सत्यमेव जयते

National Infrastructure Pipeline

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

Volume I

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Abbreviations and Acronyms

AAI	Airports Authority of India
ACS	Average cost of supply
AI	Artificial intelligence
AERA	Airport Economic Regulatory Authority
AGR	Adjusted gross revenue
AISHE	All India Survey on Higher Education
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
APDRP	Accelerated Power Development and Reforms Programme
APLM	Agricultural Produce and Livestock Marketing
APMC	Agricultural Produce Marketing Committee
APMIP	Andhra Pradesh Micro Irrigation Project
ARR	Average revenue realised
ASER	Annual Status of Education Report
ASQ	Airport service quality
AT&C	Aggregate technical & commercial
ATF	Aviation turbine fuel
AUM	Assets under management
BGFI	Bond Guarantee Fund of India

BIS	Bureau of Indian Standards
BIT	Bump integrator test
BLT	Build-lease-transfer
BOLT	Build-own-lease-transfer
BOO	Build, own and operate
BOOT	Build, own, operate and transfer
CAGR	Compound annual growth rate
CCI	Competition Commission of India
CDRI	Coalition for Disaster Resilient Infrastructure
CEF	Credit enhancement fund
CGD	City gas distribution
COD	Commercial operations date
CRZ	Coastal regulatory zone
DEA	Department of Economic Affairs
DPR	Detailed project report
EPC	Engineering procurement construction
EWS	Economically weaker section

FDI	Foreign direct investment
FIDIC	International Federation of Consulting Engineers
FPI	Foreign portfolio investment
GDP	Gross domestic product
IDF	Infrastructure debt fund
IIFCL	India Infrastructure Finance Company Ltd
INVIT	Infrastructure investment trust
IRDA	Insurance Regulatory and Development Authority of India
KPI	Key Performance Indicator
MRTS	Mass rapid transit system
NBFC	Non-banking financial company
NFHS	National Family Health Survey
NHAI	National Highways Authority of India
O&M	Operations and maintenance
PFRDA	Pension Fund Regulatory and Development Authority
PIRF	Project information request format
PPP	Public-private partnership
SBI	State Bank of India
SDG	Sustainable development goals
TOT	Toll-operate-transfer

USA	United States of America
USD	United States Dollar
VCF	Value capture finance
WEF	World Economic Forum

Conversion Factors

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

Task Force Members 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 (Investments), DEA, MoF	Member
Joint Secretary (Infrastructure Policy & Finance), DEA, MoF	Member - Secretary

**Not below the rank of Additional Secretary (AS)*
#Secretary or an officer of rank of secretary

Terms of Reference

- To identify technically feasible and financially/ economically viable infrastructure projects that can be initiated in fiscal years 2020 to 2025
- To estimate annual infrastructure investment/ capital costs
- To guide the ministries in identifying appropriate sources of financing
- To suggest measures to monitor the projects so that cost and time overrun is minimised

Acknowledgements

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Final Report of the Task Force to draw up the National Infrastructure Pipeline (NIP) from FY 2019-20 to FY 2024-25.

A Task Force to draw up the National Infrastructure Pipeline (NIP) for each of the years from FY 2019-20 to FY2024-25 was set up under the chairmanship of Secretary (DEA) to identify technically feasible & financially/economically viable infrastructure projects which can be included in the NIP. The final report of Task Force was prepared after detailed deliberations with Central Infrastructure Ministries/Departments/State Governments, Corporates, Banks/FIs/PE Funds, Industry Associations etc. The projected total infrastructure investment in Final Report stands at Rs 111 lakh crore during the period FY 2020 to FY 2025.

The Final Report of NIP task force has been prepared in three volumes. Volume-I contains executive summary of NIP, KPI and Governance Framework with escalation matrix, detailed sector-wise reforms are enumerated in volume II and details of all the projects along with analytics are available in volume -III (A&B).

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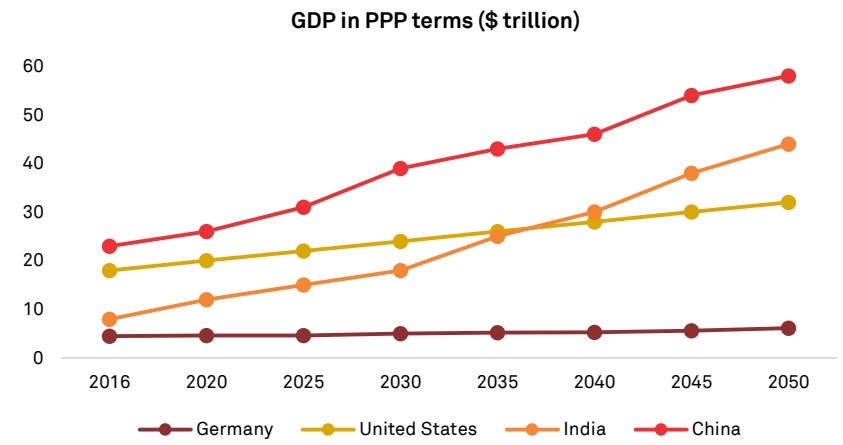
Infrastructure Vision 2025 and Goals

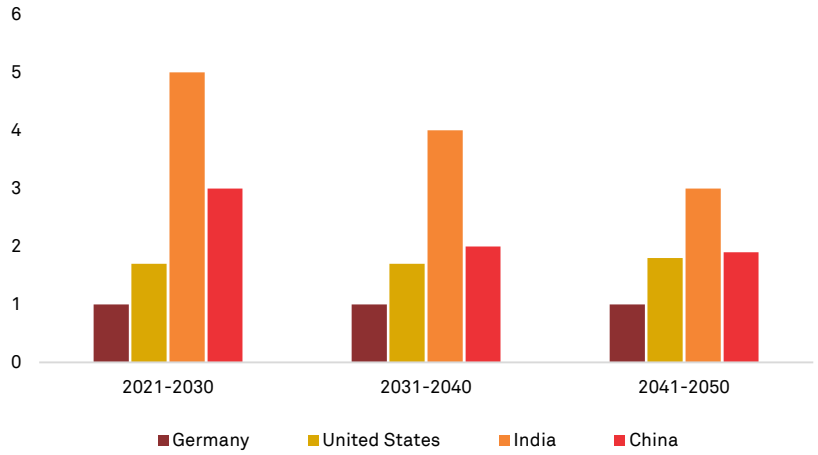
World 2050

Figure 1 GDP in PPP terms ($ trillion)



Source: The World in 2050, PwC

Figure 2 Annual average growth rate (%)



Source: The World in 2050, PwC

Some upcoming challenges

- First, 70% of the global population will be living in urban centres, some in cities of more than 100 million people, infrastructure will determine their quality of life

- 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, but should do so responsibly

- Third is the vital challenge of fresh water. Already, 20% of the population lacks clean drinking water and 40% lacks 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

- 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.

Some Complexities in 2050

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

- Lack of infrastructure is the primary growth constraint
- Lead times associated with infrastructure development mean that decisions taken now will shape the world of the future
- Increasingly, therefore, government looks to the private sector as a partner. However, effective models for co-working between the public and private sectors need to be devised.
- Governments and businesses must make vital strategic decisions now, and promote changes in behavior, before the speed and severity of climate change are fully known
- 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 supply chain disruptions
- New technologies, like high-speed broadband, are already part of infrastructure thinking. Innovations, such as Internet of Things, will make infrastructure more efficient and sustainable
- Financing of infrastructure of the needed scale is the issue for which solutions would have to be found

India - Growth and Infrastructure

Infrastructure is an enabler for 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, banks and financial institutions will be in a much better position to provide credit
- With the end of deleveraging phase, the corporates will start leveraging and this will push growth up. The corporate tax cut is allowing the companies to de-leverage faster and they will be primed up for undertaking investments when the economic cycle turns
- Payoff from reforms like Goods and Services Tax and Insolvency and Bankruptcy Code, 2016 are work in progress and once streamlined they will create possibility of an 'efficiency-led' spurt of growth over the medium run
- Capacity utilisation will catch up and result in an improvement in the investment cycle
- Infrastructure thrust by the Government of India through creating the NIP

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 the Make in India programme 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.

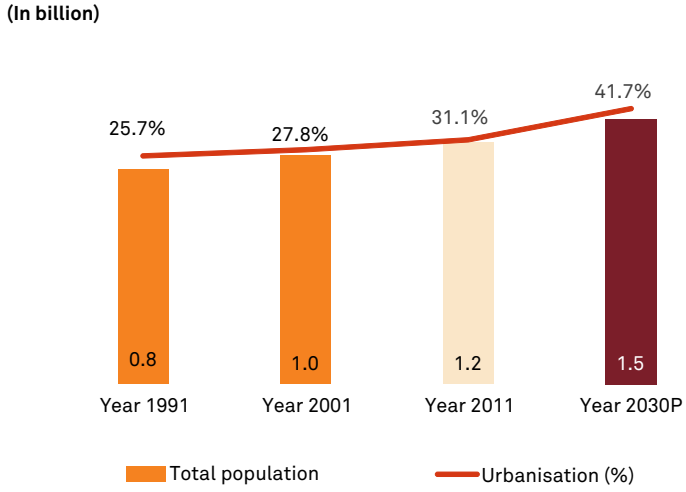
India 2030: Demographic Changes and Infrastructure Needs

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

As per World Bank data, India's population has increased at a CAGR of 1.2% during the period 2011-2017 and is expected to reach 1.52 billion by 2030. In the last decade, the 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 31% in 2011. Refer Figure 3 below.

Figure 3 Trend in India's population and urbanisation

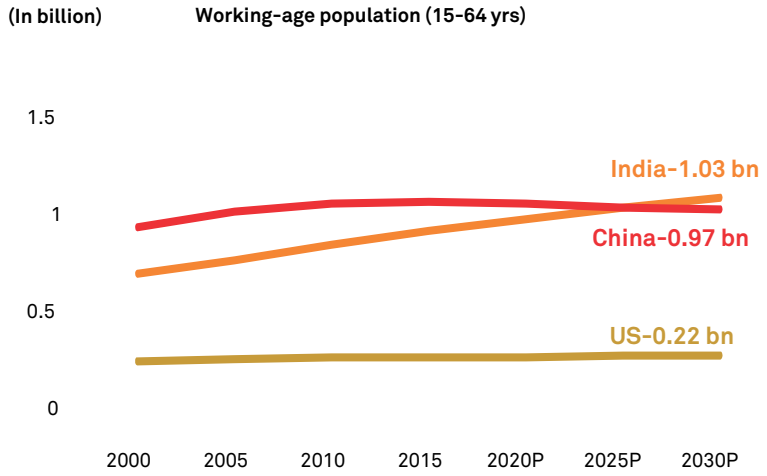


Note: P-Projected
Source: CRIS estimates, McKinsey Global Institute

By 2030, it is estimated that five states in India – Tamil Nadu, Gujarat, Maharashtra, Karnataka and Punjab will have more than 50% urbanisation. Also, the number of metropolitan cities in India are estimated to increase from 46 as per Census 2011 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 realising the full potential of a growing urban economy and raise its contribution to GDP.

Figure 4 Growing working-age population



Note: P-Projected
Source: United Nations Population Division (UNDP)

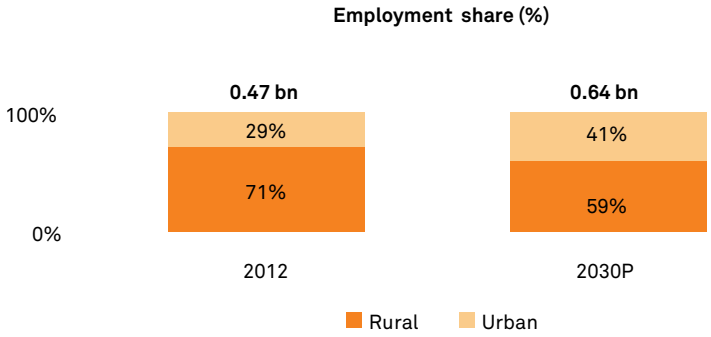
Working-age population is defined as the number of people in the age bracket 15 to 64 and is considered as a basic indicator for productive capacity. Figure 4 shows the expected growth in the working-age population of India as compared with other countries such as the US and China over the next few years.

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

Contribution to employment

As per the National Sample Survey Office 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. Figure 5 shows the contribution of urban and rural areas to total employment in India.

Figure 5 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.

Shift to service-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 54% share of services, 31% share of industry and 15% share of agriculture. By 2030, it is estimated that the share of services sector in India's GDP will be 58%, the share of industry sector will be 34%, and the share of 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 at ~24% during 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 peoples' 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. Coalition for Disaster Resilient Infrastructure (CDRI) has been conceived and conceptualised over 2018-19 involving substantive consultations with more than 35 countries including advanced economies, developing economies, small island developing countries and landlocked countries representing a range of development, climate and disaster risk contexts. CDRI was formally launched by the Hon'ble Prime Minister of India at the 2019 UN Climate Action Summit in September 2019.

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.

Infrastructure Vision and Goals

Vision and mission statement for infrastructure growth

To achieve the target of $5 trillion economy by 2025, and meet the aspirations of the citizens of India, creating new and upgrading existing infrastructure will be the key to raising India's competitiveness.

Vision

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

Mission

- Develop a five 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 practices
- Push India up in global rankings in public infrastructure

Strategic Goals

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

Figure 6 Infrastructure Vision 2025: Meeting aspirations, propelling growth and improving ease of living

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 below.

Aspirational service standards

Goals	Strategy
Affordable & clean energy	• 24x7 power supply 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 & efficient transportation and logistics	• Enhanced road connectivity to remotest areas with extensive charging and on-road traction infrastructure for e-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 National Civil Aviation Policy 2016 • Ports and waterways infrastructure focused on reducing logistics time and cost for foreign and domestic trade as per the Sagarmala National Perspective Plan 2016 • Urban mobility – mass rapid transit system (MRTS) and bus connectivity within 800 m of homes in more than 50 cities
Housing and water supply	• Housing for All by 2022 – Pradhan Mantri Awas Yojana; negligible slum population
	• All households to have piped water supply meeting national standards by 2024
Doubling farmers' income	• Increased irrigation and micro–irrigation coverage
	• Integrated agri-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 gross enrolment ratio target as per draft National Education Policy 2019
Good health & well-being	• Superior accessible primary, secondary and tertiary healthcare infrastructure facilities across India to meet National Health Policy 2017 goals
	• Medical, para-medical education infrastructure meeting manpower needs by 2025 as per Indian Public Healthcare Standards
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 and safety
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

National Infrastructure Pipeline

Executive Summary

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 to 2040. Out of this envisaged infrastructure investment, ~50% is required in Asia alone (with China, India and Japan being major contributors), and with roads and electricity sub-sectors constituting ~67% of these investment needs. 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 $1-1.5 trillion on a per annum basis.

It is estimated that India would need to spend $4.5[1] trillion on infrastructure by 2030 to realise the vision of a $5 trillion economy by 2025, and to continue on an escalated trajectory until 2030. The endeavor of the 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 is expected to gradually move upwards in the five years starting from fiscal 2020 anchored 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 Goods and Services Tax and 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 reforms. Infrastructure development is labour intensive, leading to increase in employment opportunities and thus, fueling domestic demand. All of this together can aid in initiating a virtuous cycle of higher investments, growth and employment generation in the economy.

The above envisaged economic growth will be accompanied by a shift in the underlying demographics of the country – increase in urbanisation levels, growing workable population and increase in the share of employed individuals in the 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 increase 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 2018[2]. 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

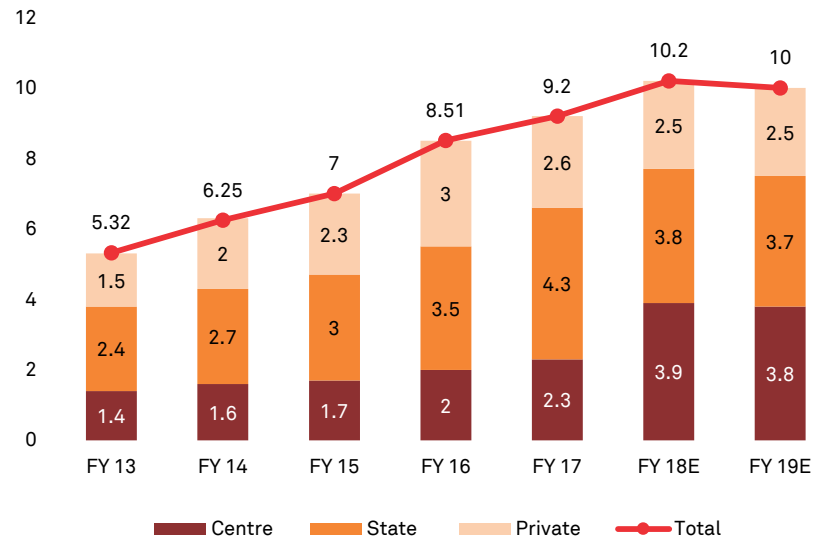
[1] *Source: CRIS estimates*
[2] *United Nations Population Division's World Urbanisation Prospects 2018*

along with achieving SDGs 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, wastewater treatment facilities, and urban mobility through public transport. Further, in order to measure the standards of living, NITI Aayog has designed the 'Ease of Living Index' comprising of 37 measurable indicators, which take into consideration the UN 2030 SDGs. 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.

Historical trend in infrastructure investment in India

Infrastructure investment in India during fiscals 2008 to 2017 was estimated at ~Rs 60 lakh crore ($1.1 trillion at average exchange rates of respective years). The infrastructure investment in the 11th Five Year Plan (fiscals 2008 to 2012) amounted to Rs 24 lakh crore and that in the 12th Five Year Plan (fiscals 2013 to 2017) amounted to Rs 36 lakh crore at current prices. However, infrastructure in GDP terms fell to ~5.8% during the 12th Five Year Plan from ~7% during the 11th five-year plan. 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 the above period, infrastructure investment was predominantly made by the public sector (i.e. Centre and state governments with a share of ~70%), while the share of private sector was ~30% (the share of private sector during last two years was ~25%). The trend in India's infrastructure investment since fiscal 2013 is highlighted in Figure 7.

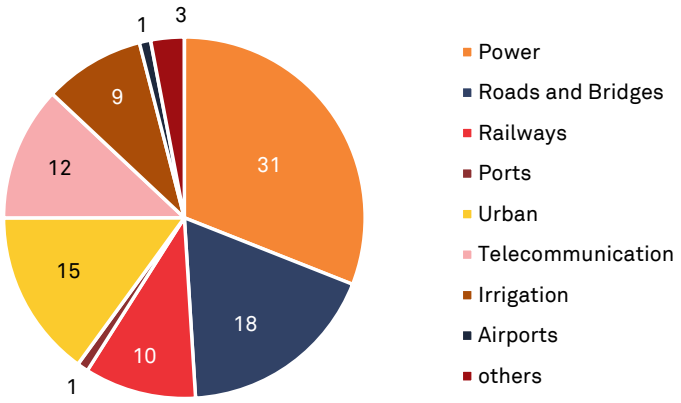
Figure 7 India's infrastructure investment trend since fiscal 2013 (Rs lakh crore)



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

Power, roads and bridges, urban, digital infrastructure and railways sub-sectors together constituted ~85% of the total infrastructure investment in India during fiscals 2013 to 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.

Figure 8 Sector-wise share (%) in infrastructure investment of Rs 57 lakh crore during fiscals 2013 to 2019



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

Infra deficit in India and competitiveness

India's ambition of sustaining its relatively high growth depends on one important factor: infrastructure. The country, however, is plagued with 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 programme, 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 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 1).

First pillar of Global Competitiveness Index – Institutions

As can be seen from Table 1 below on the first pillar:

- Focus will be given to quality of land administration (rank 112)
- On the legal framework for settling disputes (rank 53), 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 the special and designated courts for infrastructure disputes
- 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

Table 1 First pillar of Global Competitiveness Index – Institutions

Sr. no.	Parameter	India's rank
Public sector performance		25
1.01	Burden of government regulation	26
1.02	Efficiency of legal framework in setting disputes	53
1.03	E-participation	15
Transparency		66
1.04	Incidence of corruption	66
Property rights		87
1.05	Property rights	65
1.06	Intellectual property protection	57
1.07	Quality of land administration	112
Corporate governance		15
1.08	Strength of auditing and accounting standards	67
1.09	Conflict of interest regulation	21
1.10	Shareholder governance	2
Future orientation of government		**15**
1.11	Government ensuring policy stability	42
1.12	Government's responsibility to change	33
1.13	Legal framework's adaptability to digital business models	25
1.14	Government's long-term vision	31
1.15	Energy-efficiency regulation	33
1.16	Renewable energy regulation	3
1.17	Environment-related treaties in force	17

Source: World Economic Forum Global Competitiveness Report 2019

Second pillar of Global Competitiveness Index - Infrastructure

India is currently ranked 70 out of 140 countries for infrastructure quality in the Global Competitiveness Index.

- Water and electricity utility infrastructure (ranks > 100) will be a focus of attention through implementation of the Jal Jeevan Mission and the new power distribution scheme
- On-road connectivity (rank 72), significant work is being done under the Bharatmala Pariyojana and Pradhan Mantri Gram Sadak Yojana, which are expected to deliver gains in trunk and rural connectivity. Similarly on the quality of road infrastructure (rank 48), adoption of standards in the coming years will deliver better results
- Efficiency of transport services requires attention. Use of technology proposed under the National Logistics Policy is expected to deliver results

Table 2 Second pillar of Global Competitiveness Index - Infrastructure

Sr. no.	Parameter	India's rank
Transport infrastructure		28
2.01	Road connectivity	72
2.02	Quality of road infrastructure	48
2.03	Railroad density	39
2.04	Efficiency of train services	30
2.05	Airport connectivity	4
2.06	Efficiency of air transport services	59
2.07	Liner shipping connectivity	25
2.08	Efficiency of seaport services	49
Utility infrastructure		103
2.09	Electricity access	105
2.10	Electricity supply quality	108
2.11	Exposure to unsafe drinking water	106
2.12	Reliability of water supply	96

Source: World Economic Forum Global Competitiveness Report 2019

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 of funds for maintenance.

NIP

The key benefits of the NIP to all stakeholders in India are outlined below in Figure 9.

Figure 9 Key benefits of NIP

Economy

Well-planned NIP will enable more infrastructure projects, power business, create jobs, improve ease of living, and provide equitable access to infrastructure for all, thereby 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 on productive areas

Developers

Provides better prepared projects, reduces aggressive bids/failure in project delivery, ensures enhanced access to sources of finance as a result of increased investor confidence

Banks/financial institutions/investors

Builds investor confidence as identified projects are better prepared, exposures less likely to suffer stress given active project monitoring by competent authority, thereby ensuring better returns

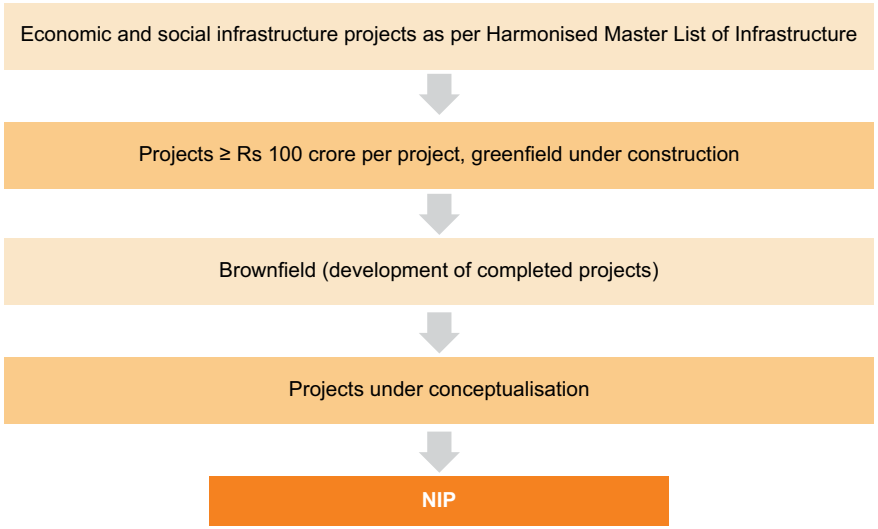
Constituents of NIP

The NIP has been made on a best effort basis by aggregating the information provided by various stakeholders including line ministries, departments, state governments and private sector across infrastructure sub-sectors identified in the Harmonised Master List of Infrastructure.

To draw up the NIP, a bottom-up approach was adopted wherein all projects costing greater than Rs 100 crore per project under construction, proposed greenfield projects, brownfield projects and those at the conceptualisation stage were sought to be captured. The investment details of fiscal 2020 are estimates and those for fiscals 2021 to 2025 are projections.

The NIP could see more updates as some states are yet to share details. The implementation of projects included in NIP will depend on multiple factors such as clearances, timely approvals, and financing. The actual expenditure may vary from the estimates/projections and NIP shall be updated accordingly.

Figure 10 Constituents of NIP



NIP: Sector-wise summary

The total capital expenditure in infrastructure sectors in India during fiscals 2020 to 2025 is projected at ~Rs 111 lakh crore. The sector-wise annual projected capital expenditure is detailed in Table 3.

Table 3 Sector-wise annual capital expenditure in infrastructure (Rs crore)

Ministry/ department	FY20	FY21	FY22	FY23	FY24	FY25	No phasing	FY20-FY25
Energy								
Power	164,140	225,551	221,734	223,487	225,236	211,002	139,279	1,410,428
Renewable nergy	30,500	151,000	144,000	170,000	217,000	217,000	0	929,500
Atomic energy	11,635	21,462	28,324	33,124	32,674	28,284	0	155,503
Petroleum and natural gas	27,332	43,510	48,314	41,523	22,858	10,535	499	194,572
Total energy	**233,607**	**441,522**	**442,372**	**468,134**	**497,768**	**466,821**	**139,778**	**2,690,003**
Roads								
Roads	332,559	383,283	356,966	252,780	240,761	332,659	134,815	2,033,823
Total roads	**332,559**	**383,283**	**356,966**	**252,780**	**240,761**	**332,659**	**134,815**	**2,033,823**
Railways								
Railways	133,387	262,465	308,800	273,831	221,209	167,870	0	1,367,563
Total railways	**133,387**	**262,465**	**308,800**	**273,831**	**221,209**	**167,870**	**0**	**1,367,563**
Ports								
Ports	13,357	18,104	20,649	15,863	7,724	10,002	35,495	121,194
Total ports	**13,357**	**18,104**	**20,649**	**15,863**	**7,724**	**10,002**	**35,495**	**121,194**
Airports								
Airports	18,667	21,655	24,820	21,334	25,386	5,141	26,445	143,448
Total airports	**18,667**	**21,655**	**24,820**	**21,334**	**25,386**	**5,141**	**26,445**	**143,448**
Urban								
Atal Mission for Rejuvenation and Urban Transformation, Smart Cities, MRTS, Affordable Housing, Jal Jeevan Mission	298,174	462,208	404,134	234,858	217,164	159,862	142,867	1,919,267
Total urban	**298,174**	**462,208**	**404,134**	**234,858**	**217,164**	**159,862**	**142,867**	**1,919,267**

Ministry/ Department	FY20	FY21	FY22	FY23	FY24	FY25	No phasing	FY20-FY25
Digital communication								
Digital communication	78,356	61,847	54,538	38,719	38,119	38,093	0	309,672
Total digital communication	**78,356**	**61,847**	**54,538**	**38,719**	**38,119**	**38,093**	**0**	**309,672**
Irrigation								
Irrigation	114,463	200,615	175,669	137,358	115,281	70,474	80,612	894,473
Total irrigation	**114,463**	**200,615**	**175,669**	**137,358**	**115,281**	**70,474**	**80,612**	**894,473**
Rural infrastructure								
Rural infrastructure	103,555	116,306	109,930	27,055	27,055	27,055	0	410,955
Water and sanitation	36,758	60,497	100,881	84,822	80,002	0	0	362,960
Total rural infrastructure	**140,313**	**176,803**	**210,811**	**111,877**	**107,057**	**27,055**	**0**	**773,915**
Agriculture and food processing infrastructure								
Agriculture infrastructure	3,109	3,376	3,423	1,850	1,176	649	148,889	162,472
Food processing industries	461	519	203	73	0	0	0	1,255
Food and public distribution	0	0	0	0	0	0	5,000	5,000
Total agriculture and food processing infrastructure	**3,570**	**3,895**	**3,626**	**1,923**	**1,176**	**649**	**153,889**	**168,727**
Social infrastructure								
Higher education	20,412	27,922	34,570	29,567	27,406	12,285	23,566	175,729
School education	5,053	7,132	7,077	6,398	6,569	5,562	0	37,791
Health and family welfare	28,719	40,132	39,914	16,096	9,756	6,544	9,858	151,019
Sports	1,320	1,547	1,424	1,389	1,220	840	1,328	9,069
Tourism	1,104	1,581	2,059	1,863	1,196	715	11,259	19,777
Total social infrastructure	**56,608**	**78,315**	**85,044**	**55,314**	**46,147**	**25,945**	**46,012**	**393,386**

Ministry/ department	FY20	FY21	FY22	FY23	FY24	FY25	No phasing	FY20-FY25
Industrial infrastructure								
Industries and internal trade	17,412	40,676	42,558	33,529	22,731	10,520	139,306	306,732
Steel	1,658	2,390	2,287	1,600	290	0	0	8,225
Total industrial infrastructure	**19,070**	**43,066**	**44,845**	**35,129**	**23,021**	**10,520**	**139,306**	**314,957**
Total	**1,442,131**	**2,153,779**	**2,132,274**	**1,647,122**	**1,540,813**	**1,315,091**	**899,218**	**11,130,428**

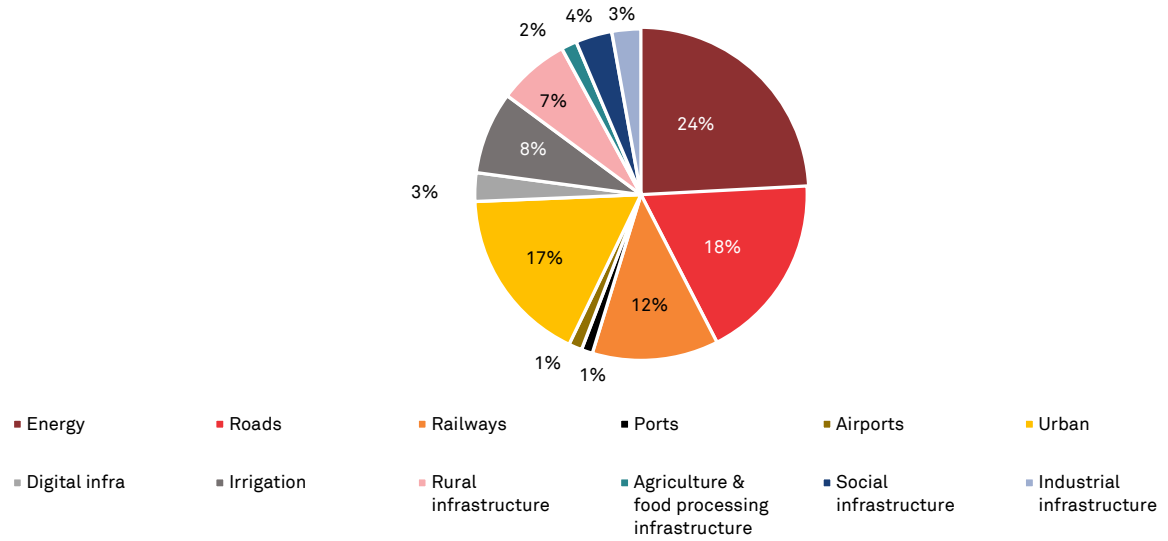
Source: Project information request format (PIRF) submitted by ministries/ departments/state governments/ private sector

Details of all the projects are available in Volume III of the publication. Volume III also has the analytics for each sector.

Sector-wise break-up of NIP

During the fiscals 2020 to 2025, sectors such as energy (24%), roads (18%), urban (17%) and railways (12%) amount to ~71% of the projected infrastructure investments in India. This is highlighted in Figure 11.

Figure 11 Sector-wise break-up of capital expenditure of Rs 111 lakh crore during fiscals 2020-2025

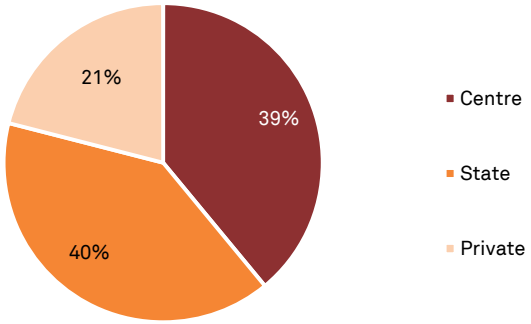


Source: Ministries/ departments/state governments/private sector

Share of Centre, state and private sector in NIP implementation

The Centre (39%) and state (40%) are expected to have almost equal share in implementing the NIP in India, followed by the private sector (21%). This is highlighted in Figure 12.

Figure 12 Share of Centre, state and private sector in the NIP

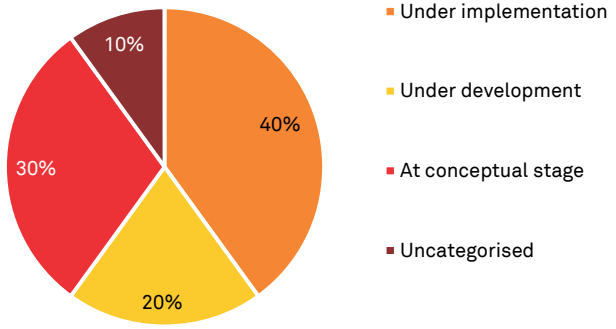


Source: PIRF submitted by ministries/ departments/state governments/private sector

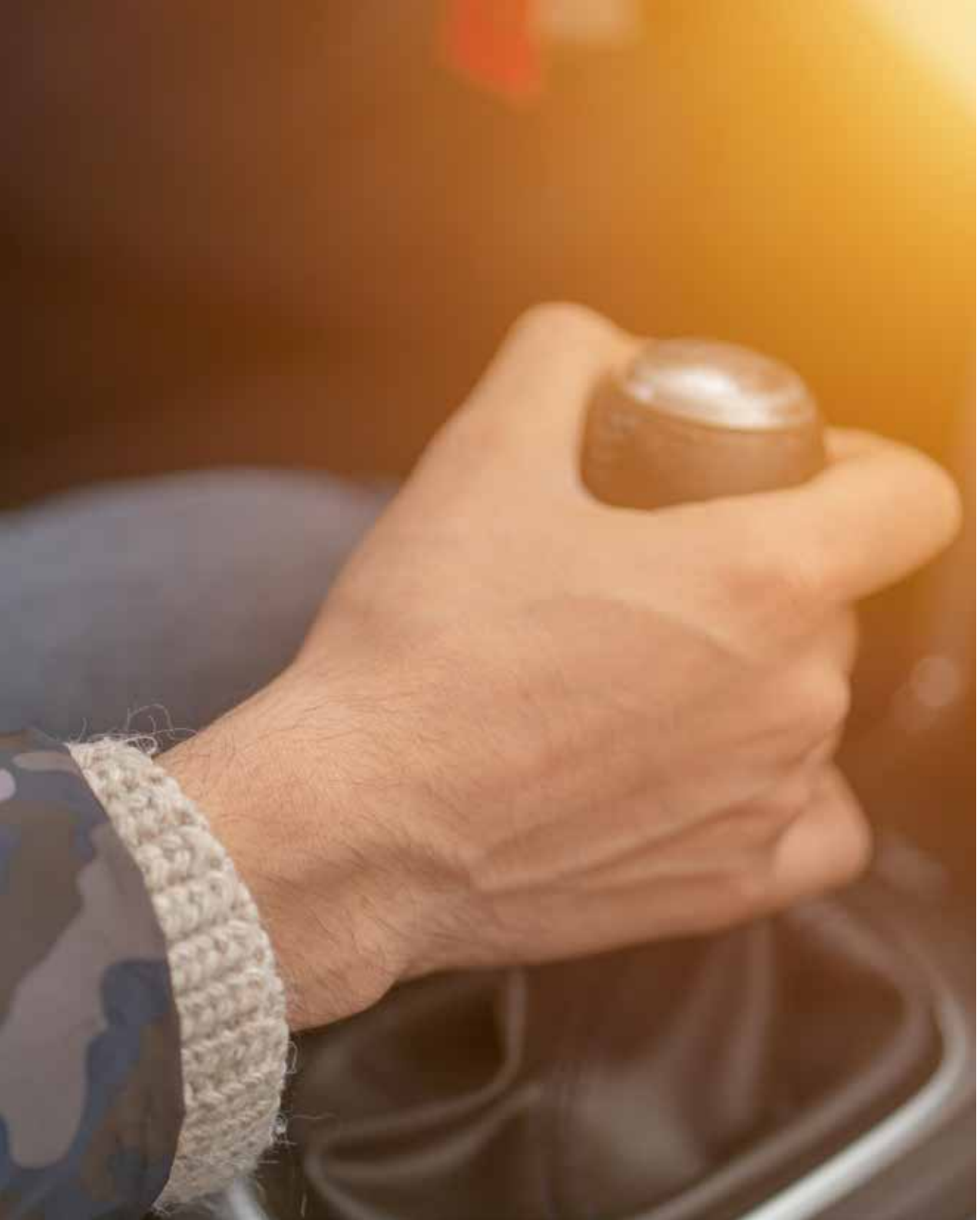
Stage of implementation of the NIP

Out of the total NIP of Rs 111 lakh crore, Rs 44 lakh crore (40%) worth of projects are under implementation, Rs 34 lakh crore (30%) worth of projects are at the conceptualisation stage, and Rs 22 lakh crore (20%) worth of projects are under development. Information regarding project stage are unavailable for projects worth Rs 11 lakh crore (10%). It is expected that greater clarity will be available in the next few months on these and updated in the subsequent NIP publications.

Figure 13 Stage of implementation



Source: PIRF submitted by ministries/ departments/state government



Reforms

General reforms

In order to scale 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 aid in propelling 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 disaster resilience; (iv) well-defined workflows, proper appraisal, audits and approvals for quality assurance of project preparation documents; and (v) establishment of a project organisation or a special purpose vehicle (SPV) with such structure and capabilities.

Enhancing execution capacity of private sector participants

For enabling robust private sector participation in the 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 the private sector and the public sector as well. Collaborations and joint ventures with strong global infrastructure developers must be facilitated to build domestic capacity.

Robust enabling environment

An effective enabling environment comprises a robust policy framework and 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 into. As a general principle, sanctity of contracts should be upheld both by the public and private sectors. 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:

1. **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 them. Further, delay in project clearances 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, both 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 the Indian Railways, with clear procedures for change of scope, termination payments and safe exits for parties

- Project bidding and awards are to be done only after fulfilling requirements such as 90% of contiguous land acquisition and all clearances for the project

2. **Sanctity and enforcement of contracts**

   In order to boost private sector interest, it is critical that the sanctity of contracts is upheld by the Centre, state and local governments as well as the private sector. 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 the form of clearly quantified termination payments under various possible scenarios.

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 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, (iv) strengthening people management processes in order to improve the project management capabilities of public institutions, and (v) provide flexibility to hire top talent at senior level including project leadership.

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 uniform regulation and output-based performance standards, consistent processes for updating/ setting standards, improving compliance mechanism, alignment with development strategy, and alignment with social and environmental sustainability would help. 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 within the next three months, based on global and national standards.

Promoting competition

In order to enhance competition in the domestic markets and to promote a culture of competition in the country, we need to establish an anti-trust resolution mechanism, improve collaboration between the Competition Commission of India (CCI) and sector regulators to address competition-related concerns and operationalisation of the National Competition Policy 2011. 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 healthy competition.

Financial sector reforms

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

Revitalising the bond and credit markets

Credit Enhancement Institution for infrastructure projects is expected to open up appetite 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 Credit Enhancement Institution should be set up early.

It is also important that long-term resources from the pension and insurance sectors are channelised into the infrastructure bond market; this may require the 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 and financial 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 IIFCL to be developed as a development finance institution (DFI) needs to be examined by the government in consultation with the Reserve Bank of India (RBI).

Strengthening the municipal bond market in India

At present, grants from both state and central governments dominate the municipal financing landscape in India. These grants are substantially lower than the investment requirement of local governments. In order to augment their funding sources, 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 reforms 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 municipal bonds include (i) improving 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 monetisation

Asset monetisation is considered critical for infrastructure sectors, as the asset-owning ministries, CPSEs and local bodies can reduce their debt burden by monetising 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 infrastructure assets. The NHAI is amongst the first to monetise operational assets in the past four years. Asset monetisation can be undertaken through sale of land, non-operational assets through long-term lease with significant upfront lease payment, the toll-operate-transfer (TOT) model for operational road assets, Infrastructure investment trusts (InvITs), sale of portfolio of assets to strategic/ financial investors, and loan asset monetisation through securitisation. The first pipeline of assets to be monetised by March 2020 has 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 three months.

Infrastructure Investment Trusts 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 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 as a crucial source of financing of public and private infrastructure, while making sure that there are adequate safeguards for double financing and ever-greening of loans.

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 and operating costs. It is necessary to determine fair value of user charges to finance and grow infrastructure. Therefore, user charges policy framework will provide more clarity to investors and in turn improve their confidence. The Task Force recommends autonomous regulation of tariffs which, however, does not always translate into independent sectoral regulations. Other regulatory options like regulation by contract with price regulation provisions mentioned in the contract itself as well as multi-sectoral regulators may be actively considered. Multi-sectoral regulators (MSRs) may be

suitable as the objectives of regulation across infrastructure sectors are the same, while MSRs economise on skills and costs while addressing issues of regulatory capture.

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 debt funds (IDFs), 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 FDI in IDFs, DFIs and securitisation markets in consultation with the RBI and the Securities and Exchange Board of India (SEBI).

Detailed reforms including those for each sector are enumerated in Volume II.

Performance monitoring and evaluation

A monitoring and evaluation tool shall be used to help all stakeholders monitor the implementation and actual progress vis-à-vis initial estimates of the NIP for each of the infra sub-sectors. While basic monitoring will vest with the ministry and project agency, there is need for higher level of monitoring on reforms to be undertaken and to deal with issues of stalled project. The basic elements of the monitoring and evaluation framework are highlighted in table below. The recommended governance escalation matrix is provided in Annexure 2.

Table 4 Elements of Monitoring and Evaluation Framework

Category	Project category	Key monitorables	Action plan
I	Projects under implementation	• Monitor actual achievement of project milestone against planned milestone • Monitor financial progress – actual progress in disbursement of debt, grant and equity against stated milestones • Close monitoring of critical issues for timely project completion • Timely highlighting of issues to concerned line ministries and stakeholders	• Results monitoring, tracking against pre-defined milestones, reporting progress • Resolution of key issues stalling progress, required intervention and responsible party • Timely action to be taken by concerned stakeholders as per the governance structure and escalation matrix provided • Plan for commissioning project–safety, service levels, staff training, etc • Operations and maintenance plan – Toll - Operate - Transfer (ToT) procurement or own operations

Category	Project category	Key monitorables	Action plan
II (a)	Projects under development - Projects achieved financial closure (FC), yet to draw-down funds	• Compliance of all conditions subsequent specific to relevant milestones and key issues stalling compliance • Monitor contractor/ developer resource mobilisation and staffing • Monitor detailed design finalisation	• Establishing the project monitoring Tool – Project mile-stones (cost and time) • Establish steering committee comprising representatives from stakeholders such as lenders and equity investors and assign responsibilities • Facilitate commencement of construction • Training for project team for project implementation
II (b)	Projects under development - Projects identified and detailed project report (DPR) prepared however yet to achieve FC	• Administrative approval of competent authority • Monitor land acquisition/ environment and forest clearance • Monitor compliance of all conditions precedent (CPs) and key issues • Approval of phasing of financial allocations	• Set up Empowered Committee (in case of large projects) for clearances • Delegate powers to SPV • Negotiate with government and financial institutions for financial allocations • Conduct detailed financial appraisal and risk management • Design of risk mitigation strategies • Execute procurement processes - EPC and PPP • Hire competent managers for SPV - depends on construction and O&M plan
III	Projects at the conceptualisation stage - Projects announced and approved recently but little visibility on project award, land acquisition etc	• Monitor progress in completion of feasibility studies/preparation of DPR • Organising and staffing the project SPV	Project formulation stage • Map key clearances: environment, CRZ, forest clearance, etc • Monitor the status of land acquisition • Economic, environment and social appraisal • Procurement strategy - EPC/PPP, etc • Risk and sensitivity analysis • Technology choice analysis – disaster resilience, inclusiveness • Operations and maintenance philosophy – ToT, own maintenance • Stakeholder consultation

Annexure 1: KPI Framework

Power

Theme	Metric	Units	Source of data	FY19 progress*	FY25 target*
Discom performance	Electricity supply quantity	% ATC losses	Ministry of Power	22.31% (March 2018)	10%
	Avg. cost & revenue gap	Rs/unit	Ministry of Power	0.3 (March 2018)	0
	Receivable days range of discom	Days	Ministry of Power	90-300	60
	Average monthly outage hours on online monitored rural feeders	Hours/month	Ministry of Power	TBD	TBD
	Smart metering	%	Ministry of Power	TBD	100%
Coverage/ electricity access	Households connected	%	Ministry of Power	TBD	TBD
Assured power	Total energy consumption per capita	kWh	Ease of Living Report	TBD	TBD
	Average number of electrical interruptions per customer per year	Nos.	Ease of Living Report	TBD	TBD
	Percentage of city population with authorised electrical services	%	Ease of Living Report	TBD	TBD

TBD – To be decided by the Line Ministry within 2 months of receiving the NIP Report
**Rest of the figures to be updated by the Line Ministry as per updated status within 2 months of receiving the NIP Report*

Theme	Metric	Units	Source of data	FY19 progress*	FY25 target*
Sustainability (achieved through renewable energy)	Cumulative installed capacity-Total	GW	MNRE	78.31	240
	Cumulative installed capacity-Wind	GW	MNRE	35.63	95.63
	Cumulative installed capacity-Solar	GW	MNRE	28.18	146
	Share of renewable energy / total elec. consumption	%	MNRE	9%	25%

Source: Ministry of Power, Ministry of New and Renewable Energy

Gas Distribution

Theme	Metric	Units	Source of data	FY19 progress*	FY25 target*
Coverage	Geographical areas covered by CGD network	Nos.	MoPNG	96	228
	Length of natural gas pipeline	Km	MoPNG	16,789	TBD
	Capacity of natural gas pipeline	MMSCMD^	MoPNG	TBD	TBD
Efficiency	Capacity utilisation of available natural gas pipeline	%	MoPNG	TBD	TBD

Note ^ Million metric standard cubic meters a day
Source: Ministry of Petroleum and Natural Gas

TBD – To be decided by the Line Ministry within 2 months of receiving the NIP Report
**Rest of the figures to be updated by the Line Ministry as per updated status within 2 months of receiving the NIP Report*

Roads

Theme	Metric	Units	Source of data	FY19 progress*	FY25 target*
Road length	Road length completed	Km	NHAI	10,855	TBD
Private participation	Cumulative BOT / HAM contracts awarded (% of total km awarded)	%	NHAI	15	TBD
Safety	Road fatalities	Lakh	NHAI	1.49	TBD
Road quality	Bump Integrator Test (BIT) <3000, proportion of total NH	%	NHAI	TBD	TBD
Road quality	Characteristics Deflection Test (CDT) <0.5 mm, proportion of total NH	%	NHAI	TBD	TBD
Quality	Quality of road infrastructure#	WEF value (scale of 1-7)*	WEF Global Competitiveness Index Report 2019	4.5	TBD
Connectivity	Road connectivity^	WEF value (scale of 0-100)^	WEF Global Competitiveness Index Report 2019	75.8	TBD

Note #Response to the survey question "In your country, what is the quality (extensiveness and condition) of road infrastructure?" [1 = extremely poor—among the worst in the world; 7 = extremely good—among the best in the world] |Source: World Economic Forum, Executive Opinion Survey (various editions; ^ • Score on the Road Connectivity Index, which measures average speed and straightness of a driving itinerary connecting the 10 or more largest cities that together account for at least 15% of the economy's total population. The scale ranges from 0 to 100 (excellent). This Index, developed by the World Economic Forum, comprises two elements: (1) a measure of the average speed of a driving itinerary connecting the 10 or more largest cities in an economy accounting for at least 15% of the economy's total population; and (2) a measure of road straightness.
Source: National Highway Authority of India, World Economic Forum

TBD – To be decided by the Line Ministry within 2 months of receiving the NIP Report
**Rest of the figures to be updated by the Line Ministry as per updated status within 2 months of receiving the NIP Report*

Railways

Theme	Metric	Units	Source of data	FY19 progress*	FY25 target*
Freight rolling stock efficiency	Wagon turnaround time (WTR)	Days	Ministry of Railways	4.74	TBD
Passenger rail outcomes	Average speed (mail/express)	Km/hour	Ministry of Railways	51	TBD
Safety	% of LHB^ coaches to total no. of coaches operational	%	Ministry of Railways	TBD	TBD
Customer satisfaction index	Punctuality	%	Ministry of Railways	TBD	TBD
Efficiency	Operating ratio	%	Ministry of Railways	98.44%	80%
Safety	Accidents/year	Nos.	Ministry of Railways	TBD	TBD
Railroad density#	Kilometre of railroad per 1,000 square kilometre of land	Km	WEF Global Competitiveness Index Report 2019	TBD	TBD
Efficiency**	Efficiency of train services	WEF value (scale of 1-7)	WEF Global Competitiveness Index Report 2019	4.4	TBD

*Note: ^LHB - Linke Hofmann Busch; #Kilometres of railroad per 1,000 square kilometres of land | 2017 or most recent year available; ** Response to the survey question "In your country, how efficient (i.e. frequency, punctuality, speed, price) are train transport services?" [1 = extremely inefficient, among the worst in the world; 7 = extremely efficient, among the best in the world] | 2018–2019 weighted average or most recent period available.*
Source: Ministry of Railways, The World Bank Group, World Development Indicators database, World Economic Forum, Executive Opinion Survey (various editions).

TBD – To be decided by the Line Ministry within 2 months of receiving the NIP Report
**Rest of the figures to be updated by the Line Ministry as per updated status within 2 months of receiving the NIP Report*

Ports

Theme	Metric	Units	Source of data	FY19 progress*	FY25 target*
Operational efficiency (ports)	Average vessel turnaround time	Hours	Ministry of Shipping**	59.85	< 24 Hours
	Average vessel turnaround time - Container	Hours	Ministry of Shipping**	37.5	< 15 Hours
	Av. ship berth day output	Tonne	Ministry of Shipping**	16,531	TBD
Traffic	Traffic volume handled in all ports - Cargo	MMT	Ministry of Shipping	758	1200 MMT; 100 MMT per Major Port
Port connectivity@	Liner Shipping Connectivity Index	WEF value (scale of 1-100)	WEF Global Competitiveness Index Report 2019	59.9	TBD
Operational efficiency^	Efficiency of seaport services	WEF value (scale of 1-7)	WEF Global Competitiveness Index Report 2019	4.5	TBD

Note: @Score on the Liner Shipping Connectivity Index, which assesses a country's connectivity to global shipping networks. The index uses an open scale, with the benchmark score of 100 corresponding to the most connected country in 2004 (China), Does not apply to land-locked countries. The index is based on five components of the maritime transport sector: the number of ships, their container-carrying capacity, the maximum vessel size, the number of services and the number of companies that deploy container ships in a country's ports. Source: United Nations Conference on Trade and Development (UNCTAD), UNCTAD; ^ Response to the survey question "In your country, how efficient (i.e. frequency, punctuality, speed, price) are seaport services (ferries, boats)?" [1 = extremely inefficient, among the worst in the world; 7 = extremely efficient, among the best in the world]. Does not apply to land-locked countries. | 2018–2019 weighted average or most recent period available
*Source: Ministry of Shipping, World Economic Forum, Executive Opinion Survey (various editions); ** Basic Port Statistics of India, Transport Research Wing, Ministry of Shipping;*

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Civil Aviation

Theme	Metric	Units	Source of data	FY19 progress*	FY25 target*
Traffic	Passenger capacity	Million passengers per annum	Ministry of Civil Aviation	378	825
	Cargo capacity	Million tonne per annum	Ministry of Civil Aviation	5.1	11.8
	Passenger movement#	Million passengers per annum	Ministry of Civil Aviation	345	700
	Cargo movement	Million tonne per annum	Ministry of Civil Aviation	3.57	10
Amenities/ services	Average ASQ Rating Index - top 11 AAI airports	Scale of 5	AAI (from Airport Council International Survey)	4.6	TBD
	Customer Satisfaction Index - AAI airports	Scale of 5	AAI (from Airport Council International Survey)	4.35	TBD
	Non-aero revenue - AAI airports	%	AAI	31	TBD
Airport connectivity**	Weighted average available seats for all airports	WEF value	WEF Global Competitiveness Index Report 2019	12,24,525.6	TBD
Airport efficiency^	Efficiency of air services	WEF value (scale of 1-7)	WEF Global Competitiveness Index Report 2019	4.9	TBD

*Note: #Till 2027 as per National Civil Aviation Policy 2016, ** Airport Connectivity: WEF Global Competitiveness Index: This represents the IATA airport connectivity indicator, which measures the degree of integration of a country within the global air transport network. For each airport, the number of available seats to each destination is weighted by the size of the destination airport (in terms of number of passengers handled). The weighted totals are then summed for all destinations, then for all airports in the country to produce a score. A log transformation is applied to the raw value before converting it to the 0 to 100 score; ^ Efficiency of air transport services: WEF Global Competitiveness Index; Response to the survey question "In your country, how efficient (i.e. frequency, punctuality, speed, price) are air transport services?" [1 = extremely inefficient, among the worst in the world; 7 = extremely efficient, among the best in the world] | 2018–2019 weighted average or most recent period available Source: World Economic Forum, Executive Opinion Survey (various editions)*
Source: Ministry of Civil Aviation, Airport Authority of India, World Economic Forum, International Air Transport Association (IATA)

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Urban

Theme	Metric	Units	Source of data	FY19 progress*	FY25 target*
Sanitation and pollution	Sanitation coverage	%	MoEF**	77% (2018)	TBD
	Waste being processed	%	MoHUA#	53.19% (2019)	TBD
	Source segregation by wards	%	MoHUA#	62.87% (2019)	TBD
	Household level coverage of municipal solid waste collection	%	Ease of Living Report	TBD	TBD
	Sewage treatment	%	MoEF**	63% (2018)	TBD
	Extent of reuse and recycling of waste water	%	Ease of Living Report	TBD	TBD
	Concentration of PM 10 – air pollution	ug/m3	Ease of Living Report	TBD	TBD
Water	Exposure to unsafe drinking water@	%	WEF Global Competitiveness Index Report 2019	51.10%	TBD
	Reliability of Water supply^	WEF value (scale of 1-7)	WEF Global Competitiveness Index Report 2019	4.4	TBD
	Per capita supply of water	Litre per capita per day (lpcd)	Ease of Living Report	TBD	TBD
	Level of non-revenue water (NRW)	%	Ease of Living Report	TBD	TBD
	Household level coverage of direct water supply connections	%	Ease of Living Report	TBD	TBD

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Theme	Metric	Units	Source of data	FY19 progress*	FY25 target*
Transportation and mobility	Mode share of public transport	%	Ease of Living Report	TBD	TBD
	Geographical coverage of public transport	%	Ease of Living Report	TBD	TBD
Land use and inclusiveness	Percentage of slum/ EWS households covered through formal/ affordable housing	%	Ease of Living Report	TBD	TBD
	Percentage of slum households covered through basic services	%	Ease of Living Report	TBD	TBD

Note: @ Exposure to unsafe drinking water, risk-weighted percentage of population exposed to unsafe drinking water | 2017 estimate. This indicator is reported as a summary exposure value (SEV): it measures a population's exposure to unsafe drinking water, taking into account the extent of exposure by risk level and the severity of that risk's contribution to disease burden. The indicator ranges from 0, when no excess risk for a population exists, to 1, when the population is at the highest level of risk; ^Reliability of water supply Response to the survey question "In your country, how reliable is the water supply (lack of interruptions and flow fluctuations)?" [1 = extremely unreliable; 7 = extremely reliable] | 2018–2019 weighted average or most recent period available.
*Source: MoEF **Sulabhenvis.nic.in; MoHUA #Handbook of Urban Statistics, World Economic Forum, Executive Opinion Survey (various editions);*

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Digital Infrastructure

Theme	Metric	Units	Source of data	FY19 progress*	FY25 target*
Rural coverage	Cumulative gram panchayats connected by broadband	Nos.	Department of Telecom	1,35,178	100% of all GPs
	Rural mobile teledensity (% of population)	%	TRAI#	56.68%	100%
	Rural internet subscribers per 100 population	%	TRAI#	27%	75%
Data speed-broadband	Average upload and download speed for fixed broadband	Mbps	Speedtest.net (Ookla)	23 Mbps	100 Mbps
Data speed-mobile	Average upload and download speed for mobile	Mbps	TRAI^	10.8 Mbps	50 Mbps

Note: TRAI#Report: Indian Telecom Services Performance Indicators; TRAI^ - Myspeed Portal

Irrigation

Theme	Metric	Units	Source of data	FY19 progress*	FY25 target*
Coverage	Command area under irrigation	Ha	DoWR, RD&GR	TBD	TBD
Efficiency	Water productivity (volume of water for one unit of agri produce)	M3/tonne	DoWR, RD&GR	TBD	TBD

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Social Infrastructure

Theme	Metric	Units	Source of data	FY19 progress*	FY25 target*
School education	Proportion of school with boundary walls	%	ASER Report*	77% (2018)	TBD
	Share of schools with provision of drinking water	%	ASER Report*	47%	TBD
	Share of schools with no library	%	ASER Report#	63%	TBD
	Share of schools with electricity connection	%	ASER Report#	63%	TBD
Higher education	Colleges per lakh population	Nos.	AISHE Report***	28	TBD
Health	Proportion of institutional deliveries	%	NFHS-IV^	80%	TBD
	Proportion of public health facilities with accreditation certificates by a standard quality assurance programme (NQAS /NABH/ISO/AHPI) **	%	NFHS-IV^	TBD	TBD

*Note: # ASER Report, Annual Publication by Pratham on State of Schooling; ^ National Family Health Survey; **National Quality Assurance Standards; National Accreditation Board for Hospitals and Healthcare Providers; Association of Healthcare Providers; International Organization for Standardization; *** All India Survey on Higher Education by MHRD*

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Annexure 2: Governance Framework with Escalation Matrix

Sr. No.	Concerned authority	Focus	Total project cost per project (Rs crore)	Delay in project completion (revised vs original estimated COD)	Delay in pending land acquisition – vis-à-vis initial estimates	Delay in receipt of key approvals/ clearances
1	Cabinet Secretary/ Committee of Secretaries	Time and cost over-run	Above Rs 500 crore	Above 6 months	Above 6 months	Above 6 months
2	Inter-Ministerial Steering Committee headed by Secretary of the Line Ministry	Time and cost over-run	All projects forming a part of the NIP	Any delay	Any delay	Any delay
3	Inter-Ministerial Steering Committee headed by Secretary DEA for Financing NIP	Financing of NIP projects	All NIP projects			