

National Infrastructure Pipeline



Government Of India

Report of the Task Force
Department of Economic Affairs
Ministry of Finance
Government of India



PM's vision for infrastructure

In his Independence Day speech 2019, Prime Minister Narendra Modi highlighted that

Rs 100 lakh crore would be invested on infrastructure over the next 5 years

Emphasis on ease of living: Safe drinking water, access to clean and affordable energy, healthcare for all, modern railway stations, airports, bus terminals and world-class educational institutes



Task Force constitution and terms of reference



Secretary, Department of Economic Affairs (DEA), Ministry of Finance (MoF)	Chair
CEO, NITI Aayog or his nominee*	Member
Secretary, Department of Expenditure, Ministry of Finance or his nominee*	Member
Secretary of the Administrative ministry#	Member
Additional Secretary (investment), DEA, MoF	Member
Joint Secretary (Infrastructure Policy & Finance), DEA, MoF	Member - Secretary

Terms of reference of the Task Force

1. To identify technically feasible and financially/ economically viable infrastructure projects that can be initiated in fiscals 2020 to 2025
2. To estimate annual infrastructure investment/capital costs
3. To guide the ministries in identifying appropriate sources of financing
4. To suggest measures to monitor the projects so that cost and time overruns are minimised

Infrastructure Vision 2025

Meeting aspirations, propelling growth, facilitating ease of living



Affordable and clean energy

24x7 power availability;
Reduce pollution through **green and clean renewable energy** and **environment friendly** fuel for transportation



Digital services: access for all

100% population coverage for telecom and **high quality broadband services** for socio-economic empowerment of every citizen; end-to-end online delivery of government services



Quality education

World class education and research institutes, **technology-driven** learning



Convenient and efficient transportation and logistics

Enhanced **road connectivity to remotest areas** and trunk connectivity through expressways, major economic corridors, strategic areas and tourist destinations.

World-class stations and fully integrated **rail network with inter-modal connectivity to remote regions** and close to nil accidents

Air connectivity to all Tier II and most Tier III cities

Port-led development to create **new employment opportunities**, considerable reduction in **logistic cost** with quick turnaround

High standards of living for citizens by providing **metro connectivity** in at least 25 cities



Housing and water supply for all

Zero slums due to PMAY
All households to have piped water with 24X7 supply
Most **waste water recycled** and treated



Disaster-resilient standards compliant public infrastructure



Doubling farmer income

Increased **irrigation (83%)** with **storage, processing and marketing** infrastructure

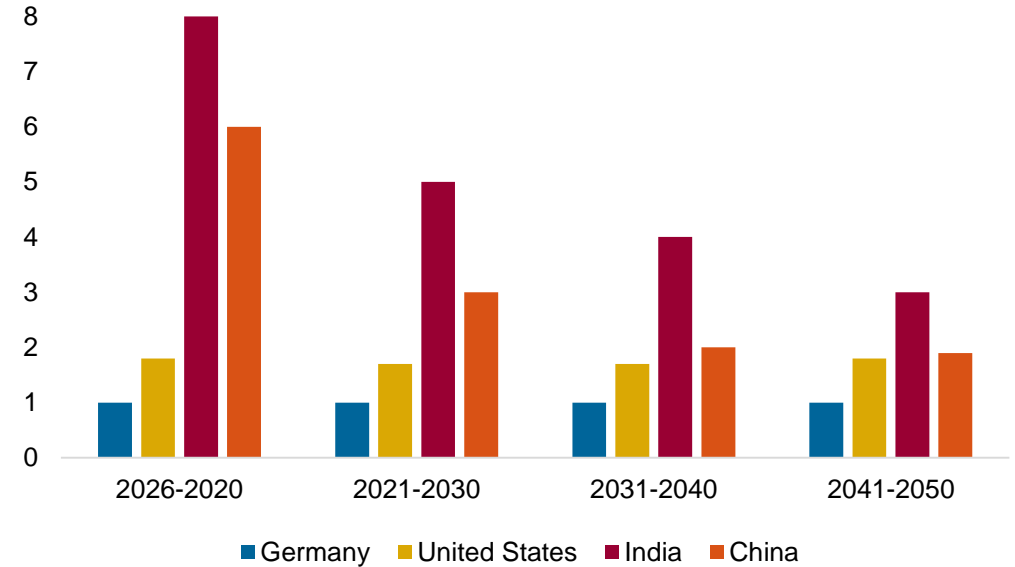
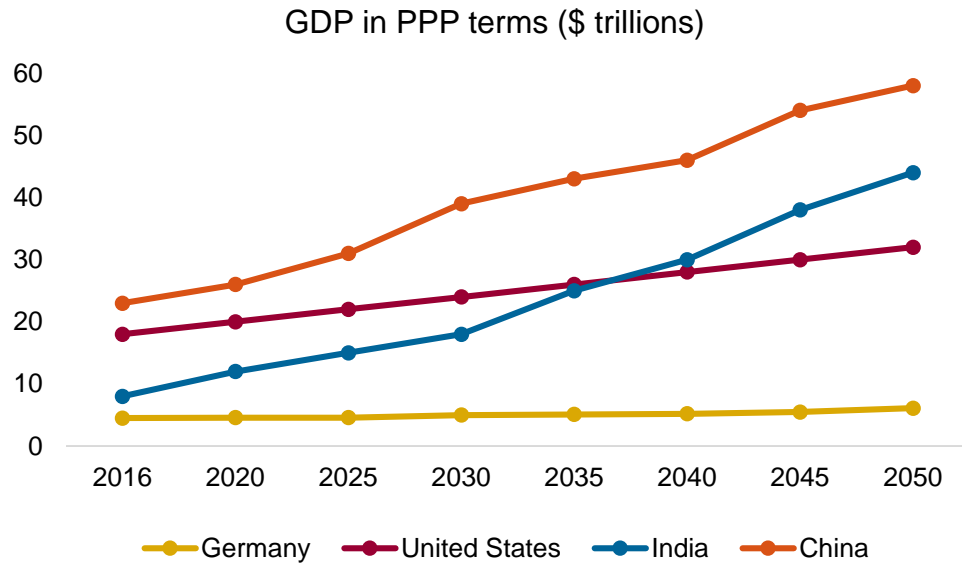


Good health and well being

Superior healthcare facilities, electronic health records infrastructure

The vision, mission and strategic goals would be towards improving the ease of living, or the physical quality of life for each individual in the country. These goals would eventually contribute to the SDG 2030 agenda to which India is a signatory. The investment in infrastructure would aim to achieve this through the aspirational standards set out in the following page.

World in 2050 (1/2)



Source: World in 2050, PwC

In 2050, we would have seen the human population explode to 9.2 billion and urban population to 6.5 billion. The world economy could more than double in size by 2050, far outstripping population growth. As a result, six of the seven largest economies in the world are projected to be ‘emerging economies’ in 2050 led by China (No 1), India (2) and Indonesia (4). While these changes shape the direction of the world’s growth, infrastructure requirements would be influenced by the following factors

World in 2050 (2/2)



- I. 70% of the global population will be living in urban areas, some in cities of more than 100 million people. So infrastructure will determine their quality of life.
- II. The second great challenge relates to energy. As more people demand greater levels of energy to fuel consumption, there are challenges of supply, sufficiency and sustainability. Infrastructure must support this growth, and do so responsibly.
- III. Third is the vital challenge of fresh water. Already, 20% of us lack clean drinking water and 40% lack basic sanitation. As this global divide becomes even more acute, it will drive radical changes in awareness and behaviour around water usage and management, and the energy intensity of our consumption. Infrastructure is vital in addressing this challenge.
- IV. The fourth great challenge relates to social infrastructure and the question of how we – collectively and as individuals – will finance the cost of more people, living longer, and having fewer children.

Therefore, the emerging economies need to enhance their institutions and their infrastructure significantly if they are to realise their long-term growth potential.



World in 2050 : Some complexities



Complexities of infrastructure development need to be understood in order that the support frameworks are sensitive to these needs:

- I. Lack of infrastructure is the primary *constraint on economic growth*.
- II. Lead times associated with infrastructure development mean that *decisions taken now will shape the world of the future*.
- III. Increasingly, therefore, government looks to the *private sector as a partner*. Effective models for co-working between the public and private spheres need to be devised.
- IV. Governments and businesses must make vital strategic decisions now, and *promote changes in behaviour*, before the speed and severity of climate change are fully known.
- V. An increase in natural disasters or unpredictable events will test the *resilience of infrastructure*, not just in terms of reconstruction, but also in terms of disruption to supply chains.
- VI. New technologies, like high-speed broadband, are already part of infrastructure thinking. *Innovations*, such as Internet of Things (IoT) and Artificial Intelligence, will make infrastructure more efficient and sustainable
- VII. *Financing of infrastructure* of the needed scale is the issue for which solutions would have to be found.

Growth and infrastructure in India



Infrastructure is a crucial enabler of growth. We expect India's GDP to recover in the five years beginning fiscal 2021 (2020-21 to 2024-25). The growth will be supported by the following factors:

- With the clean-up of financial sector balance sheets, institutions will be in a much better position to provide credit
- Corporate tax cuts in 2019 is allowing the companies to de-leverage faster and they will be primed up for undertaking investments when the economy cycle turns.
- Payoff from reforms such as the Goods and Services Tax (GST) and the Insolvency and Bankruptcy Code, 2016 (IBC) are work in progress and once streamlined they will create possibility of an 'efficiency led' spurt of growth over the medium run.
- Capacity utilisation is bound to improve with rising population and result in revival of the investment cycle.
- Infrastructure thrust by the Government of India through creating the National Infrastructure Pipeline.

Infrastructure development critical for boosting growth prospects

For faster growth to meet the target of \$5 trillion economy by 2025, more supply-side reforms are needed. Creating new and upgrading existing infrastructure will be key to raising India's competitiveness and achieving this target. It will specially be critical for the success of 'Make in India' program as manufacturing competitiveness critically depends on infrastructure. The supply additions through infrastructure development boost short-term as well as the potential rate of GDP growth. Infrastructure creation is also labour absorbing, which boosts employment and income generation in the economy and further spurs domestic demand. Improved infrastructure capacities also create efficiency gains through improved logistics and networks, which would improve the competitiveness of the economy. This can help kick in a virtuous cycle of higher investments, growth and employment generation in the economy.

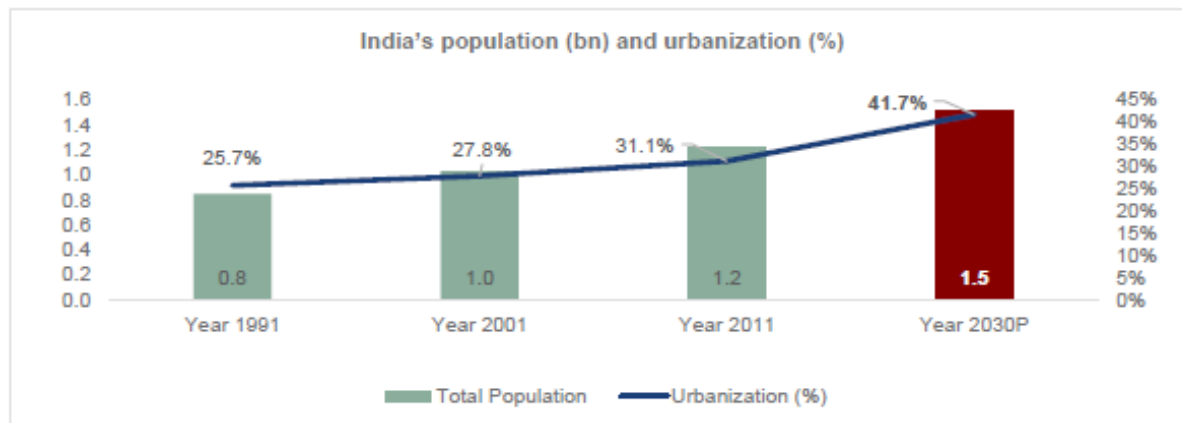
India 2030: demographic changes and infrastructure needs (1/6)

Economic growth will be accompanied by shift in the underlying demographics. There will be an increasing trend of urbanisation, a peaking of the population in the working age group, and a larger share of this population will be employed in the services sector.

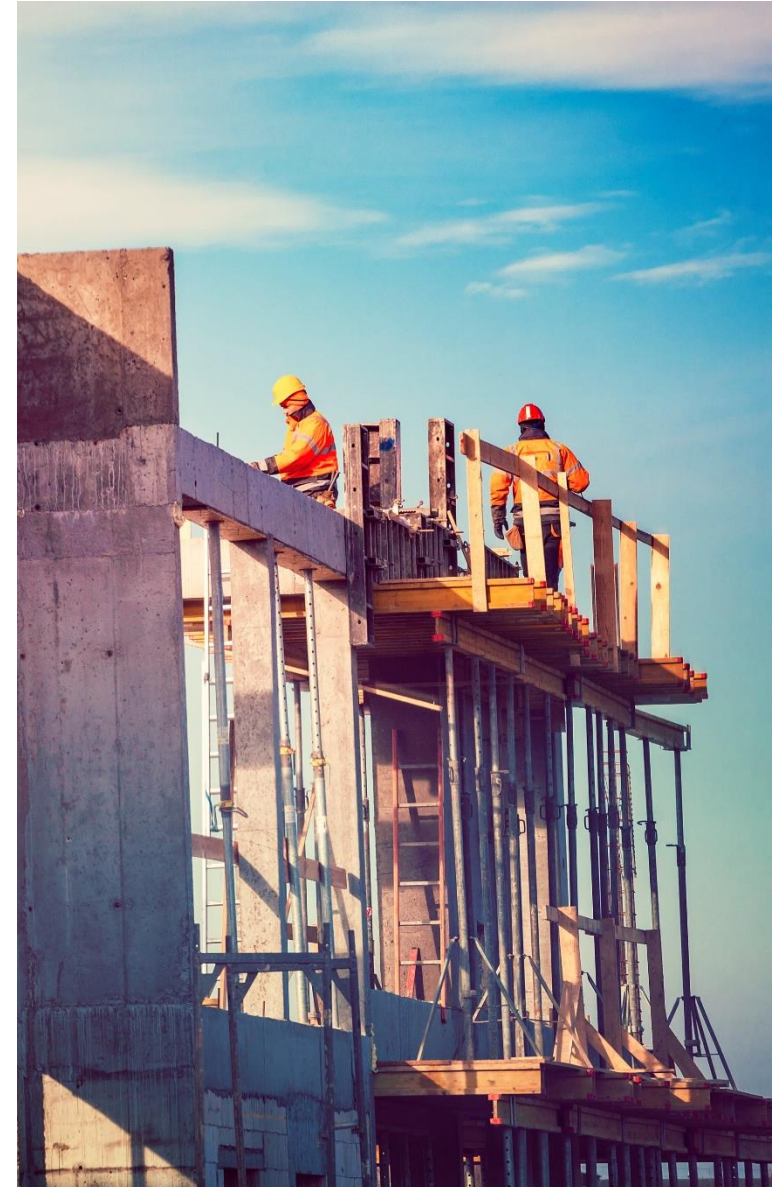
Increasing urbanisation

According to World Bank data, India's population has increased at a compound annual growth rate of 1.2% during calendar years 2011 to 2017, and is expected to reach 1.52 billion by 2030. In the last decade, urban population in India has increased at an annual rate of 2.4%. By 2030, it is estimated that around 42% of India's population would be urbanised from the current 31%.

Trend in India's population and urbanisation



Source: CRIS Estimates, McKinsey Global Institute, P - Projected

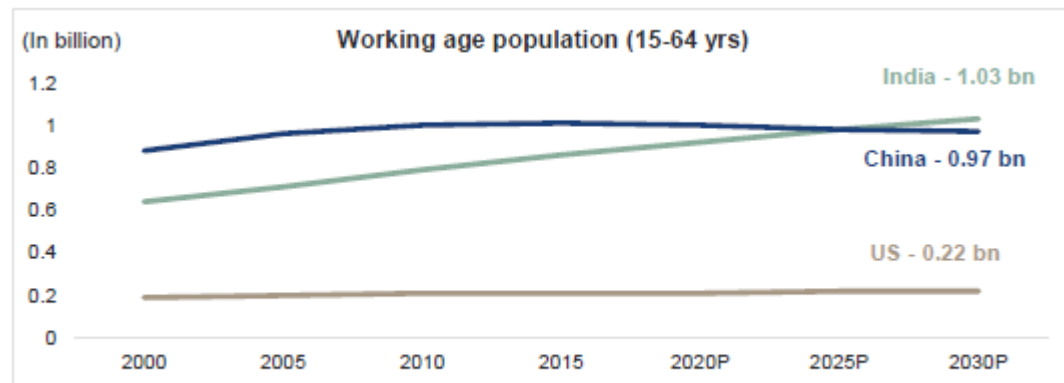


India 2030: demographic changes and infrastructure needs (2/6)

By 2030, it is estimated that 5 states – Tamil Nadu, Gujarat, Maharashtra, Karnataka and Punjab – will have >50% urbanisation. Also, the number of metropolitan cities in India is estimated to increase from 46 as per 2011 census to 68 in 2030.

Plugging the deficiency in infrastructure will smoothen the process of urbanisation by promoting ease of living and facilitating economic activity. It will thus help in realizing the full potential of growing urban economy and raise its contribution to GDP.

Growing working-age population



Source: United Nations Population Division (UNDP)

Working age population is defined as the number of people in the age bracket 15 to 64 and is considered as a basic indicator for employment. The chart above shows the expected growth in the working-age population of India, compared with other countries such as the US and China over the past few years.

It is expected that the working-age population of India will grow ~1.2x times during 2015-2030. India is expected to have the world's largest working-age population of 1.03 billion (~68%) by 2030 compared with 0.97 billion in China and 0.22 billion in the US. By 2030, India will have a median age of 31 years versus 43 years for China and 40 years for the US. This will be an important growth booster.

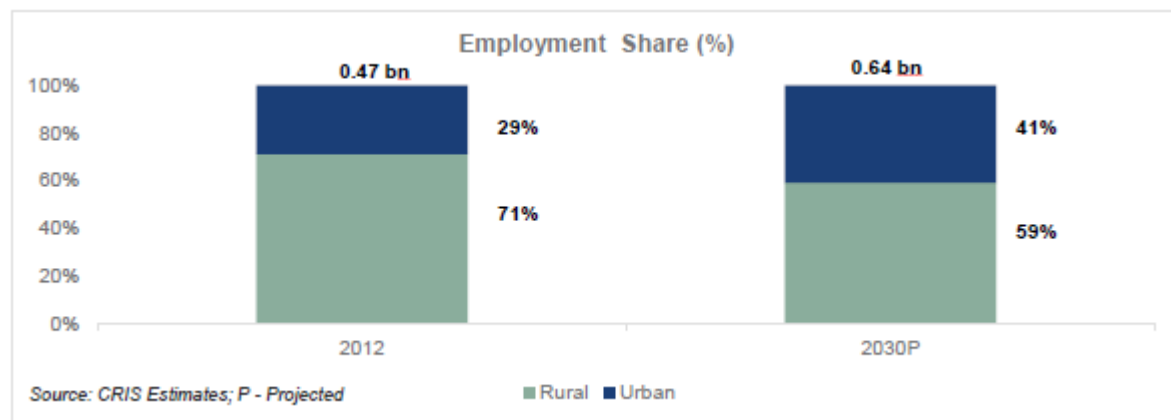
India 2030: demographic changes and infrastructure needs (3/6)



Contribution to employment

As per the NSSO survey conducted in 2011-12, India had a total workforce of 0.47 billion out of which, 0.34 billion are employed in the rural areas and 0.14 billion are employed in urban areas. The chart below shows the contribution of urban and rural areas to total employment in India.

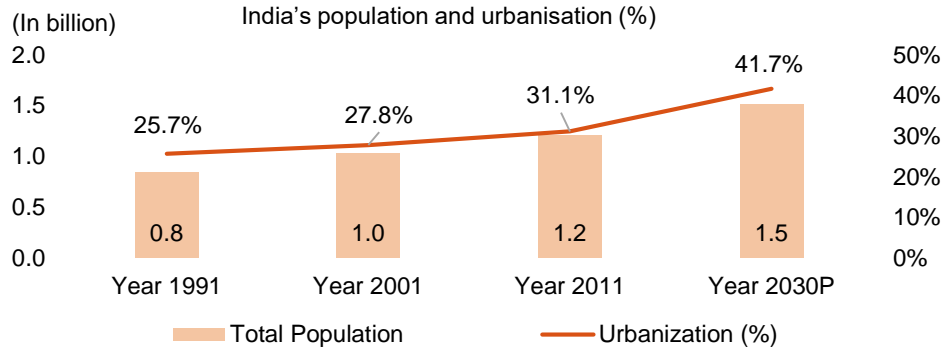
Contribution of urban and rural areas to total employment in India



It is estimated that India's total workforce will reach 0.64 billion by 2030, out of which 0.38 billion will be employed in the rural areas and 0.26 billion will be employed in the urban areas. Contribution of urban areas in total employment will increase at a higher rate than the contribution of rural areas during the period 2018-30. The proportion of urban areas in total employment will increase from 29% in 2012 to 41% in 2030 while that of the rural areas will decrease from 71% in 2012 to 59% in 2030.

India 2030: demographic trends and infra needs (4/6)

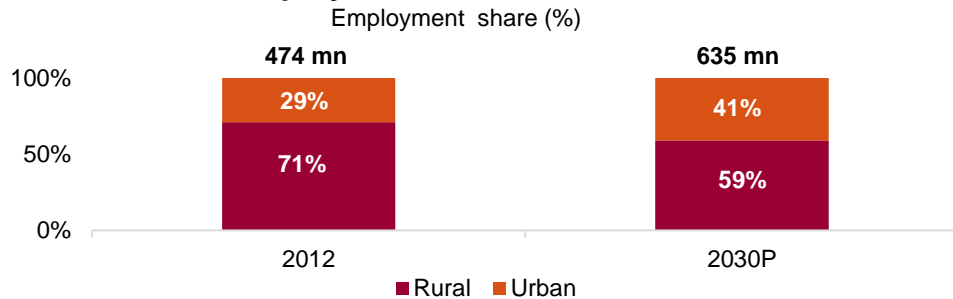
Increasing urbanisation



Source: CRIS Estimates, McKinsey Global Institute, P - Projected

- Metropolitan cities in India to increase from **46** in 2011 to **68** in 2030

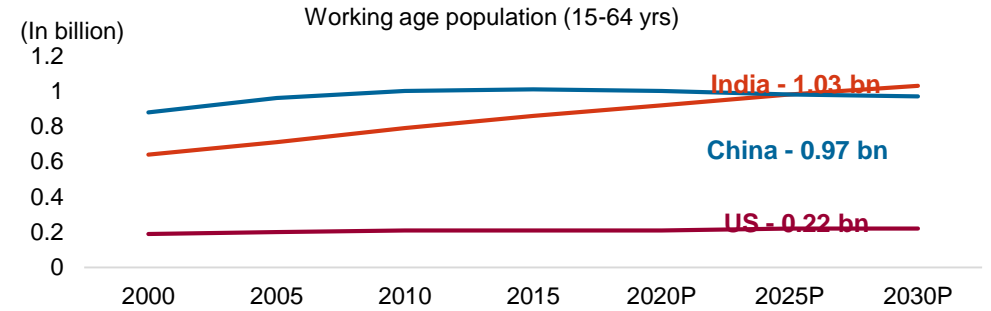
Contribution to employment



Source: CRIS Estimates; P - Projected

- Share of urban in total employment is estimated to gradually increase by 2030

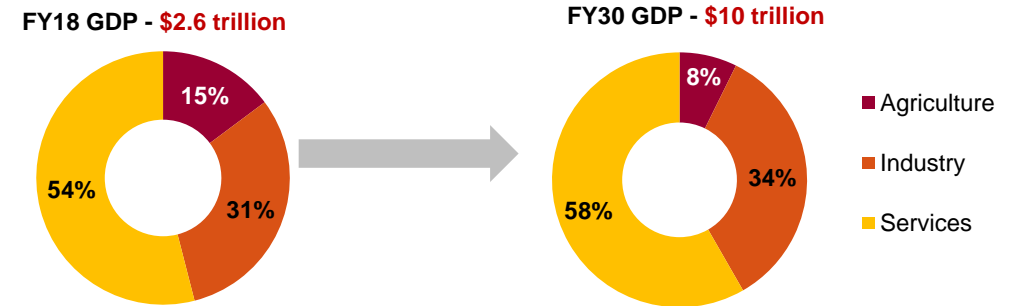
Growing working-age population



Source: United Nations Population Division (UNDP)

- India to have **world's largest working age population** by 2030, with a median age of **31 yrs** versus **China (43 yrs)** and **USA (40 yrs)**

Shift to service-based economy



Source: CRIS Estimates

- India's shift from an agrarian economy to a **service-centric economy** is **expected to continue**

India 2030: demographic changes and infrastructure needs (5/6)



Shift to services-based economy

As seen above in the share of sectors in overall employment in India, a similar trend is observed in the contribution of these sectors to the overall GDP of India. As of 2018, India's GDP was \$2.6 trillion with services having a 54% share, industry 31%, and agriculture 15%. By 2030, the services sector is estimated to have a share of 58% and industry 34%, while the agriculture sector will decline to 8%.

It is estimated that the share of services in total employment in India will grow from 27% in 2012 to 48% in 2030, while that of agriculture will reduce from 49% in 2012 to 29% in 2030. The share of industry in total employment is expected to remain ~24% during the period 2012-30. These trends are reflective of India's economy gradually transitioning from an agrarian economy to a service centric economy.

Climate change and disaster resilience

Resilient infrastructure is critical for people's well-being, quality of life, and economic prospects. It is as much about water-pipes withstanding an earthquake, as it is about people having adequate and safe access to their workplaces, schools, and hospitals. At a macro level, physical infrastructure underpins the achievement of all 17 sustainable development goals (SDGs). An estimated \$94 trillion is expected to be invested in infrastructure globally in the next 25 years to sustain economic growth. Meanwhile, recent disasters indicate that up to 66% of total public sector losses in weather and climate related extreme events are related to infrastructure damage. *There is a clear need for ensuring that all new and existing infrastructure systems are climate and disaster resilient.*

Reflecting these concerns, the Government of India, in partnership with the UN Office for Disaster Risk Reduction, and in collaboration with the World Bank, the UN Development Programme and the Global Commission on Adaptation, hosted two International workshops on Disaster Resilient Infrastructure (the first and second IWDRI). The CDRI was conceived and conceptualised over 2018-19, through substantive consultations with over 35 countries including advanced economies, developing economies, small island developing countries and landlocked countries representing a range of development, climate, and disaster risk contexts. The CDRI was formally launched by the Prime Minister at the 2019 UN Climate Action Summit in September 2019.



India 2030: demographic changes and infrastructure needs (6/6)

Infrastructure needs of the changed demographics and environment

The changed demographics and environment will need the converged development of a host of infrastructure facilities. From the provision of housing, to water and sanitation services, to digital and transportation needs, there is a compelling demand for increased and improved delivery across the entire infrastructure spectrum.

Delivering the full spectrum of required infrastructure will ensure economic growth, ease of living as well as improved competitiveness across sectors.

National infrastructure vision, mission and strategic goals



To achieve the target of \$5 trillion economy by 2025, and meet the aspirations of the changing demographic profile, creating new and upgrading existing infrastructure is an imperative.



Vision

- Infrastructure services that raise the quality of life and ease of living in India to global standards



Mission

- Develop a 5-year plan of infrastructure development for India in key sectors
- Facilitate design, delivery and maintenance of public infrastructure as per global standards
- Facilitate generic and sectoral reforms in regulation and administration of public infrastructure services as per global best practice
- Push India up in global rankings in public infrastructure



Strategic goals

1. Provide a positive and enabling environment for significant private investment in infrastructure at all three levels of government
2. Design, deliver and maintain public infrastructure projects to meet efficiency, equity and inclusiveness goals
3. Design, construct and maintain public infrastructure to meet disaster resilience goals
4. Create a fast track institutional, regulatory and implementation framework for Infrastructure
5. Benchmark infrastructure performance to global best practices and standards
6. Leverage technology to enhance service standard, efficiency and safety.

Infrastructure Goals, Strategies & Standards



Goals	Strategy
Affordable and clean energy	✓ 24x7 power availability for all - reliable transmission and distribution infrastructure
Digital services access for all	✓ 100% population coverage for telecom and high quality broadband services for socio-economic empowerment of every citizen ✓ Digital payments and e-governance Infrastructure for delivery of banking and public services
Convenient and efficient transportation and logistics	✓ Enhanced road connectivity to remotest areas with extensive charging and on-road traction infrastructure for electric vehicles ✓ World-class stations and fully integrated rail network with connectivity to remote regions with focus on safety ✓ Airport and related infrastructure to enable international and regional connectivity so as to achieve passenger and cargo traffic on the vision of NCAP 2016 ✓ Port and Waterway infrastructure focused on reducing logistics time and cost for foreign and domestic trade as per the Sagarmala National Perspective Plan 2016
Housing and water supply	✓ Urban mobility – MRTS and bus connectivity within 800 metres of homes in more than 50 cities ✓ Housing for all by 2022 – PMAY; negligible slum population ✓ All households to have piped water meeting national standards by 2024
Doubling farmer income	✓ Increased irrigation and micro-irrigation coverage ✓ Integrated agro-logistics systems from farm-gate to end consumers – storage, processing and packing, transportation, market and digital infrastructure for agriculture produce
Quality education	✓ World-class educational institutes for teaching and research, technology driven learning meeting GER target of 35% by 2025 as per the draft National Education Policy, 2019
Good health and well being	✓ Superior accessible primary, secondary and tertiary healthcare infrastructure facilities across India to meet NHP 2017 goals ✓ Medical, para-medical education infrastructure meeting manpower needs by 2020 and CHVs by 2025 as per IPHS norms
Sustainable and smart cities	✓ Waste water collection, treatment/recycling to national standards in all towns across India ✓ Smart City infrastructure for mobility, entertainment, business, high quality river-front, safety and resilience
Disaster Resilience	✓ Design and construct public infrastructure to meet Disaster Resilience standards in infrastructure
Leverage technology for public good	✓ Use data generated by infrastructure services in enhancing quality, safety and efficiency of operation and maintenance of infrastructure services ✓ Leverage technology to enhance cost efficiency, access, durability and resilience of public infrastructure projects

NIP



NIP executive summary (1/8)



Global trends in infrastructure spending

As per the *Global Infrastructure Outlook 2017* published by Oxford Economics, the estimated global infrastructure investment requirement is \$94 trillion during the period 2016 and 2040. Of this, around half is required in Asia alone (primarily China, India and Japan), with roads and electricity sub-sectors constituting around ~67% of these investment needs, followed by the telecommunication, railways and water sub-sectors. Another study has estimated that while the demand of infrastructure is growing at about \$4 trillion per annum, the supply of infrastructure is growing at only \$2.7 trillion annually, leading to a deficit of about \$1-1.5 trillion on a per annum basis.

It is estimated that India would need to spend \$4.5 trillion on infrastructure by 2030 to sustain its growth rate.. The endeavour of the National Infrastructure Pipeline (NIP) would be to make this happen in an efficient manner.

Importance of infrastructure sector given the transformation in India's demographics

India's GDP growth is expected to gradually swing upwards over the next five years starting from fiscal 2020 following on the clean-up of financial sector balance sheets, reversing the deleveraging phase with corporates starting to leverage for funding capex, leading to growth and payoff from policies and reforms such as the Goods and Services Tax and the Insolvency and Bankruptcy Code 2016.

Capacity utilisation is expected to catch up resulting in an improvement in the investment cycle. It is a given that infrastructure development is a critical factor for boosting the economy, providing improved growth prospects. In order to improve India's global competitiveness, creating new and upgrading existing infrastructure will be critical along with introducing a slew of supply side reforms. Infrastructure development is labour-intensive, leading to increase in employment opportunities and thus, fuelling domestic demand. All of this together can aid in initiating a virtuous cycle of higher investments, growth and employment generation in the economy.



NIP executive summary (2/8)

The above envisaged economic growth will be accompanied by a shift in the underlying demographics of the country – increase in urbanisation levels, growing working population and an increase in the share of employed individuals in services sector in urban areas. In the last decade, India's urban population has increased at an annual rate of ~2.4%, which is expected to improve in the near future, given the focus on urban infrastructure and increase in employment opportunities in the urban areas. India's urbanisation levels are estimated to improve to ~42% in 2030 from 34% as of 2018¹. These transformed demographics will require development of a host of infrastructure facilities, thus increasing the demand for increase in coverage and quality of service delivery across the entire infrastructure spectrum.

Overcoming the deficiencies in infrastructure and improving the quality of services provided in both urban and rural areas in India will help in realising full potential of the growing urban economy, thus raising its contribution to India's GDP. Thus, focus on developing infrastructure along with achieving SDG goals and improving the living standards will lead to infrastructure investment in required areas such as redevelopment of slum neighbourhoods, urban roads, water supply coverage and quality, waste-water treatment facilities, urban mobility through public transport, etc. Further, in order to measure the performance of standard of living, NITI Aayog has designed 'The Ease of Living Index' comprising 37 measurable indicators, which takes into consideration the UN 2030 Sustainable Development Goals. The indicators in the Ease of Living Index are categorised into – Basic needs, Welfare and Human Betterment. In order to meet growth aspirations and provide improved standard of living, the infrastructure investments need to focus on the above categories of the Ease of Living Index.

¹United Nations Population Division's World Urbanisation Prospects 2018

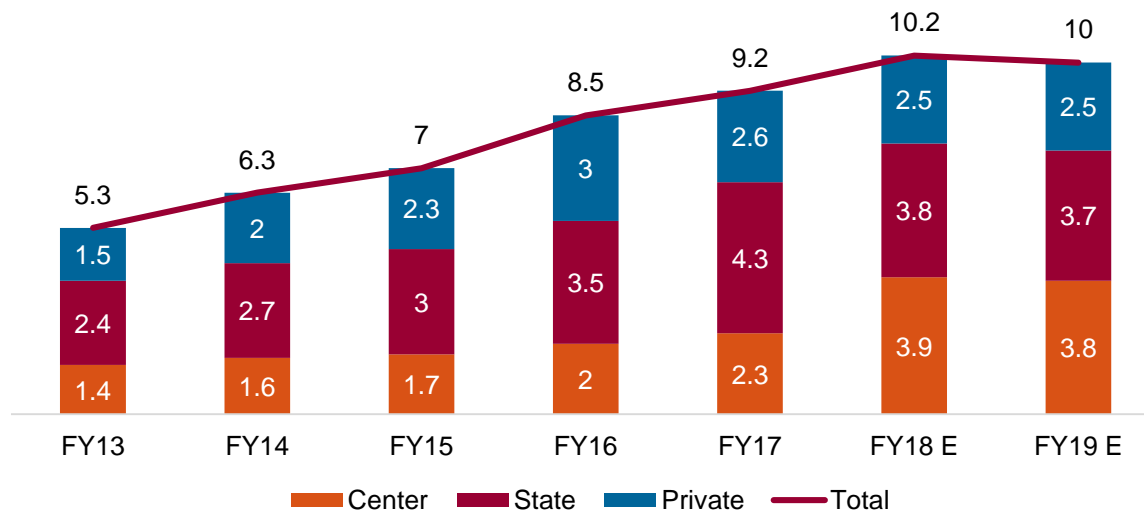
NIP executive summary (3/8)



Historical trend in infrastructure investment in India

Infrastructure investment in India during the fiscal 2008 to 2017 was estimated at ~Rs 60 lakh crore (\$1.1 trillion at average exchange rates of respective years). Infrastructure investment in the Eleventh Five-Year Plan (fiscals 2008 to 2012) was Rs 24 lakh crore and in the Twelfth Five-Year Plan (fiscals 2013 to 2017) was Rs 36 lakh crore at current prices. However, infrastructure as a proportion of GDP fell to ~5.8% during the Twelfth Five-Year Plan from ~7% during the Eleventh. As per estimates, India's infrastructure investment for fiscals 2018 and 2019 are ~Rs 10.2 lakh crore and ~Rs 10 lakh crore, respectively. During this period, infrastructure investment was predominantly made by the public sector (Centre and state governments, with a share of ~65%), while the share of private sector was ~35%.

India's infrastructure investments since fiscal 2013 (Rs lakh crore)



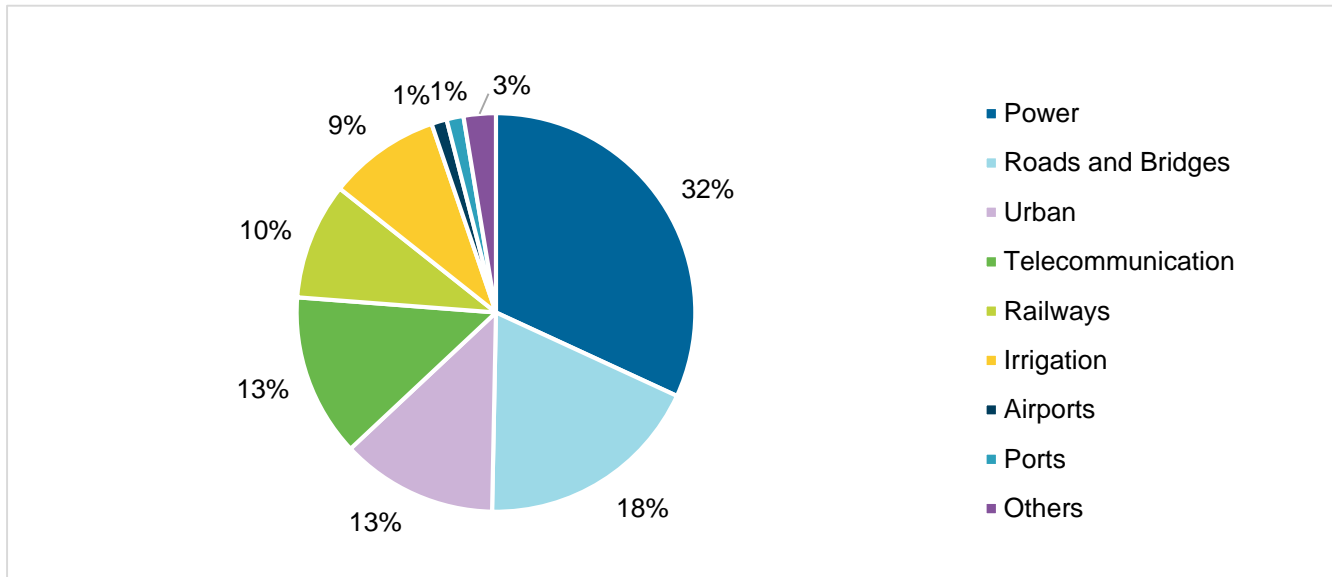
Source: Appraisal documents for five-year plans, CRIS estimates (investments mentioned are at current prices)

NIP executive summary (4/8)



Power, roads and bridges, urban, digital infrastructure and railways sub-sectors together constituted ~85% of the total infrastructure investment in India during fiscals 2008 and 2019. The Centre and states were the major funding sources for sectors such as power and roads and bridges, with moderate participation from the private sector. Digital sector investments were largely driven by the private sector, while investments in the Irrigation sector were predominantly made by the state governments.

Sector-wise share of infrastructure investments of Rs 80 lakh crore made during FY08-FY19



Source: Appraisal documents for five-year plans, CRIS estimates (investments mentioned are at current prices)

NIP executive summary (5/8)



Infrastructure deficit in India and Global Competitiveness

India's ambition of sustaining its relatively high growth depends on an all-important factor: infrastructure. The country, however, is plagued with a weak infrastructure incapable of meeting the needs of a growing economy and growing population. Also in order to fulfill SDG Number 9, India needs to develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure to support economic development and human well-being, with a focus on affordable and equitable access for all.

Quality of infrastructure is among the biggest hurdles facing the Indian government's ambitious program, called 'Make in India', which aims to improve the nation's manufacturing capabilities and support higher growth for generating employment. The corporate growth and investments can also be hampered if the government fails to close the infrastructure deficit, which some experts estimate costs about 4%-5% of GDP due to inefficiencies. Infrastructure development can not only help remove some of these inefficiencies contributing immediately to economic expansion but also support stronger long-term growth. India's infrastructure bottleneck is a primary constraint to improving its global competitiveness, as measured by the World Economic Forum's Global Competitiveness Index (table below).

Global Competitiveness Index first pillar: Institutions

As can be seen from the table on the next page regarding the first pillar:

- i. Focus needs to be given to quality of land administration (rank 112)
- ii. On the legal framework for settling disputes (rank 53), a lot of work has been done under the Commercial Courts Act, 2015, and the Specific Relief Amendment Act, 2018. Work will be done this year to operationalise these special and designated courts.
- iii. On transparency (rank 66), significant work has been done by amendments to regulations and enforcement by regulatory bodies. More work will be done to enhance transparency.

NIP executive summary (6/8) :

Global Competitiveness Index first pillar: Institutions



Public-sector performance 0–100	-	66.4 ↓	25	Singapore
1.10 Burden of government regulation 1–7 (best)	4.1	51.8 ↓	26	Singapore
1.11 Efficiency of legal framework in settling disputes 1–7 (best)	4.1	51.8 ↓	53	Singapore
1.12 E-Participation 0–1 (best)	0.96	95.5 =	15	Multiple (3)
Transparency 0–100	-	41.0 ↑	66	Denmark
1.13 Incidence of corruption 0–100 (best)	41.0	41.0 ↑	66	Denmark
Property rights 0–100	-	47.8 ↓	87	Finland
1.14 Property rights 1–7 (best)	4.4	56.9 ↓	65	Finland
1.15 Intellectual property protection 1–7 (best)	4.4	57.4 ↓	57	Finland
1.16 Quality of land administration 0–30 (best)	8.7	29.0 ↑	112	Multiple (5)
Corporate governance 0–100	-	74.2 ↑	15	New Zealand
1.17 Strength of auditing and accounting standards 1–7 (best)	4.7	62.5 ↑	67	Finland
1.18 Conflict of interest regulation 0–10 (best)	7.3	73.0 =	21	Kenya
1.19 Shareholder governance 0–10 (best)	8.7	87.0 =	2	Kazakhstan
Future orientation of government 0–100	-	69.7	15	Luxembourg
1.20 Government ensuring policy stability 1–7 (best)	4.5	58.6	42	Switzerland
1.21 Government's responsiveness to change 1–7 (best)	4.4	55.9	33	Singapore
1.22 Legal framework's adaptability to digital business models 1–7 (best)	4.5	58.9	25	United States
1.23 Government long-term vision 1–7 (best)	4.6	60.0	31	Singapore
1.24 Energy efficiency regulation 0–100 (best)	66.4	66.4	33	Italy
1.25 Renewable energy regulation 0–100 (best)	87.3	87.3	3	Germany
1.26 Environment-related treaties in force count (out of 29)	26	89.7	17	Multiple (6)


NIP executive summary (7/8)



Global Competitiveness Index second pillar: infrastructure

India is currently ranked 70 out of 140 countries for *infrastructure quality* in global competitive index.

- *Water and electricity utility infrastructure* (ranks > 100) will be a focus of attention through implementation of Jal-Se-Nal and the Uday 2.0 programs.
- On *road connectivity* (rank 72), significant work is being done under the BharatMala and PMGSY schemes which are expected to deliver gains in trunk and rural connectivity.
- Similarly, on *quality of road infrastructure* (rank 48) adoption of standards in the coming years will deliver better results.
- *Efficiency of transport services* (Rank 59) requires attention. Use of technology proposed under the National Logistics Policy is expected to deliver results.

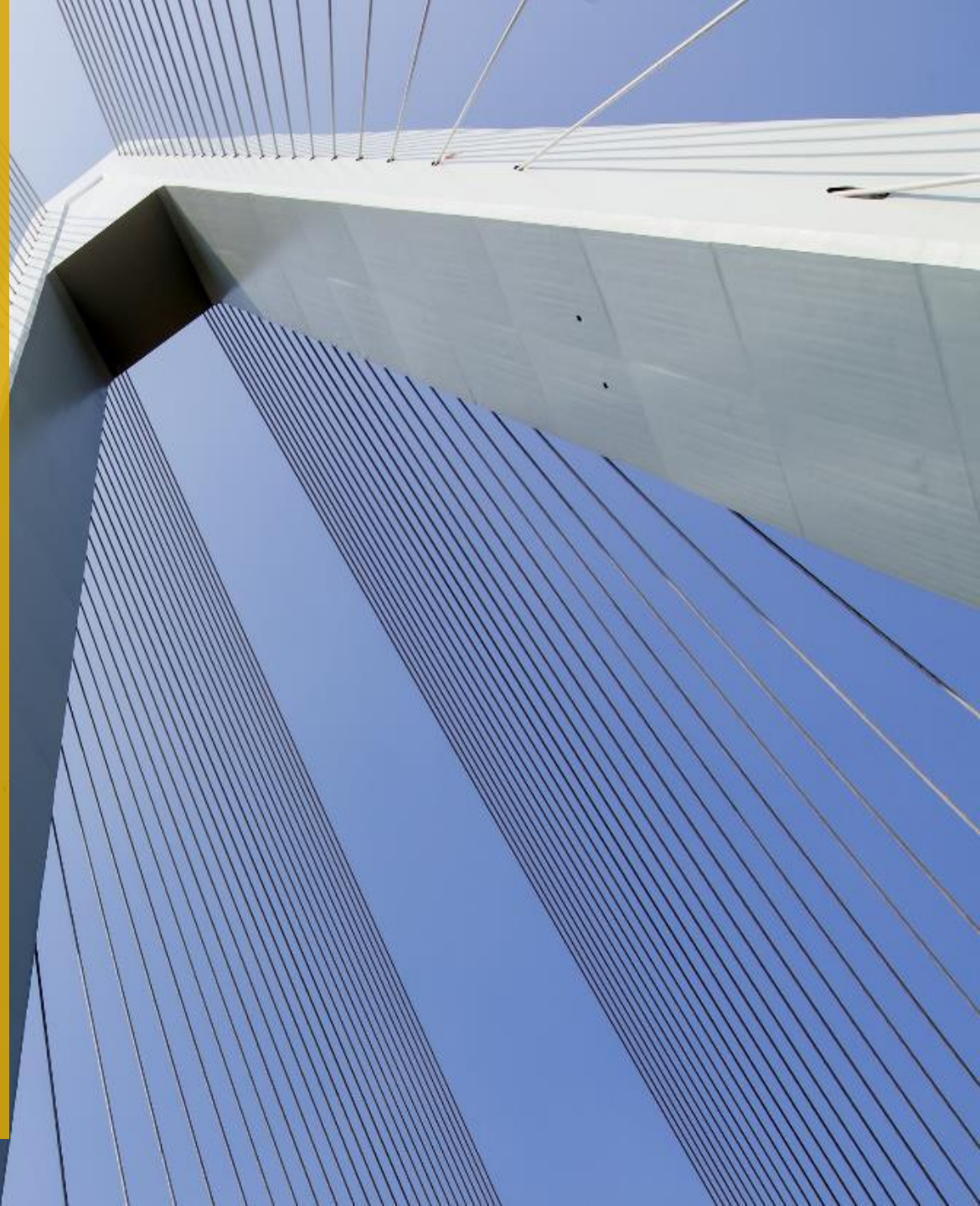
 2nd pillar: Infrastructure 0–100	-	68.1 ↓	70	Singapore
Transport infrastructure 0–100	-	66.4 ↑	28	Singapore
2.01 Road connectivity 0–100 (best)	75.8	75.8 ↑	72	Multiple (3)
2.02 Quality of road infrastructure 1–7 (best)	4.5	58.6 ↑	48	Singapore
2.03 Railroad density km/1,000 km ²	22.7	56.6 ↑	39	Multiple (24)
2.04 Efficiency of train services 1–7 (best)	4.4	57.0 ↓	30	Japan
2.05 Airport connectivity score	1,224,525.6	100.0 =	4	Multiple (8)
2.06 Efficiency of air transport services 1–7 (best)	4.9	64.3 ↑	59	Singapore
2.07 Liner shipping connectivity 0–100 (best)	59.9	59.9 ↑	25	Multiple (5)
2.08 Efficiency of seaport services 1–7 (best)	4.5	59.1 ↓	49	Singapore
Utility infrastructure 0–100	-	69.8 ↓	103	Iceland
2.09 Electricity access % of population	87.5	87.5 ↑	105	Multiple (67)
2.10 Electricity supply quality % of output	17.6	85.8 ↑	108	Multiple (10)
2.11 Exposure to unsafe drinking water % of population	51.1	49.9 ↓	106	Multiple (28)
2.12 Reliability of water supply 1–7 (best)	4.4	55.9 ↓	96	Iceland

NIP executive summary (8/8)

The major constraints faced are availability of funds for financing large projects, lengthy processes in land acquisition and payment of compensation, environmental concerns, time and cost overruns due to delays in project implementation, procedural delays and lesser traffic growth than expected increasing the riskiness of the projects resulting in stalled or languishing projects and shortfall in funds for maintenance.



Benefits of the NIP



Key benefits of the NIP



Economy

Well-planned NIP will enable more infra projects, grow businesses, create jobs, improve **ease of living**, and provide equitable access to infrastructure for all, making growth more inclusive



Government

Well-developed infrastructure enhances level of economic activity, creates additional fiscal space by **improving revenue base of the government**, and **ensures quality of expenditure focused in productive areas**



Developers

Provides better view of project supply, provides time to be **better prepared for project bidding**, reduces aggressive bids/ failure in project delivery, ensures enhanced access to sources of finance as result of increased investor confidence



Banks/ financial institutions (FIs)/ investors

Builds investor confidence as identified projects are likely to be better prepared, exposures less likely to suffer stress given active project monitoring, thereby **less likelihood of NPAs**

Developing the NIP



Infrastructure ministries and departments consulted



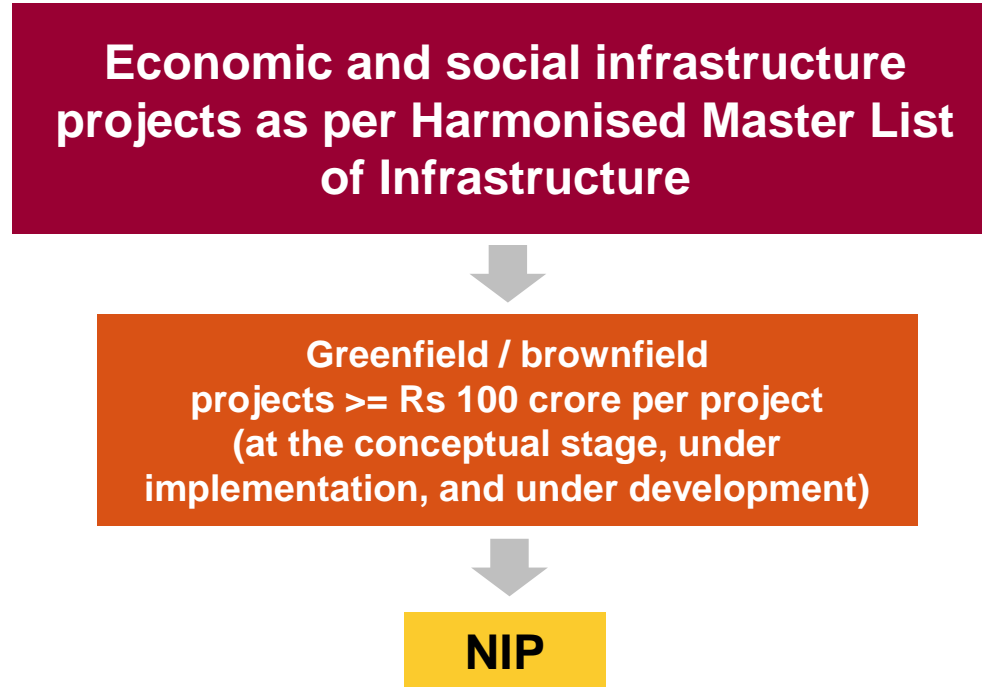
Economic infrastructure

Social infrastructure

Roads	Power	Telecom
Railways	MNRE	DPIIT
Civil aviation	MoPNG	Defence production
Shipping	DAE	Steel
MOD - BRO		Commerce
Rural development (PMGSY)		Tourism
MHA		Chemicals/ oetrochem

Water resources	School education
Drinking water	Higher education
MoHUA	Sports
Health	Agriculture
Food processing	Food & PD

Constituents of the NIP



Notes

1. The NIP has been made on the best-effort basis by aggregating the information provided by various stakeholders including line ministries, departments, state governments and the private sector across the infrastructure sub-sectors.
2. To draw up the NIP, a bottom-up approach was adopted wherein all projects under construction, proposed greenfield projects, brownfield projects and those at the conceptualisation stage were sought to be captured. The investment details of FY19-20 are estimates, while those for FY2020-21 to 2024-25 are projections.
3. The NIP could see more updates as some states are yet to share the details. The implementation of projects included in the NIP will depend on multiple factors such as clearances, timely approvals and financing. The actual expenditure may vary from the estimates/projections and the NIP shall be updated accordingly.

NIP details



NIP summary (1/3)

(Rs. Crore)

Ministry/ Department	FY20	FY21	FY22	FY23	FY24	FY25	No phasing	FY20-25
Energy								
Power	104065	119650	101399	81749	73807	69161	626166	1175995
Renewable energy	30500	151000	144000	170000	217000	217000	0	929500
Atomic energy	11152	21046	27863	33069	32674	28284	0	154088
Petroleum and natural gas	27514	43665	48391	41533	22878	10560	124	194666
Total energy	173,231	335,360	321,653	326,351	346,359	325,005	626,290	2,454,249
Roads								
Roads	324,426	369,700	343,791	236,850	229,446	324,915	134,815	1,963,943
Total eoads	324,426	369,700	343,791	236,850	229,446	324,915	134,815	1,963,943
Railways								
Railways	133,232	262,510	309,360	274,181	221,369	167,870	0	1,368,523
Total railways	133,232	262,510	309,360	274,181	221,369	167,870	0	1,368,523
Ports								
Ports	12,067	16,128	18,755	15,273	7,134	9,251	22,314	100,923
Total ports	12,067	16,128	18,755	15,273	7,134	9,251	22,314	100,923
Airport								
Airport	18,827	21,665	24,780	21,294	25,346	5,041	26,445	143,398
Total airport	18,827	21,665	24,780	21,294	25,346	5,041	26,445	143,398

NIP summary (2/3)

(Rs. Crore)

Ministry/ Department	FY20	FY21	FY22	FY23	FY24	FY25	No phasing	FY20-25
Urban								
<u>AMRUT, SMART Cities, MRTS, affordable housing, Jal Jeevan Mission</u>	294,775	413,513	326,875	161,464	146,213	109,017	177,155	1,629,012
<u>Total urban</u>	294,775	413,513	326,875	161,464	146,213	109,017	177,155	1,629,012
Irrigation								
<u>Irrigation</u>	101,688	169,379	157,739	107,645	92,502	64,221	79,504	772,678
<u>Total irrigation</u>	101,688	169,379	157,739	107,645	92,502	64,221	79,504	772,678
Rural infrastructure								
<u>Water and sanitation</u>	36,200	60,705	100,730	84,175	80,000	0	0	361,810
<u>Rural infrastructure</u>	103,555	116,306	109,930	27,055	27,055	27,055	0	410,955
<u>Total rural infrastructure</u>	139,755	177,011	210,660	111,230	107,055	27,055	0	772,765
Digital infrastructure								
<u>Digital infrastructure</u>	83,891	63,833	55,365	39,577	38,977	38,855	0	320,498
<u>Total digital infrastructure</u>	83,891	63,833	55,365	39,577	38,977	38,855	0	320,498
Agriculture and food processing infrastructure								
<u>Agriculture infrastructure</u>	8,488	7,644	7,206	5,861	5,633	5,374	14,092	54,298
<u>Food processing industries</u>	461	519	203	73	0	0	0	1,255
<u>Food and public distribution</u>	0	0	0	0	0	0	5,000	5,000
<u>Total agriculture and food processing infrastructure</u>	8,949	8,163	7,409	5,934	5,633	5,374	14,092	60,553

*PIRF- Project Information Request Format

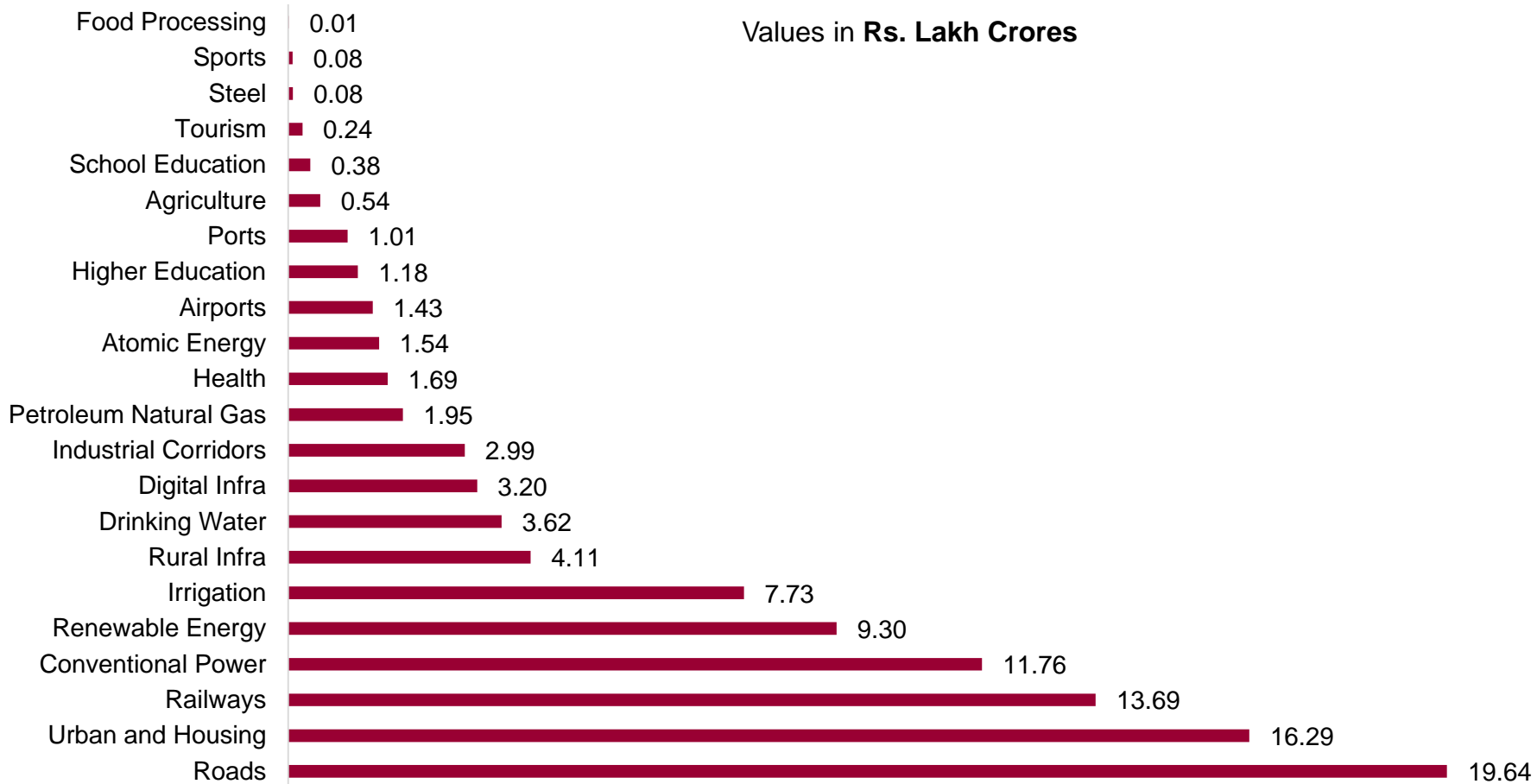
NIP summary (3/3)

(Rs. Crore)

Ministry/ Department	FY20	FY21	FY22	FY23	FY24	FY25	No phasing	FY20-25
Social infrastructure								
Higher education	13,172	18,474	22,710	18,983	17,170	5,272	22,566	118,348
School education	5,053	7,132	7,077	6,398	6,569	5,562	0	37,791
Health and family welfare	34,456	43,663	43,082	17,913	9,441	6,379	13,687	168,622
Sports	1,188	1,175	1,207	999	880	840	1,328	7,618
Tourism	1,584	1,997	2,698	2,065	1,373	855	0	24,321
Total social infrastructure	55,454	72,441	76,774	46,360	35,433	18,907	0	356,701
Industrial infrastructure								
Industries and internal trade	15,578	38,304	40,610	32,569	22,484	10,386	139,306	299,237
Steel	1,658	2,390	2,287	1,600	290	0	0	8,225
Total industrial infrastructure	17,236	40,694	42,897	34,169	22,774	10,386	139,306	307,462
Total	1,363,530	1,950,397	1,896,059	1,380,329	1,278,239	1,105,896	1,221,731	10,250,704

*PIRF- Project Information Request Format

Sector-wise break-up of the NIP

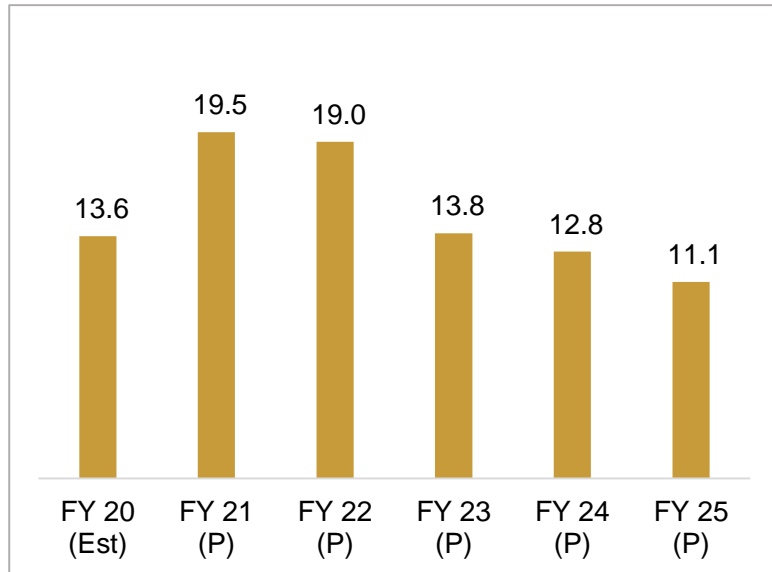


- Roads, urban and housing, railways, power (renewable and conventional) and irrigation to comprise ~80% of the NIP

Overview of the NIP (1/2)

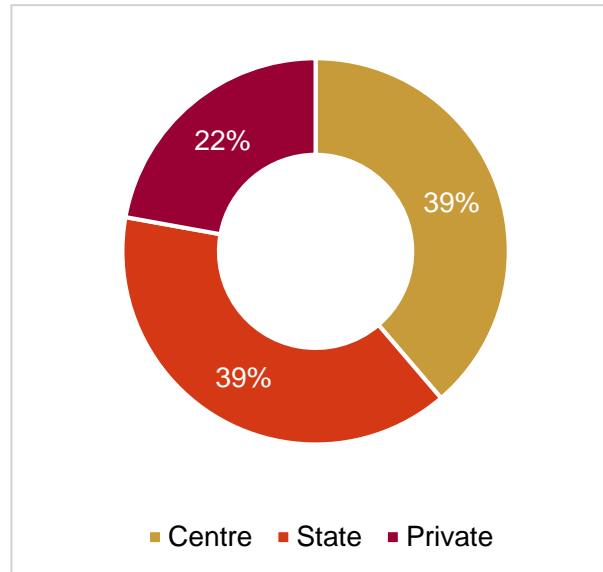


Annual investment phasing (Rs crore)

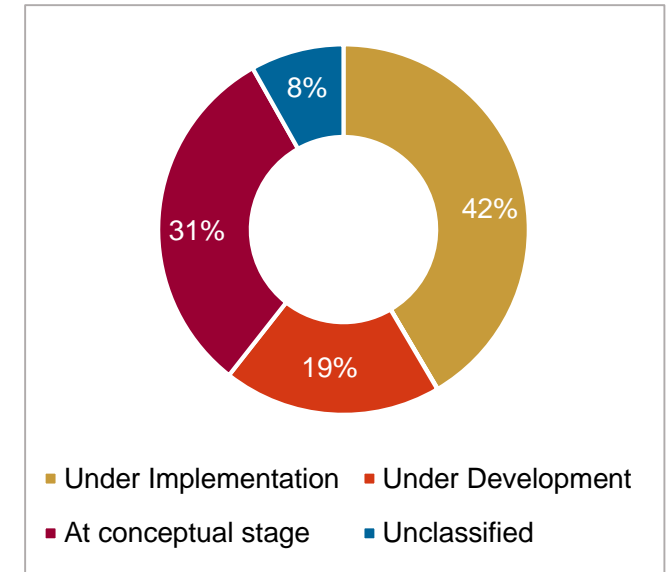


^ Excludes the power sector and some states with phasing not provided

Implementing agency



Status of projects



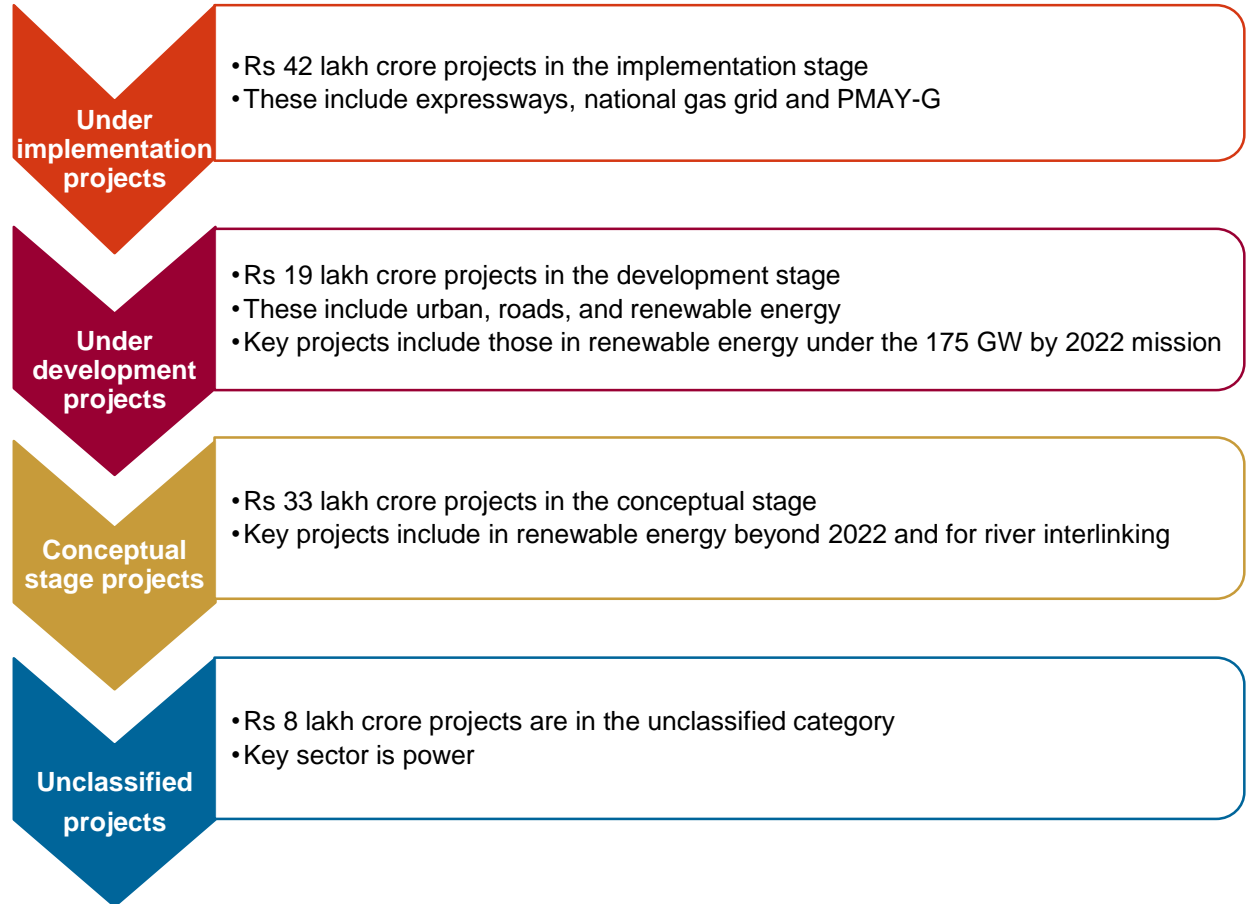
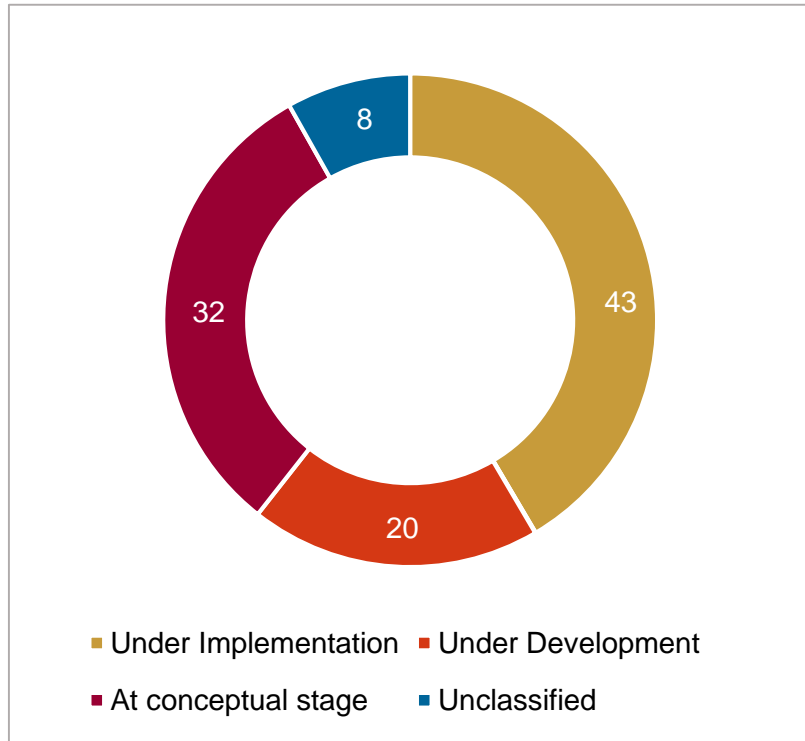
^ Power sector data has no classification provided

- Large states yet to provide adequate data are Gujarat, West Bengal, Rajasthan and Bihar
- Projected peak in annual phasing of investment spend in FY20-21, however, could spill over to FY23-25
- Conceptual stage projects include in expressways, freight corridors, river inter-linking and renewable energy

Overview of the NIP (2/2)



Status of projects (Rs lakh crore)



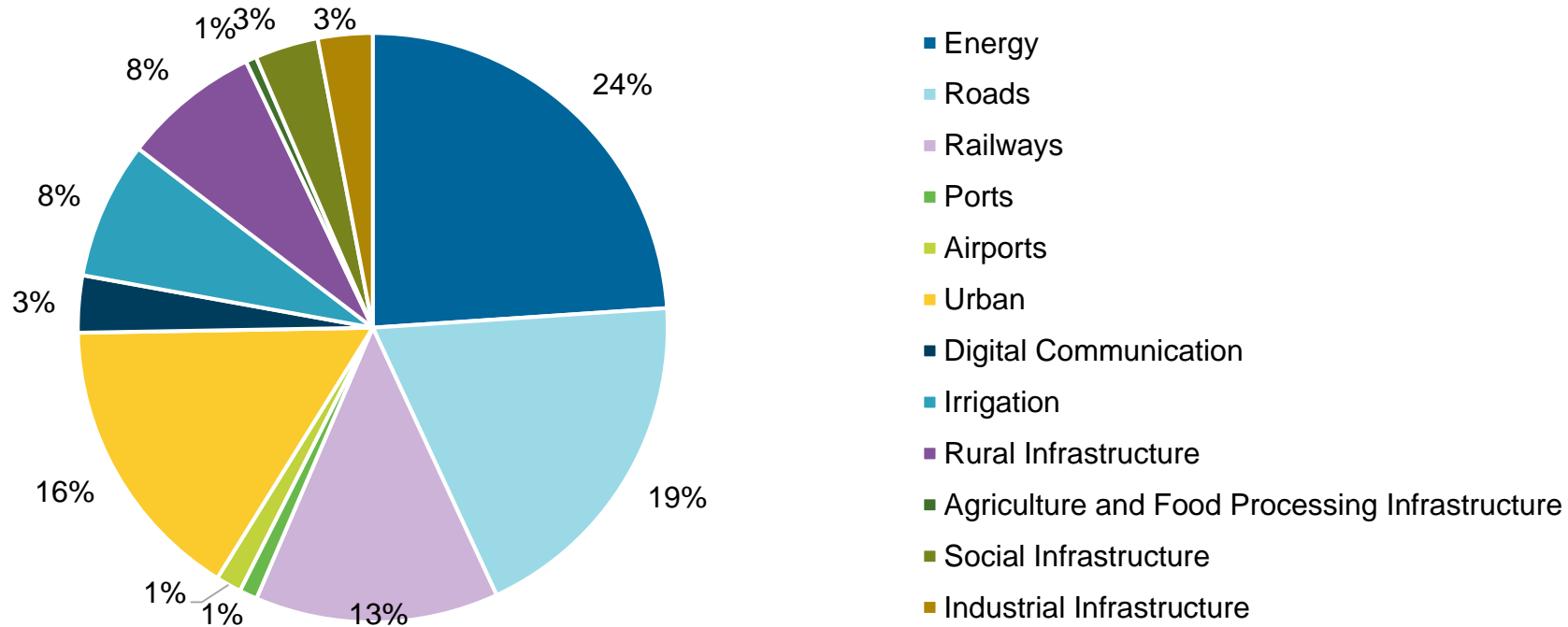
^ Excludes the power sector and some states with phasing not provided

NIP sector-wise summary



The total project capital expenditure in infrastructure sectors in India during the fiscals 2020 to 2025 is projected at ~ Rs 102 lakh crore. The sector-wise annual projected capital expenditure is detailed below. During fiscals 2020 to 2025, sectors such as energy (24%), urban (16%), railways (13%) and roads (19%) accounted for ~70% of the projected infrastructure investments in India.

Sector-wise break-up of project capital expenditure worth Rs 102 lakh crore during FY20-25



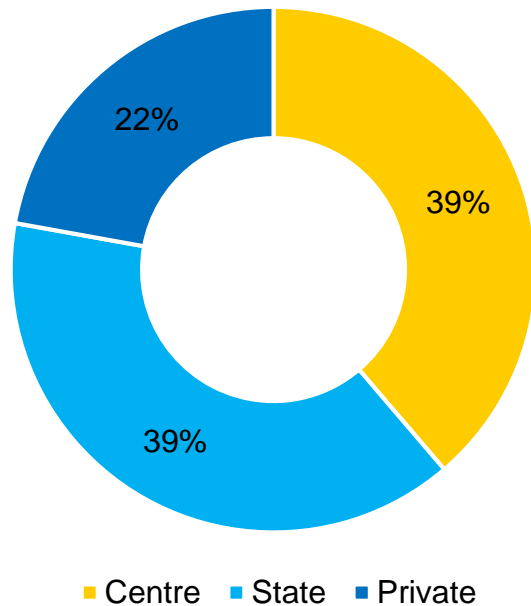
Source: Ministries/ departments/state governments



Share of Centre, states and the private sector in the NIP

The Centre (39%) and states (39%) are expected to have equal share of the capital expenditure to be undertaken in the infrastructure sector, followed by the private sector (22%).

Share of Centre, states and the private sector in the NIP



Source: PIRF submitted by Ministries/ Departments/State Governments

NIP : Sector Profiles



Road sector





Current status

National Highways (NH) total length ~1.32 lakh km; including **expressways** of ~1,600 km

Low private sector participation in NH - **15%**

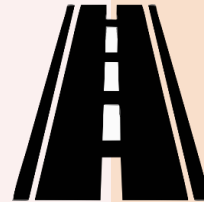
Poor connectivity of remote areas with trunk routes and metros

Asset ownership mainly with public authorities

Cash collection - resulting in revenue leakages and congestion at toll plazas

Flat rate toll irrespective of actual distance travelled

Limited use of advanced technology in safety and security - traffic management, surveillance, automated fare collection system



Vision 2025

NH total length - **1.99 lakh km**; expressways - **10% of total NH (20,000 km)** in major economic corridors, strategic areas and major tourist destinations

Significantly higher share of the private sector in NH

Last-mile connectivity – improve access to remote areas

Asset ownership to tilt in favour of financial investors/ asset aggregators

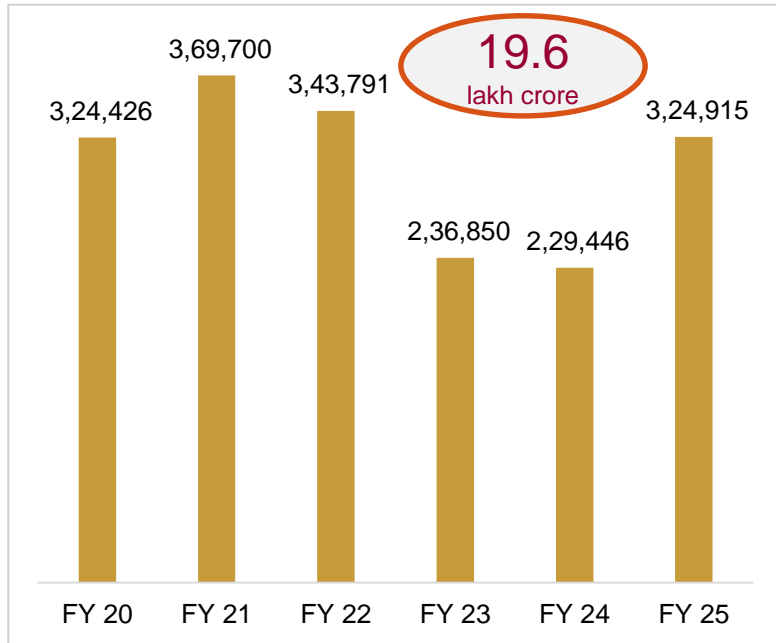
Increased use of fastag and RFID devices - reduction in leakages and congestion at toll plazas
Tolling based on **'pay as per use'** concept

Deeper penetration of advanced technologies such as automated traffic controllers for improved safety, security and traffic management, LIDAR guns, speed regulators, digital message boards

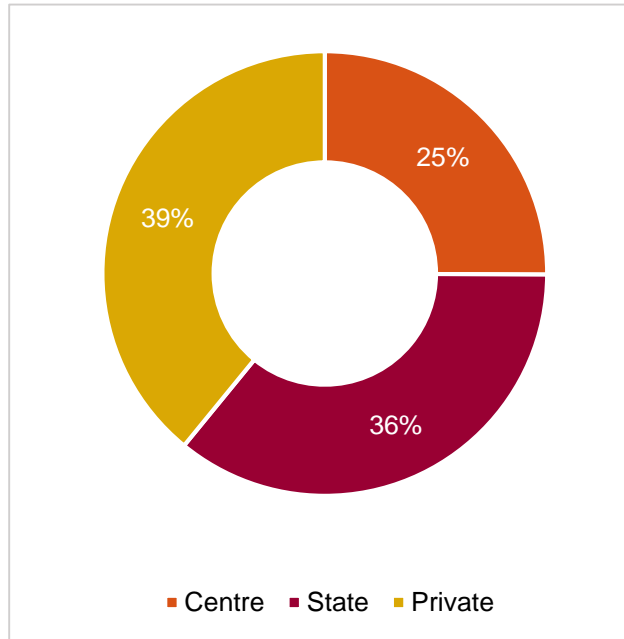
Road NIP summary



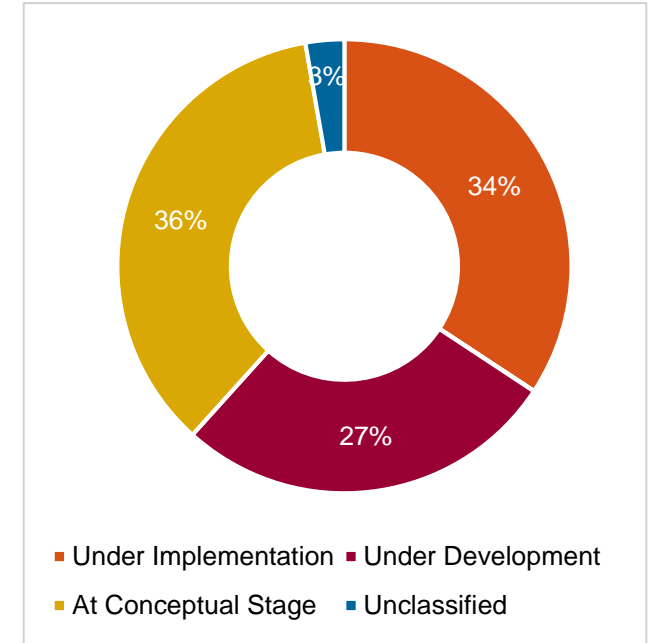
Annual phasing of investments (Rs crore)



Implementing agency



Status of projects



- 39% of the NIP to be implemented by the private sector; 34% projects are in the implementation stage
- Major projects include the Delhi-Mumbai Expressway and Chennai-Bengaluru Expressway

Energy sector



Energy sector vision



Current status

Total capacity: **356 GW**

Thermal: 66%, Renewable: 22%,

Hydro: 13%, Nuclear: 2%

Low per-capita electricity consumption at 1,181 kWh

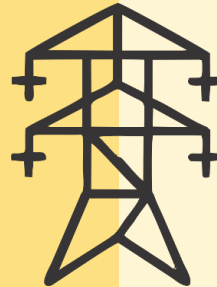
Renewable energy share in consumption stands at ~9%

Regular load shedding: Discoms under huge debt burden and resort to unscheduled load-shedding

High AT&C losses of discoms currently at 8-41% (except J&K)

Smart metering: <5% of meters installed as on June 30, 2018

Services such as new connections, security deposits and reconnections, except bill payments and lodging of complaints, are **not digitalised**



Vision 2025

24x7 clean and low cost power available to all households, industry, commercial businesses, agriculture

Total capacity: **619 GW**

Thermal: 50%, renewable: 39%, hydro: 9%, nuclear: 2%

Substantial increase in per-capita electricity consumption to **1,616 kWh**

Renewable energy's share in consumption to increase to **~19%**

Low AT&C losses through increased PPP in discoms

Reformed power sector - open access in distribution, regular tariff revisions, extensive metering

Smart metering to be implemented for all categories of customers

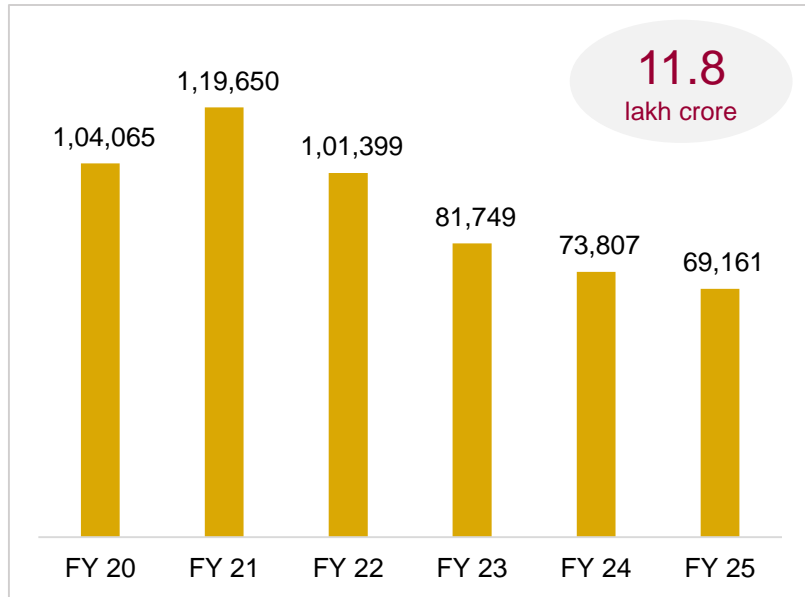
All related services on digital platform



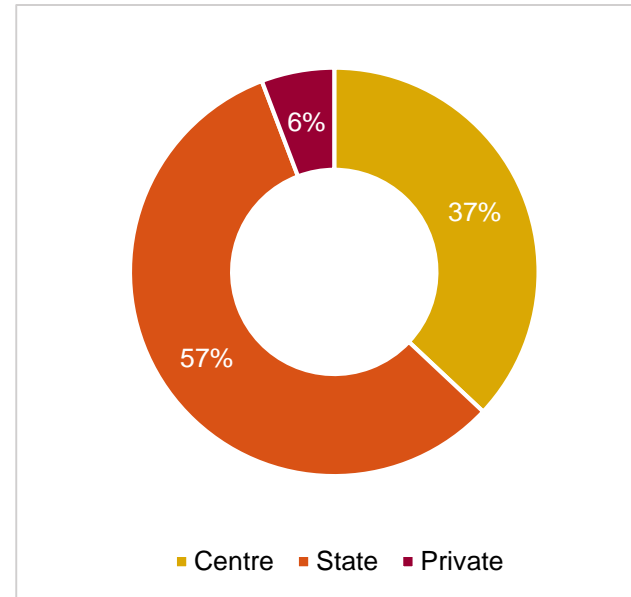
Conventional power NIP summary



Annual phasing of investments (Rs crore)



Implementing agency



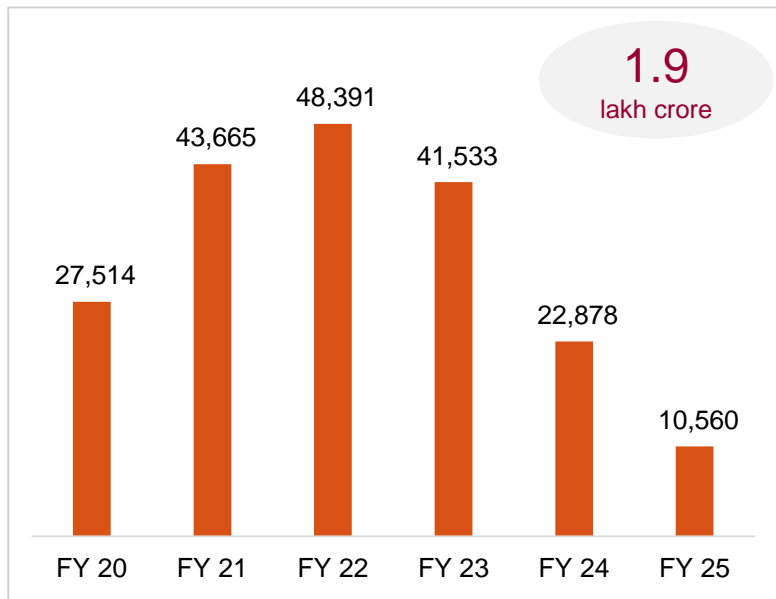
^ Excludes the power sector from the MOP as the Phasing of data has not been provided

- 57% of the NIP to be implemented by states
- Major projects include the Dibang Hydel Power Project and HVDC Bipole Link Project (transmission)

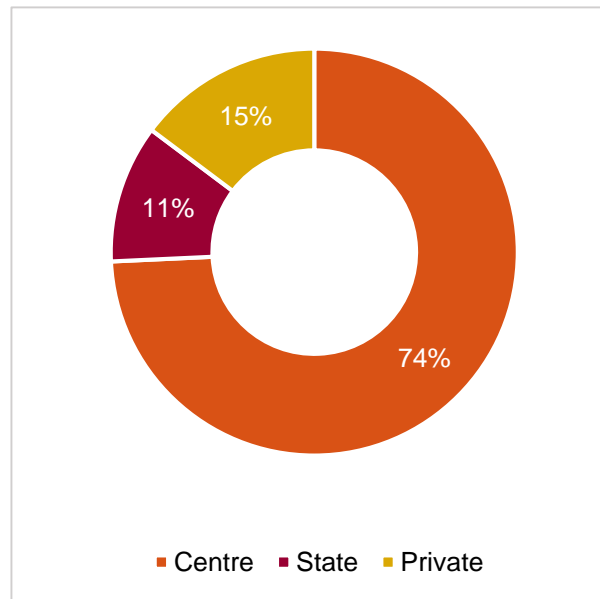
Petroleum and natural gas NIP summary



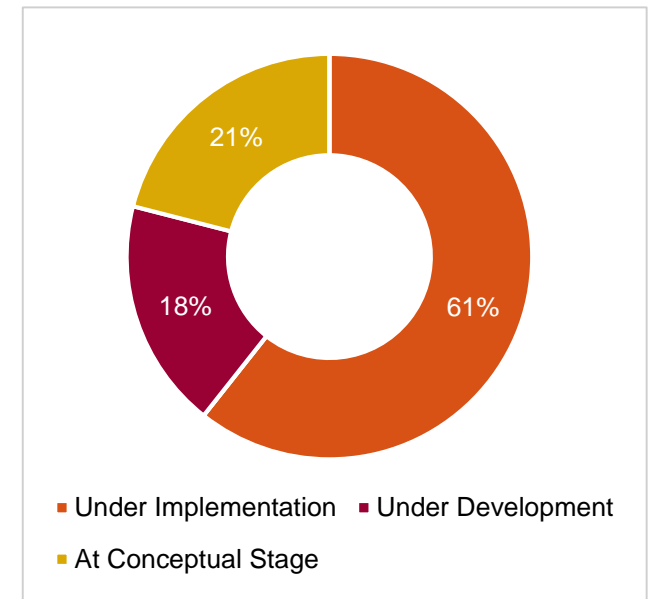
Annual phasing of investments (Rs crore)



Implementing agency



Status of projects

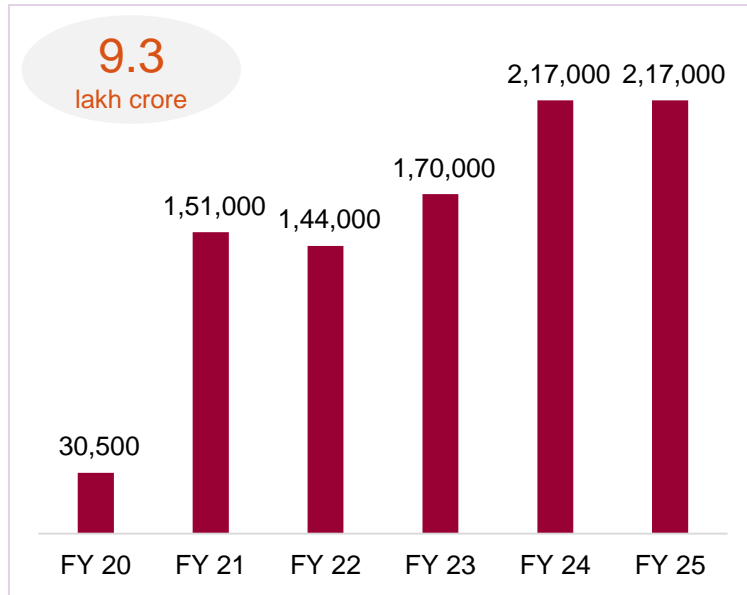


- 74% of the NIP to be implemented by the Centre; 61% of projects currently under implementation
- Major projects include the Strategic Petroleum Reserve at Chandikhol and the Jagdishpur– Haldia, and Bokaro-Dhamra Natural Gas Pipeline (JHBDPL)

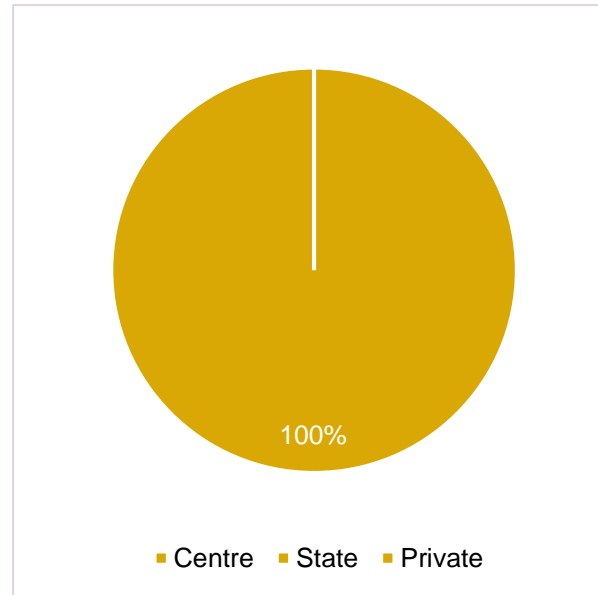
Renewable energy NIP summary



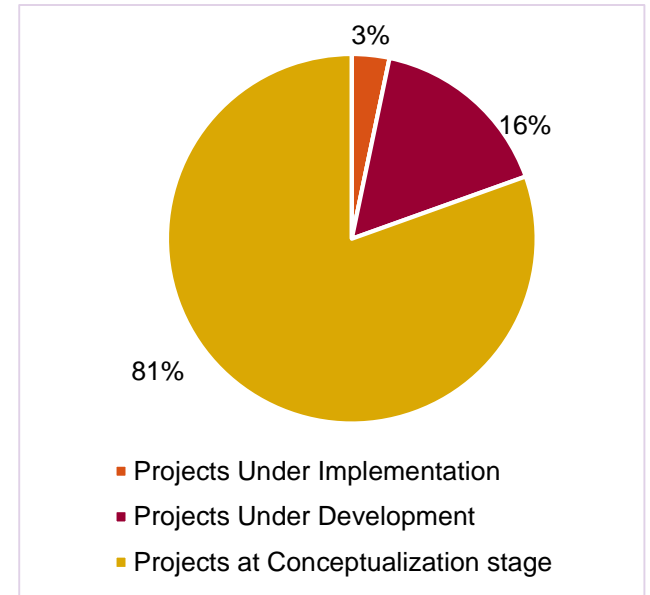
Annual phasing of investments (Rs crore)



Implementing agency



Status of projects

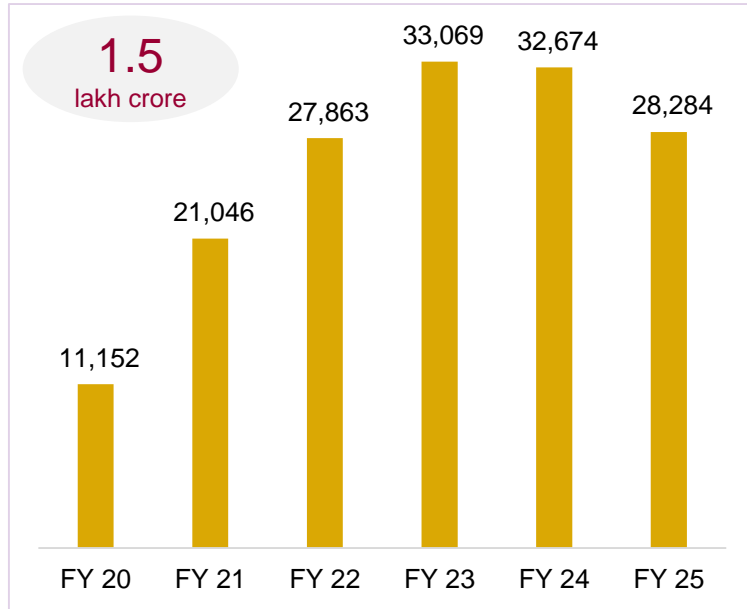


- 100% of the NIP to be implemented by the private sector
- Well-stocked pipeline through to FY25 because of 450 GW target visibility

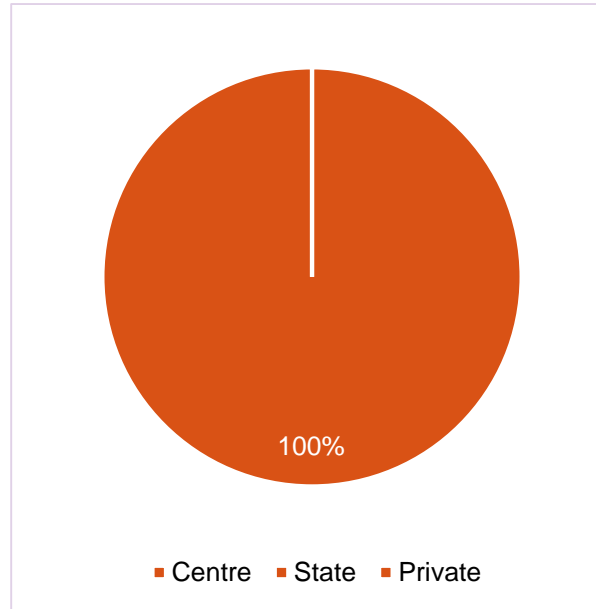
Atomic energy NIP summary



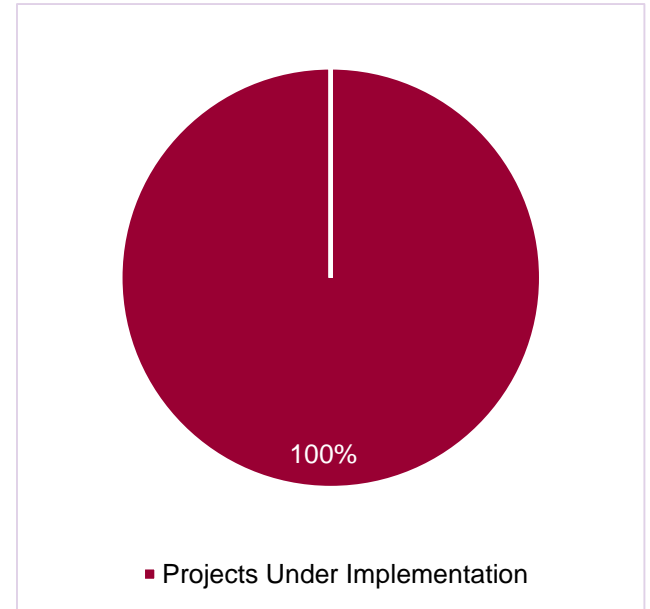
Annual phasing of investments (Rs crore)



Implementing agency



Status of projects



- 100% of the NIP to be implemented by the Centre; all projects in the implementation stage
- Long gestation period of execution leads to even spread in annual phasing
- Major projects include 4 new reactors at the Kudankulam Nuclear Power Project

Railways sector



Railways sector vision



Current status

Low modal share of Indian Railways (IR) in **freight traffic** at 33%

Two DFCs of total length ~3,360 km under implementation

High-speed railway (**HSR**) network - **NIL**

Two stations being developed on **PPP basis** - Gandhinagar and Habibganj

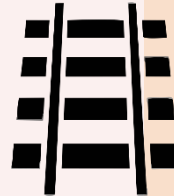
46% of the existing railway network has been **electrified** as of March 31, 2018

High network congestion: **50%** sections on high-density routes operate at a **capacity utilisation > 120%**

Limited focus on safety and security aspects

Customer experience to be improved given **lack of basic amenities, frequent delays**

Average accidents per year: ~113 for the period 2015-17



Vision 2025

Healthy private sector participation: 30% of net cargo volumes and 500 passenger trains privatised; 30% of 750 stations privatised; rolling stock from the private sector

Higher > 40% modal share of railways in freight traffic

EDFC and WDFC fully operational with **construction underway of planned DFCs:** east-west, north-south, east-coast and south-west

Mumbai-Ahmedabad HSR to be operational; other identified HSR at **advanced stage** of implementation

100% of the existing railway network electrified

Optimum utilisation of existing rail network – lesser delays, due to doubling / tripling of sections on high density corridors

Focus on **safer travel**, accidents to reduce drastically

Improved customer experience with high-quality amenities, modern stations and quality catering

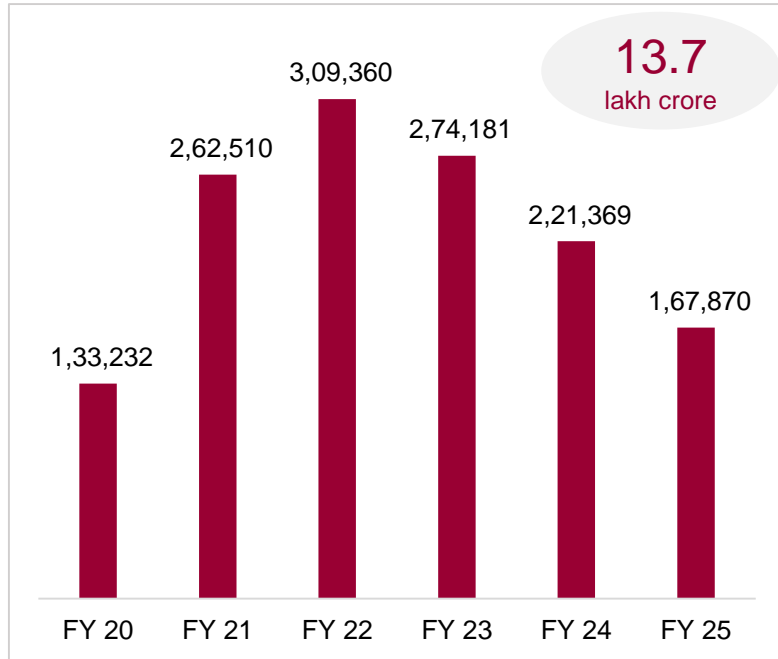
Higher average speed due to investment in better coaches, track upgrades, upgraded locomotives



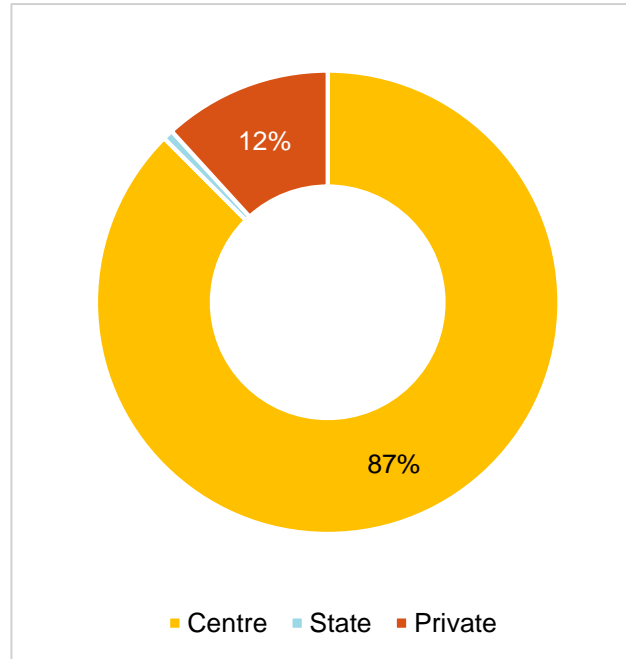
Railways NIP summary



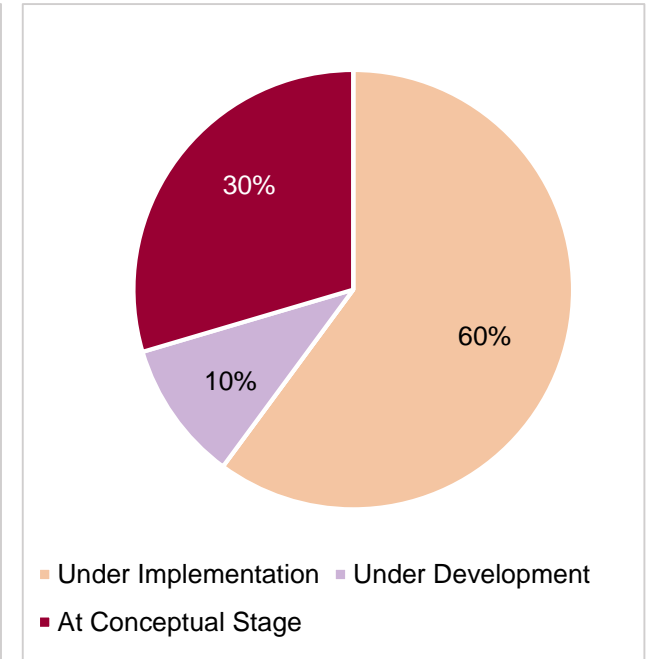
Annual phasing of investments (Rs crore)



Implementing agency



Status of projects



- 87% of the NIP to be implemented by the Centre; 60% of the projects are in the implementation stage
- Lower execution rate after FY23 through to FY25
- Major projects include dedicated freight corridors and high speed rail

Port sector





Current status

India has **12 major and ~200 minor ports**

Overall capacity utilisation of Indian ports **~60% of total capacity of ~2 billion tonne**

Higher logistics cost and turnaround time and **low** output per ship berth due to issues in **hinterland connectivity** and lack of use of **advanced technologies**

Passenger and freight movement through **inland waterways** at very **nascent stage** – Reforms, policies and projects **under consideration/ development**

Maritime trade contributes **~95%** of the trade by volume and **~70%** by value in India



Vision 2025

Under **Sagarmala**, **new major and minor ports** will be constructed, besides existing port **modernisation and capacity expansion**

Overall capacity utilisation of Indian ports to be **>65% of total capacity of ~2.5 billion tonne**

Improved hinterland connectivity, port modernisation and computerisation to **reduce** logistics cost, reduce turnaround time and **increase output per ship berth**

Use of robots for packing and delivering, and **data analytics** to monitor logistics flow will **improve operational efficiency and turnaround time**

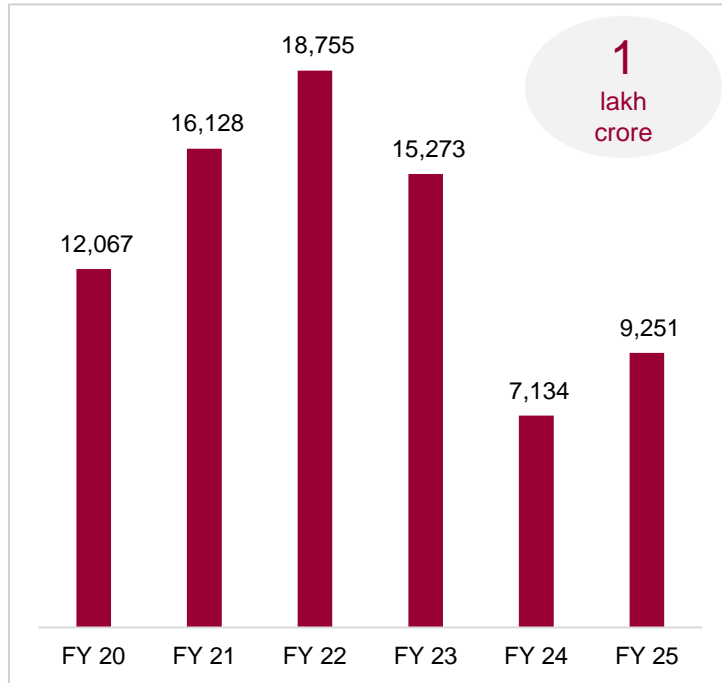
Higher share of inland waterways in both freight and passenger traffic

Increased share of ports by volume and by value to the overall trade in India

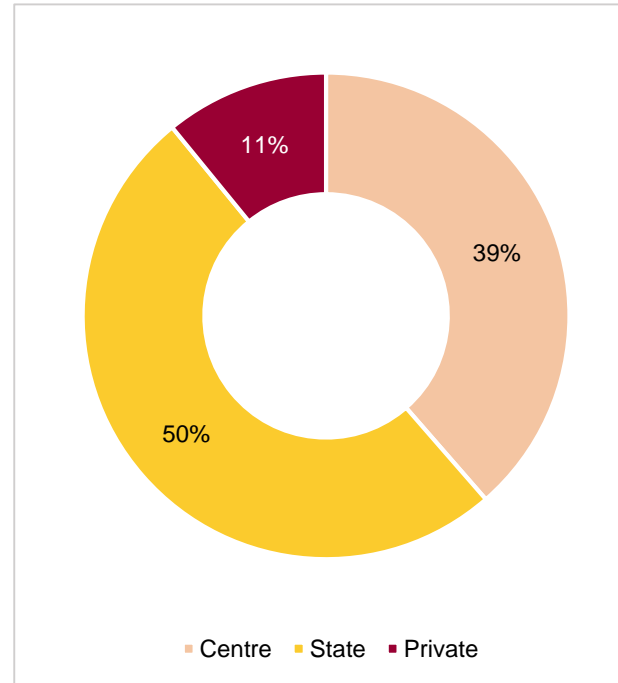
Port NIP summary



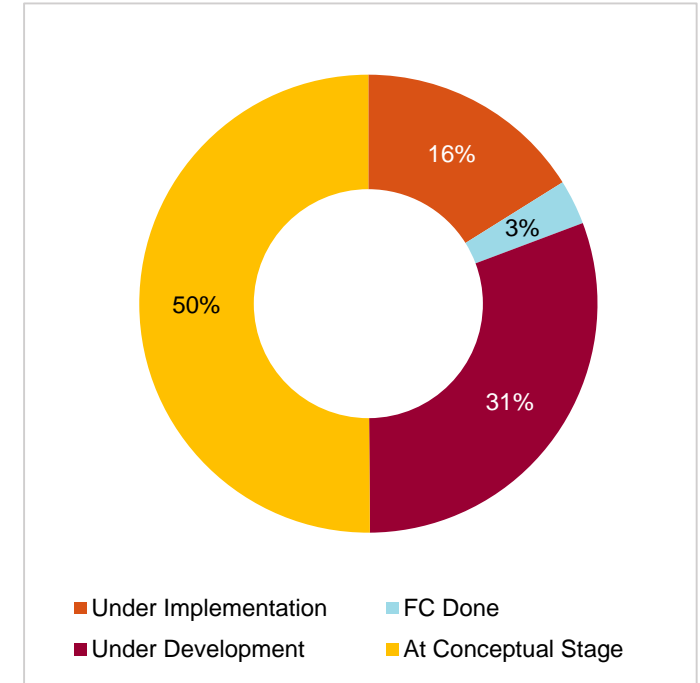
Annual phasing of investments (Rs crore)



Implementing agency



Status of projects



- 50% of the NIP to be implemented by the Centre; 50% of projects in the conceptualisation stage
- Lower execution rate after FY23 through to FY25
- Major project includes the Vadhavan port

Airport sector



Airport sector vision



Current status

India's rank: **3rd** largest aviation market globally

Insufficient capacity: 25 of the 50 busiest airports operate at >100% capacity utilisation

Six airports owned by AAI have been **privatised as PPPs**

Regional connectivity scheme **UDAN** is expected to make air travel affordable and connect many under-served areas

Absence of in-house MRO facility - India is dependent on South-east Asian, Middle-east or European countries for MRO of planes

Manual safety and security checks have led to **long queues and delays in boarding** at busy airports in key metros



Vision 2025

India's rank to improve and will be in the **Top 2 in the world**

All major airports will run at **optimum capacity utilisation** due to addition of new airports and capacity expansion in existing airports

30-35 airports owned by AAI will be **privatised as PPPs**

All tier-II and most tier-III cities will be well-connected with **fully functional airports** – with affordable fares and world class facilities

Development of **high quality in-house MRO facilities** to substantially reduce operating costs of carriers thus making air travel more affordable

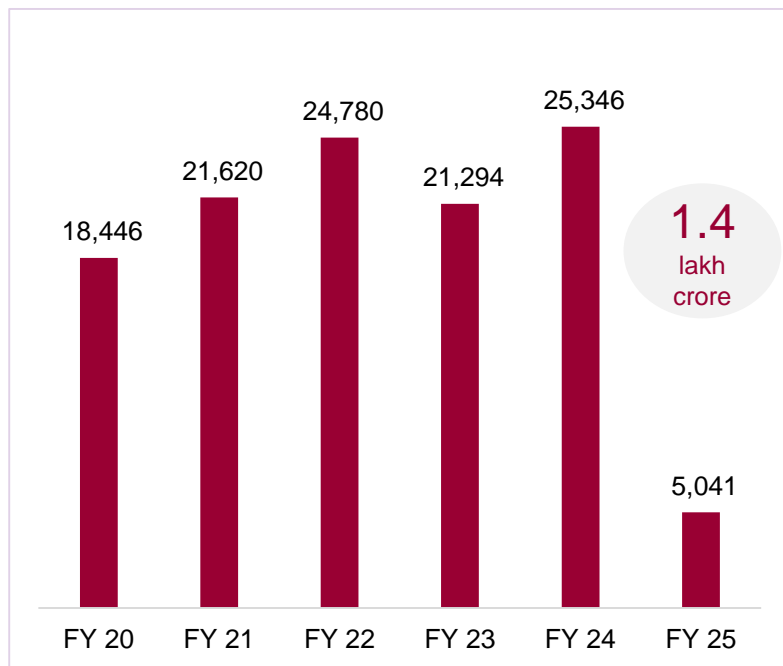
Digi Yatra Biometric Boarding System to be operational to improve **passenger throughput**

Installation of smart cameras and use of robots for check-in and transferring luggage of passengers

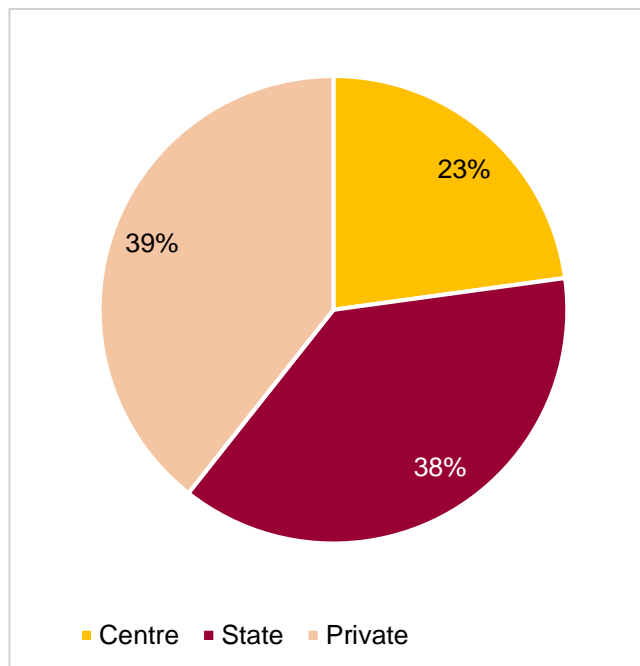
Airport NIP summary



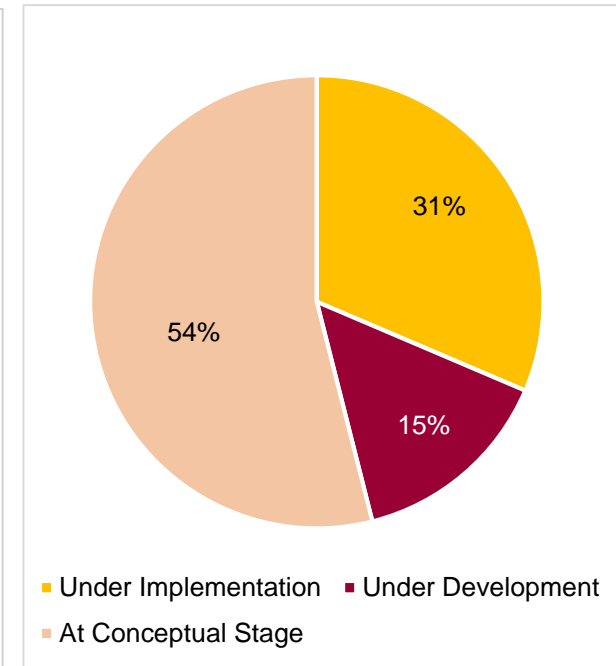
Annual phasing of investments (Rs crore)



Implementing agency



Status of projects



- 39% of the NIP to be implemented by the private sector; 54% of projects are in the conceptualisation stage
- Major projects include the Navi Mumbai and Jewar airports

Urban sector



Urban sector vision (1/2)



Current status

~**25%** urban households have drinking water on their premises

70% of water is contaminated – India ranks 120th among 122 countries in the water quality index

Limited waste water is treated

~**25%** of the municipal solid waste generated is treated

High proportion of population living in slums in India

Limited number of parks and green spaces

11 cities in India have a metro rail-transit system

Low quality and poor connectivity of public transport
- ~7% of daily trips catered to by public transport



Vision 2025

~**100%** of urban and rural households are connected to **pipel-water supply**

Significant improvement and use of advanced techniques in maintaining quality of water

Most of the waste water treated and re-used in urban and rural areas

~**100%** of the municipal solid waste generated is treated with advanced scientific techniques

Low proportion of population living in slums with implementation of the PMAY

Significant increase in parks and green spaces

Metro rail transit system to be available in **>25 cities**

Improved quality and connectivity of public and mass-transport system

Urban sector vision (2/2)



Current status

High dependence on privately owned vehicles with internal combustion engines

Low penetration of electric vehicles

Advanced public transport technologies such as Hyperloop and Transit X in conception stage



Vision 2025

Increased use of public transport to reduce the proportion of privately owned vehicles plying on roads

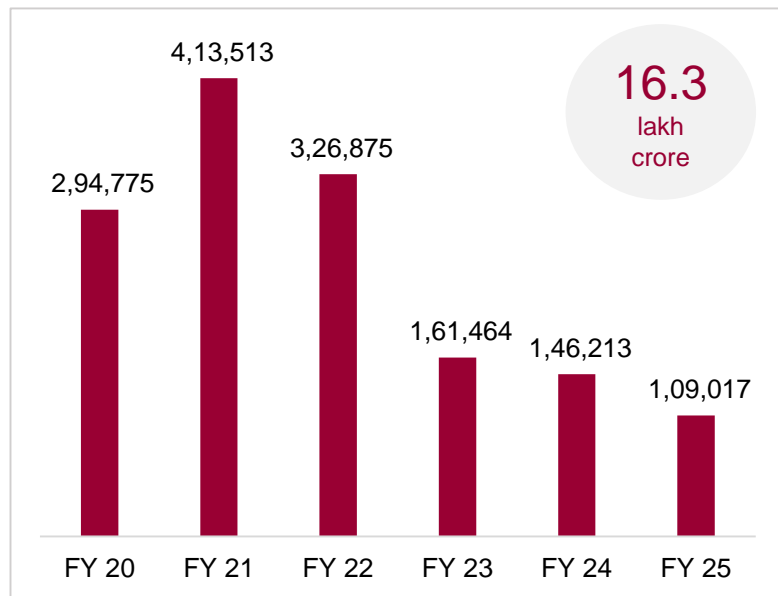
Higher penetration of electric vehicles due to lower costs and increased awareness about hazards of internal combustion engines vehicles

Introduction of advanced public transport technologies

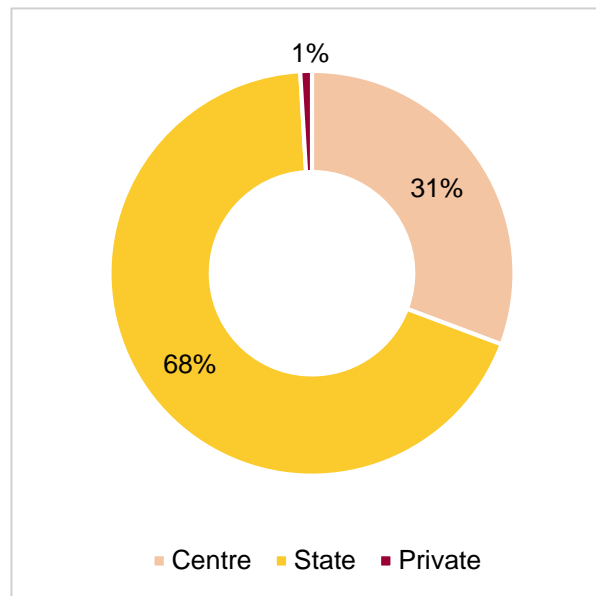
Urban NIP summary



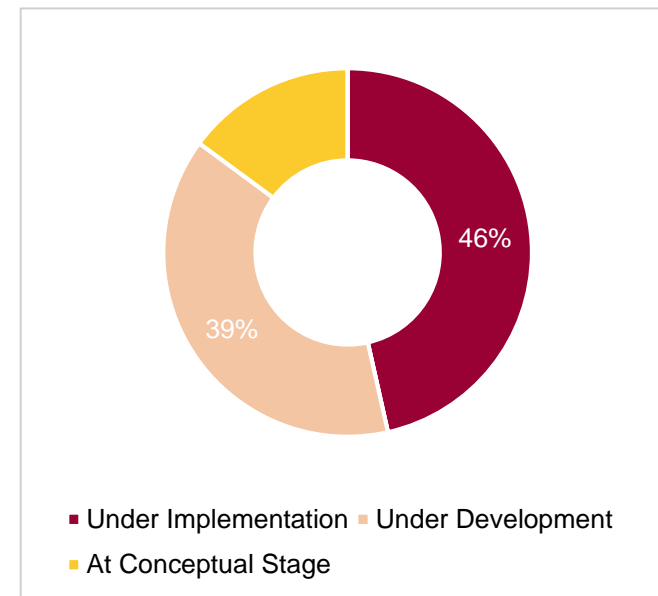
Annual phasing of investments (Rs crore)



Implementing agency



Status of projects



- 68% of the NIP to be implemented by states; 46% projects in the implementation stage
- Lower execution rate after FY23 through FY25
- Major projects include Surat Metro Rail, Kanpur metro, Affordable Housing and Jal Jeevan Mission (Urban)

Digital infrastructure sector

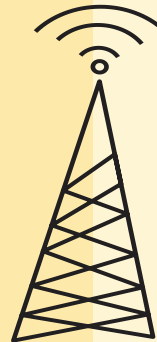


Digital infrastructure sector vision



Current status

- **India ranks second in terms of mobile phones** – 119 crore total mobile subscribers
- **Internet penetration is ~40%**
- **> 100,000** gram panchayats have been connected under Bharat Net project
- **Issues such as poor connectivity and data speeds prevail** due to poor O&M
- **4G technology** has enabled India to move towards a digital economy by providing faster internet connectivity at affordable prices
- Private business focusing to build massive data centres on the back of data localisation, uptake of cloud computing and growing e-governance.



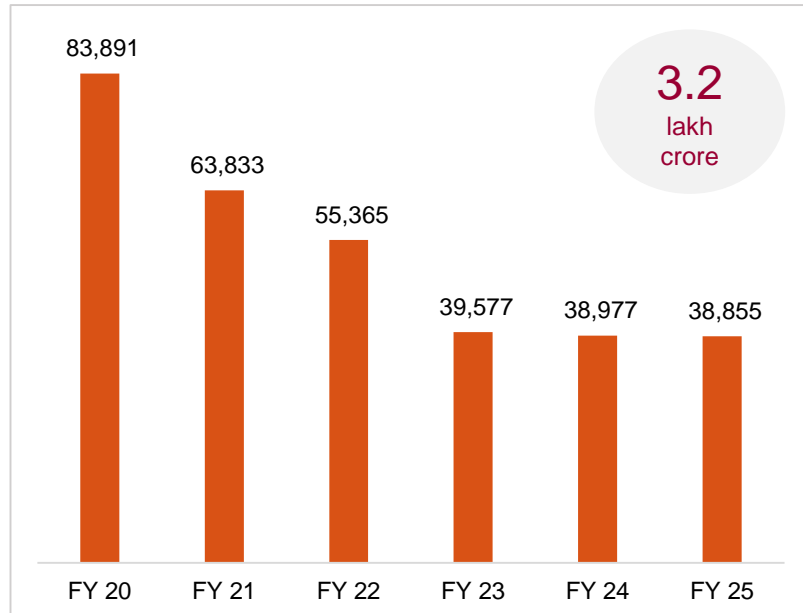
Vision 2025

- **India ranks first in terms of mobile phones** – 100% teledensity, even in rural areas
- **Higher internet penetration** of more than **80%** providing seamless connectivity of rural and remote through schemes such as Bharat Net
- Availability of **government services in real time** on mobile, access to quality education, healthcare facilities and financial inclusion
- **5G technology** to fuel industry growth and innovation, harnessing the power of emerging digital technologies, such as IoT, cloud, AI and Big Data, payment gateways, fintech
- India to emerge as data-centre hub fuelling growth of Fintech, ecommerce, OTT sectors

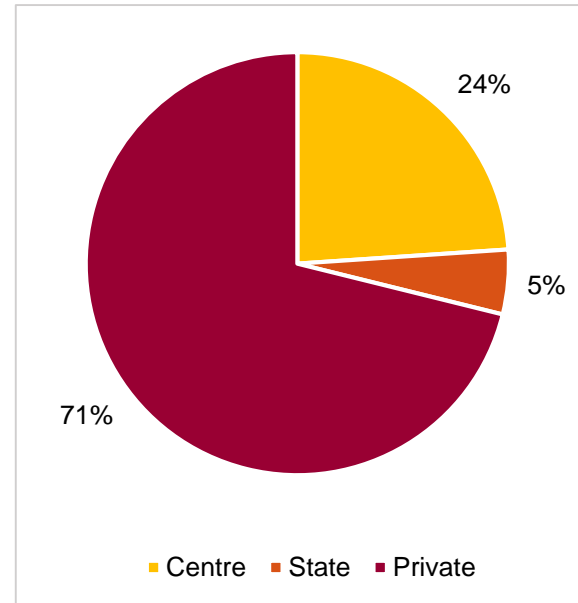
Digital infrastructure NIP summary



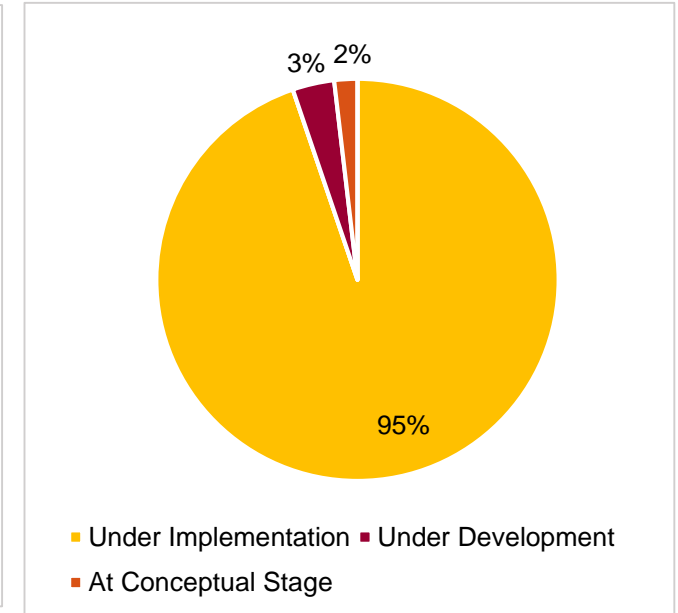
Annual phasing of investments (Rs crore)



Implementing agency



Status of projects



- 71% of the NIP to be implemented by the private sector; 95% of projects are in the implementation stage
- Tapered execution rate from FY20 through FY25
- Key drivers will be private player capex and Bharat Net

Irrigation sector



Irrigation sector vision



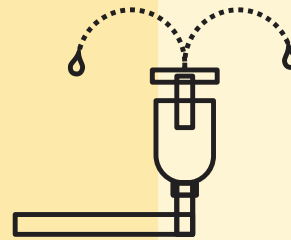
Current status

Low irrigation coverage: Area under irrigation is ~68 million hectare (~49% of total) with the balance being unirrigated and dependent mostly on monsoon

- **Low focus** on efficient methods of irrigation
- **Land irrigated under micro-irrigation (most efficient method of irrigation):** ~15% of total net irrigated area (NIA)
- **No interlinking of rivers** – three priority links identified under National Perspective Plan (NPP). **30 identified interlink projects** are under various stages of project preparation

Limited focus on efficient use of water for irrigation

Pricing method based on irrigated land area-based fees`



Vision 2025

Higher irrigation coverage: Total irrigated land is ~85 million hectare (~61% of total). **Reduced dependence** on rains to improve farmers' incomes and consumption levels

Emphasis on efficient methods of irrigation

- Micro irrigation to cover **28%** of total NIA, leading to **efficient use of scarce water**
- **Switchover** from traditional methods of tank and canal irrigation to **efficient methods: drip and sprinkler irrigation**

Judicious use of water for irrigation

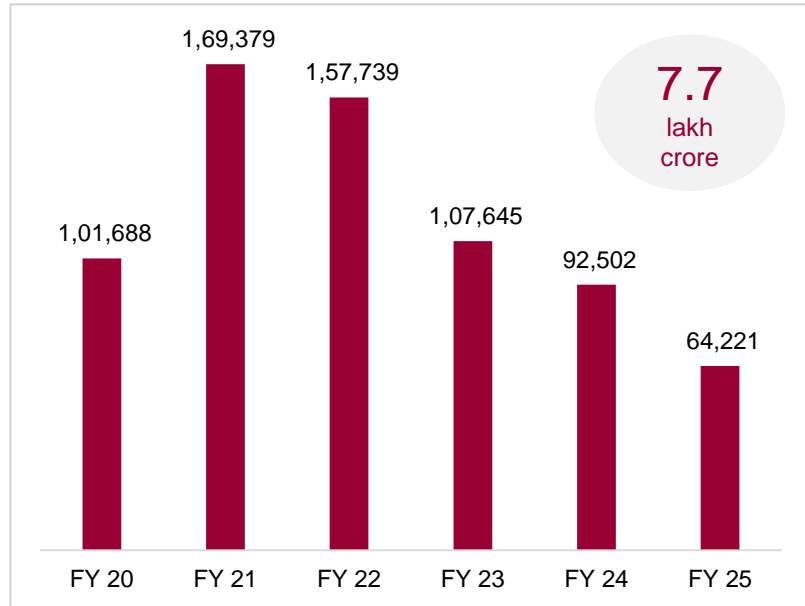
Pricing method based on **water quantity-based fees**

Priority links identified as per NPP to be taken up. **River interlinking** to increase overall area under irrigation, domestic and industrial water supply

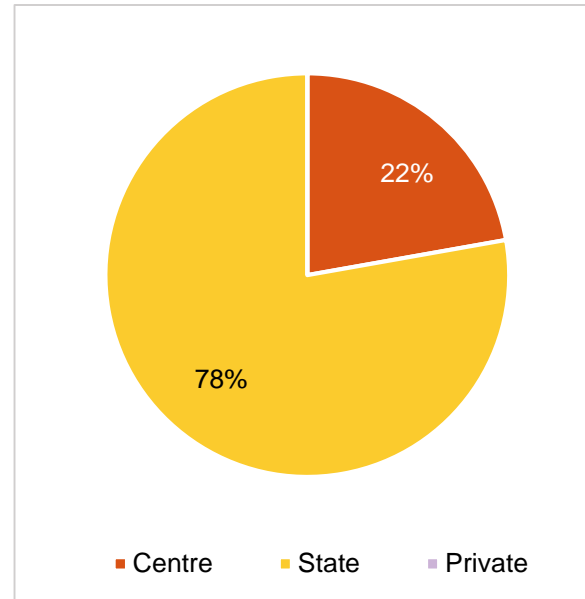
Irrigation NIP summary



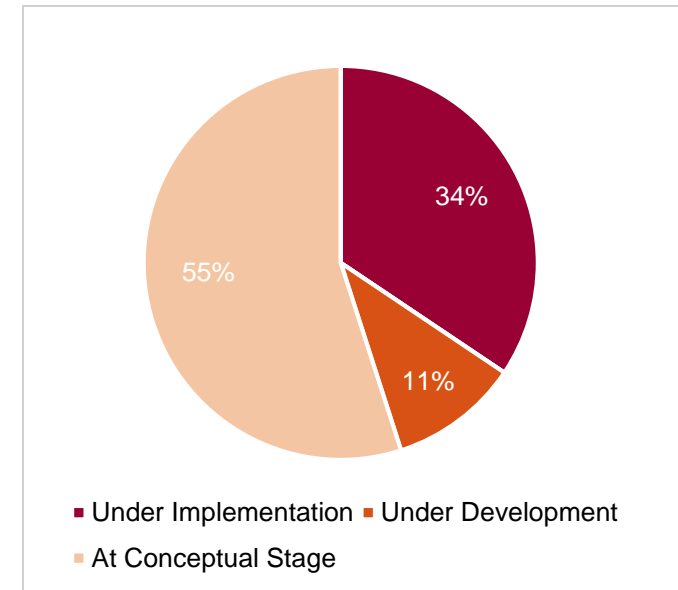
Annual phasing of investments (Rs crore)



Implementing agency



Status of projects



- 78% of the NIP to be implemented by states; 55% of projects are in the conceptualisation stage
- Lower execution rate after FY22 through FY25
- Major projects include Ken-Betwa, Godavari-Cauvery river linking, Clean Ganga, and reservoir projects

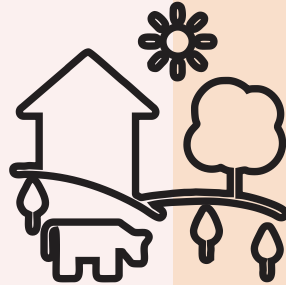
Rural sector



Rural infrastructure vision

Current status

- A majority of the rural population **lack access** to pucca houses
- **Lack of access** to basic civic amenities: piped drinking water, power supply and LPG connection
- Pradhan Mantri Gram Sadak Yojana (**PMGSY**) under implementation to improve **connectivity issues** for existing rural roads
- As per NRDWP, **only 18%** of rural households have access to piped water supply
- As per Swachh Bharat Mission (Gramin), 99.4% of rural households have **access to individual household toilets** and 90% of villages have been considered as **Open Defecation Free (ODF)**



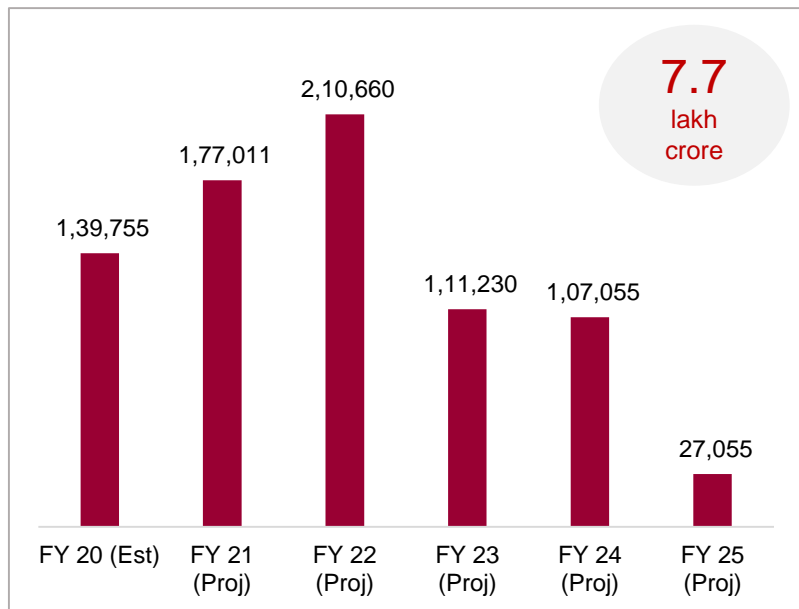
Vision 2025

- **100% of rural** population to have access to pucca houses with basic civic amenities
- **Planned provision of urban facilities** in rural areas under Rurban Mission
- High standard, structurally sound and well-maintained rural roads facilitating **improved connectivity with safer and efficient access**
- Under **Jal Jeevan Mission**, **all** rural households to have piped water supply by 2024
- **100%** of rural households to have access to individual household toilets and **100%** of villages to be ODF

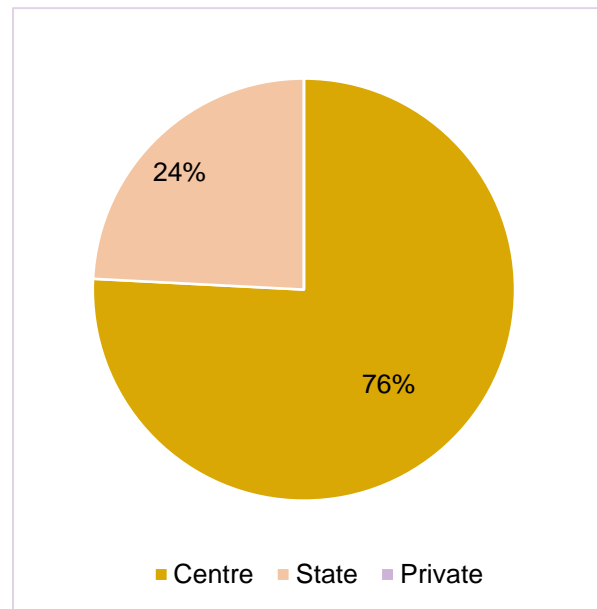
Rural Infrastructure NIP summary



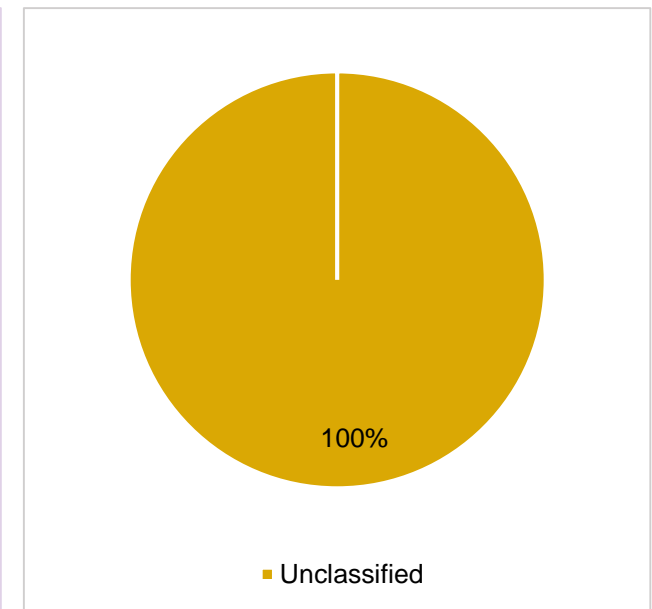
Annual phasing of investments (Rs crore)



Implementing agency



Status of projects



- 76% of the NIP to be implemented by the Centre; all projects are in the implementation stage
- Lower execution rate after FY23 through to FY25
- Major projects include Jal Jeevan Abhiyan (Rural), PMGSY and PMAY-G

Agriculture sector



Agriculture sector vision



Current status

- **Implementation challenges and infrastructure bottlenecks** have prevented wide adoption of e-NAM.
- **APMC regulations** have prevented effective functioning of e-NAM and help in fair price discovery for farmers
- Existing yield levels of many crops remain **much lower than the world average**
- Key challenges include use of **low quality seeds and low adoption of technology**
- **60%** of cold storage facilities are located in UP, Punjab, Gujarat and West Bengal, rest **are dispersed across India**
- **Sub-optimal** storage and cold chain infra has resulted in high post-harvest wastage
- **FCI currently has an installed modern silos capacity of 7.25 lakh MT**



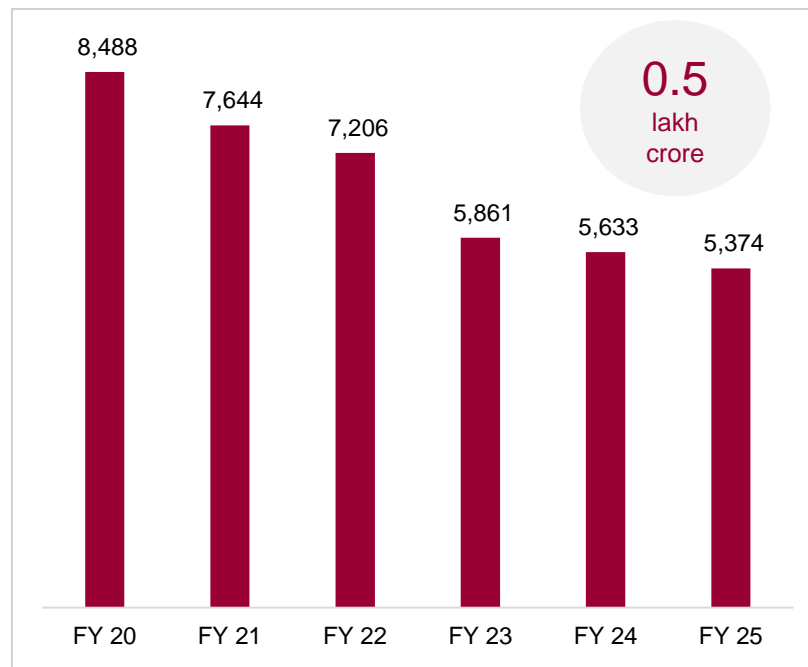
Vision 2025

- **Doubling farm incomes** by upgrading of 22,000 rural haats into Gramin Agricultural Markets (GrAM).
- **Using FPOs/ SHGs based** aggregation for maximizing value to farmers
- **Using drones** for real-time updates regarding impact of adverse weather events
- **GrAM to be exempt from APMC regulations and linked to e-NAM** to develop agri-marketing infrastructure and bring markets closer to farm gate
- Uniform pan-India distribution of **cold storage** facilities to improve agri-export quality
- **Building packaging and processing units** near farms and using **refrigerated** transportation to reduce wastage
- Modernising the **storage infrastructure** by adding **modern silos** for capacity of 100 lakh MT in order to improve the shelf life of food grains for PDS

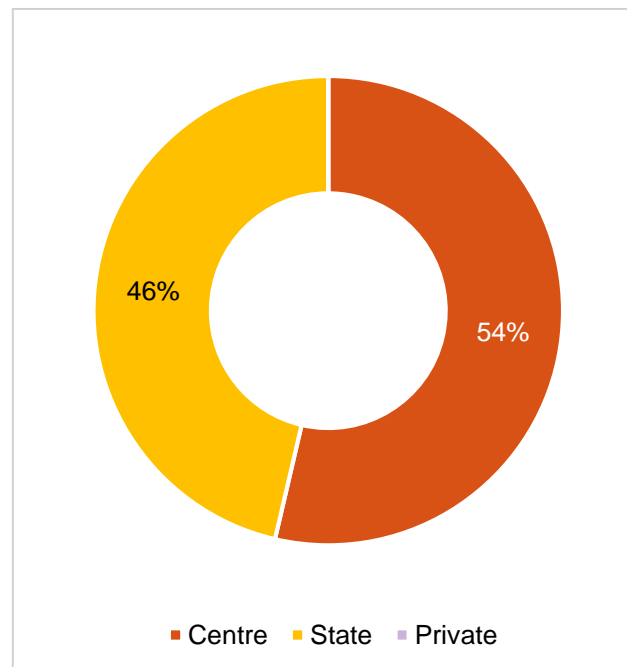
Agriculture NIP summary



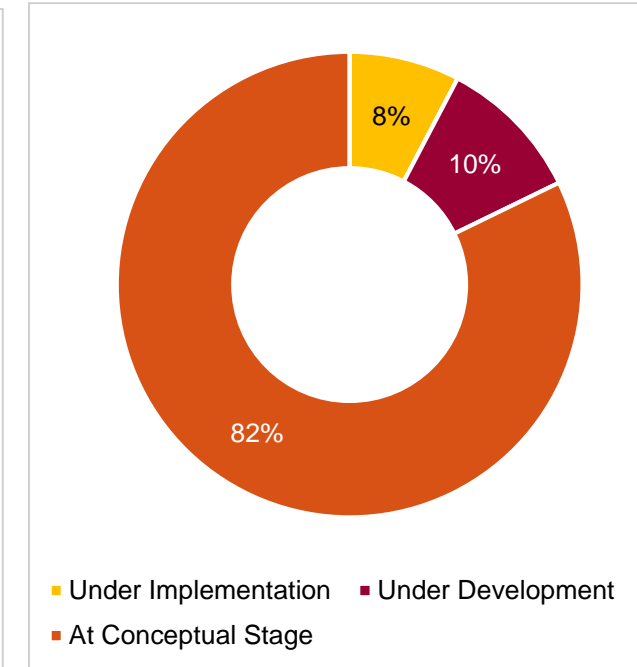
Annual phasing of investments (Rs crore)



Implementing agency



Status of projects



- 54% of the NIP to be implemented by the Centre; 82% projects are in the conceptualisation stage
- Major projects include conversion of Rural Haats to Grameen Agricultural Markets (GRAMS)

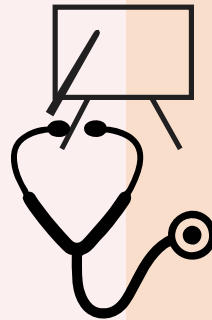
Social infrastructure sector



Social infrastructure sector vision

Current status

- Out of the total 39,931 colleges, only 2.5% (~ 998) offer Ph D programme and 34.9% (~13,936) offer post graduate level programmes
- The pupil-teacher ratio (PTR) is currently 24, which has resulted in sub-optimal learning outcome
- Gross enrolment ratio (GER) in higher education, which is calculated for 18-23 years age group, is 25.8%
- India's GDP spend on healthcare has been 1.28% of GDP which reflects on the infrastructure, bed density and service quality of healthcare system
- Immunisation levels has been sub optimal which has made it challenging to tackle non-communicable diseases. Only 62% children between ages 12 and 23 months are fully immunised



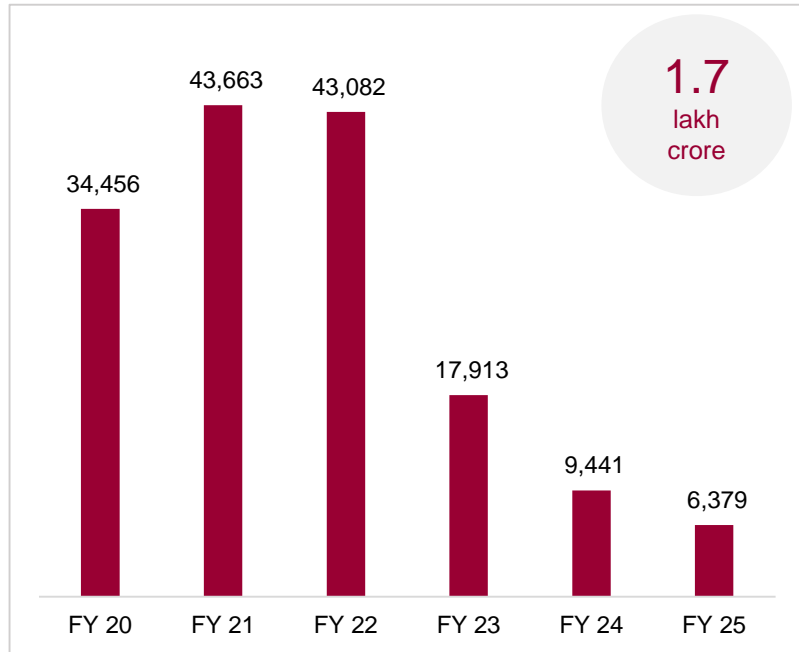
Vision 2025

- Overall GER needs to improve to at least 40% with reduced interstate disparity.
- India to spend higher amounts on healthcare at about 2.5% of GDP to revamp the existing health care system and improve hospital bed density in line with global benchmark like 4.9% for China.
- Focus on better research quality, and setting up new institutes dedicated to research
- **73 new medical colleges** to add to enhance doctor availability
- **World-class technical education and Research institutes** providing state-of-the-art technology driven learning in line with global peers

Health infrastructure NIP summary

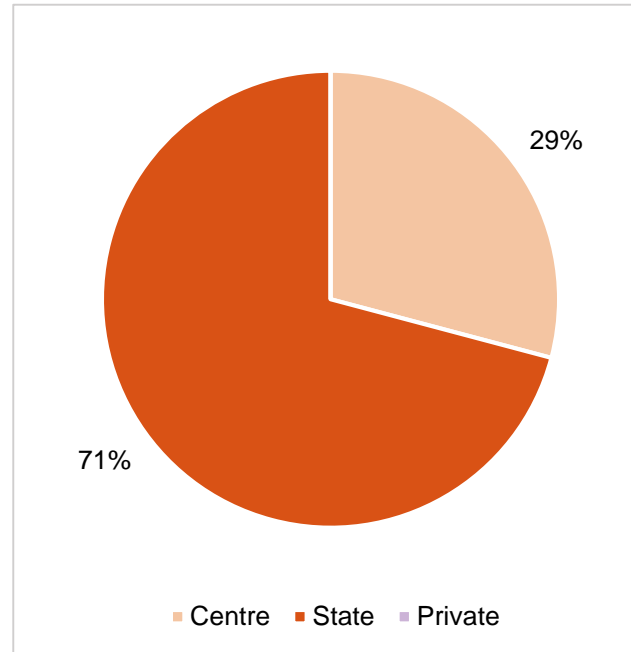


Annual phasing of investments (Rs crore)

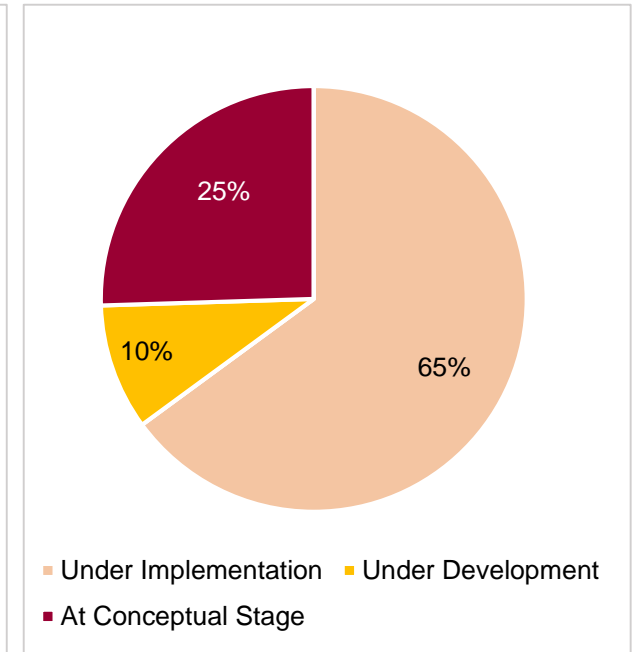


^ Excludes some states phasing data

Implementing agency



Status of projects

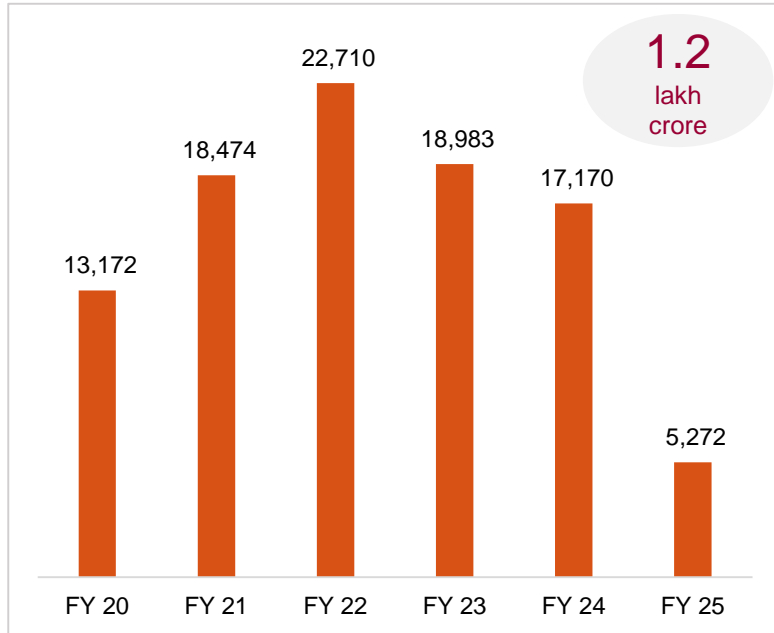


- Majority of the spending is being done by the state governments in social infrastructure
- Lower execution rate from FY23 through FY25
- Major projects include setting up of AIIMS medical colleges

Higher education infrastructure NIP summary

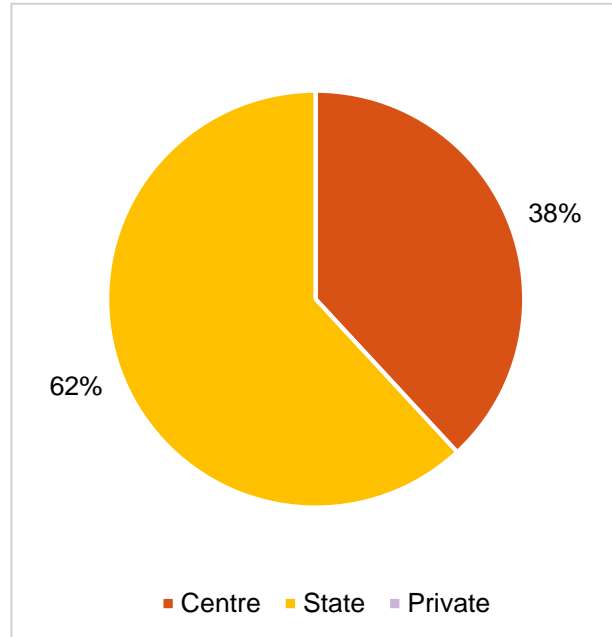


Annual phasing of investments (Rs crore)

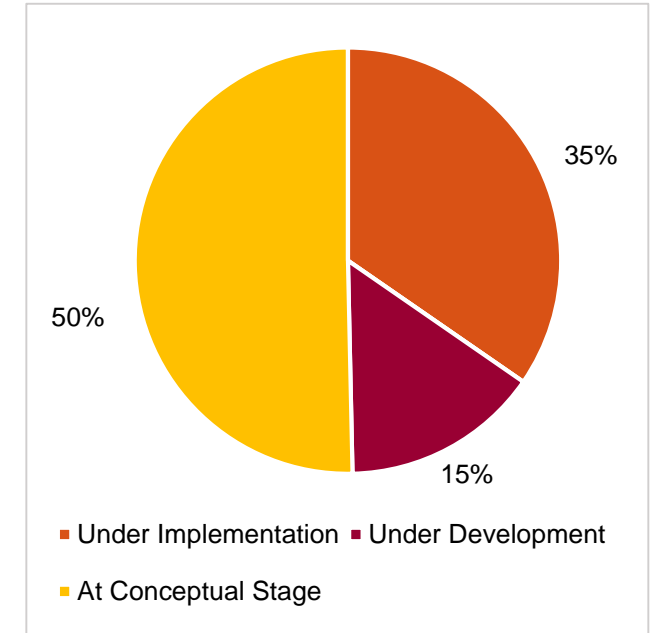


^ Excludes some states phasing data

Implementing agency



Status of projects



- Majority of the spending done by the government in social infrastructure
- Lower execution rate from FY23 through FY25
- Major projects include setting up of AIIMs medical colleges, IITs and school infrastructure

Reforms



Reforms (1/6)

General reforms

In order to ramp up infrastructure investments in various sectors throughout the country, it is critical to introduce a set of general reforms and also update existing sectoral policies and reforms. This will help propel investments in the infrastructure sector.

Some of the key policies and reform initiatives to be undertaken are highlighted below.

- **Improving project preparation processes**

Project preparation processes such as planning and design are considered critical steps in creation and efficient implementation of bankable infrastructure projects. Inadequate attention to project planning may lead to avoidable delays in the implementation of the project or may even lead to scrapping of projects prior to its implementation. It is critical to have a robust project preparation framework consisting of (i) transparent policy and legislative framework, (ii) presence of an overarching, capable and empowered public institution for infrastructure planning, (iii) presence of guidelines, national standards, model bidding documents and standard procedures, design considerations, including technology choices and disaster resilience, (iv) well-defined workflows, multi-stage reviews, audits and approvals for quality assurance of project preparation documents, and (v) establishment of a project organization or SPV with such structure and capabilities.

- **Enhancing execution capacity of private sector participants**

For enabling robust private sector participation in infrastructure sector, it is critical to have a deep pool of experienced developers with required competence and execution capacity. At present, in most of the infrastructure sectors in India, only a handful of strong private sector participants are available, reducing the pace of infrastructure build-out through PPP modes. To alleviate the lack of capacity for scheduled delivery of projects and development of a pool of private developers, it is necessary to have an effective enabling environment and capacity development of private sector and the public sector as well. Collaborations and joint-ventures with strong global infrastructure developers must be facilitated to build domestic capacity.

Reforms (2/6)

- **Robust enabling environment**

An effective enabling environment comprises a robust policy framework and a well-developed public institutional capacity. This will help improve private sector participation through well-framed contractual agreements with optimal risk allocation, and honouring of the contracts entered. As a general principle, sanctity of contracts should be upheld. Any issues related to contract deviation should be smoothly adjudicated through a dedicated dispute resolution mechanism in a timely manner by focusing on the following two elements below:

- **Optimal risk sharing**

There should be optimal risk sharing between the public and private sector entities, and the risks should be allocated to parties that are best equipped to handle it. Further, delay in project implementation has been the most common reason for stalling of many infrastructure projects in India. Hence, a new mechanism needs to be established to ensure that all key clearances and approvals are in place upfront before awarding the project. Loading contracts with difficult conditions, financial and non-financial, has led to unnecessary burden leading to financial stress and potential insolvency amongst developers. This must stop. Hence, the following are recommended:

- Adoption of international contract standards (such as FIDIC standards) by all infrastructure departments, including Railways, with clear procedures for change of scope, standardisation of contract and safe exits for parties.
- Project bidding and awards are to be done only after fulfilling conditions precedent such as 90% of contiguous land acquisition and all clearances for the project.

- **Sanctity and enforcement of contracts**

In order to boost private sector interest, it is critical that the sanctity of contracts is upheld by the central, state and local governments. Repudiation of contracts must be restricted only to situations to be clearly defined in the contract. Provisions of contracts therein should be legally enforceable, which makes the parties involved legally abide by these contracts. In case of inability, there should be adequate safeguards built in in the form of clearly quantified termination payments under various possible scenarios.

Reforms (3/6)

- **Institutionalisation and efficiency of dispute resolution**

A critical step in addressing dwindling private sector participation in infrastructure can be institutionalising dispute resolution mechanism to efficiently resolve disputes related to PPP projects. Adequate investments must be made in the institutions created under The Commercial Courts Act 2015, The Specific Relief (Amendment) Act 2018 and the New Delhi Arbitration Centre Act 2019 to enable them to deliver sound results in enabling speedy resolution in the next few years. The Task Force also recommends that Ministry-level Committees to resolve complex contractual disputes as mediation mechanisms that can settle disputes out of court.

- **Improving Capacity development of Project Execution Agencies**

The capacity of public institutions to plan, prepare and deliver infrastructure projects on schedule is key to effective infrastructure development. It is critical to undertake steps such as (i) establishing a robust project governance structure (ii) use of agile planning (iii) improving procurement process and strengthening contract management and (iv) strengthening people management processes in order to improve the project management capabilities of public institutions.(v) provide flexibility to hire top talent at senior level including project leadership must be provided for.

- **Strengthening infrastructure quality**

Good quality infrastructure is important for attaining faster economic growth, ensuring an improved human development index and broad-based participation in development with equitable distribution of benefits. Initiatives such as having a uniform regulation and output-based performance standards are adopted, developing consistent processes for updating/ setting standards, improving compliance mechanism, alignment with development strategy and alignment with social and environmental sustainability. A number of global benchmarks are available, including the G20 Principles for Quality Infrastructure Investment. The Task Force recommends that a National Framework for Infrastructure Quality must be laid down in each sector within the next three months, based on global and national standards.

- **Promoting competition**

In order to enhance competition in the domestic markets and to generate or promote a culture of competition in the country we need to establish an anti-trust resolution mechanism in order to expedite resolution of anti-trust cases, improve collaboration between Competition Commission of India (CCI) and sector regulators to ensure coordination between them to address competition related concerns and operationalisation of the National Competition Policy 2011 to establish uniform competition principles across different sectors. Ministries must build capacity and coordination mechanisms with market players and consumers to periodically assess the state of competition and put in place enabling conditions for growth of health competition.

Reforms (4/6)

- **Financial sector reforms**

In order to address key issues and attract foreign and private capital into infrastructure, it is critical to undertake following policies and reforms.

- **Revitalising the bond and credit markets**

A credit enhancement fund (CEF) to be established for infrastructure sector projects, is expected to open up appetites of bond market investors for investing in infrastructure projects. Institutional investors are more suited to fund infrastructure projects given the long-term patient capital requirement of infrastructure projects. However, strict regulatory requirements require these investors to invest only in safe government and public sector bonds and they have limited appetite for lower rated assets (below AA). As most of the infrastructure projects are rated below AA, it is critical to enhance their rating to augment the access of institutional investors to infrastructure sector through capital market instruments. A well-capitalised CE Institution should be set up early.

It is also important that long-term resources from the pension and insurance sector are channeled into the infrastructure bond market. This may require Government to work with IRDA and PFRDA to re-examine existing investment guidelines. Further, growing the pool of pension and insurance assets through sector reforms is a pressing requirement, including potential FDI reforms.

Building up capacity of banking institutions, including IIFCL and SBI, to provide long-term infrastructure finance is critical for growth of the sector. The Task Force also recommends suitable governance reforms in IIFCL. The possibility of regulatory reforms enabling and attracting private sector DFI licensing also needs to be examined by Government in consultation with RBI.

Reforms (5/6)

– **Strengthening the municipal bond market in India**

At present, grants from both state and central government dominate the municipal financing landscape in India. These grants are substantially lower as compared to the investment requirement of local governments. In order to augment their funding source, it becomes critical that these local governments start tapping the bond markets. So far eight local bodies in India have raised Rs 3,390 crore via municipal bonds. By 2024, fifty cities are expected to issue municipal bonds. Given the governance and accounting reform that municipalities need to undertake before they can inspire trust in the market, Municipal bonds are a sure way to transform urban governance.

Key steps needed to be undertaken by the local government for raising funds through issuing municipal bonds – (i) improve financial discipline and regular disclosures, (ii) augmenting revenue base and buoyancy of revenues of local governments, (iii) addressing gap in creditworthiness of local governments through innovative credit enhancement structures, and (iv) encouraging pooled bond issuances

– **Revitalising asset monetization**

Asset monetisation is considered critical for infrastructure sectors, as the asset owning ministries, CPSEs and local bodies can reduce their debt burden by monetizing their asset portfolio for further investment in creation of assets. The direct benefit of asset monetisation is that it creates an enabling environment for participation of long-term institutional investors and introduce private sector efficiencies in the management of infra assets. NHAI and AAI are amongst the first to monetise operational assets in the last 4 years. Asset monetisation can be undertaken through sale of land, non-operational assets through long-term lease with significant upfront lease payment, toll-operate-transfer (TOT) model for operational road assets, infrastructure investment trusts (InvITs), sale of portfolio of assets to strategic/ financial investors, loan asset monetisation through securitisation and value capture financing (VCF). The first pipeline of assets to be monetised by March 2020 have been finalised and options such as TOT and InvITs have been initiated by the Ministries of Power, Shipping, Highways and Railways. The Task Force recommends that the pipeline for the next two years also be finalised within the next 3 months.

Reforms (6/6)

InvITs are a key way in which private developers could monetise their investments in infrastructure projects to enable them to raise cash for new project development. The Indian InvIT market is not yet mature and has supported formation of 10 InvITs till date, of which only two are listed. The market is not very deep. The leverage norms (debt to asset value) for InvITs have been recently relaxed to 70% from 49%. The Task Force recommends further facilitation and regulatory tweaks to enable InvITs to emerge a crucial source of financing of public and private infrastructure.

– **Enabling User charges to finance infrastructure**

It is critical to ensure appropriate pricing of infrastructure services, for the sponsors and investors of the infrastructure assets to recover both capital cost and operating costs. It is necessary to determine fair value of user charges to finance and grow infrastructure. Therefore, user charges deduced with excellent planning, execution and policy framework will provide more clarity to investors and in turn improve their confidence. The Task Force recommends setting up independent regulators or legislating regulatory mechanisms (such as the Fare Fixation Committee under Section 34 of the Metro Railways Act 2002) in sectors where such market pricing mechanism is lacking. This can enable fixation of fares at an arm's length. Alternatively, there may be regulation by contract with price regulation provisions mentioned in the contract itself.

– **Long-term financing landscape**

Necessary steps or initiatives need to be undertaken in order to solve the challenge of stressed assets faced by banks and infra-NBFCs besides liquidity crunch faced by NBFCs, by encouraging usage of innovative mechanisms such as loan securitisation, InvITs, etc. and increased participation of Infrastructure Development Funds (IDFs), Development Finance Institutions (DFIs), etc. The Task Force believes that deepening IDF markets and developing the Asset backed Securitisation market for infrastructure could significantly relieve banks of current exposure in commissioned projects and enable them to direct more capital for greenfield projects. Taking note of the scarcity of long-term capital for infrastructure, the Task Force recommends regulatory revamp to enable significant participation of FPIs and inflow of FDI into IDFs, DFIs and securitisation markets may be undertaken in consultation with RBI and SEBI.

Project monitoring



Project monitoring framework key elements



Category	Project category	Key monitorables	Action plan / KPIs
I	Project under implementation	<p>Live monitoring</p> <ul style="list-style-type: none"> • Compliance of Conditions Subsequent (CS) specific to relevant milestones • Actual achievement of project milestone against planned milestone • Actual progress in disbursement of debt and equity against stated milestones • Key potential issues stalling compliance for pending CS besides monitoring of critical areas required for timely project completion and timely highlighting of issues to concerned line ministries, etc. 	<ul style="list-style-type: none"> • Results monitoring, tracking against pre-defined milestones, reporting progress • Identification of key issues stalling progress, required intervention and responsible party • Timely action to be taken by concerned stakeholders as per governance structure and escalation matrix provided.
II	Project achieved financial closure (FC), yet to drawdown funds	<ul style="list-style-type: none"> • Monitor compliance of all CS and key issues stalling compliance 	<p>Establish project team and steering committee comprising representatives from stakeholders: lenders, equity investors</p> <ul style="list-style-type: none"> • Fulfilment of conditions precedent to appointed date • Create work-plan based on project design / milestones • Assign responsibilities in the project team/steering committee • Manage risk mitigation activities
III	Project under development - Project identified and DPRs prepared but yet to achieve FC	<ul style="list-style-type: none"> • Monitor progress in completion of Feasibility study/ preparation of DPRs • Monitor approval from the competent authority • Monitor status of and actual progress in compliance of all Conditions Precedent (CPs) and key issues 	<ul style="list-style-type: none"> • Conduct detailed financial appraisal and risk management • Assumptions w.r.t. estimated costs and benefits • Financial appraisal spreadsheets, showing individual benefit and cash flows • Design of risk mitigation strategies
IV	Project at the conceptualisation stage - project announced but little visibility on project award, acquisition, etc.	<ul style="list-style-type: none"> • Monitor number and value (project expenditure) of projects • Task Force to monitor progress of projects at the conceptualisation stage 	<p>Project formulation stage</p> <ul style="list-style-type: none"> • Track status of DPR • Track status of likely date of obtaining key clearances: environment, CRZ, forest clearance, etc. • Economic, environment and social appraisal • Risk and sensitivity analysis

A governance framework for monitoring will be put in place.

Financing the NIP



Financing the NIP for the Centre

Rs lakh crore	FY19 (RE)	FY20 (BE)	FY21 (P)	FY22 (P)	FY23 (P)	FY24 (P)	FY25 (P)
Total capital outlay by Centre (infra) A	3.54	3.77	4.58	5.56	6.76	8.21	9.97
Budgetary support (infra) B	1.39	1.53	1.86	2.25	2.74	3.33	4.04
C = B/A	39%	41%	41%	41%	41%	41%	41%
Budgetary support/GDP (D= B/E)	0.73%	0.74%	0.82%	0.89%	0.96%	1.03%	1.11%
Incremental budgetary support/GDP vs FY20			0.07%	0.14%	0.21%	0.29%	0.36%
GDP in Rs lakh crore (E)	190.10	205.37	227.00	254.27	286.42	323.25	365.49



Currency conversion



Rs 10 lakh	Rs 1 million
Rs 1 crore	Rs 10 million
Rs 100 crore	Rs 1 billion
Rs 1 lakh crore	Rs 1 trillion
\$1	~ Rs 71

Notes



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Report of the Task Force on the National Infrastructure Pipeline



Government Of India

Infrastructure Policy & Finance Division
Department of Economic Affairs, Ministry of Finance
Government of India

<http://www.dea.gov.in/>