24.

National Infrastructure Pipeline (NIP)

NIP was launched in December 2019 with a focus on infrastructure development in order to enable the country to achieve its target of USD 5 trillion economy by FY2025 and USD 10 trillion by FY2030. Infrastructure to play a major role with 3% contribution to the GDP by FY25 (Rs 11.11 trillion) and is expected to remain same or increase its share by FY30 (Rs 25.00 trillion).

A taskforce was created to set up the pipeline. In the final report submitted by the task force in April 2020, the pipeline covers multiple sectors such as urban infrastructure, renewable and conventional energy, roads and railways that constitute nearly 71% of the projected total capex of Rs 111 trillion. It also includes investments in other sectors such as rural infrastructure, ports, airports among others. The proposed investments will be implemented by both the government and the private sector.

Chart 16: National Infrastructure Pipeline Yearly Split (Rs. Billion)



Source: NITI Aayog's report on National Infrastructure Pipeline

During FY20-25, sectors wise breakup of NIP investment is with energy contributing the highest at Rs 26,900 Bn around 24% of the total plan followed by roads Rs. 20,338 Bn at 18%, urban Rs. 19,193 Bn at 17%, and railways with an investment of Rs. 13,676 which contributes 12% amount to ~71% of the projected infrastructure investments in India.

Sector Wise Breakup is provided in the Below Table:

Table 5: National Infrastructure Pipeline Sectoral Split (Rs. Billion)

	FY20	FY21	FY22	FY23	FY24	FY25	No Phasing	Total
Power	1641.40	2255.51	2217.34	2234.87	2252.36	2110.02	1392.78	14104.28
Renewable Energy	305.00	1510.00	1440.00	1700.00	2170.00	2170.00	-	9295.00
Atomic Energy	116.35	214.62	283.24	331.24	326.74	282.84	-	1555.03
Petroleum and Natural Gas	273.32	435.10	483.14	415.23	228.58	105.35	5.00	1945.72
Total Energy	**2336.07**	**3353.60**	**4423.72**	**4681.34**	**4977.68**	**4668.21**	**1397.78**	**26900.03**
Roads	3325.59	3832.83	3569.66	2527.80	2407.61	3326.59	1348.15	20338.23

Railways	1333.87	2624.65	3088.00	2738.31	2212.09	1678.71	-	13675.63
Ports	133.57	181.04	206.49	158.63	77.24	10,0.02	354.95	1211.94
Airport	186.67	216.65	248.20	213.34	253.86	51.41	264.35	1434.48
Urban	2981.74	4622.08	4041.34	2348.58	2171.64	1598.62	1428.67	19192.67
Irrigation	1144.63	2006.15	175,6.69	1373.58	1152.81	704.74	806.13	8944.73
Rural Infrastructure	1403.13	1768.03	2108.11	1118.77	1070.57	270.54		7739.15
Digital Infrastructure	783.56	618.47	545.38	387.19	381.19	380.53	-	3096.32
Agriculture and Food Processing Infrastructure	260.40	263.65	260.96	243.93	236.46	231.19	190.68	1687.27
Social Infrastructure	594.71	806.85	935.04	651.04	565.79	243.91	334.25	4131.59
Industrial Infrastructure	174.12	406.76	425.58	335.29	227.31	105.20	1393.06	3067.32
Total	**13635.30**	**19503.97**	**18960.59**	**13803.29**	**12,782.39**	**11058.96**	**12217.31**	**111419.36**

Source: NITI Aayog's report on National Infrastructure Pipeline

Concluding Remarks

- Indian economy is on the path of USD 10.00 Trillion of GDP by FY30, infrastructure sector continues to play major role with 3.50% of GDP contribution with Rs. 52,962.00 billion investments in Infrastructure industry between FY24-FY28. Key growth driver for the infrastructure investment are as under;

- In roads, with over 45,000 km (including 5,000 km of having specialised structures like elevated roads, tunnels, bridges etc) of road under balance of award and NHAI expected to award ~ 5,000 km every year across BOT and EPC giving huge opportunity to infrastructure construction players in India Additionally, continuous bidding for third party O&M provides huge opportunity with Rs 77.21 billion projects currently in pipeline.

- India currently has 874.13 km of operational metro lines including regional rapid transit systems (RRTS) is proposed, to be expanded to 1,700.00 Km across 27 cities by 2025 and subsequently to 50 cities. The investment is expected to grow at a CAGR of 5-10% in the range of Rs. 6,500.00 billion to Rs. 6,700.00 billion from FY24 to FY28.

- The investment in the Water Supply and Sanitation (WSS) sector has increased at a CAGR of 32.48% from Rs. 362.00 billion in FY20 to Rs. 841.75 billion in FY23. Furthermore, from FY24 to FY28, the investments are estimated to grow at a CAGR of 10-12% and be in the range of Rs. 3,700.00 billion to Rs. 4,100.00 billion.

- Currently in India there are 149 airports carrying ~ 327.00 million passengers annually. The opportunity for EPC player in airport sector would be driven by the new planned airport ~ 20 in Tier II and III cities .and expansion plan in the existing major busy airports mainly in Metro cities.

Key Takeaway on Infrastructure:

India stands out as the fastest-growing economy among the major economies with real gross domestic product of Rs. 160.06 trillion in Fiscal 2023 and estimated to emerge as the third-largest economy globally by 2027, infrastructure sector continues to play major role with 3.50% of gross domestic product contribution with Rs.52,962.00 billion investments in Infrastructure industry between Fiscal 2024 to Fiscal 2028. Road construction is amongst the critical sub-segments for infrastructure development, economic growth, and employment creation. Key growth drivers for infrastructure sector are rapid urbanization, higher budgetary outlay towards infrastructure, smart cities mission. The key challenges in the infrastructure sector are regulatory and policy risks, funding challenges, land acquisition and environmental clearances.

3. Road Infrastructure in India

The road transport sector contributed 2.5% to GVA in FY21, after been in the range of 3.2%-3.3% from FY12 to FY20. Post the pandemic effect in FY21, the sector's growth rate has returned to pre-pandemic level of 3.2% of India's GDP in FY22. The road transport sector has grown on a CAGR of about 5.20% against the total CAGR growth of the GVA of about 5.5% during the period FY12-FY22.

Table 6: Gross Value Added at Constant (2011-12) Basic Prices

Year	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22
Road Transport (Rs. Billion)	2624	2824	3006	3208	34312	3623	3964	4175	4322	3217	4355
% Share in total GVA	3.2%	3.3%	3.3%	3.3%	3.3%	3.2%	3.3%	3.3%	3.3%	2.5%	3.2%

Source: Ministry of Statistics and Programme Implementation, CareEdge Research

3.1. Total Length and Break-Up into National, State, and Rural Roads

India has the second-largest road network in the world, with about 63.32 lakh km as of FY23. This comprises national highways, expressways, state highways, major district roads, other district roads, and village roads. To accelerate the country's growth, the development of national highways has been the key focus area. On the other hand, state highways, district and rural roads continue to be a large part of the overall road network.

Table 7: Road Network of Past 5 Years (In Km)

Particulars	FY19	FY20	FY21	FY22	FY23
National Highways	1,32,500	1,32,500	1,36,440	1,40,995	1,44,955
State Highways	1,56,694	1,56,694	1,76,818	1,71,039	1,67,079
Other Roads	56,08,477	56,08,477	59,02,539	60,59,813	60,19,757
Total	58,97,671	58,97,671	62,15,797	63,71,847	63,31,791

Source: Ministry of Road Transport and Highways of India Annual Reports, CareEdge Research

Road transportation, the most common mode of transportation in India, accounts for about 87% of passenger traffic and more than 60% of freight traffic. Despite having a network of 1,44,955 km, Indian national highways account for only 2% of total road network and 40% of total road traffic. State highways and major district roads make up the country's secondary road transportation system, accounting for 60% of traffic and 98% of road length.

Table 8: Percentage Share in Total Road Length Across Various Categories

Year	National Highways	State Highways	District Roads	Rural Roads	Urban Roads	Project Roads
2019	2.1%	2.8%	9.7%	71.4%	8.6%	5.4%

Source: Ministry of Road Transport and Highways of India Annual Reports, CareEdge Research

3.2. Maintenance of Roads in India

Huge Opportunity for EPC Companies in the O&M Space

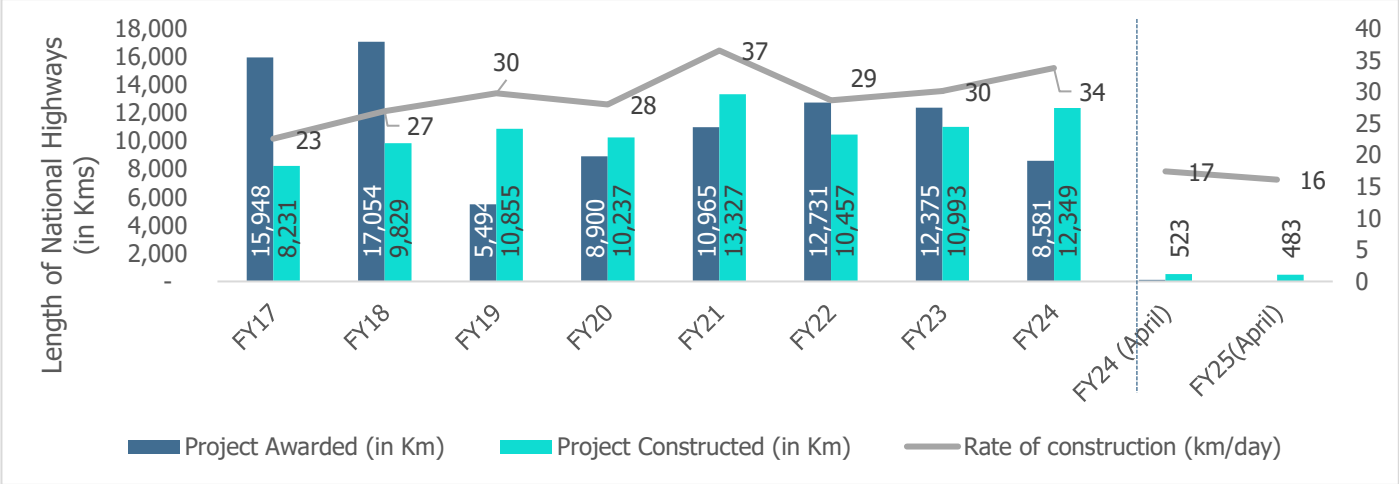
In the initial 10 months of FY24, NHAI has authorized O&M-related projects worth Rs. 77.21 billion through various tenders. Coupled with the Asset Monetization Program, this presents a significant opportunity for EPC companies in the forthcoming years. Furthermore, the government's emphasis on sustained infrastructural development serves as a pivotal driving force for this sector.

3.3. Key Growth Drivers and Emerging Trends for the Road Sector

• Hybrid Annuity Model (HAM) facilitates Private Participation in Highway Construction

The national highway projects have witnessed a decline in awarding activity due to lower participation from private players. However, with an increased focus on Engineering, Procurement and Construction (EPC) and Hybrid Annuity Model (HAM) models, the pace of awards of NH projects till FY23 grew at a strong pace of 11.41% CAGR over the past 4 years (Refer to the chart below).

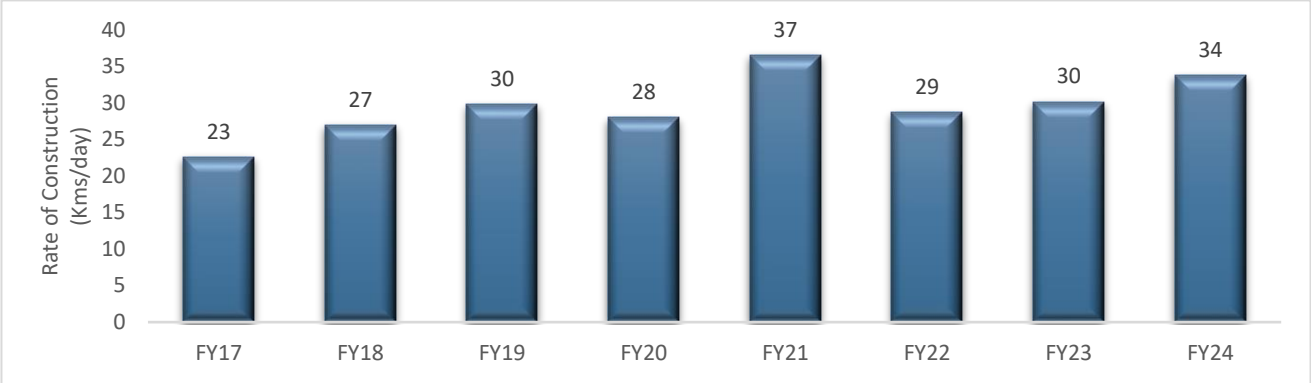
Chart 17: Road Projects Awarded and Constructed



Source: Ministry of Road Transport and Highways of India Annual Reports & CareEdge Research
Note: * refers to period April to November 2023

Strong execution of projects was witnessed in FY22, albeit lower than in FY21 as it was impacted by the reinforcement of lockdowns and extended monsoons. In FY23, construction activity picked up but was still lower than in FY21 on account of lower awarding activity than in FY22. However, project execution is expected to continue its momentum in FY24 on the back of various government initiatives such as Gati Shakti, Bharatmala Pariyojana, National Infrastructure Pipeline and change in the Model Concession Agreement (MCA) of the Hybrid Annual Model (HAM) of road project implementation.

Chart 18: Pace of Construction (Km/Day)



Source: Ministry of Road Transport and Highways of India Annual Reports & CareEdge Research
Note: * refers to period April to November 2023

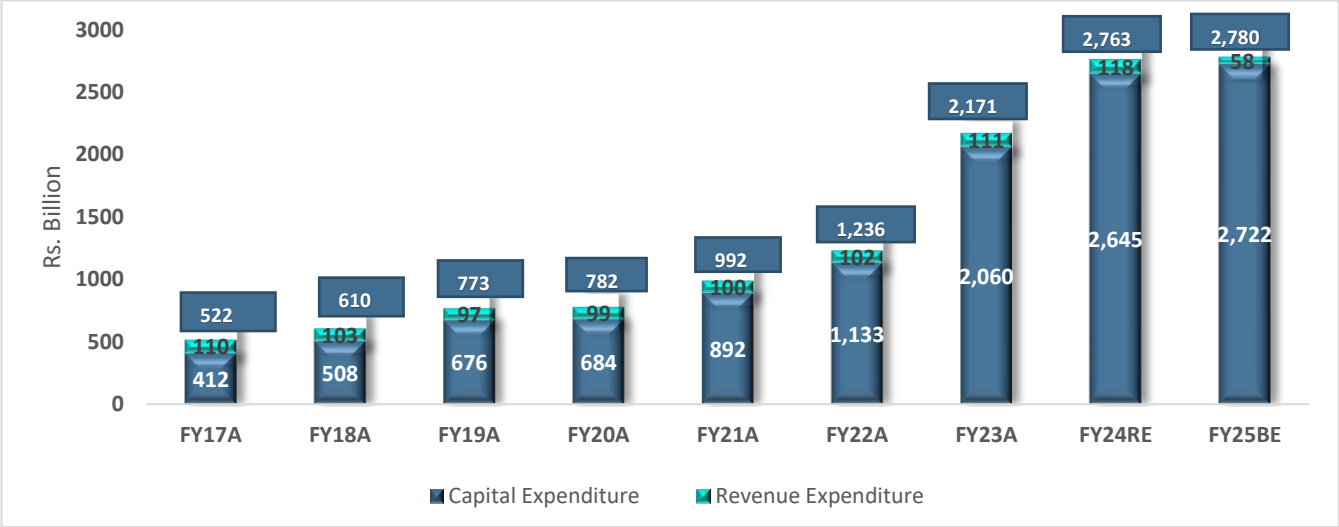
Government's Infrastructural Development Plans to Support Medium-Term Growth

Road construction is amongst the critical sub-segments for infrastructure development, economic growth, and employment creation. Besides, the government is primarily focusing on infrastructure. For instance, in the Union budget 2024-25, the government budgeted to incur higher expenditure toward road construction. Wherein, the central government made the highest ever outlay of Rs 2,780 billion (compared to the estimated expenditure of Rs 2,763 billion for 2023-24).

Overall, the Union Budget for 2024-25 emphasized infrastructure development. The budget plan aims for multi-modal logistics facilities and connectivity systems under the PM Gati Shakti. For infra push, financial assistance of Rs 1,300 billion in interest-free loans for 50 years has been allocated to states from the Centre. This augurs well for the roads sector alongside the government's plans to generate employment opportunities.

Moreover, Rs 111 trillion of investments have been projected in infrastructure projects for FY20-FY25 by the Task Force on National Infrastructure Pipeline (NIP), with ~18% of the targeted investment expected to be made in the road sector in India. Also, under the recently announced Asset Monetization Pipeline, around Rs 1,600 billion are to be raised through the monetization of roads.

Chart 19: Budget Allocation for the Ministry of Road Transport and Highways



Source: Demand for Grants 2024-25
RE – Revised Estimates
BE – Budgeted Estimates

3.4. Challenges Faced by the Roads Sector

Despite the government's continuous support by way of finance and amendments in the PPP model framework, few challenges still persist for the sector

- **Delay in land acquisition and receipt of approvals for road construction:** Post Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2003, many land owners demand higher compensation and refuse to hand over possession of their land. With the Act coming into effect, the cost of land has increased thereby increasing higher cash outflow from the government towards land acquisition. Furthermore, delay in land acquisition and receipt of approvals for road construction leads to substantial project cost and time overruns, thereby impacting the project viability.

- **Mismatches between Project Cashflows and Debt Repayment Tenure:** Revenue from large infrastructure projects is spread over 20-30 years whereas the loan for the same project is for 10-15 years. This results in cash flow mismatches in the initial years of operations till the project stabilizes, thereby resulting in private players funding cashflow mismatches from their own sources.

- **Limited private sector participation in BOT projects due to past financial stress; however good participation seen in HAM projects awarded in past few years:** Due to failed BOT projects on account of lower than-estimated traffic volumes or delays in project completion due to approvals/ land acquisition, private players have come under financial stress due to significantly leveraged balance sheets in anticipation of high levels of project revenue growth. However, road authority has been awarding projects under HAM wherein the risks are limited and lower funding is required because 40% of the project cost is provided by the NHAI in 10 installments based on the milestone achieved. Also in the remaining 60% of the project cost, the developer needs to finance only 20-25% and the rest can be raised on debt. Hence, decreased financial stress.

• **Cautious bank lending approach to road sector, due to highly Stressed Loan Portfolio in the past:** With higher debt exposure to road project and many projects getting stuck or delayed resulted in loans turning into non-performing assets (NPAs), which had contracted the lending capacity of banks. With lower than anticipated revenues, the private players' debt servicing capacity has been impacted. To mitigate the risk of failure of the company, restructuring of loans has been opted by the private players. Restructuring of loans for the first time does not impact asset classification but subsequent restructuring leads to NPA recognition in the books of financial institutions. Hence, banks have become cautious in terms of lending to road sector.

• **Toll collection and willingness of users to pay toll:** The sector is susceptible to end users willingness to pay toll, as there have been instances of people skipping toll payments, backed by regional groups or political parties. This in turn impacts the toll collection efficiency and revenues from the road projects, thereby adversely impacting the project cashflow position.

3.5. Policy Framework at the Central Level

MoRTH, an apex ministry under the central government, is entrusted with the task of formulating and administering policies for road transport, national highways and transport research, in consultation with other central ministries/departments, state governments/UT administrations, organizations and individuals, with a view to increasing the mobility and efficiency of the road transport system in the country.

National Highways Authority of India (NHAI), is responsible for the development and maintenance of national highways. The **National Academy of Highway Engineers** (formerly National Institute of Training for Highway Engineers) is responsible for sharing of knowledge and pooling of experience on the entire range of subjects dealing with the construction and maintenance of roads, bridges, tunnels, and road transportation including technology, equipment, research, planning, finance, taxation, organization, and all connected policy issues. A wholly owned company of MoRTH, **National Highways and Infrastructure Development Corporation (NHIDCL)**, is responsible for promoting, surveying, establishing, designing, building, operating, maintaining, and upgradation of national highways and strategic roads including interconnecting roads in parts of the country which share international boundaries with neighboring countries.

3.6. Overview of PPP Framework and Models in Operation

Overview:

Connectivity has been the priority of the government and roads are the best and cheapest way of increasing last-mile connectivity. Construction of roads in every corner of the country by only government agencies is difficult as it will increase both time and cost. Accordingly, the government partnered with the private players under Public Private Partnership (PPP) to achieve complete connectivity by way of roads. Initially, PPP road projects broadly fell into one of the two categories of toll or annuity.

However, private sector participation gradually became subdued post-2012 due to various issues including aggressive bidding, the over-leveraged balance sheet of developers, shortcomings in project preparation activities, and land acquisition issues. To attract private participation in the road sector, the government introduced the Hybrid Annuity Model (HAM). It focused on the proper allocation of risk among partners. On the other hand, the operational asset monetization model has gained prominence recently with the advent of the TOT. Other asset monetization options like the use of InvITs and securitization of toll revenue have also been introduced.

PPP models

To boost private participation, the government has come up with various models including the PPP model.

- **Build Operate and Transfer (BOT) Toll Model**

This is a simple and conventional PPP model where the private partner is responsible for designing, building, operating (during the concession period), and transferring back the facility to the public sector. The role of the private sector partner is to bring the finance for the project and take the responsibility to construct and maintain it. In return, the public sector will allow it to collect revenue from the users by way of tolls. To increase the viability of projects, a capital grant up to a maximum of 40% is provided by NHAI.

- **BOT (Annuity) Model**

In the BOT (Annuity) mode, the private partner is responsible for building, operating, and transferring the road at the end of the agreement period to the public sector. The toll collection is however undertaken by the government agency and the payment is made on a semi-annual basis to the private players.

- **Hybrid Annuity Model (HAM)**

Due to subdued private participation in the bidding process, the government opted for an advanced version of the Hybrid Annuity Model (HAM) in FY2017. It was introduced when private players were piling on debt and banks were reluctant to provide additional loans as the majority of the projects were failing. Major BOT projects had proven to be a bad choice as the main assumption for the returns was traffic. If there was not enough traffic as assumed, the whole project would turn into a fund trap for private players.

HAM is a mix of BOT (Annuity) and EPC models. This model safeguards the interest of both the parties, i.e., government and private entities. During the construction period, the private entity is provided a grant equivalent to 40% of the bid project cost by the government in five equal instalments depending on the physical progress of the project. The remaining 60% of the bid project cost is to be borne by a private entity through debt and equity. The government generates its revenue from the project by way of toll collection.

This model has been very successful as the burden of financing on private players has been reduced. In the first year of its implementation, projects worth Rs 280 billion were awarded by the NHAI of which 50% of the projects were under HAM. HAM has not only brought back private participation but has also safeguarded the banks as the funds disbursed to private players are backed by the government annuity payments, i.e., the traffic risk is taken care by the government, private players are only responsible for building the project and there is no role in road's ownership, toll collection or maintenance.

- **Engineering, Procurement and Construction (EPC)**

In the EPC mode, the cost is completely borne by the public sector (government). The public sector invites bids for engineering knowledge from the private players. Procurement of raw materials and construction costs are met by the public player. The private sector's participation is limited to the provision of engineering expertise.

- **Service contract**

In this approach, the private promoter performs a particular operational or maintenance function for a fee over a specified period of time. In addition, there are modes such as TOT and Operate-Maintain-Transfer (OMT) for monetizing future toll earnings of completed projects.

- **Toll Collection**

In 2009, the concept of Toll collection emerged as a distinct business model similar to outsourcing. In this arrangement, the private parties are invited by the authority to collect tolls on highways built under EPC and BOT-annuity contracts. It is often used for projects which last less than a year.

The project is given to the private player with the highest bid and the contracting authority determines the user fee. During the concession time, the private player has the power to collect user fees.

- **OMT**

Under the OMT model, the private party is responsible for maintenance for a set period of time. The concept of OMT was established to ensure optimum quality and safety for road travelers. An OMT project includes a contract for the right to collect tolls as well as a contract for the stretch's management and maintenance. The OMT idea was established to ensure adequate quality and safety for travelers. An OMT project includes an agreement for the ability to collect tolls as well as a contract for the stretch's management and maintenance.

- **TOT**

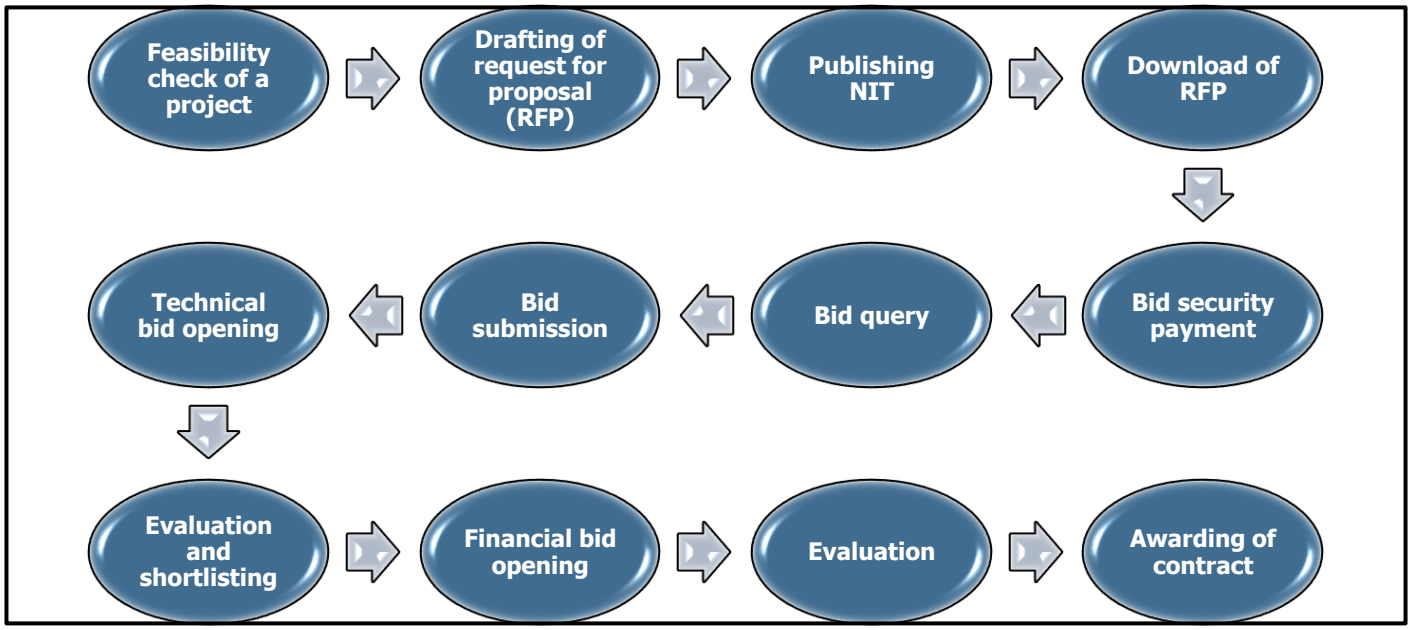
Under the TOT model, the right of collection and appropriation of fees for selected operational NH projects constructed with public funds shall be assigned to developers for a pre-determined concession period in exchange for an upfront payment to NHAI. Such rights assignment shall be based on the toll income potential of the identified NH projects. The developer will be responsible for the operation and maintenance (O&M) of such projects until the concession period expires.

Table 9: Key Features

Type of Project	Development Risk	Financing Risk	Traffic Risk and accrual of toll fee collection	Award Criteria
BOT-HAM	Concessionaire	Concessionaire	Authority	Lowest project and O&M cost
EPC	Concessionaire	Authority	Authority	Lowest contract price
OMT	No to minimal development risk	Concessionaire	Concessionaire	Highest % of toll revenue share or highest premium per year
Tolling	No development risk	Concessionaire	Concessionaire	Highest revenue sharing bid
TOT	Authority in case of lane upgradation in the concession period	Concessionaire	Concessionaire	Highest upfront payment

Source: MORTH

Bidding Process of a Construction Project



3.7. Key Parameters of Existing BOT MCA and Bidding Process

Key Challenges Addressed in BOT MCA Model by the Ministry in order to Promote Private Participation

Parameters	Proposed Clause	Impact
Land Acquistion	Proposed a change in Right of Way from 80% to 90%.	This will bring more ease and comfort to lenders and builders. The remaining 10% must be paid within 180 days of the scheduled date, or it will be withdrawn from the scope of work.
Policy for Harmonious Substitution	Proposed to facilitate harmonious substitution of developer in National Highway Projects.	Will accelerate implementation of road development in the country. Will protect the NHAI from large financial claims and unnecessary disputes. Will further provide flexibility in terms of exit options for existing developers.
Resolution Of Stuck Projects	If the project has not achieved COD a year after its expected completion date, it will be jointly forfeited, and the Authority will pay the developer a sum equivalent to or less than: 90% of the debt payable less insurance cover.	This will ensure timely-execution of the projects and aviod delays.
Bidding Process	There was a modification in bidding documents (Change in technical capacity) for BOT (Toll) projects as well.	This will enhance larger participation.
Ownership	The change of ownership from 2 years to 1 year of commercial Operation Date (COD) in BOT (Toll) projects has been permitted.	This amendment was implemented to provide developers more flexibility, allowing them to change ownership after a year rather than two years.

3.8. Key Initiatives and Overview of HAM

- The ham model is a type of PPP model introduced in January 2016 which is used in the building and development of roads in India.
- The National Highways Authority of India (NHAI) has developed national highways all over the nation by largely utilizing the ham model. It has aided in luring private capital into road projects, accelerating the momentum in developing road infrastructure, and improving the quality of roads.
- HAM assures better risk allocation between the government and the private developer.
- In new HAM, 40% of the bid project cost is funded by the government and is payable to the private developer in ten equal instalments and the remaining cost is arranged by the developer.
- Traffic risk is not associated with the private developer and will be borne by the government with developers earning fixed annuities.
- After completion of the project, the NHAI collects toll and the private developer is repaid in the form of annuity payments.
- All payments have been inflation-indexed using a Price Multiple Index, which is a 70:30 weighted average of WPI and CPI (IW). This mitigates the inflation risk for the developer.

3.9. Overview of Recent Changes in the Model Concession Agreement for HAM Projects

- Bidder Eligibility criteria of NH projects under Hybrid Annuity Mode: The ministry has amended the Standard RFP document of HAM Mode to incorporate provisions relating to Threshold Technical capacity prescribed for similar work experience for EPC works related to Major Bridges and Tunnels. This will enable NHAI to procure concessionaires having appropriate experience in Major Bridges/ Tunnels for projects being executed under HAM mode.
- Changes have been made in the relevant clauses of the model RFP and MCA of the HAM project to allow the Lowest Quoted Bid Project Cost (BPC) as the basis for awarding the HAM Project and O&M cost to be fixed as in EPC projects. It was a much-needed demand of the industry as it will now bring out the winner immediately after the opening of financial bids in a transparent manner as in EPC mode of bidding. The earlier practice of making the award of the project in HAM after converting BPC and O&M quotes to NPV was not clear to many bidders.
- Changes have been made in the relevant clauses of the Model Concession Agreement of the BOT (Toll) project permitting the change of ownership from existing 2 years to 1 year after the Commercial Operation Date (COD). This move will free the equity/funds of construction companies for taking up other projects.

Amendments to HAM –

Some of the major amendments To HAM after Model Concession Agreement (2020)-

- Back- ending of premium payment
- Redefinition of project milestones
- Interest on annuity payments linked to average one-year MCLR of top 5 scheduled commercial banks +1.25%
- 10 milestone payments each equal to 4% of the bid project cost
- Lenders receive first charge on all receivables
- Deemed termination of projects
- Maintenance obligations
- Toll fee notification

3.10. Overview of the TOT Model, its Advantages to the Government, and its Impact on the Road Sector and its Current Status

In 2016, the TOT model was introduced by Cabinet Committee on Economic Affairs (CCEA). CCEA authorized NHAI to monetize publicly funded NH projects in 2016. In TOT model, developers are chosen through a fair and competitive bid process, assuring fairness and transparency in the selection.

The NHAI had begun an asset recycling project using the TOT concept. Through the TOT model, NHAI has been authorized to monetize publicly funded NH Projects that have been operational and collected tolls for at least one year.

The TOT model is a new idea for asset recycling that envisions long-term investment opportunities in the highway sector for Indian developers, as well as a platform built by Pension and Foreign Infrastructure and Pension Funds.

Benefits to the Government

- The developer's upfront payments in the TOT model provide the government with immediate revenues, serving as a vital financial source for highway expansion and maintenance in future.
- The TOT model encourages private participation by allowing private enterprises to invest in highway construction. The model attracts private investment which supplements government resources allowing for greater and efficient development. This also helps in reducing the load on the government's budget and enables them to grant funds to other critical sectors.
- Private enterprises are responsible for the development and operation of toll roads under the TOT concept. These firms usually have the skills, expertise and resources necessary for effective project execution which can result in faster project completion, minimizing the time and expense associated with road construction.
- The model will also assist the government in utilizing the corpus (produced from the proceeds of project monetization) to satisfy financing requirements for future development and O&M of roads in the country.

Status of Projects Awarded Under TOT

- 2,014 km have already been monetized through TOT mode in from FY18.
- A total of Rs. 329.50 Billion has already been realized and remitted to CFI under TOT Bundles.
- Recently, TOT bundle 11, 12, 13 and 14 have been allotted by NHAI raising a total of Rs 159.68 Billion.

3.11. Key Budget Announcements for the Roads Sector

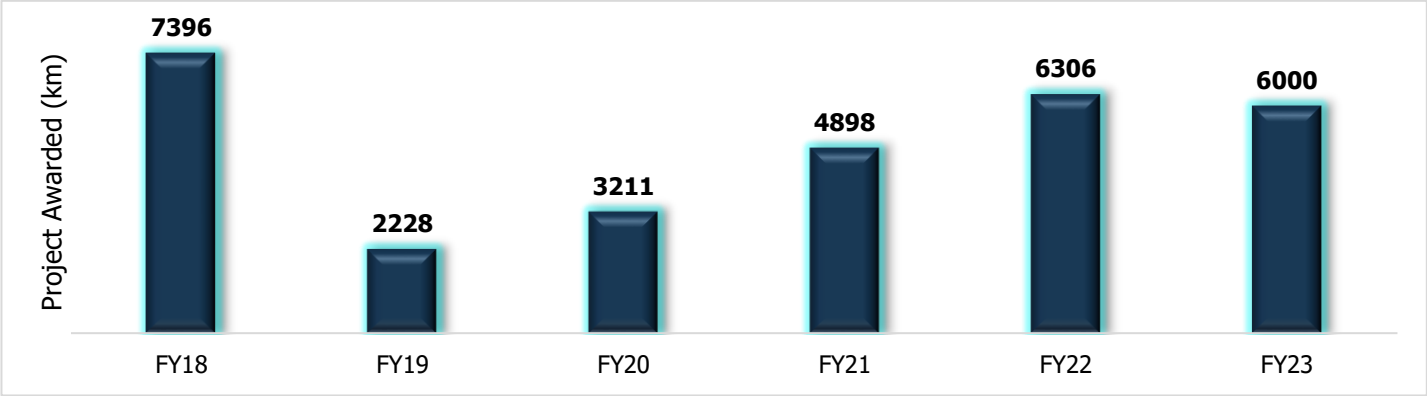
The 2024-25 budget by the Government highlights the impetus for growth by focusing on big public investments for modern infrastructure, which shall be guided by PM Gati Shakti and benefited from the synergy of a multi-modal approach.

- The Ministry of Road and Highways gross budgetary outlay has doubled from Rs. 1.28 trillion in fiscal 2019 to 2.64 trillion in fiscal 2024. In fiscal 2025, the capex witnessed a modest 3% y-o-y growth with an allocation of Rs. 2.72 trillion which is expected to normalise the order book of road EPC companies for the coming fiscal.
- The assets monetization target has increased to Rs. 150 billion in fiscal 2025 from Rs. 100 billion in fiscal 2024.
- The budgetary outlay of Rs 1.68 trillion towards the NHAI for fiscal 2025 has remained flattish as compared to fiscal 2024.
- The NHAI aims to increase project awards by modifying the build-operate-transfer (BOT) model with fast-tracked clearance, as its share has decreased in recent years.

3.12. Outlook on investments in national highways

The length of projects awarded by the National Highways Authority of India (NHAI) has increased over time, going from just 2,222 km in FY19 to 6,306 km in FY22. Even amidst the disruptions caused by the COVID-19 pandemic, FY21 saw a remarkable upswing, with the NHAI awarding 4,818 km of highway projects – the highest in three years at that time.

Chart 20: Projects Awarded by NHAI

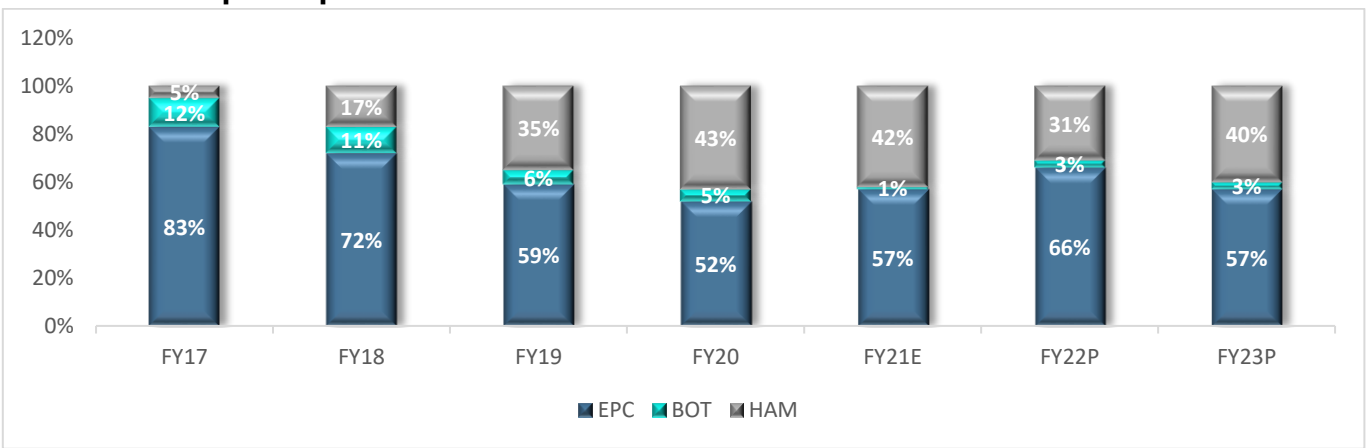


Source: NHAI Annual Reports, CareEdge Research

The NHAI awarded 6,306 km in FY22, demonstrating the increasing trend of awarding, while in FY23 it reached at around 6000 km and the awarding is expected to slow down and reach approx. 5000 km per year upto FY27. Since the cost of essential input materials, such as steel, bitumen, and cement, have been volatile, developers have been delaying the purchase of these supplies, which has prevented construction from moving forward much this year. The construction speed has slowed down as a direct result, affecting everyday operations.

According to Ministry of Road Transport & Highways, out of the total length approved, an aggregate length of 14,317 km have been approved on EPC mode, an aggregate length of 10,898 km on HAM mode and an aggregate length of 408 km on BOT mode as on 31st December 2022.

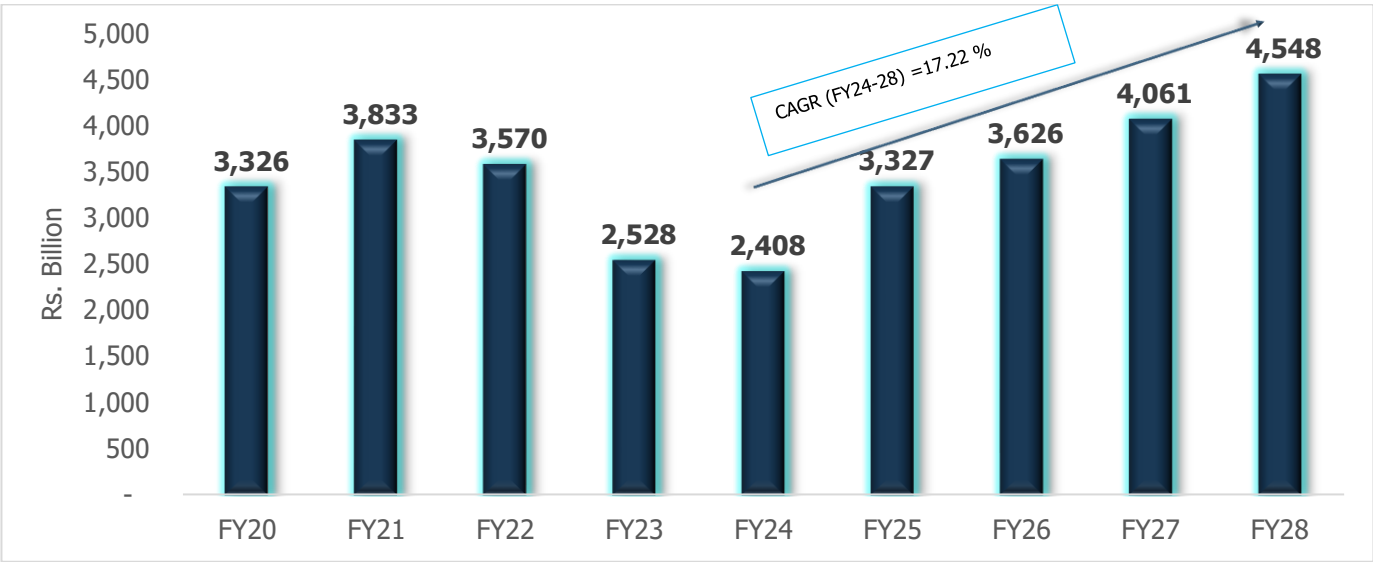
Chart 21: Breakup Of CapEx Mix of NHAI



Source: NHAI Annual Reports, CareEdge Research

The investments in roads sector is expected to grow by a CAGR of around 10-12% during the period FY25-FY28.

Chart 22: Investments in Roads sector



Source: Niti Aayog report on National Infrastructure Pipeline, CareEdge Research

3.13. Qualitative views on overview of InvITs as an instrument for asset monetization

Utilizing InvITs for Public Participation: A Strategic Move in India's National Monetisation Pipeline

Government of India has launched National Monetisation Pipeline (NMP) in 2021, wherein a detailed plan of monetization of infrastructure assets has been unveiled, the top sectors being roads, railways, power etc. Investment Infrastructure Trusts (InvITs) were launched in FY22.

InvITs are a hybrid between equity and debt investment, i.e., it has features of both equity and debt. While the operating business model helps provide stable, predictable, and relatively low-risk cash flows like debt, there is growth potential like equity as the returns are not fixed with a scope of change in the unit price.

In order to diversify the investment portfolio in road InvITs, which mostly receive funding from long-term institutional investors, insurance and pension funds, and private equity firms, the new InvITs will seek to raise funds for highway development from the general people. The public can profit from the nation's infrastructure development program by investing in such assets, which can yield guaranteed returns.

Infrastructure developers can free up capital by using InvITs to monetize completed assets. An infrastructure developer may assign a portion of its assets that generate income to an InvIT, which will then be able to issue units to its investors. As a result, InvITs promote the development of new infrastructure by offering an effective means of obtaining funds from institutional and private investors for the building of new projects.

It is anticipated that InvITs will engage in public fundraising and integrate with India's highway development NHAI established National Highways Infra Trust (NHIT) in FY2020-21 to monetize its assets and attract private investment. They also set up Special Purpose Vehicles (SPVs) to manage NHIT and road projects. Asset monetisation through TOT and, more recently, the InVIT route is difficult in and of itself; obtaining outside funding raises the authority's debt to equity, and repayments now represent a significant outflow for NHAI. In order to achieve its ambitious Bharatmala project, NHAI must promptly monetarily seize its assets. In FY22, InvIT proceeds of Rs. 73.50 Billion has been utilized towards repayment of term loans, which the NHAI had received as concession fee from InvIT (phase-I).

Table 10: **Market Activity – InvITs**

Particulars	FY22	FY23
Number of registered trusts at the end of the period	17	20
Number of entities listed on stock exchanges	10	15
Funds raised during the year (Rs Billion)	212	64

Source: SEBI Annual Report FY2023

3.14. Qualitative views on asset monetisation of HAM projects by EPC players to aid in deleveraging balance sheet

Roads sector to hold significant potential for asset monetisation in the medium term

The potential is expected to be realized through an expanded portfolio of NHAI HAM assets, as well as through EPC projects.

CAREEDGE projects a substantial monetisation potential for HAM projects, with BPC ranging from Rs. 1.75 Billion to Rs. 2.2 Billion during FY24-FY28. Additionally, NHAI is expected to commission EPC-roads length of 4,000- 4,500 km each year, which could potentially be transferred to either InvIT or TOT.

Notwithstanding the large pipeline of operational highways, CAREEDGE opines quality of roads construction, robustness of Operations and Maintenance assumptions and movement in bank rates shall be key determinants for fructification of asset monetization deals.

Asset monetization of HAM projects by EPC players to aid in deleveraging their balance sheets is a strategy that involves selling ownership stakes in operational Highway Asset Management (HAM) projects to external investors. This can help EPC players achieve several key benefits:

- **Reduce developer's debt levels**: The upfront capital received from the sale of assets provides significant cash flow for EPC players, allowing them to bid for new projects as well as deleverage their balance sheet.
- **Free up capital for new projects**: With reduced debt obligations, EPC players can redeploy the freed-up capital into new infrastructure projects, expand their business operations and portfolio. This can accelerate overall infrastructural development.
- **Improve cash flow**: While HAM projects offer long-term periodic payments from the government, asset monetization provides an immediate cashflows. This can improve the company's liquidity and cash flow predictability, which makes it easier to handle operational expenses and potential financial fluctuations.
- **Attract new investors**: Bringing in external investors through monetization diversifies the funding base for the project. This can attract new sources of capital, particularly long-term institutional investors interested in stable returns from infrastructure assets.

Overall, asset monetization of HAM projects creates a win-win situation for both EPC players and the government. EPC players improve their financial health and gain resources for further growth, while the government benefits from increased efficiency in project execution and access to diverse funding sources.

3.15. Overview of upcoming projects

As on Jan 2024, NHAI has identified projects over 45,000 kms to be awarded in the medium term. Out of which, almost 5,000 kms are specialised structures project including tunnels, elevated roads, bridges etc.

Table 11: **Balance for award of specialized structure by NHAI**

Specialised structures	Kms
Ring road	2,642.03
Bridges	1,270.24
Elevated Corridor	380.19
Tunnels	365.38
Flyover	298.96
Total	**4,956.80**

Note: This includes standalone projects as well as part of a specific large projects
Source: NHAI Balance for Award

3.16. Overview of Tunneling Projects in India and Recent Upcoming Projects

Tunnel construction in India has picked up pace in the last decade given factors like upgrading the water supply & sewerage system, expanding the road & rail network, and constructing underground crude oil storage. Tunnel development was initially undertaken by the railway sector, while the maximum number of tunnels have been developed in the hydropower sector.

In the past few years, tunnel development has consistently received a push with high CapEx toward infrastructure development across various segments. Expansion in hydropower capacity, underground rail metro projects, Bharatmala, Chardham Connectivity, AMRUT, and the Smart Cities Mission are thus expected to provide ample opportunities to tunnel contractors and consultants in the coming years. Also, most upcoming tunnel projects are of longer lengths, larger diameters, and even higher contract values, which is reflected in tunnelling project size with a substantial increase.

The growing complexity of tunnel construction in the Himalayan and peninsular regions has necessitated the use of new & advanced materials. Some of the key materials used in the construction of tunnels are steel fibre-reinforced shotcrete, safer emulsion-based explosives, geosynthetics such as 5D steel fibres (for increased tensile strength), mineral admixtures, geotextile membranes, steel anchors, and self-drilling rock bolts. However, this segment does face some challenges with respect to issues arising from geological complexities and inadequate investigation of ground & soil conditions, which may lead to failure of tunneling projects. Over the coming years, the tunneling sector is expected to offer multifold opportunities across sectors with 19 road tunnels with a length of 31.92 kms under bidding and 78 road tunnel projects with a length of 348.18 kms under planning stage. This holds immense opportunities for engineering, procurement and construction contractors, consultants, technology and equipment providers, construction material suppliers, etc., over the long term.

In terms of the method/technique of tunnel construction, the drill-and-blast method (DBM) continues to be the dominant mode of tunneling, especially in the Himalayan region and the Western Ghats. Mechanised/Advanced tunneling techniques such as tunnel boring machines (TBMs) are also being used extensively for tunneling activities in congested urban areas. TBMs have predominantly been deployed for the construction of tunnels in the metro rail sector. Another method of tunneling that has been witnessing increasing acceptance is micro-tunneling or the trenchless construction method. It is used to install pipelines beneath highways, railways, runways, harbors, rivers, and environmentally sensitive areas.

Completed Tunnels:

- Sela Tunnel Project comprises of two tunnels of length 1km and 1.5km each. The construction is completed and the inauguration will take place in March 2024.
- Rewa Sidhi tunnel on NH24 in Madhya Pradesh with a length of 2.28 km is a six-lane tunnel and inaugurated in December 2022.
- The Baramulla Rail Link (USBRL) Project has completed construction of the 3,209-meter-long Tunnel T-1, which connects Katra and Reasi Stations, marking a remarkable achievement in the Himalayan region in December 2023.

Under Construction Tunnels:

Table 12: Under Construction Tunnels:

Sector	Name of tunnel	Length of tunnel (in km)
Railways	Jammu-Udhampur-Katra-Qazigund-Baramulla	42.64
	Mumbai-Ahmedabad High Speed Rail Corridor	26.20
Urban Transport	Chennai Metro Rail Project Phase-II (under planning)	12.00
	Chennai Metro Rail Project Phase-II (under planning)	9.00
Irrigation	Wainganga-Nalganga Link (under planning)	480.00
	Krishna (Satpewadi)-Nira (Somanathali) link canal (Part IV of Upper Krishna-Bhima Intra-State Link Project) (under planning)	95.40
Roads	Bhenda Hera-Moondiya Eight-Lane Tunnel Project (under planning)	59.62
	Dehradun-Tehri Tunnel Project (under planning)	20.00
Water Supply & Sanitation	Khadakwasla Dam-Fursungi Water Tunnel	34.00
	Koyna-Mumbai City Intra State Link	17.95
Hydro	Luhri Hydro Electric Project Stage I	38.00
	Parbati Hydro Electric Project Stage II	31.54

Source: CareEdge Research; India Infrastructure Research

- The work on 138 km of the total 213 km of the new Rishikesh-Karnaprayag line is finished. The estimated cost of the project is Rs. 162 Billion, of which 113 Billion has already been spent as of March 2023. Furthermore, a budget of Rs. 45 Billion has been set up for this project in 2023-24.

- There are currently 34 tunnel projects on National Highways (NHs) across the country, with 26 of them in the Himalayan region.

3.17. Overview of Cable Stayed Bridge

The cable stayed bridges is a structure composing central tower and a deck supported by cables. It's a versatile concept and can be adapted for different types of terrain like over water or valleys. Also, the structure has a longer life span as compared to other bridges which makes the cable stayed bridges ideal for infrastructure projects for constructing highways and railways. A cable stayed bridge is modern and pleasing in appearance and fits extremely well in almost any environment.

In a country like India, cable stayed bridges provides an infrastructure opportunity to reduce congestion on the existing highways or rail lines by providing an alternate structure without blocking the water ways. There has been an increase in such structure in the country in the past few years and are proving to be beneficial in the long run.

Some of the cable stayed road bridges in India –

- Sudarshan Setu
- Bandra-Worli Sea Link
- Zuari Bridge
- Chambal Hanging Bridge
- Narmada Bridge
- Vidyasagar Setu
- New Yamuna Bridge
- Signature Bridge

3.18. Overview of Elevated roads

Indian has been witnessing rapid urbanisation over the last couple of decades. However, this growth has largely been unplanned putting huge pressure on existing infrastructure especially road transport. This led to increased traffic congestion in cities thereby diminishing the quality of life. Elevated roads is one of the solution that has been implemented across Indian cities in recent years to address the issue to a certain extent. It provides an alternate to decongest roads within the city and divert traffic outwards. Government has been active in implementing elevated corridors in expressways in order to decongest city roads and provide a seamless and faster way to commute between cities with almost 380.19 kms of elevated roads under awarding stage as per NHAI data. Some of the expressways with elevated sections are listed below –

- PVNR Elevated Expressway – Hyderabad
- Hosur Road Elevated Expressway-Bangalore
- East Coast Elevated Expressway-Chennai
- Badarpur Elevated Expressway-Delhi
- Panipat Elevated Expressway-Panipat
- Lalbaug Elevated Expressway-Mumbai
- Two-Level Elevated Expressway-Ahmedabad
- AJC Bose Road Flyover-Kolkata
- Yamuna Elevated Expressway-Noida
- Ambal- Chandigarh Elevated Expressway
- DND Elevated Expressway

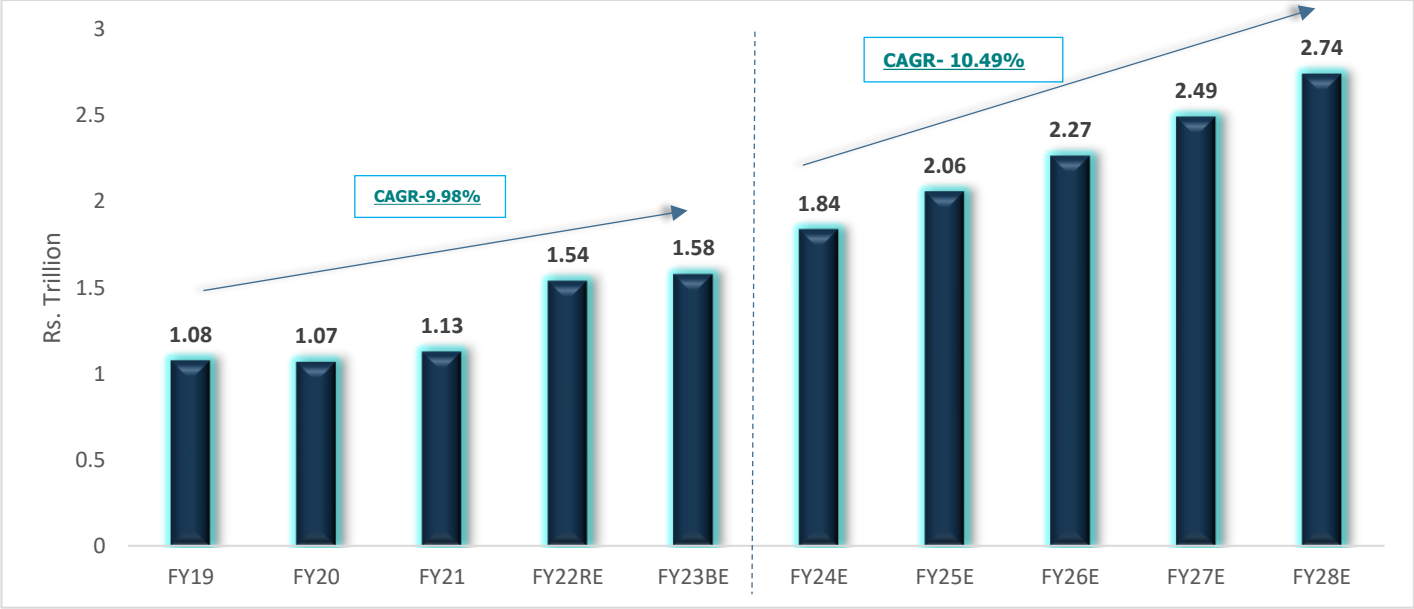
4. State Road Segment

State roads encompass highways, major district roads, and rural roads that do not come under the purview of the Pradhan Mantri Gram Sadak Yojana. The state roads constitute more than 20% of the total road network in India and handle almost 40% of the country's traffic. The development of the state road networks is of much importance to the economic development of the country as it will help aid the movement of goods to and from remote areas. As per the Ministry of Road Transport and Highways, India has about 63.73 lakh km of road network, out of which 1.90 lakh km belongs to the state highways.

4.1. Review of Investments

The state road CapEx forms 45%-50% of the total road infrastructure CapEx of the country. The funding in the state sector witnessed some slowdown during the COVID years but has grown in FY22 and FY23. For instance, the state road funding has grown at a CAGR of 9.98% from FY19 to FY23 to reach Rs. 1.58 Trillion from Rs. 1.08 Trillion.

Chart 23: Total CapEx in State Road (FY19-FY23) and Projected Investments (FY24- FY28)

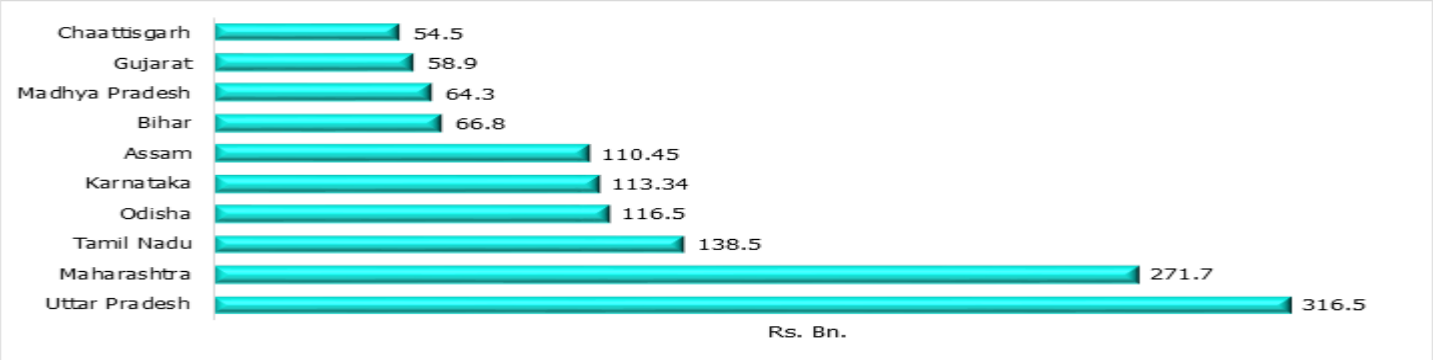


Source: PMGSY, MORTH, CareEdge Research

The projected investments in state roads are expected to grow to ~ INR 11.40 trillion at around 10.49% CAGR from FY24 to FY28. The investments are expected to be driven by the growing demand for state highways, major districts roads and rural road connectivity.

The following is the state-wise CapEx for road infrastructure. Uttar Pradesh and Maharashtra with a CapEx outlay of Rs. 316.52 billion and Rs. 271.70 billion, respectively.

Chart 24: State Wise CapEx (FY23)



Source: Pradhan Mantri Gram Sadak Yojana, MORTH, CareEdge Research

4.2. Central Assistance for State Roads

The state government is under the jurisdiction of the respective state governments. However, the central government provides financial assistance to state governments for various development projects for the construction of road networks. The contracts, however, are awarded by the state government divisions of Public Work Department (PWD) and Road Development Corporation (RDC). The central government provides this financial assistance through the Central Road and Infrastructure Fund (CRIF).

Further, to strengthen the hands of the states in the spirit of cooperative fiscal federalism, the scheme for providing financial assistance to the states for capital expenditure introduced in FY 2022-23 has been extended in FY 2023-24, with the enhanced outlay of Rs.1.30 Trillion. This represents an increase of 30.00% over BE 2022-23 allocation and accounts for nearly 0.40% of GDP of FY 2023-24.

Central Road and Infrastructure Fund

The Ministry of Road Transport and Highways provides funds to state governments and union territories for the development and maintenance of roads under the CRIF scheme under the Central Road and Infrastructure Fund (CRIF) Act, 2000 amended by the Finance Act, 2019. At present, about six state road projects with a length of about 54 km amounting to Rs. 5.66 Billion, are ongoing under the CRIF Scheme in Bihar. These projects are targeted to be completed in a phased manner by February 2025.

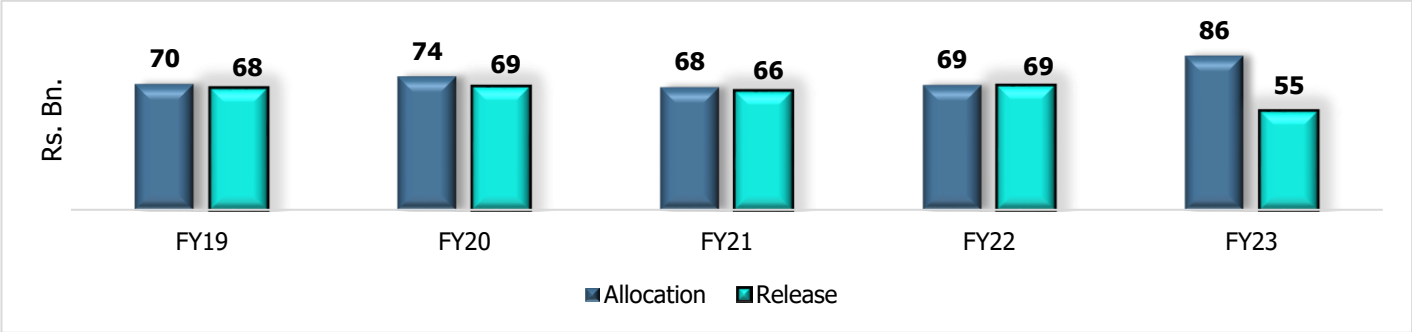
On the basis of the CRIF Act 2000, the Ministry of Road Transport & Transport has finalized the criteria for the allocation of funds.

The criteria are as follows-

- Project monitoring and quality control of works to be done at regular intervals.
- Quality monitoring system at State/UT level to consist of experts and supporting staff appointed by State Govt./UT including State Quality Monitor.
- Quality monitoring system at the State/UT level to devise a Quality Assurance System delineating the requirement of quality, the responsibility of officers and contractors, conducting independent tests, examining quality assurance documentation, the responsibility of training PWD staff, and recommending laboratory and field-testing facilities.
- Inspection of works by civil engineer(s) having a degree in civil engineering and a 10-year experience/inspection of works by an independent impartial agency/ firm.

The following chart represents the allocated fund and released fund under CRIF for state roads. The average achievement for the FY19 to FY23 ratio, i.e., released fund as compared to allocation fund is around 96.55%.

Chart 25: Allocation and Release under CRIF for State Roads



Source: MoRTH Annual Report 2023
*Till 31.12.22

In addition to above, development of North Eastern states has been one of the priority and hence the Cabinet recently approved an outlay of Rs. 81.4 billion for the North East Special Infrastructure Development Scheme (NESIDS) from 2022-23 to 2025-26, which includes two components: NESIDS-Road and NESIDS-Other Than Road Infrastructure (OTRI). The scheme is a central-sector initiative with full government funding.

The Government's decision including the merger of the former NERSDS into the NESIDS-Road component, necessitated the development of new guidelines to administer and implement the restructured NESIDS during the 15th Finance Commission's whose objective is to fund infrastructure development in specific sectors, particularly connectivity in the North Eastern States.

Moreover, the Union Cabinet has authorized the continuation of the Schemes of North Eastern Council (NEC) for the period 2022-23 to 2025-26, with a total outlay of Rs. 32.03 billion.

5. Raw Materials for Road Construction

5.1. Overview of the Bitumen Derivatives Market in India

Bitumen is a viscous liquid or a solid essentially consisting of hydrocarbons and their derivatives, which are tri-chloro-ethylene soluble and substantially non-volatile. It is black or brown in colour and consists of waterproof and adhesive properties.

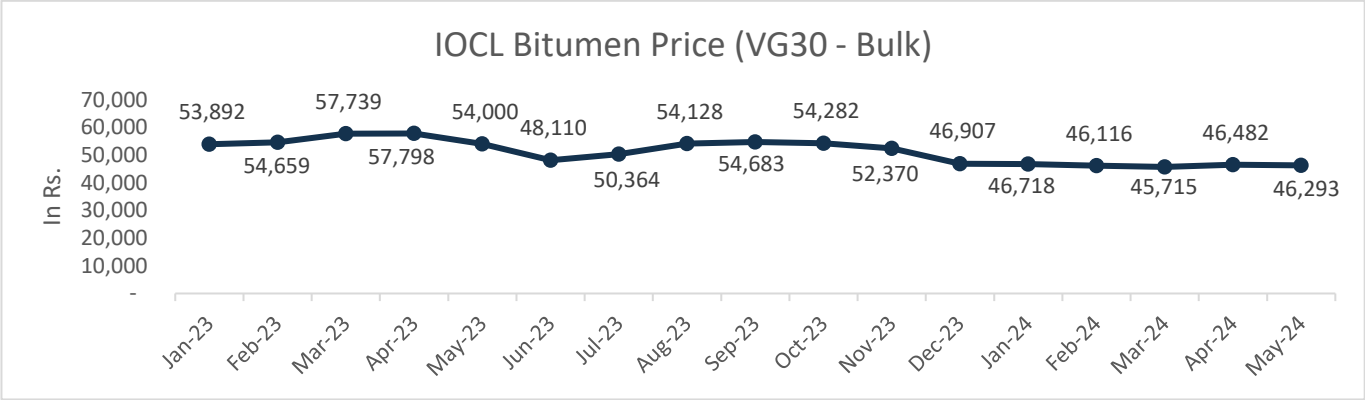
Bitumen is a product derived from crude oil. It is the last remaining residue in the fractional distillation of crude petroleum. In a petroleum refinery, components like LPG, naphtha, kerosene, diesel, etc., are separated through fractional distillation. Bitumen is obtained when the heaviest material obtained from the fractional distillation is processed and blended to make different grades of it.

Bitumen derivatives are widely used in road/airfield construction in India. They are also used to carry out niche road maintenance activities like micro surfacing and slurry sealing.

5.2. Prices of Bitumen

The prices of bitumen are affected by multiple factors such as cut in production, limited supply, inflation, delay in crude oil imports, geo-political tensions and macroeconomic headwinds. The prices observed a decline of around 14% in May-24 on a y-o-y basis.

Chart 26: Bitumen Prices (VG30)



Source: Industry sources

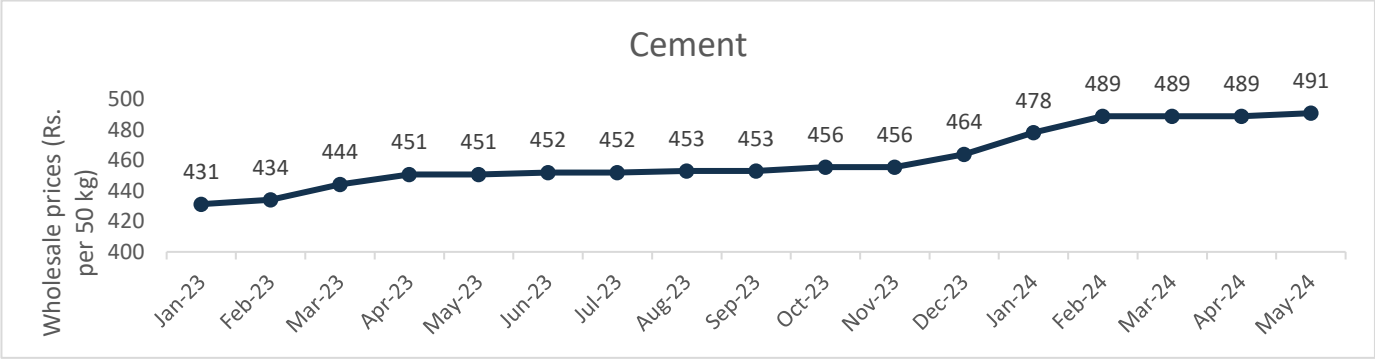
5.3. Other Raw Materials

Raw materials such as cement, steel and aggregates are also used in development of roads. These are meticulously selected to meet the specific standards and requirements for construction of road projects in order to provide strength, stability, flexibility and durability of the infrastructure.

Trend in Prices of Raw Materials:

- **Cement:** The prices of cement have been range bound from Apr-23 to Nov-23. During Dec-23 they observed an uptick and further increased by 8.92% on a y-o-y basis in May-24.

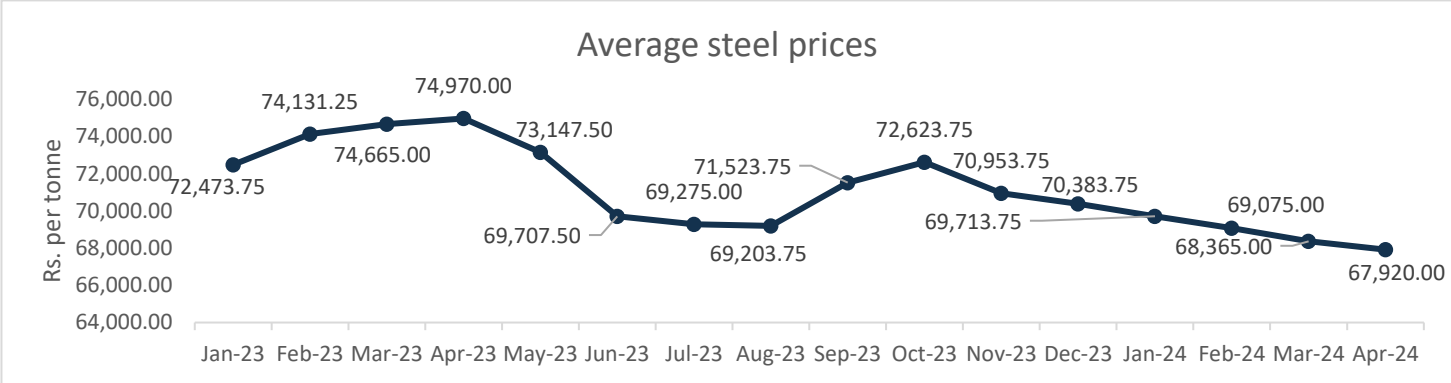
Chart 27: Trend in Cement Prices



Source: CMIE

- **Steel:** The prices of average finished steel fluctuated and had been impacted by global headwinds. As of Apr-24, they stood at Rs. 67,920 per tonne, a growth of around 1.97% on a y-o-y basis.

Chart 28: Trend in Average Finished Steel Prices



Source: CMIE

5.4. Technological Shift in Raw Materials

The inflation of petroleum costs around the 1970s forced the road industry to explore new avenues for acquiring road construction materials. Since then, various new recycling techniques have been developed. With a higher push on infrastructure development, the road construction industry in India is undergoing a paradigm shift. Stronger demand, higher investments, and innovative & emerging technologies are pushing the road construction sector to focus on sustainable development. These changes in technologies include enhanced raw materials for construction like recycled materials, plastic wastes, asphalt, etc.

New Surface Materials

Generally, asphalt is used in the construction of roads. However, it is being replaced by environmentally friendly, organic resin-based roads such as EcoPave. The manufacturers are also planning to use recycled plastic in road construction.

Recycled Asphalt Pavement (RAP)

RAP is typically used for materials obtained from scrapping/milling/demolishing existing asphalt pavement layers of flexible pavement. The use of RAP in the construction of new pavements can lead to significant savings in terms of cost, raw materials, and energy.

High-Performance Steel (HPS)

HPS provides increased strength and ease in welding. HPS consists of half the carbon and one-tenth the sulphur content as that of conventional steel. The low-carbon content helps the steel to weld components together without pre-heating, which reduces both construction time and costs. HPS is tougher than conventional steel, resulting in a bridge that absorbs the impact of traffic loads better and reduces susceptibility to fractures.

Fibre-Reinforced Polymer Composites

These are non-metallic composites typically made of a polymer matrix reinforced with fibres. The fibres are usually glass, carbon, or aramid, as well as polymer resin matrixes. These are more corrosion resistant than conventional steel and are lightweight which is easier to handle and install. Hence, the reduced construction time.

Epoxy-Coated Rebar

The epoxy-coated rebar is used to protect concrete bridges from corrosion, which enables highway agencies to extend the service life of these structures and reduce life-cycle costs.

Self-Healing Asphalt

Concrete surfacing requires a bacteria-like formula, that learns its original shape and recreates it when changed. Asphalt, however, has a special form of material named ZOAB (Zeer Open Asphalt Beton), wherein it contains small steel wool fibres. This aids the material in 'healing itself', working almost like a memory material.

New Technologies in Raw Material

Secondary Raw Materials (SRMs)

Secondary raw material is a replacement for finite raw materials used in the construction works of buildings and roads, which require vast quantities of raw materials. SRMs are manufactured by using a broad range of inorganic waste materials like mining waste, different industrial wastes, construction, demolition waste, etc. Hence, SRMs are recognized as a more cost-efficient and environmentally friendly alternative to conventional raw materials.

Bio-Bitumen

Bitumen derived from crude oil is mixed with aggregates such as crushed rock, sand, and gravel to create asphalt. Bitumen is the sticky substance used to bind it all together to build roads. Agricultural products like sugar, molasses, rice, gum resins, natural latex rubber, vegetable oils, lignin, cellulose, coconut waste, peanut oil waste, dried sewerage, etc., are used to manufacture bio-bitumen. Bitumen can also be manufactured by using used motor oils. This bio-bitumen is then used to make bio- asphalt.

6. Indian Railway Sector

6.1. Railway Infrastructure

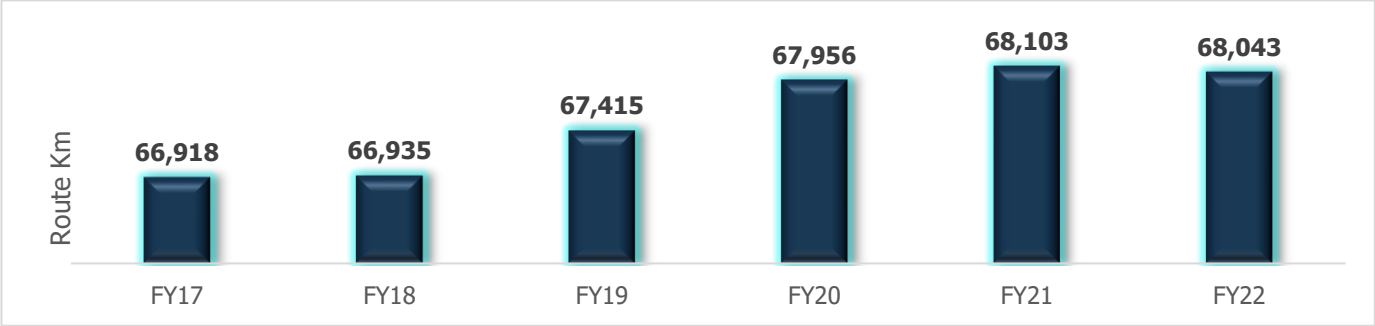
Railways are one of the most efficient and cost-effective modes of transport globally as they can carry higher numbers of passengers and cargo at higher speeds over long distances. It is also the most environment-friendly mode of land transport with much lower energy consumption and carbon dioxide emission compared to roadways or waterways.

6.2. Overview on Indian Rail Track Length

Indian Railways is the fourth-largest railway system in the world behind the US, Russia, and China. India has over 68,043 km of the route km along with 7,308 stations as of FY22. The number of passengers carried and freight transported has been on the rise over the past few years.

Further, the Indian railway sector has witnessed multiple developments in the last decade such as the introduction of high-speed trains and the modernization of railway stations. In addition, India Railways has set out massive network expansion and decongestion targets. It plans to undertake 17,000 track km of new lines, doubling and gauge conversion work by FY24, out of which, 5,243 km was achieved during FY23 as compared to 2,909 km during FY22. It also plans to become a net zero carbon emitter by FY30 as part of the country's strategy to combat climate change. It plans to source 1,000 MW of solar power and 200 MW of wind power across zonal railway and production units.

Chart 29: Indian Railway Route Length



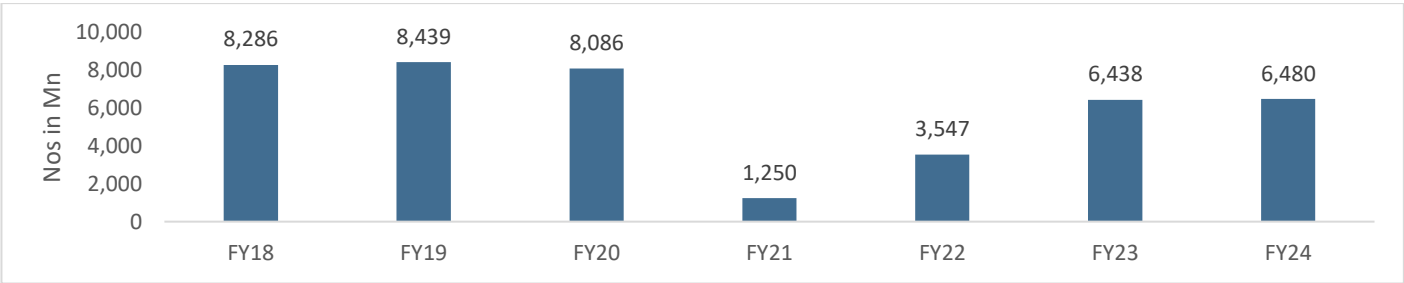
Source: Indian Rail Yearbook 2022

Further, as on April 2022, across Indian Railways, 452 Railway projects (183 New Line, 42 Gauge Conversion and 227 Doubling) of total length 49,323 Km, costing approx. Rs 7.33 Trillion are in different stages of planning/sanction/execution, out of which 11,518 Km length have been commissioned and an expenditure of approx. Rs 2.35 Trillion has been incurred up to March, 2022.

6.3. Freight and Passengers Carried by Indian Railways

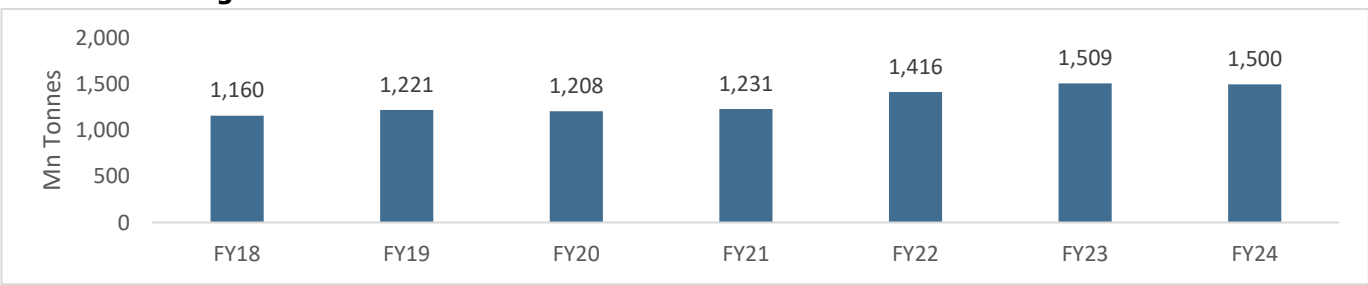
Passenger and freight traffic were adversely affected in FY21 due to the COVID-19 pandemic, associated lockdowns, and restricted movement of passengers and cargo. The passenger numbers decreased by 84.54% in FY21 but the tonnage carried remained afloat due to the cargo carriages. Whereas in FY23, the passenger traffic rebound with 81.50% growth and freight traffic grew by 6.56%. There was a marginal increase in the number of passengers from FY23 to FY24.

Chart 30: No of Passengers Over the Years



Source: Indian Rail Yearbook; Indian Railway Monthly Evaluation Report August 2023
Note: YTD FY24 and YTD FY23 refer to period from April -August 2023 and April-August 2022, respectively

Chart 31: Tonnage Carried Over the Years



Source: Indian Rail Yearbook; Indian Railway Monthly Evaluation Report August 2023

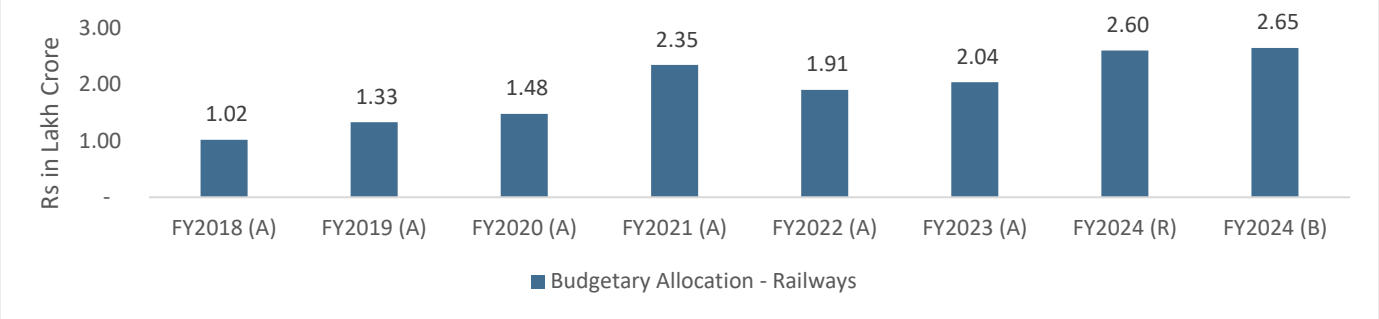
Note: YTD FY24 and YTD FY23 refer to period from April -August 2023 and April-August 2022, respectively

6.4. Government Policies for Railway freight Industry

6.5. Budgetary Support

Railways is one of the key enablers for economic growth and an investment of USD 750.00 billion was suggested by the government in the Union Budget 2019-20 to improve the railway infrastructure over FY18 - FY30. The budgetary allocation to Indian Railways has been on a rise.

Chart 32: Budgetary Outlay towards Indian Railway



Source: Budget Documents. Note: B – Budgeted, A – Actual, R – Revised and Includes Internal and Extra Budgetary Resources (IEBR)

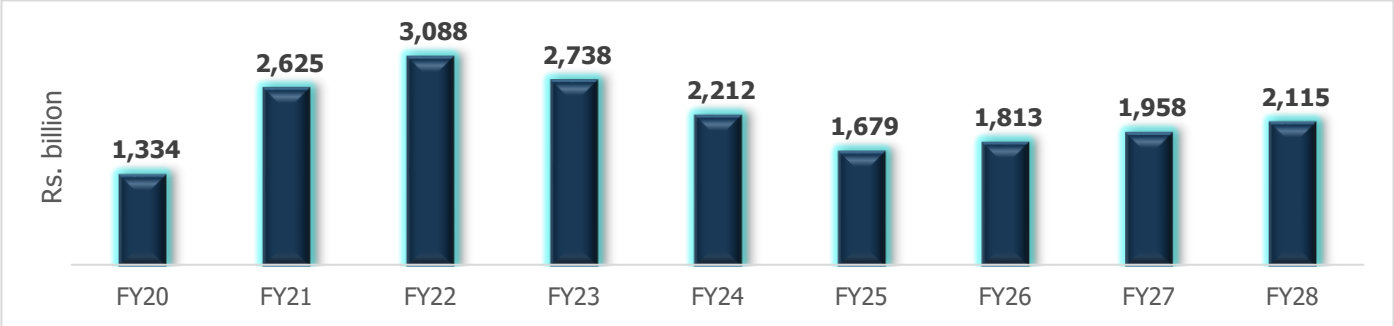
In the Union Budget FY24-25, the government allocated Rs 2.65 Trillion towards railways with an increase of 1.92% over previous year's allocation. The allocation towards rolling stock is Rs 375.81 Billion in the union budget 2024-25 from Rs 151.58 Billion (revised budget) in FY23-24.

Table 13: Budgetary Outlay toward Railway Projects

Railway Projects	FY2018 (A)	FY2019 (A)	FY2020 (A)	FY2021 (A)	FY2022 (A)	FY2023 (A)	FY2024 (R)	FY2025 (B)	
Doubling	1,290	610	678	379	3,000	24,093	35,046	30,000	
New Lines (Construction)	8,952	5,648	9,871	1,058	16,246	24,914	34,410	36,091	
Track Renewals	8,884	9,690	9,387	0	10,695	15,388	16,286	17,150	
Gauge Conversion	2,555	2,590	3,313	117	1,803	3,220	4,279	4,534	
Rolling Stock	1,514	4,572	3,963	839	6,815	15,158	40,396	41,086	
Passenger Amenities	1,287	1,586	1,903	1,788	2,800	3,824	9,618	16,352	
Road Safety Works	4,167	4,733	4,874	17	6,400	7,965	8,849	12,295	
Signalling and Telecom	1,257	1,538	1,623	6		2,448	2,428	3,581	4,492
Leased assets - Payment of Capital Component	7,980	9,112	10,462	11,948		19,459	18,898	21,300	24,270
Investments & Others	28,867	42,328	46,580	30,523		68,065	61,768	318,607	82,955
Manufacturing Misc.	29,403	34,281	39,854	31,103		40,097	46,745	52,923	59,298

Source: Budget Documents. Note: B – Budgeted, A – Actual, R – Revised and Includes Internal and Extra Budgetary Resources (IEBR)

Chart 33: Investments in Railway Sector



Source: NIP, CareEdge Research

6.6. National Rail Plan 2030

Indian Railways has prepared a National Rail Plan (NRP) for India – 2030 which envisages creation of a 'future ready' railway system by FY30. NRP aims to increase modal share of the Indian Railways in freight to 45% by FY30 from the current 26% by augmenting the freight volumes from 1,418 million tonnes in FY22 to 3,600 million tonnes by FY31. The objective of the Plan is to create and invest towards capacity ahead of demand, which in turn would also cater to future growth in demand up to FY50.

Objectives, and plans to improve modal share of railways in freight transport

Following are the key objectives of National Railway Plan:

- Formulate strategies based on both operational capacities and commercial policy initiatives to increase modal share of the Railways in freight to 45% by FY30
- Reduce transit time of freight substantially by increasing average speed of freight trains to 50Kmph
- As part of the National Rail Plan, Vision 2024 has been launched for accelerated implementation of certain critical projects by 2024 such as 100% electrification, multi-tracking of congested routes, upgradation of speed to 160 kmph on Delhi-Howrah and Delhi-Mumbai routes, upgradation of speed to 130kmph on all other Golden Quadrilateral-Golden Diagonal (GQ/GD) routes and elimination of all Level Crossings on all GQ/GD route.
- Identify new Dedicated Freight Corridors.
- Identify new High-Speed Rail Corridors.
- Assess rolling stock requirement for passenger traffic as well as wagon requirement for freight.
- Assess Locomotive requirement to meet twin objectives of 100% electrification (Green Energy) and increasing freight modal share.
- Assess the total investment in capital that would be required along with a periodical break up
- Sustained involvement of the Private Sector in areas like operations and ownership of rolling stock, development of freight and passenger terminals, development/operations of track infrastructure etc.

Table 14: Proposed Expenditure under NRP (Rs. Trillion)

Head	FY21-26	FY26-31	FY31-41	FY41-51	Total
Dedicated Freight Corridors	-	1.5	0.5	0.3	2.3
High Speed Rail Corridors	-	5.1	2.9	7	15
Network improvements	1.3	0.7	2.2	1.8	6
Flyovers and Bypasses	0.8	-	-	-	0.8
Terminals	0.6	0.2	0.1	0.04	0.9
Rolling Stock	3.1	1.7	3.6	4.8	13.2
Total	**5.8**	**9.2**	**9.3**	**13.9**	**38.2**

Source: Draft NRP Document, Ministry of Railways

7. Indian Airports Infrastructure

7.1. Overview

The Indian airport sector has witnessed significant growth and transformation during the period driven by a confluence of factors like rising passenger traffic, private sector participation, technological advancements, and government focus on improving the airport infrastructure. There have been several notable developments in the sector, such as the construction of big-ticket greenfield airports, the privatization of airports, the launch of a new airline, and the formulation of a drone policy, which have contributed to the positive sentiment.

Airport infrastructure, as part of the aviation industry, plays a significant role in the development of the national economy due to its globalized nature. Entry of private players in the Indian airport sector introduced the concept of 'Airport Retailing'. Whereas the Regional Connectivity Scheme "Ude Desh ka Aam Nagrik" (RCS UDAN) scheme, has helped air traffic grow, with new routes being awarded, and more and more airports being operationalised.

Besides, technology has become an integral part of the aviation sector. Airports and airlines are extensively using technology and digitalization, including plane boarding procedures, contactless screening, and biometrics to make travelling more efficient and smoother for passengers.

Further, the swift rebound of the Indian aviation industry post-COVID-19 highlights its resilience and adaptability. Additionally, with the continuous expansion of the domestic market and the resurgence of international travel, the aviation sector in India is poised to strengthen its position on the global stage. This includes expansion of terminal buildings, setting up new domestic cargo terminals, provision of navigational facilities, and development of greenfield airports. Whereas passenger and cargo traffic are expected to continue its growth momentum, driven by economic development, rising disposable income, and an e-commerce boom.

Moreover, there is an increasing focus on sustainability, technological advancements, and regional connectivity. For instance, the Ministry of Civil Aviation (MoCA) has taken initiatives to work toward carbon neutrality and achieving net zero carbon emissions at airports in the country by way of standardising the Carbon Accounting and Reporting framework of Indian Airports. For this purpose, airport operators with scheduled operations have been advised to map the carbon emission at their respective airports and work toward carbon neutrality & net zero emission in a phased manner. MoCA has also advised developers of the upcoming Greenfield Airports and the respective state governments to work toward achieving Carbon Neutrality & Net Zero, which inter-alia includes the use of green energy.

Airports at Delhi, Mumbai, Hyderabad, and Bengaluru have achieved Level 4+ and higher Airports International Council (ACI) Accreditation and have become carbon neutral. Additionally, 66 Indian airports are operating on 100% Green Energy. These government initiatives and private investments will play a crucial role in further infrastructure development and modernization.

In the interim budget 2024, the government focused on the development of new airports and the extension of current airports that will continue expeditiously going forward. Over the last ten years, there has been a surge in the aviation industry. There are now 149 airports, which is a twofold increase. With 517 new routes conveying 1.3 crore passengers, the Ude Desh ka Aam Naagrik (UDAN) initiative has widely expanded air connectivity to Tier II and III cities. Indian airlines have taken the initiative to order more than a thousand new aircraft. The government would carry on developing the airport infrastructure in the future. The development of new airports and the extension of current airports will continue expeditiously going forward.

7.1.1. Split of Airports into PPP & Non-PPP Categories

Public-Private Partnership (PPP) has become critical for developing and managing airports in India. PPPs are the dominant model for major airport development and modernization projects in India. The Airports Authority of India (AAI) typically acts as the public partner, partnering with private companies or consortiums through various PPP models like Design-Build-Finance-Operate (DBFO) or Operate-Maintain-Develop (OMD). The PPP model is preferred for large-scale projects and major hubs due to its ability to mobilize significant investments and expertise.

Non-PPPs, also known as Private Greenfield Airports, involve private entities developing and operating airports entirely without AAI involvement. However, the government incentivizes Non-PPPs through concessions on land leases, tax breaks, and other benefits to encourage private investment in underserved regions. Non-PPPs are more suitable for greenfield airports in smaller Tier-I and Tier-II cities.

Five bustling airports – Delhi, Bangalore, Hyderabad, Kochi, and Mumbai – handle over half of India's passenger air traffic, powered by private sector expertise. Delhi and Mumbai paved the way, becoming the first brownfield airports entrusted to PPPs. Kochi followed suit, later joined by Hyderabad and Bangalore.

Table 15:Total Airports in India

Airports in India	No. of Airports
Government – Operational	148
Private – Operational (PPP)	14

Source: Press Information Bureau (PIB) Press Releases (8th December 2023 and 27th July 2023), CareEdge Research

The momentum continues, with 14 airports currently thriving under PPPs, according to a December 2023 report by the Ministry of Civil Aviation. The National Monetisation Pipeline (NPM) takes it further, earmarking 25 Airports Authority of India (AAI) airports for leasing between 2022 and 2025, including Bhubaneshwar, Varanasi, Amritsar, Chennai, Jaipur, and others. The non-operational are primarily greenfield projects planned for future development.

Table 16: Private Operational Airport List in India

Private Operational Airports	Private Group
Delhi Indira Gandhi International Airport (DEL)	GMR Group
Bangalore Kempegowda International Airport (BLR)	Bengaluru International Airport Limited (BIAL)
Mumbai Chhatrapati Shivaji Maharaj International Airport (BOM)	Mumbai International Airport Limited (MIAL) / Adani Group
Chennai International Airport (MAA)	Adani Airports
Jaipur International Airport (JAI)	Adani Group
Ahmedabad Sardar Vallabhbhai Patel International Airport (AMD)	Adani Airports
Kochi International Airport (COK)	GMR Group
Hyderabad Rajiv Gandhi International Airport (HYD)	GMR Group
Goa Dabolim International Airport (GOA)	AAHL(Adani Airport Holdings Limited) & Adani Group
Trivandrum International Airport (TRV)	Adani Group
Chandigarh Airport (IXC)	DIAL
Lucknow Chaudhary Charan Singh International Airport (LKO)	Adani Airports
Guwahati Lokpriya Gopinath Bordoloi International Airport (GAU)	Adani Airports
Kannur International Airport (CAN)	GMR Group

Source: Airports Authority of India (AAI) Annual Reports, Ministry of Civil Aviation (MoCA) Annual Reports, CareEdge Research

7.2. Investments across Major Airports in India

In order to handle increased passenger and cargo traffic capacity, improved efficiency and service quality, enhance connectivity and accessibility and to boost economic activity and job creation, the major Indian airports are undergoing huge investments projects. These investment projects include construction of new terminals, expansion of existing terminals, and renovation/upgradation of existing facilities, construction of new runways, extension of existing runways, and rehabilitation of existing runways. There is also investment in various support facilities such as cargo terminals, Maintenance, Repair and Overhaul (MRO) facilities, ground transportation infrastructure, air traffic control (ATC) towers, security systems, fire stations, and other operational buildings.

India aviation market is highly under penetrated, and this market is expected to double by 2030. The domestic seat per capita is expected to grow from 0.13x to 0.26x by 2030 as per the report of GMR Airports Infrastructure Ltd. Rapid growth in domestic outbound traffic is expected to grow led by spurt in international traffic due to growth in tourism, migration and trade. However, it will still remain below the other large markets. On the other hand, India's international seat per capita capacity have a significant headroom to grow in medium term.

The segment-wise investments across major airports in India are:

Table 17: Segment Wise Investments across Key Segments for Major Airports

Company Name	Project Name	Product	Total Project Cost (in Rs. Crore)	Status	Type	Completion Date
Bangalore International Airport Ltd.	Devanahalli (Kempegowda) Airport Expansion Project (Stage 2 & 3)	Terminal 2 (Phase 1) (PAI 1)	37,167	Completed	Expansion	November 2022
Navi Mumbai Intl. Airport Pvt. Ltd.	Navi Mumbai International Airport Project (Delhi Mumbai Industrial Corridor)	- Terminal Building (Passenger Capacity in Phase 1) - Runway	19,646	Under Implementation	New Unit	March 2030 (Phase 1 to be operational from March 2025)
Delhi International Airport Ltd.	Delhi International Airport Expansion Project (Phase 3A)	- Terminal 1D Expansion (Phase 3A) - Fourth Runway (Phase 3A) - Elevated Eastern Cross Taxiway - T1 Apron (Phase 3A) - T1 Apron (Phase 1 of 3A) - Terminal 3 Expansion (Phase 3A)	10,500	Completed	Expansion	March 2024
Yamuna International	Noida (Jewar) International Greenfield Airport Project (Phase 1)	- Runway - Terminal Building	6,000	Under Implementation	New Unit	December 2050 (First phase to

Airport Pvt. Ltd.						be completed by March 2025)
G M R Hyderabad Intl. Airport Ltd.	Rajiv Gandhi (Hyderabad) International Airport Expansion Project (Phase-1C)	- VVIP Terminal - Terminal 1 Expansion (Passenger Handling Capacity) - Apron Expansion - Taxiway Expansion - Parallel Taxiway Expansion - Cargo Terminal Building Expansion	3,500	Completed	Expansion	March 2024
Airports Authority of India	Chennai Airport Expansion Project (Phase 2)	Twin Tunnel	2,895	Under Implementation	Expansion	December 2025
G M R Hyderabad Intl. Airport Ltd.	Rajiv Gandhi International Airport Expansion Project (Phase-1B)	- Remaining Parking Stand (Apron Expansion) - Cargo Complex - Passenger Handling Capacity (Terminal)	2,629	Completed	Expansion	March 2024
Airports Authority of India	Kolkata Airport Third Terminal Building Project	Phase 1, 2 & 3	1,000	Announced	Expansion	December 2026

Source – CMIE, CareEdge Research

The government's focus on improving regional connectivity, expanding cargo facilities, and promoting sustainability through eco-friendly technologies is driving capex requirements for aviation industry. The focus is on improving non-metro connectivity under RCS-UDAN scheme. In addition, increased participation of private players through Public-Private Partnerships (PPPs) will contribute to the CapEx influx.

The Airports Authority of India (AAI) is leading the charge in the development program for existing airports over the next five years, focusing on expansion and modernization. Meanwhile, the private sector is also playing a crucial role, with three major PPP airports – Delhi, Hyderabad, and Bengaluru, embarking on ambitious expansion plans by 2025. Major hubs like Delhi, Mumbai, Bengaluru, and Chennai need additional runways to handle the increasing traffic. Construction of greenfield airports in Tier-II and Tier-III cities will also require significant investments.

Fueled by a strategic blend of public and private investments, over by Rs. 250 Billion of capital expenditure, is driving a wave of modernization at existing airports. This commitment to enhance existing infrastructure is complemented by the active participation of private players, who are investing in the construction of greenfield projects such as the Navi Mumbai International Airport and regional hubs across Karnataka, Uttar Pradesh, Gujarat, and Andhra Pradesh.

Furthermore, the government's ambitious Regional Connectivity Scheme (RCS-UDAN) aims to bridge the air travel gap in underserved regions by constructing 100 new airports in the next few years. This multifaceted approach to airport development signifies a strategic shift toward enhancing India's aviation landscape. By catering to the ever-growing demand for air travel, fostering economic opportunities through improved regional connectivity, and solidifying its position as a key player in the global aviation sector, India is poised to take flight on a trajectory of sustained growth and development in the future.

7.3. Major Upcoming Airports in India

India is seeing a surge in airport development, with several major projects in the pipeline across the country.

- **Greenfield Airports:**

Airport	Location	Status	Key Features
Navi Mumbai International Airport	Near Mumbai, Maharashtra	Under construction **(2024)**	Expected to handle 60+ million passengers, easing congestion at Mumbai's main airport.
Purandar Airport	Approximately 100 km from Bengaluru, Karnataka	**Initial** development stages	Aiming to meet growing air travel demand, improving connectivity to South India.
Mopa International Airport	Goa	Operational since July **2023**	Striking butterfly-inspired design, projected to handle 5+ million passengers.
Jewar Airport	Uttar Pradesh	**Nearing** completion	Envisioned as one of the world's largest airports, with test flights expected in March-April 2024.
Dholera International Airport	Near Ahmedabad, Gujarat	**Part of** Dholera Smart City project	Aiming to be a regional aviation hub, contributing to regional development.

- **Expansion of Existing Airports**

Airport	Location	Expansion Phase	Key Additions	Increased Capacity
Chennai International Airport	Tamil Nadu	**Phase II**	New terminal and additional runways	Over **60 million** passengers annually
Bengaluru International Airport	Karnataka	**Phase IIA**	New runway and terminal	Over **70 million** passengers annually

Trivandrum International Airport	Kerala	**Ongoing Expansion**	New terminal and parallel taxiway	**Increased capacity** for growing tourist influx
Hyderabad International Airport	Telangana	**Phase II**	New runway and terminal	Over **50 million** passengers annually

8. Urban Infrastructure Sector

8.1. Water Supply and Sanitation (WSS)

Given India's increasing population, the need for water and its management is on the rise. Water availability is projected to become a major concern in the future. In addition, the damage to water resources done by pollution is another concern. Releasing industrial waste, discharge of untreated or partly treated municipal wastewater through drains, discharge of industrial effluent, improper solid waste management, illegal groundwater abstraction, encroachments in flood plains/ river banks, deforestation, improper water shade management, and non-maintenance of e-flows and agriculture run-off are some of the major reasons for pollution of water bodies.

Accordingly, the Government of India (GoI) has come up with various schemes that emphasize water conservation and restoration. As a result, the number of polluted river stretches has reduced from 351 in 2018 to 311 in 2022 and improvement in water quality has been observed in 180 out of 351 Polluted River Stretches (PRS) during 2018. As per a report by the Ministry of Jal Shakti, the assessment of water quality over the years discloses that in 2015, 70.00% of rivers monitored were identified as polluted, whereas in 2022 only 46.00% of rivers monitored were identified as polluted. The water requirement is only estimated to grow higher in the coming years.

Table 18: Market Size for Water Requirement for Different Uses (in Billion Cubic Meters) in Coming Years:

Sr No.	Uses	Scenario (2025)	Scenario (2050)
1	Irrigation	611.00	807.00
2	Domestic	62.00	111.00
3	Industries	67.00	81.00
4	Power	33.00	70.00
5	Others	70.00	111.00
	Total	**843.00**	**1,180.00**

Source: Basin Planning Directorate, CWC, XI Plan Document

Report of the Standing Sub-Committee on "Assessment of Availability & requirement of water for diverse uses – 2000"

National Commission on Integrated Water Resources Development, Ministry of Water Resources

The Central Water Commission (CWC) periodically assesses the country's overall water resources and it has accorded water supply for drinking purposes as the top priority under water allocation.

To address the present and future food and water security concerns, the GoI has been implementing various schemes.

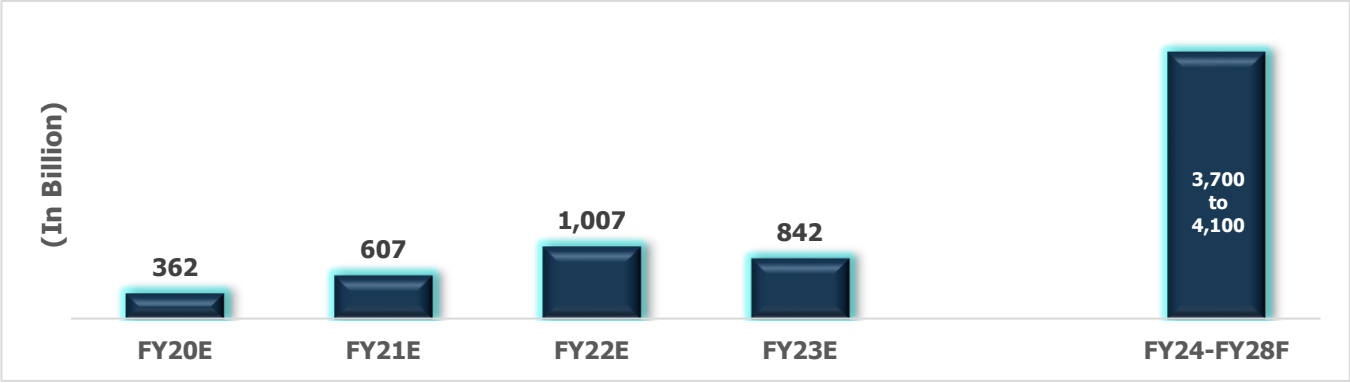
Following are some of the priority areas, focusing on water resources development, that have been identified by the GoI:

- Improving the overall water use efficiency in irrigation and drinking water supply system
- Adoption of the piped distribution system in place of an open canal system to reduce the conveyance water loss
- Command area development by implementing more micro irrigation systems and participatory irrigation management
- Dam safety, dam rehabilitation, and performance improvement
- Repair, renovation, and restoration of existing water bodies for irrigation, drinking water supply, cultural activities, etc.
- Improving the rural drinking water supply system and sanitation

Trend in Investments in Water Supply & Sanitation

The investment in the Water Supply and Sanitation (WSS) sector has increased at a CAGR of 32.49% from Rs. 362.00 Billion in FY20 to Rs. 841.75 Billion in FY23. This growth is supplemented by investments in WSS under various schemes such as Jal Jeevan Mission and Atal Mission for Rejuvenation and Urban Transformation (AMRUT). Investments peaked in FY22 due to the low base in FY21 given the loss of man days on account of labor migration and diversion of state funds allocated to infrastructure CapEx for meeting social & healthcare needs. Furthermore, from FY24 to FY28, the investments are estimated to grow at a CAGR of 10-12% and be in the range of Rs. 3,700.00 Billion to Rs. 4,100.00 Billion.

Chart 34: Trend in Investments in Water Supply & Sanitation



Source: National Infrastructure Pipeline 2020

8.2. Urban Waste Generation and Treatment

In India, the sewage generation in the urban region was 72,368 Million Litres per Day (MLD) for 2020-21, while the installed sewage treatment capacity was 31,841 MLD. The operational capacity is 26,869 MLD, which is lower than the load generation. As per a NITI Aayog report, as of August 2022, of the total sewage generation, only 28.00%, i.e., 20,236 MLD is treated. This implies that 72.00% of the wastewater is left untreated and disposed of in various water bodies like rivers, lakes, or underground water. Some capacity additions like 4,827 MLD sewage treatment have been proposed, but a gap between the wastewater generation and treatment of 35,700 MLD, i.e., 49.00% remains.

Additionally, as per the CPCB (2021) in the city-scale assessments, the wastewater generation from Class I cities and Class II towns (as per the 2001 census) is estimated at 29,129 MLD. Under the assumption of a 30.00% decadal increase in urban population, it is expected to be 33,212 MLD at present. Conversely, the existing capacity of sewage treatment is only 6,190 MLD. There is still a 79.00% (22,939 MLD) capacity gap between sewage generation and existing sewage

treatment capacity. Another 1,742.6 MLD wastewater treatment capacity is being planned or built. Even with this added to the current capacity, there is still a sewage treatment capacity shortfall of 21,196 MLD.

8.3. Key Drivers for Water Supply Management

- **Making Water Available to All**

  In the last few years, the government has increasingly focused on making potable water available to all households in India. The per capita water availability in the country is decreasing due to increasing population. As per a NITI Aayog report, India is facing a water crisis with around 50% population experiencing a high-to-extreme water shortage.

  Accordingly, several schemes have been established by the Government of India (GoI). The central government in partnership with the state has introduced schemes like the 'Jal Jeevan Mission' (JJM) to execute the mission of providing a safe & adequate tap water supply to every rural household in the country by 2024. Under JJM, the tap connections in rural households have increased to 55% as of December 2022.

- **Focus on Improving Water Availability**

  Based on the study 'Reassessment of Water Availability in India using Space Inputs' (CWC, 2019), the average annual per capita water availability for 2031 has been assessed as 1,367 cubic meters.

Accordingly, the government is coming up with measures to improve the availability of water by building and maintaining natural resources of water.

Below are the schemes set up by the GoI to tackle the declining availability of water:

Atal Bhujal Yojana (Atal Jal): Sustainable Groundwater Management

• The Atal Bhujal Yojana was launched in 2019 to undertake community-led sustainable groundwater management of the stressed areas identified. It was launched to strengthen the institutional framework, monitor groundwater data, and improve the planning & implementation of water management interventions.
• It is a government scheme aided by the World Bank with an outlay of Rs 60 billion and is implemented to focus on community participation and sustain groundwater levels in identified water-stressed areas during the five-year duration. The schemes currently are taken up in seven states, Haryana, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, and Uttar Pradesh.
• It is the world's largest community-led groundwater management program, which is helping villagers understand the water availability and usage patterns in their areas.

Jal Shakti Abhiyan: "Jal Shakti Abhiyan: Catch the Rain" focuses on creating Rainwater Harvesting Structures
• Jal Sakti Abhiyan - I was launched in 2019 in the stressed districts of the country to promote the conservation of water, water resource management, implementation of rainwater harvesting, renovation of traditional water bodies, reuse of water, recharging water body structures, watershed development, and afforestation. The actual expenditure from the MGNREGS fund was Rs 180.66 billion.
• JSA is expanded to 'Jal Sakti Abhiyan: Catch the Rain' to cover all the blocks of the districts across the country to focus on –

1. Rainwater harvesting & water conservation
2. Enumerating, geo-tagging, and taking inventory of all water bodies
3. Setting up Jal Shakti Kendras
4. Afforestation
5. Generation of awareness

Rejuvenation of Urban Water Bodies

Water bodies in urban areas such as lakes, ponds, step-wells, and baolis have traditionally served the function of meeting water requirements for various needs like washing, agriculture, or religious/cultural purposes. Surface water bodies and traditional water harvesting structures in numerous cities have either dried up, or disappeared due to encroachment, dumping of garbage, and entry of untreated sewage.

- **Atal Mission for Rejuvenation and Urban Transformation (AMRUT)**

The Atal Mission for Rejuvenation and Urban Transformation (AMRUT) was launched in June 2015 under GoI. It is the first focused national water mission launched in 500 cities and covers 60% of the urban population. In the FY24 Budget, the allocation to AMRUT has increased from Rs 153 billion to Rs 160 billion.

The program focuses on the development of basic infrastructure, in the sectors of water supply, sewerage and septage management, stormwater drainage, green spaces and parks, and non-motorized urban transport.

The projects will be prioritized based on the following outcomes with a focus on improving sustainability and efficiency in the water sector:

i. Universal coverage of water supply
ii. Sewerage, septage management, and recycling/reusing of treated water
iii. Rejuvenation of water bodies (including urban wetlands) and creation of green spaces

The universal coverage of water supply is the priority under the mission, under which 2.28 million tap connections have been provided. The total plan size of all State Annual Action Plans (SAAPs) was Rs 776.40 billion. Of which, Rs 390.11 billion, i.e., 50% has been allocated to water supply.

The tentative distribution of central fund allocation among project components of Mission are as follows:

Description	Central Share (In Cr)
Water supply projects	35,250
Rejuvenation of water bodies and developing green spaces and park projects	3,900
Sewerage and septage management projects	27,600

Source: AMRUT 2.0 Operational Guidelines October 2021

8.4. Metro Rail Segment

India currently has 874 km of operational metro lines wherein over 2,500 metro coaches are being deployed.
The metro network, including regional rapid transit systems (RRTS) is proposed, to be expanded to 1,700 Km across 27 cities by 2025 and subsequently to 50 cities. The government is proposing Metro Lite and Metro Neo lines suitable for smaller cities with lower peak traffic. The operational metro lines are expected to increase by more than 2x over the next 4-5 years.

Smart Cities Mission (SCM)

The Smart Cities Mission (SCM) was launched by GoI on 25 June 2015 and 100 smart cities have been selected through 4 rounds of competition held from January 2016 to June 2018. The objective of SCM is to promote cities that provide core infrastructure, a decent quality of life to their citizens, and a clean & sustainable environment through the application of smart solutions.

As of 7th July 2023, the status of the work is as follows:

- 7,978 projects issued by 100 smart cities, out of which 5,909 projects (74%) are completed
- Rs. 734.54 Billion have been released for 100 smart cities, out of which Rs. 660.23 Billion (90%) is utilized
- More than 2,700 km of smart roads have been constructed, close to 7,000 smart classrooms have been built, 50 lakh LED/solar lights have been installed, and more than 300 health centers have been constructed
- To improve public safety, 1,884 emergency call boxes and 3,000 public address systems and traffic enforcement systems have been installed

Project Plan for Smart Cities

- **Area-Based Development:** In this plan, the chosen area of the city will be developed through redevelopment or greenfield, retrofitting, or a combination of these.
- **Pan-City Solution:** In this plan, the entire city is considered and information and communications technology (ICT) is used for various purposes like managing traffic, water, and electric supply and solid waste.

The implementation of SCM at the city level is done by SPV (Special Purpose Vehicle) created for the purpose. At the state level, mission implementation is being monitored by the State Level High Powered Steering Committee (HPSC).

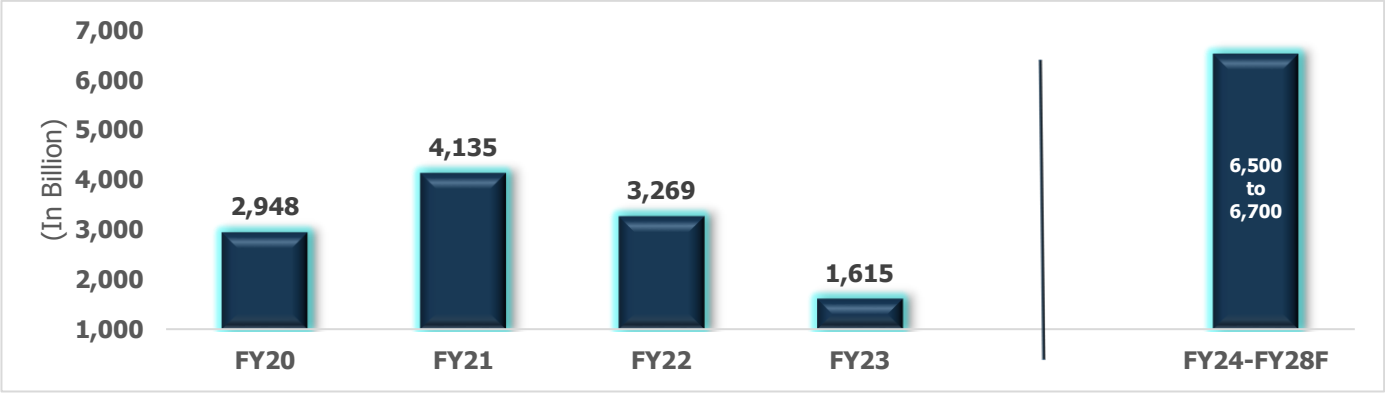
At the national level, implementation is monitored by an Apex Committee headed by the Secretary, the Ministry of Housing and Urban Affairs (MoHUA) and the nominee directors of MoHUA on the Boards of SPVs monitor progress in respective cities regularly. MoHUA regularly interacts with the states/smart cities through video conferences, review meetings, field visits, regional workshops, etc.

Smart cities are continuously assessed on various parameters including, but not limited to, project implementation and utilization of funds through the Real Time Online Geospatial Management Information System (GMIS). The period of implementation of SCM has been extended to June 2024.

Trend in Investments in Metro and Smart Cities Projects

The investments from FY20 to FY23 have degrown at 18.20%. This is majorly on account of projects being executed between FY19 and FY21. Around 74.00% of projects are completed in SCM and 90.00% of funds are utilized. However, in the case of metros, it is proposed to be expanded to 1,700 Km across 27 cities by 2025 and subsequently to 50 cities. The investment is expected to grow at a CAGR of 5-10% in the range of Rs. 6,500 to Rs. 6,700 Billion from FY24 to FY28.

Chart 35: Trend in Investments in Metro and Smart Cities Projects



Source: National Infrastructure Pipeline 2020

8.5. Progress of Key Metro Projects Across the Country

As of October 2023, about 874 Km of metro lines have been operationalized across 20 cities. The metro network is proposed to be expanded to 1,700 Km across 27 cities by 2025 and subsequently to 50 cities.

Table 19: Metro Rail Network Under Construction

Sr No	Name of Metro Rail Project	Under Construction Length (Km)
1.	Delhi Metro Extension from Dwarka Sector 21 to India International Convention & Expo Centre (IICC), Dwarka	2.03
2.	Delhi Metro Phase IV (03 Priority Corridors)	65.20
3.	Patna Metro Rail Project	32.51
4.	Bangalore Metro Rail Project Phase II	58.48
5.	Bangalore Metro Rail Project Phase 2A & 2B	58.19
6.	Ahmedabad Metro Rail Project Phase I	29.46
7.	Ahmedabad Metro Rail Project Phase II	28.25
8.	Surat Metro Rail Project	40.35
9.	Bhopal Metro Rail Project	27.87
10.	Indore Metro Rail Project	31.55
11.	Kanpur Metro Rail Project	23.38
12.	Agra Metro Rail Project	29.40
13.	Mumbai Metro Line 3	33.50
14.	Nagpur Metro Rail Project Phase I	12.12
15.	Pune Metro Rail Project Phase I	21.28
16.	Pune Metro Line III	23.33
17.	Mumbai Metro Line 2A	8.77
18.	Mumbai Metro Line 2B	23.60
19.	Mumbai Metro Line 4	32.30
20.	Mumbai Metro Line 4A	2.70
21.	Mumbai Metro Line 5	24.90
22.	Mumbai Metro Line 6	14.50
23.	Mumbai Metro Line 7	5.60
24.	Mumbai Metro Line 9(7A)	13.72
25.	Navi Mumbai Metro Line 1	11.10
26.	Kochi Metro Rail Project Phase 1A	2.00
27.	Kochi Metro Rail Project Phase 2	11.20
28.	Chennai Metro Rail Project Phase II	118.90
29.	Kolkata Metro East-West Corridor	85.16
30.	Other Metro Rail Projects in Kolkata	
	TOTAL	**871.34**

Source: PIB 2023

Table 20: Metro Rail Network Under Appraisal/Approval

Sr No	Name of Project	Stretch (Kms)
1.	Remaining three corridors of Delhi Metro Phase-IV Projects	43.68
2.	Nashik MetroNeo	33.00
3.	Nagpur Metro Phase II	43.80
4.	Pune Metro Phase 1A	4.41

5.	Thane Integral Ring Metro	29.00
6.	Pune Metro Rail Project extension Line from Swargate to Katraj	5.46
7.	Gorakhpur MetroLite Project	15.14
8.	Extension of Noida-Greater Noida Metro Rail	14.96
9.	Kochi Metro Phase 1A	2.00
10.	Kochi Metro Phase II	11.20
11.	Jammu MetroLite	23.00
12.	Srinagar MetroLite	25.00
13.	MetroNeo project in Dehradun	22.42
14.	Metro Rail from HUDA City Centre to Cyber City and Spur to Dwarka Expressway	28.50
15.	Chennai Metro Phase II	118.90
	TOTAL	**420.92**

Source: PIB 2023

Mentioned below are some of the metro projects done under the PPP model:

Project Name	Project Capacity (in km)	Total Project Cost (In Rs. Billion)
Gurgaon Metro South Extension (RMGSL) project	12.00	22.00
Hyderabad Metro Rail Project	71.00	164.00
Airport Metro Express Line - New Delhi Railway Station to IGI Airport to Sector 21, Dwarka, New Delhi	23.00	57.00
Development of metro link from Delhi Metro Sikanderpur to NH 8 Gurgaon	5.10	11.00
Mumbai Metro Line I - Versova-Andheri-Ghatkopar Corridor	11.40	43.00

Source: Department of Economic Affairs

Outlook

Along with the expansion of metro lines with double the targets of operational line of 874 Km to 1,700 Km by 2025 along with it the government is also proposing Metro Lite and Metro Neo lines which are suitable for smaller cities with lower peak traffic. Currently, approximately 2,500 coaches have been deployed in the operational metro lines roughly costing Rs. 32,500 Crores. As the operational metro lines are expected to increase by more than 2x over the next 4-5 years, domestic demand for metro rail rolling stock is expected to witness significant increase.

9. Brief Profile of Ceigall India Limited (Ceigall India)

9.1. Background

Ceigall India, incorporated in July 2002, has gradually increased project execution capabilities in the EPC segment in terms of project size. Ceigall India Limited has expertise in constructing state and national highways, specialized structures such as elevated corridors, bridges, flyovers, and rail over-bridges, along with the maintenance of highways, which is an integral component of its projects.

Over the last two decades Ceigall India Limited has transitioned from a small construction company to an established EPC player, demonstrating expertise in the design and construction of various road and highway projects including specialised structures across ten states in India.

Year	Particulars
2002	The company incorporated as Ceigall Builder Private Limited
2008	Won first EPC project from MORTH
2011	Renamed Ceigall India Limited; forayed into Punjab region road projects
2013	Ceigall India forayed into Chandigarh region road projects
2014-15	Awarded first NHAI road project contract directly; forayed into the construction of bridges and roads
2018	Awarded five EPC contracts from NHAI/MORTH
2021	Awarded first tunnel project in J&K and first HAM project
2022	Awarded a 6-lane Elevated Corridor project of 16.85 km with 11.24 km of elevated portion (7.52 km and 3.72 km each)
2023	Ceigall has been awarded by NHAI, four laned Danapur - Bhita Elevated Corridor project in Bihar for a total length of 23.6 Km with 19.87 km Elevated portion (14.26 km and 5.16 km each). With 14.26 km elevated corridor, this project is one of the longest four lane continuous elevated corridor stretch in India. Ceigall has substantially completed (i.e. 90 percent on Jan 15, 2024), a Six laned Elevated Highway of 16.85 km with 11.24 km of elevated portion (7.52 km and 3.72 km each) on Delhi - Saharanpur Economic Corridor Pkg- II. With 7.52 km of completed six lane elevated corridor makes it one of the longest Six Lane Elevated Highway in India.
2024	CIL's entry into the metro segment with Two project awarded in March-24 i.e. Kanpur MRTS and Agra Metro Project. The Kanpur MRTS Project involves the design and construction of an elevated viaduct and five elevated stations (Agriculture University, Vijay Nagar Chauraha, Shastri Chowk, Barra-7, and Barra-8). This includes architectural finishing, electrical and mechanical work, and special spans. The construction spans from the end of the ramp after Double Pulia Station to Barra-8 Station (chainage 3783.000m to 7528.566m) and from the end of the ramp in the Depot to Agriculture University Station (chainage -297.460m to -855.339m). The project is located in Kanpur, Uttar Pradesh, India, with a contract value of ₹427.12 crore. The letter of acceptance (LOA) was issued on 15-Mar-2024, marking the commencement date, with a construction period of 24 months and a completion date of 14-Mar-2026. The Agra Metro Project (AGCC-05) involves the design and construction of an elevated viaduct and three elevated stations, including civil-associated ancillary structures, architectural finishes, E&M works, and PEB structures. This project covers the remaining section of Corridor-1 of the Agra Metro in Agra, Uttar Pradesh, India. The contract is valued at ₹266.94 crore. The project commenced on 15-Mar-2024 and has a construction period of 24 months, with an expected completion date of 14-Mar-2026.

Since its inception, Ceigall India Limited (CIL) has executed several projects with the Public Works Department (PWD) in Punjab, the National Highways Authority of India, and the Ministry of Road Transport and Highways (MoRTH) by bidding for tenders. Other notable public sector clients include Indian Railway Construction International Limited (IRCON), Military Engineer Services (MES), and Bihar State Road Development Corporation Limited (BSRDCL).

Ceigall have demonstrated track record of completing the Projects ahead of schedule. As on date, Ceigall have completed seven EPC projects out of 16 before the schedule completion date.

- Khemkaran Town to start of Amritsar Bypass
- Karnal-Pehowa
- Ramdas to Gurdaspur
- Talwandi-Bhai to Ferozepur
- Phagwara city
- Ludhiana-Talwandi Bhai
- Malout Abohar

Furthermore, Ceigall India recently acquired a 50% stake in R.K Infra by way of the partnership deed executed between Karan Singla, Sakshi Singla and Ceigall India Limited on 22nd Feb 2024, which will benefit Ceigall in terms of project execution capabilities and bidding credentials for future projects.

9.2. Threats and Challenges to Ceigall India Limited and its services

- **Delays in Land Acquisition and Approvals:**
  The process of acquiring land for infrastructure projects often faces significant delays. One of the key reason is the demand for higher compensation from landowners, as stipulated under the 2003 Land Acquisition Act. These increased compensation results in high cash outflow from the government/ project authority. Consequently, the projects experience significant cost and time overruns, which can severely impact their project viability, funding requirement and overall project returns.

- **Reviving Private Sector Participation in Road Construction**
  The road construction sector needs to be more attractive to private players, especially for BOT projects, as past financial stress has deterred investment. The past BOT projects due to lower-than-expected traffic volumes or project execution delays have led to financial strain and highly leveraged balance sheets of road project developers. The government needs to streamline procedures and create supportive contractual arrangements to enhance the sector's attractiveness for private sector players.

- **Fluctuations in Raw material prices:**
  The prices of essential raw materials such as steel, cement, bitumen, and others may adversely impact the project cost and project return on investment. For instance, cement prices were range-bound from April to November 2023 but observed an uptick in December 2023, increasing by 8.92% year-

on-year by May 2024. Average finished steel prices fluctuated due to global headwinds, standing at Rs. 67,920 per tonne in April 2024, a 1.97% year-on-year growth. Bitumen prices are influenced by factors like production cuts, limited supply, inflation, crude oil import delays, geopolitical tensions, and macroeconomic headwinds. They saw a 14% year-on-year decline in May 2024. This volatility in raw material costs can disrupt project cost and impact overall project profitability.

- **Challenges in Scaling up project execution and managing Large Size Projects:**
  The company's order book surged from approximately Rs. 63,461.30 million in FY22 to Rs. 92,257.78 million in FY24, posing challenges in scaling up project execution substantially and executing larger size projects. This surge presents challenges in scaling operations, requiring strategic resource allocation, enhanced operational efficiency, and robust quality control measures to maintain high standards. Additionally, meeting project timelines continues to be important, necessitating effective scheduling, proactive risk management, and timely interventions to avoid delays and cost overruns.

- **Adherence to Contractual Obligations:**
  Failure to adhere to contractual obligations can have severe repercussions for road project developers, including financial penalties, reputational risk, and severe financial obligations. These lapses can significantly impact the overall performance and timelines of projects. It is imperative for companies to meticulously follow contract specifications to mitigate these risks and uphold their commitments. This ensures smoother project execution and fosters trust and credibility with clients, contributing to future project awarding from the authority.

10. Competitive Landscape

10.1. Benchmarking Based on Operational Parameters

The following players in the road construction segment have been considered for peer benchmarking of Ceigall India Limited:

Table 21: Key Construction Peers

Name of the Company	Business Overview
Ceigall India Limited	Ceigall is an infrastructure construction company with an experience in undertaking specialized structural work such as elevated roads, flyovers, bridges, railway over bridges, tunnels, highways, expressways and airport runways. It is an unlisted company. Accolades received include the "Gold Award" at the National Highways Excellence Award 2020 for Excellence in Project Management, presented by the Ministry of Road Transport and Highways, Government of India. Ceigall India Limited was also honoured with the "Special Award" at the National Highways Excellence Awards 2020 and 2021 for outstanding work in challenging conditions, by the Ministry of Road Transport and Highways, Government of India.

J. Kumar Infraprojects	J. Kumar Infraprojects Ltd. is an infrastructure company, specializing in construction and engineering projects across various sectors such as transportation, urban infrastructure, and civil engineering. With a strong track record spanning over three decades, the company is renowned for its expertise in building highways, bridges, flyovers, metro rail projects, and water supply systems.
ITD Cementation India Limited	ITD Cementation India Limited is an Indian construction company. With a heritage extending over eight decades, the company has been engaged in diverse sectors such as transportation, marine, buildings, and industrial infrastructure. Recognized for its unwavering dedication to excellence, innovation, and environmental responsibility, ITD Cementation India Limited has successfully delivered landmark structures including bridges, highways, ports, airports, and buildings nationwide.
G R Infraprojects Limited (GR Infra)	Established in 1995, G R Infraprojects Limited (GR Infra) is involved in the construction of roads and is promoted by Mr Vinod Kumar Agarwal and his family. It is Listed on the Bombay Stock Exchange and the National Stock Exchange. The company predominantly engages in road construction projects awarded by the National Highways Authority of India and the Ministry of Road Transport and Highways. These projects operate on an EPC (engineering, procurement, and construction), build-operate-transfer, and hybrid annuity model basis. GR Infra owns three emulsion manufacturing plants having an aggregate installed capacity of 84,960 MTPA at Udaipur, Lucknow and Assam. It also has an in-house fabrication and galvanising unit (24,000 MT) as well as a pole manufacturing unit.
H.G. Infra Engineering Limited (HG Infra)	HG Infrastructures Limited, incorporated in 2003, focuses on EPC projects, particularly in the construction of highways, bridges, and other critical infrastructure. HG Infra is accredited AA class by the Public Works Department (PWD) of the Government of Rajasthan (GoR) and is registered as an SS class contractor by the Military Engineer Services (MES). HG Infra, along with its twelve HAM SPVs, is primarily involved in the construction of roads and highways in Odisha, Telangana, Rajasthan, Delhi, Andhra Pradesh, Haryana, and Uttar Pradesh. It is Listed on the Bombay Stock Exchange and the National Stock Exchange.
KNR Constructions Limited (KNRCL)	Listed on the Bombay Stock Exchange and the National Stock Exchange, KNR Constructions Ltd (KNRCL) was established in 1995. The company specializes in providing engineering, procurement, and construction (EPC) services, primarily focusing on the roads and highways sector. Over the past few years, KNRCL has diversified its portfolio, successfully executing orders in segments such as irrigation, flyovers, and bridge construction.
PNC Infratech Limited	PNC Infratech Limited is a listed public limited Indian infrastructure investment, development, construction, operation, and management company. The company specializes in areas such as expressways, highways, bridges, flyovers, airport runways, water supply, industrial area development, and other related activities. PNC Infratech Limited offers comprehensive infrastructure implementation solutions encompassing design, engineering, procurement, construction, and O&M services. These services are delivered through various formats including fixed-sum turnkey (EPC), Design-

	Build-Finance-Operate-Transfer (DBFOT) Toll, Annuity, Hybrid Annuity, Operate-Maintain-Transfer, and other models.

In the infrastructure industry, an order book is considered an indicator of future performance since it represents a committed portion of anticipated future revenue.

Sectors	ITD Cementation India Limited	J. Kumar Infraprojects	PNC Infratech Limited	G R Infraprojects Limited	H.G. Infra Engineering Limited	KNR Constructions Limited	Ceigall India Limited
Roads, Highways, Flyovers, Tunnels	16.76%	63.00%	59.84%	81.00%	68.24%	60.00%	90.99%
Railways & Metros	22.04%	27.00%	0.00%	2.00%	21.32%	0.00%	7.52%
Hydro, Dams & Irrigation	11.59%	0.00%	0.00%	9.00%	0.00%	19.00%	0.00%
Water & Waste water	2.80%	5.00%	24.14%	0.00%	0.00%	21.00%	0.00%
Others	46.82%*	5.00%	16.02%	8.00%	10.44%	0.00%	1.49%#

* refers to Maritime Structures for ITD Cementation
# refers to Airport runways for Ceigall India

	NHAI/Government Entities				Others			
Peers	FY21	FY22	FY23	FY24	FY21	FY22	FY23	FY24
J. Kumar Infraprojects	NA	NA	NA	NA	NA	NA	NA	NA
ITD Cementation India Limited	NA	NA	NA	NA	NA	NA	NA	NA
PNC Infratech Limited	NA	NA	NA	NA	NA	NA	NA	NA
G R Infraprojects Limited	NA	121,866.27	183,572.60	154,381.52	NA	9,172.73	11,717.40	13,424.48
H.G. Infra Engineering Limited	54,912.78	73,350.68	86,907.57	103,526.00	15,488.22	6,378.32	39,045.43	20,814.00
KNR Constructions Limited	69,043.63	87,307.76	86,059.37	51,987.04	2,135.37	2,700.23	2,661.63	1,060.96
Ceigall India Limited	16,921.40	47,408.60	96,973.83	70,723.55	2,887.00	16,052.70	11,116.60	21,534.23

Source: Audited financial statements of companies for FY2021-23, CareEdge Research, FY24 Investor presentation
Note: NA- Not Available

Table 22: Comparison of Order Book (In Million)

Peers	FY22	FY23	FY24
J. Kumar Infraprojects	1,19,360.00	1,18,540.00	2,10,110.00
ITD Cementation India Limited	1,55,500.00	2,00,440.00	1,99,180.00
PNC Infratech Limited	1,46,630.00	1,56,760.00	1,54,900.00
H.G. Infra Engineering Limited	79,729.00	1,25,953.00	1,24,340.00
KNR Constructions Limited	90,008.00	88,721.00	53,048.00
G R Infraprojects Limited	1,31,039.00	1,95,290.00	1,67,806.00
Ceigall India Limited	63,461.30	1,08,090.43	92,257.78

Table 23: Comparison of New Orders Received (In Million)

Peers	FY21	FY22	FY23	FY24
J. Kumar Infraprojects	22,590.00	36,850.00	26,520.00	1,18,100.00
ITD Cementation India Limited	77,700.00	77,693.09	79,651.89	69,000.00
PNC Infratech Limited	76,770.00	1,11,460.00	48,550.00	NA
H.G. Infra Engineering Limited	19,333.00	43,279.00	86,219.00	NA
KNR Constructions Limited	81,956.00	10,778.00	17,800.00	NA
G R Infraprojects Limited	42,543.40	93,499.00	65,498.90	NA
Ceigall India Limited	12,461.30	80,676.70	84,785.20	6,940.50

Source: Audited financial statements of companies for FY2021-23, CareEdge Research, FY24 Investor presentation

Ceigall Orderbook at June 30, 2024 is 94,708.42 million.

10.2. Benchmarking Based on Financial Parameters (Standalone Performance)

EPC business performance of all the peers being shown standalone financials hence an additional comparison of Ceigall India Ltd standalone KPI being added along with consolidated KPIs.

Table 24: KPIs Comparison

Metric	Operational/ Financial	Ceigall India Ltd				KNR Constructions Limited				J. Kumar Infraprojects			
		FY22	FY23	FY24	3 year average	FY22	FY23	FY24	3 year average	FY22	FY23	FY24	3 year average
Order Book	Operational	63,461.30	1,08,090.43	92,257.78	87,936.50	90,008.00	88,721.00	53,048.00	77,259.00	1,19,360.00	1,18,540.00	2,10,110.00	1,49,336.67
HAM	Operational	27,118.70	61,818.90	30,302.64	39,746.75	40,503.60	44,360.50	20688.72	35,184.27	NA	NA	NA	NA
Third Party	Operational	36,342.60	46,271.53	61,955.14	48,189.76	49,504.40	44,360.50	32359.28	42,074.72	NA	NA	NA	NA
Revenue from Operations	Financial	11,306.44	20,653.44	29,547.48	20,502.45	32,725.92	37,437.96	40,909.78	37,024.55	35,272.00	42,031.43	48,792.05	42,031.83
Book-to- Bill Ratio (x)	Operational	5.61	5.23	3.12	4.65	2.75	2.37	1.30	2.14	3.38	2.82	4.31	3.50
EBITDA	Financial	1,870.68	2,982.64	4,385.93	3,079.75	6,991.36	8,596.86	7,003.58	7,530.60	5,045.93	5,970.72	7,324.66	6,113.77
EBITDA Margin (%)	Financial	16.55%	14.44%	14.84%	15.28%	21.36%	22.96%	17.12%	20.48%	14.31%	14.21%	15.01%	14.51%
Profit after Tax ("PAT")	Financial	1,270.38	1,853.08	2,769.32	1,964.26	3,817.96	4,988.33	4,938.31	4,581.53	2,058.77	2,743.91	3,285.93	2,696.20
PAT Margin (%)	Financial	11.24%	8.93%	9.37%	9.85%	11.67%	13.32%	12.07%	12.35%	5.84%	6.53%	6.73%	6.37%
Cash Profit Margin (%)	Financial	12.74%	10.65%	10.81%	11.40%	15.58%	17.12%	15.11%	15.94%	9.93%	10.14%	10.12%	10.06%
Net Worth (Total Equity)	Financial	4,329.04	6,130.80	8,784.53	6,414.79	22,419.69	27,342.75	32,256.59	27,339.68	20,866.50	23,397.28	26,440.93	23,568.24
Total Debt	Financial	1,718.67	4,648.71	5,069.39	3,812.26	-	2.55	-	NA	4,312.01	5,163.72	5,759.88	5,078.54
Net Debt	Financial	-144.38	1,055.78	1787.43	899.61	-1,733.04	-1,995.95	-2,165.26	-1,964.75	576.96	1,398.45	4,728.06	2,234.49
Net Debt to EBITDA	Financial	-0.08	0.35	0.41	0.23	-0.25	-0.23	-0.31	-0.26	0.11	0.23	0.65	0.33
Total Debt to Equity	Financial	0.40	0.76	0.58	0.58	0	0	0	0	0.21	0.22	0.22	0.22
Return on Equity (RoE) (%)	Financial	29.35%	30.23%	31.52%	30.37%	17.03%	18.24%	15.31%	16.86%	9.87%	11.73%	12.43%	11.34%
Return on Capital Employed (RoCE) (%)	Financial	39.49%	37.45%	42.35%	39.76%	26.72%	26.94%	22.13%	25.26%	17.14%	18.62%	19.19%	18.32%
Net Working Capital (in days)	Financial	12	10	15	12.33	83.34	75.61	91.78	NA	52.27	63.09	70.51	NA
Gross Block	Financial	1,886.07	3,422.15	3,936.94	3,081.72	14,811.89	15,946.18	NA	NA	14,809.86	17,242.57	NA	NA
Fixed Asset Turnover	Financial	0.17	0.17	0.13	0.16	0.45	0.43	NA	0.45	0.42	0.41	NA	0.45
Employee count	Operational	1,138	1,899	2,256	1,764	5,613	5,712	2,456	4,593.67	7,021	7,434	7500	7,318

Metric	Operational/ Financial	PNC Infratech Limited				G R Infraprojects Limited			
		FY22	FY23	FY24	3 year average	FY22	FY23	FY24	3 year average
Order Book	Operational	1,46,630.00	1,56,760.00	1,54,900.00	1,52,763.33	1,31,039.00	1,95,290.00	1,67,806.00	1,64,711.67
HAM	Operational	NA	NA	NA	NA	52,415.60	66,398.60	NA	NA
Third Party	Operational	NA	NA	NA	NA	78,623.40	1,28,891.40	NA	NA
Revenue from Operations	Financial	63,055.03	70,608.40	72,723.45	68,795.63	79,191.75	81,475.88	77,879.64	79,515.76
Book-to- Bill Ratio (x)	Operational	2.33	2.22	2.13	2.23	1.65	2.4	2.15	2.07
EBITDA	Financial	7,872.46	9,538.83	12,770.00	10,060.43	12,779.72	13,130.86	11,354.50	12,421.69
EBITDA Margin (%)	Financial	12.49%	13.51%	17.56%	14.52%	16.14%	16.12%	14.58%	15.61%
Profit after Tax ("PAT")	Financial	4,478.31	6,114.74	8,497.90	6,363.65	7,608.15	8,517.68	19,774.32	11,966.72
PAT Margin (%)	Financial	7.10%	8.66%	11.69%	9.15%	9.61%	10.45%	25.39%	15.15%
Cash Profit Margin (%)	Financial	9.08%	10.16%	12.33%	10.52%	12.95%	13.18%	27.72%	17.95%
Net Worth (Total Equity)	Financial	33,402.13	39,415.62	47,813.14	40,210.30	43,635.53	52,151.61	71,957.24	55,914.79
Total Debt	Financial	2,157.83	4,499.63	3,821.23	3,492.90	11,019.86	10,758.80	7,389.32	9,722.66
Net Debt	Financial	-3,119.17	765.67	-2341.2	-1,564.90	6,569.57	8,340.73	4795.36	6,568.55
Net Debt to EBITDA	Financial	-0.4	0.08	-0.18	-0.17	0.51	0.64	0.19	0.45
Total Debt to Equity	Financial	0.06	0.11	0.08	0.08	0.25	0.21	0.10	0.19
Return on Equity (RoE) (%)	Financial	13.41%	15.51%	17.77%	15.56%	17.44%	16.33%	27.48%	20.42%
Return on Capital Employed (RoCE) (%)	Financial	16.86%	19.03%	21.95%	19.28%	22.25%	21.01%	27.42%	23.56%
Net Working Capital (in days)	Financial	38.69	85.35	94.04	NA	56.80	67.87	47.99	NA
Gross Block	Financial	11,183.35	11,619.41	NA	NA	23,876.20	25,443.98	NA	NA
Fixed Asset Turnover	Financial	0.18	0.16	NA	NA	0.3	0.31	NA	NA
Employee count	Operational	8,796	8,320	8,879	8,665	17,735	16,157	14,432	16,108

Metric	Operational/ Financial	H.G. Infra Engineering Limited				ITD Cementation India Limited			
		FY22	FY23	FY24	3 year average	FY22	FY23	FY24	3 year average
Order Book	Operational	79,729.00	1,25,953.00	1,24,340.00	1,10,007.33	1,55,500.00	2,00,440.00	1,99,180.00	1,85,040.00
HAM	Operational	43,850.95	56,678.85	49,663.00	50,064.27	NA	NA	NA	NA
Third Party	Operational	35,878.05	69,274.15	74,677.00	59,943.07	NA	NA	NA	NA
Revenue from Operations	Financial	36,151.95	44,185.36	51,217.44	43,851.58	32,495.00	46,749.00	75,421.15	51,555.05
Book-to- Bill Ratio (x)	Operational	2.21	2.85	2.43	2.50	4.79	4.29	2.64	3.91
EBITDA	Financial	5,847.43	7,103.03	9,413.13	7,454.53	3,007.09	4,201.71	7,960.25	5,056.35
EBITDA Margin (%)	Financial	16.17%	16.08%	18.38%	16.88%	9.25%	8.99%	10.55%	9.60%
Profit after Tax ("PAT")	Financial	3,387.60	4,213.83	5,454.88	4,352.10	688	1,243.00	2,737.38	1,556.13
PAT Margin (%)	Financial	9.37%	9.54%	10.65%	9.85%	2.12%	2.66%	3.63%	2.80%
Cash Profit Margin (%)	Financial	11.70%	11.67%	13.37%	12.25%	5.02%	4.95%	6.30%	5.42%
Net Worth (Total Equity)	Financial	13,643.43	17,784.35	23,184.93	18,204.24	11,311.96	12,375.32	14,937.32	12,874.87
Total Debt	Financial	3,146.55	5,036.67	4,512.07	4,231.76	5152	7247	8620.301	7,006.43
Net Debt	Financial	1,561.56	3,243.00	3,438.37	2,747.64	1,404.89	1,804.27	2,841.71	2,016.96
Net Debt to EBITDA	Financial	0.27	0.46	0.48	0.40	0.47	0.43	0.36	0.42
Total Debt to Equity	Financial	0.23	0.28	0.19	0.23	0.46	0.59	0.58	0.54
Return on Equity (RoE) (%)	Financial	24.83%	23.69%	23.53%	24.02%	6.08%	10.04%	18.33%	11.48%
Return on Capital Employed (RoCE) (%)	Financial	33.09%	30.83%	31.22%	31.71%	16.65%	22.90%	34.82%	24.79%
Net Working Capital (in days)	Financial	36.59	25.67	15.73	NA	-2.52	-2.65	-4.10	NA
Gross Block	Financial	8,077.28	10,336.00	NA	NA	8,754.34	11,647.38	NA	NA
Fixed Asset Turnover	Financial	0.22	0.23	NA	NA	0.27	0.25	NA	NA
Employee count	Operational	1,866	4,034	NA	NA	6,088	14,545	NA	NA

- CIL is one of the fastest-growing engineering, procurement and construction company (EPC) in terms of 3-Year Revenue CAGR as of Fiscal 2024 among the companies with a turnover of over Rs. 10,000 million in Fiscal 2024. It achieved one of the highest year-on-year revenue growth of around 43.10% in FY24. It has demonstrated a strong CAGR of approximately 50.13% between Fiscal 2021 and 2024, far surpassing the peer average of 21.99%. This strong growth can be attributed to a substantial increase in the order book, as reflected in the book-to-bill ratio comparison where Ceigall India Limited outperformed with a ratio of 3.12x for FY24, while the peer average stood at about 2.58x.

Revenue from Operations	Units	FY21	FY22	FY23	FY24	3 Year CAGR (FY21-FY24)
J. Kumar Infraprojects	Million	25,708.00	35,272.00	42,031.00	48,792.05	23.81%
ITD Cementation India Limited	Million	22,083.00	32,495.00	46,749.00	75,421.15	50.60%
G R Infraprojects Limited	Million	72,444.55	79,191.75	81,475.88	77,879.64	2.44%
H.G. Infra Engineering Limited	Million	25,349.70	36,151.95	44,185.36	51,217.44	26.42%
KNR Constructions Limited	Million	27,026.29	32,725.92	37,437.96	40,909.78	14.82%
PNC Infratech Limited	Million	49,254.19	63,055.03	70,608.40	72,723.45	13.87%
Peer Average						**21.99%**
Ceigall India Limited	Million	8,732.02	11,306.44	20,653.44	29,547.48	50.13%

- Ceigall India Limited recorded a consistent growth in book-to-bill ratio since FY22, which is quite high as compared to the peer average of 3.00x, thereby indicating a healthy pipeline of projects and good revenue visibility for the coming years. This indicates good new order inflow and project execution pace in the past few years.
- For FY24, the operating profit margin of the peers has been in the range of 10.00% to 18.00% and, the margin declined gradually from 16.55% in FY22 to 14.84% in FY24 for Ceigall India Limited.
- On account of efficient utilization of resources and low working capital cycle, effective control over operational expenses, strategic management policies like the low emphasis on fixed assets, and priority to buy the back model of assets, the company has been able to generate a better return ratio as compared to peers, i.e., ROCE and ROE, for the last three Fiscals (Average) at a rate of 30.37% and 32.14%, respectively.
- Ceigall has an average fixed asset turnover ratio of 0.15, which is better than most of the peers. Ceigall has been able to generate more revenue per rupee of investment in fixed assets as compared to peers. It is crucial to recognize that EPC players, due to their operational approach, maintain a relatively lower gross block. This is because post completion of the construction they are immediately handed over to the project awarding authority. Consequently, their investment in fixed assets is minimal, as it is covered by the project awarding authority at various stages of project completion. On the other hand, players who build projects on their own books invest heavily to fund the projects.

11. Key Performance Indicators (Consolidated Performance)

Table 25: KPIs Comparison

Metric	Operational/ Financial	Ceigall India Ltd			KNR Constructions Limited			J. Kumar Infraprojects		
		FY22	FY23	FY24	FY22	FY23	FY24	FY22	FY23	FY24
Order Book	Operational	63,461.30	1,08,090.43	92,257.78	90,008.00	88,721.00	53,048.00	1,19,360.00	1,18,540.00	2,10,110.00
-HAM	Operational	27,118.70	61,818.90	30,302.64	40,503.60	44,360.50	20,688.72	NA	NA	NA
-Third Party	Operational	36,342.60	46,271.53	61,955.14	49,504.40	44,360.50	32,359.28	NA	NA	NA
Revenue from Operations	Financial	11,337.88	20,681.68	30,293.52	36,058.22	40,623.60	44,294.86	35,272.00	42,031.43	48,792.05
Book-to- Bill Ratio (x)	Operational	5.60	5.23	3.05	2.50	2.18	1.20	3.38	2.82	4.31
EBITDA	Financial	1,859.15	2,956.29	5,176.62	7,986.55	9,173.14	10,662.74	5,294.55	6,275.08	7,040.62
EBITDA Margin (%)	Financial	16.40%	14.29%	17.09%	22.15%	22.58%	24.07%	15.01%	14.93%	14.43%
Profit after Tax ("PAT")	Financial	1,258.61	1,672.72	3,043.07	3,663.93	4,394.09	7,337.78	2,058.77	2,743.91	3,307.69
PAT Margin (%)	Financial	11.10%	8.09%	10.05%	10.16%	10.82%	16.57%	5.84%	6.53%	6.78%
Cash Profit Margin (%)	Financial	12.60%	9.82%	11.72%	14.55%	15.13%	19.47%	9.93%	10.14%	10.12%
Net Worth (Total Equity)	Financial	4,312.51	5,930.62	9,064.13	25,591.52	27,478.28	34,976.74	20,866.50	23,397.28	26,440.93
Total Debt	Financial	3,163.09	7,000.98	10,611.21	14,571.24	6,464.00	12,582.21	4,312.01	5,163.72	5,759.88
Net Debt	Financial	1,242.01	3,393.87	6,930.57	11,979.29	4,262.02	9,018.41	576.96	1,398.45	4,728.06
Net Debt to EBITDA	Financial	0.67	1.15	1.34	1.50	0.46	0.85	0.11	0.22	0.65
Total Debt to Equity	Financial	0.73	1.18	1.17	0.06	0.02	0	0.21	0.22	0.22
Return on Equity (RoE) (%)	Financial	29.19%	28.20%	33.57%	14.31%	16.00%	20.98%	9.87%	11.73%	12.51%
Return on Capital Employed (RoCE) (%)	Financial	29.84%	28.67%	31.98%	17.73%	25.48%	17.85%	17.14%	18.62%	15.37%
Net Working Capital (in days)	Financial	12	7	8	336	400	NA	52.27	63.09	NA
Gross Block	Financial	1,884.92	3,422.15	4,256.78	15,269.43	16,402.24	NA	14,809.86	17,242.57	NA
Fixed Asset Turnover	Financial	0.17	0.17	0.14	0.42	0.40	NA	0.42	0.41	NA
Employee count	Operational	1,138	1,899	2,256	5,613	5,712	2,456	7,021	7,434	7400+

Note:

- The aforementioned figures are in Rs. Million.

Metric	Operational/ Financial	PNC Infratech Limited			G R Infraprojects Limited		
		FY22	FY23	FY24	FY22	FY23	FY24
Order Book	Operational	146,630.00	156,760.00	1,54,900.00	131,039.00	195,290.00	1,67,806.00
-HAM	Operational	NA	NA	NA	52,415.60	66,398.60	NA
-Third Party	Operational	NA	NA	NA	78,623.40	128,891.40	NA
Revenue from operations	Financial	72,080.36	79,560.83	86,498.68	84,583.48	94,815.15	89,801.50
Book to Bill Ratio (x)	Operational	2.03	1.97	1.79	1.55	2.06	1.87
EBITDA	Financial	15,344.74	16,000.48	20,045.29	17,354.43	25,537.02	24,350.38
EBITDA Margin (%)	Financial	21.29%	20.11%	23.17%	20.52%	26.93%	27.12%
Profit after tax ("PAT")	Financial	5,804.30	6,584.51	9,094.21	8,319.14	14,544.27	13,229.66
PAT Margin (%)	Financial	8.05%	8.28%	10.51%	9.84%	15.34%	14.73%
Cash Profit Margin (%)	Financial	13.30%	11.34%	12.44%	13.06%	17.77%	17.25%
Net Worth (Total Equity)	Financial	36,278.72	42,850.43	51,848.20	48,108.67	62,651.34	75,201.93
Total Debt	Financial	47,788.37	62,713.30	80,164.58	52,505.36	56,789.77	38,027.61
Net Debt	Financial	40,315.40	55,649.80	70,148.22	41,558.02	48,996.78	32,688.88
Net Debt to EBITDA	Financial	2.63	3.48	3.50	2.39	1.92	1.34
Total Debt to Equity	Financial	0.13	0.15	1.55	0.11	0.09	0.53
Return on Equity (RoE) (%)	Financial	15.99%	15.37%	17.54%	17.29%	23.21%	17.40%
Return on Capital Employed (RoCE) (%)	Financial	23.77%	13.30%	11.75%	15.93%	20.71%	24.87%
Net Working Capital (in days)	Financial	36	428	314	420	290	NA
Gross Block	Financial	11,287.71	11,729.81	NA	23,876.20	25,443.98	NA
Fixed Asset Turnover	Financial	0.16	0.15	NA	0.28	0.27	NA
Employee count	Operational	8,796	8,320	8,879	17,735	16,157	14,432

Note:

- The aforementioned figures are in Rs. Million.

Metric	Operational/ Financial	H.G. Infra Engineering Limited			ITD Cementation India Limited		
		FY22	FY23	FY24	FY22	FY23	FY24
Order Book	Operational	79,729.00	125,953.00	1,24,340.00	155,500.00	200,440.00	1,99,180.00
-HAM	Operational	43,850.95	56,678.85	49,663.00	NA	NA	NA
-Third Party	Operational	35,878.05	69,274.15	74,677.00	NA	NA	NA
Revenue from operations	Financial	37,514.31	46,220.08	53,784.79	38,090.17	50,909.11	77,178.73
Book to Bill Ratio (x)	Operational	2.13	2.73	2.31	4.08	3.94	2.58
EBITDA	Financial	7,101.02	8,953.66	10,799.51	3,379.10	4,627.79	8,089.13
EBITDA Margin (%)	Financial	18.93%	19.37%	20.08%	8.87%	9.09%	9.86%
Profit after tax ("PAT")	Financial	3,800.36	4,931.91	5,385.86	693.41	1,247.28	2,741.85
PAT Margin (%)	Financial	10.13%	10.67%	10.01%	1.82%	2.45%	3.55%
Cash Profit Margin (%)	Financial	12.37%	12.71%	12.60%	4.50%	4.65%	6.21%
Net Worth (Total Equity)	Financial	14,359.75	19,218.75	24,550.31	11,346.71	12,414.88	14,981.35
Total Debt	Financial	11,832.39	19,067.51	15,044.20	5,151.06	7,247.41	8,620.30
Net Debt	Financial	(4617.11)	(7978.49)	13891.3	236.11	951.60	2532.55
Net Debt to EBITDA	Financial	(0.65)	(0.89)	1.27	0.07	0.21	0.33
Total Debt to Equity	Financial	0.08	0.10	0.61	0.45	0.58	0.58
Return on Equity (RoE) (%)	Financial	26.46%	25.66%	21.94%	6.11%	10.14%	18.30%
Return on Capital Employed (RoCE) (%)	Financial	25.98%	23.60%	20.57%	18.23%	23.62%	28.87%
Net Working Capital (in days)	Financial	224	149	NA	(3)	(3)	NA
Gross Block	Financial	8,083	10,339	NA	9,495.00	12,229.00	NA
Fixed Asset Turnover	Financial	0.22	0.22	NA	0.25	0.24	NA
Employee count	Operational	1,866	4,034	NA	6,088	14,545	NA

Note: The aforementioned figures are in Rs. Million.

Table 26: KPI Formulas

Metric	Formula
Order Book	Order Book represents the estimated contract value of the unexecuted portion of existing assigned EPC contracts and is an indicator of visibility of future revenue for the Company
HAM Order Book	HAM order Book means an unexecuted portion of a captive order where an EPC contract is entered into by project SPVs
Third-Party Orderbook	Third-party orderbook means all the unexecuted orders other than HAM projects executed
Book-to-Bill Ratio (x)	Book-to-Bill Ratio is calculated as the Order Book at a particular period divided by the Revenue from operations for that period
EBITDA	EBITDA is calculated as Restated profit before exceptional items and tax minus Other Income plus Finance Costs, Depreciation and amortisation expense.
EBITDA Margin (%)	EBITDA Margin (%) is the percentage of EBITDA divided by Revenue from Operations.
PAT Margin (%)	PAT Margin (%) is calculated as Restated profit (after tax) for the period/year as a % of Revenue from Operations.
Cash Profit Margin %	Cash Profit is calculated as PAT plus depreciation/amortization expense. Cash Profit Margin is calculated as Cash Profit as a % of Total Income
Net Worth (Total Equity)	Net worth has been defined as the aggregate value of the paid-up equity share capital and all reserves created out of the profits and securities premium account and debit or credit balance of profit and loss account, after deducting the aggregate value of the accumulated losses, deferred expenditure and miscellaneous expenditure not written off, as per the audited balance sheet, but does not include reserves created out of revaluation of assets, write-back of depreciation and amalgamation as on March 31, 2020; 2021, 2022 and December 31, 2022 in accordance with Regulation 2(1)(hh) of the SEBI ICDR Regulations, as amended. It includes NCI.
Total Debt	Total Debt is computed as Non-Current Borrowings plus Current Borrowings.
Net Debt	Total Debt minus cash and cash equivalents, bank balances other than cash and cash equivalents (including bank balances in margin money and DSRA Account).
Net Debt to EBITDA Ratio	Calculated as Net Debt divided by EBITDA.
Total Debt to Equity Ratio (Gearing Ratio)	Calculated as Total Debt divided by Total Equity.
Return on Equity (RoE) (%)	ROE is calculated as PAT as a % of Total Equity.
Return on Capital Employed (RoCE) (%)	ROCE is calculated as EBIT as a % of Capital employed wherein capital employed refers to the difference of Total Assets and Current Liabilities.

Net Working Capital (in days)	Net Working Capital (in days) is calculated as (Inventory Day + Debtor's Day - Payable day) While calculating Net working capital inventory days , debtor days and payable days following formula is used 1) Inventory days – 365/Inventory Turnover ratio ((Raw material consumed + Construction costs)/Average inventory) 2) Debtor Days -365/Debtors Turnover ratio (Revenue from Operations/Average Debtors) 3) Payable days -365/Payable Turnover ratio ((Raw material consumed + Construction costs)/Average payables)
Fixed Asset Turnover	Fixed Asset Turnover is calculated as Gross Block as a % of Revenue from Operations
Employee count	Employee means Permanent employee on the rolls of the company

Table 27: KPI Explanation

Metric	Explanation for the KPI
Order Book	Order Book represents the estimated contract value of the unexecuted portion of our existing assigned EPC contracts and is an indicator of visibility of future revenue for the Company
HAM Order Book	HAM Order book represents the estimated unexecuted contract value from HAM projects and is an indicator of visibility of future revenue from special purpose vehicle entities created for executing HAM Projects, i.e., related party entities.
Third-Party Orderbook	Third Party Orderbook as the name suggest represents estimated unexecuted contract value from a third party, it is an indicator of visibility of future revenue from third-party customers.
Book-to-Bill Ratio (x)	Book-to-Bill Ratio is an indicator of the size of the order book as of a particular period to the revenue generated for that period
Order Inflow	Order Inflow represents the number of orders won for a particular period
Revenue from operations	Revenue from operations represents the scale of our business as well as provides information regarding our overall financial performance
EBITDA	EBITDA provides a comprehensive view of our financial health. It facilitates evaluation of the year-on-year performance of our business and excludes other income.
EBITDA Margin (%)	EBITDA Margin (%) is an indicator of the profitability of our business and assists in tracking the margin profile of our business and our historical performance, and provides financial benchmarking against peers.
Restated profit for the period/year after tax ("PAT")	PAT represents the profit/loss that we make for the financial year or during a given period. It provides information regarding the overall profitability of our business.
PAT Margin (%)	PAT Margin (%) is an indicator of the overall profitability of our business and provides financial benchmarking against peers as well as to compare against the historical performance of our business.

Cash Profit Margin (%)	Cash Profit is an indicator of the profitability of the business ex-depreciation and amortization expenses. Cash Profit Margin provides the financial benchmarking against peers as well as compares against the historical performance of our business.
Net Worth (Total Equity)	Net Worth is an indicator of our financial standing/ position as of a certain date. Net Worth is also known as Book Value or Shareholders' Equity.
Total Debt	Total Debt is a financial position metric and it represents the absolute value of borrowings
Net Debt	Net Debt is a liquidity metric and it represents the absolute value of borrowings net of cash and cash equivalents, bank balances and other cash and cash equivalents and current investments in the company.
Net Debt to EBITDA	Net Debt to EBITDA ratio enables us to measure the ability and extent to which we can cover our debt in comparison to the EBITDA being generated by us.
Total Debt to Equity	The total Debt to Equity Ratio is a measure of the extent to which our Company can cover our debt and represents our debt position in comparison to our equity position. It helps evaluate our financial leverage.
Return on Equity (RoE) (%)	Return on Equity represents how efficiently we generate profits from our shareholders' funds.
Return on Capital Employed (RoCE) (%)	Return on Capital Employed represents how efficiently we generate earnings before interest & tax from the capital employed.
Net Working Capital (in days)	Net Working Capital Days describes the duration it takes for us to convert our working capital into revenue
Gross Block	Gross block represents the total worth of all the assets currently employed in the business
Fixed Asset Turnover	Fixed Asset Turnover is a measure of our efficiency in utilizing assets to generate revenue
Employee count	Employee count shows Employees strength of the company

12. Abbreviations

Abbreivations	Full form		Abbreivations	Full form
AAI	Airports Authority of India		MoRTH	Ministry of Road Transport & Highways
ACI	Airports International Council		MRO	Maintenance, Repair and Overhaul
AMRUT	Atal Mission for Rejuvenation and Urban Transformation		NEC	North Eastern Council
ATC	air traffic control		NHAI	National Highways Authority of India
BOT	Build Operate and Transfer		NHIDCL	National Highways and Infrastructure Development Corporation

BOT	build-operate-transfer		NHIT	National Highways Infra Trust
BPC	Bid Project Cost		NHs	National Highways
CCEA	Cabinet Committee on Economic Affairs		NHSRCL	National High-Speed Rail Corporation Limited
COD	Commercial Operation Date		NIP	National Infrastructure Pipeline
CRIF	Central Road and Infrastructure Fund		NMP	National Monetization Pipeline
CWC	Central Water Commission		NPA	non-performing assets
DBFO	Design-Build-Finance-Operate		NQMs	National Quality Monitors
DFI	Development Finance Institution		NRP	National Rail Plan
DLF	Defect Liability Period		O&M	operation and maintenance
DPIIT	Department for Promotion of Industry and Internal Trade		OMD	Operate-Maintain-Develop
EPC	Engineering, Procurement and Construction		PLI	Production-linked Incentive
FDI	Foreign Direct Investment		PMAY	Pradhan Mantri Awaas Yojna
GDP	Gross Domestic Product		PMGKAY	Pradhan Mantri Garib Kalyan Anna Yojna
GFCF	Gross Fixed Capital Formation		PPP	Purchasing Power Parity
GMIS	Geospatial Management Information System		PPPs	Public-Private Partnerships
GoI	Government of India		PRS	Polluted River Stretches
GVA	Gross Value Added		PWD	Public Works Department
HAM	Hybrid Annuity Model		RAP	Recycled Asphalt Pavement
HPS	High-Performance Steel		RDC	Road Development Corporation
ICT	information and communications technology		RRTS	regional rapid transit systems
IMD	Indian Meteorological Department		SAAPs	State Annual Action Plans
InvITs	Investment Infrastructure Trusts		SCM	Smart Cities Mission
JICA	Japan International Cooperation Agency		SPVs	Special Purpose Vehicles
MAHSR	Mumbai-Ahmedabad High-Speed Rail		SRMs	Secondary Raw Materials
MCA	Model Concession Agreement		TOT	Toll Operate Transfer
MLD	Million Litres per Day		UDAN	Ude Desh ka Aam Naagrik
MoCA	Ministry of Civil Aviation		USBRL	The Baramulla Rail Link
MoHUA	Ministry of Housing and Urban Affairs		WSS	Water Supply and Sanitation

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