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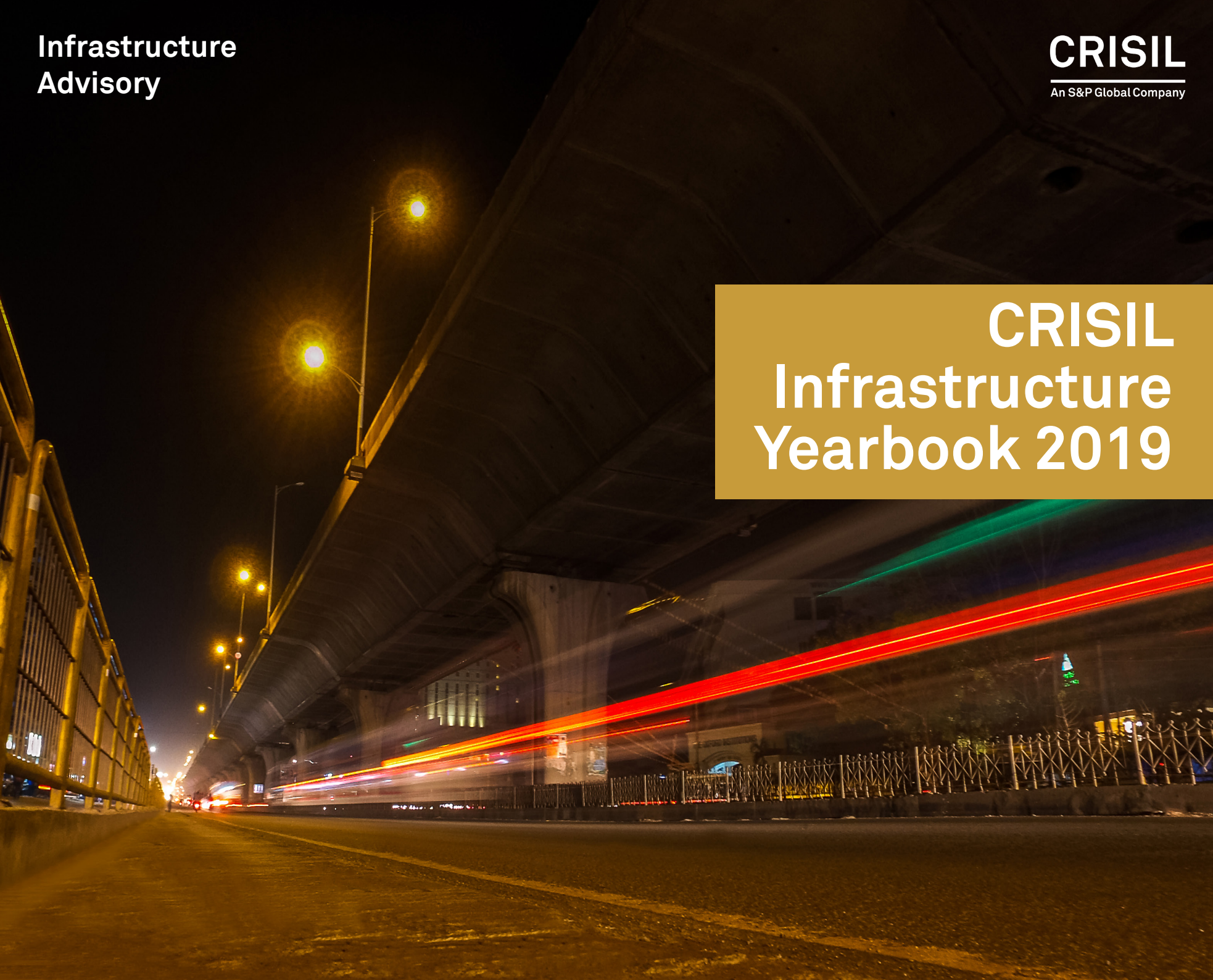

CRISIL Infrastructure Yearbook 2019

Analytical contacts

Vivek Sharma
Senior Director
CRISIL Infrastructure Advisory
vivek.sharma@crisil.com

Anand Madhavan
Director
CRISIL Infrastructure Advisory
anand.madhavan@crisil.com

Contributors

Sudip Sural, Jagannarayan Padmanabhan, Abhay Kantak, Pranav Master, Akshay Purkayastha, Hyrdhal Damani, Anshuman Chauhan, Meghana Goradia, Probal Biswas, Parul Garg, Golesh Gupta, Pratik Desai and Nidhi Bansal

Editorial

Raj Nambisan, Subrat Mohapatra, Sowmya Sivakumar, Varsha D'Souza, Nisha Prabhakaran, Smitha Puthiyadan, Rajesh Pandathil, Mustafa Hathiari, Yohan Paul, Shachi Trivedi and Narasimham Vemuganti

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CRISIL Infra Intelligence is a platform that aims to offer multi-dimensional views and insights on the infrastructure space in India

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Foreword

It is a matter of immense pride for us that the CRISIL India Infrastructure Conclave has, since its pioneering launch in 2017, become one of the most sought-after platforms for tracking – and deliberating on – the trends, challenges and opportunities in India's infrastructure sector.

The annual CRISIL Infrastructure Yearbook has also become a benchmark national publication that has contributed to shaping policies and improving the infrastructure ecosystem.

In 2017, we had highlighted the need to scale up infrastructure spending and the criticality of strengthening the supply side of infrastructure financing. In 2018, we flagged concerns around the sharp fall in private investment and called for actions to reverse this slide.

We find their resonance in the policy actions and announcements of the central government – be it the goal of increasing infrastructure spending to over Rs 100 lakh crore over the next five fiscals, the proposed credit enhancement fund, or the plans for asset monetisation across infrastructure sectors.

In keeping with tradition, our yearbook and conclave this year focus on yet another crucial but under-analysed aspect – the central role of states in India's infrastructure build-out. While the government needs to push ahead on several fronts to step up infrastructure investments, including creating greater fiscal space, ushering in more private sector investment, reviving stalled projects, resolving financing and legal challenges, we believe the time has come to also shine the arc lights on states.

It is our deeply held view that India's infrastructure build-out cannot be sustainably accomplished without significantly scaling up both the share and the impact of investments of state governments. It is pertinent to note that the cumulative development spending and capital expenditure of states have consistently exceeded that of the Centre for nearly a decade. The skew towards states is only going to increase. We examine this in greater detail inside, and identify measures that states ought to adopt to unlock their potential.

The yearbook also has an update of the CRISIL InfraInvex scores, which factor in the drivers and drags to private investment emerging across sectors.

CRISIL is committed to being a leader in shaping India's infrastructure development.

And as always, I look forward to your feedback.

Ashu Suyash
Managing Director & CEO
CRISIL Ltd

Infrastructure Advisory

Foreword

I am delighted to present the third edition of the CRISIL Infrastructure Yearbook, which has become a very important reference document for stakeholders in India's infrastructure development.

It's been a privilege to steer the call-for-action on some of the imperatives of this sector.

We welcome the government's plan to step up infrastructure investments in the country to Rs 100 lakh crore over the next five fiscals – or twice the minimum spending estimated as necessary by CRISIL in 2017. A sustained gross domestic product (GDP) growth of 7.5% and more over the next decade, along with scaling up of infrastructure spending to ~6% of GDP from 5.5% or lower now, should be o

India is facing immediate-term headwinds of slowing economic growth, financial sector stress and pressure in the fiscal space because of subdued government revenue. There is also a crying need for corrective policy action in several infrastructure sectors. A look at CRISIL's InfraInvex, the one-of-its kind yardstick of investability attractiveness in India, vouchers this – InfraInvex scores of most sectors have declined.

Airports and railways are the only sectors that saw some positive action at the start of this fiscal, with the successful award of contracts for modernisation of six airports and increased outlay and cost recovery in railways. Conversely, the renewable energy sector – which was among the leaders of CRISIL InfraInvex last time – has seen a substantial decline in its score this year. Ports continue to face the brunt of the flux in global trade and slowing exports. Persistent weakness in power distribution, including increased gap in tariff recovery and institutional bottlenecks to investments in urban infrastructure have kept scores low for these segments.

The call-out to the policy makers is to address these headwinds on mission-mode, and to revive investor interest and confidence. Infrastructure development needs all three cylinders – central government, private capital and state investments – to fire simultaneously, and for an extended period of time.

The role of states becomes absolutely central to this cause and, accordingly, forms the thematic focus of this third edition of our CRISIL Infrastructure Yearbook.

We trace the steady growth in capital spending by states on infrastructure over the past few years and the constraints to the next scale-up. We emphasise the need to not just crank up this spending, but also to improve efficiency through institutional strengthening and capacity building to tap commercial financing and private investment.

We remain deeply engaged with stakeholders and committed to bringing out insights to propel India's infrastructure development.

I am sure you will find the insights in this edition of the yearbook incisive enough to catalyse action.

Sameer Bhatia
President
CRISIL Infrastructure Advisory

Infrastructure Advisory

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Executive summary

For decades, infrastructure development hinged on policy facilitation and public spending by the central government, with the role of private-sector investments restricted to covering gaps in spending.

That 'centre' of gravity is now shifting to states, especially facilitated by two seminal developments: a big leap – of a full 1,000 basis points (bps) – in vertical tax devolution afforded by the Fourteenth Finance Commission; and, the onus of the factor markets – labour, land and taxation – increasingly falling on states as competitive and cooperative federalism take root.

That's reflected in the trends in capital expenditure[1] (capex) and infrastructure investments[2] .

Capex of states nearly quadrupled from Rs 1.7 lakh crore in fiscal 2011 to an estimated Rs 6 lakh crore this fiscal, as their share of total spending surged 1,300 bps to 65%.

In this period, cumulative infrastructure investment by states totted up to ~Rs 31 lakh crore, or 41% of the total ~Rs 77 lakh crore spent (including by the centre and the private sector).

This growth in spending has also been driven by rising economic heft and per capita incomes of the larger states, and greater determination to address infrastructure gaps.

A few smart moves by states over the past decade or so have helped address certain qualitative aspects. Some have enacted legislation and created nodal agencies to ensure infrastructure policy coherence, and enabled public-private partnership (PPP) frameworks. The growth of private ports in Gujarat, private airports in Hyderabad and Bengaluru, debt financing of urban water projects in Tamil Nadu, and state-level financing entities set up by Kerala and Tamil Nadu to raise resources – are cases in point.

Despite these strides, three factors constrain sustained improvement in infrastructure investment: (i) fiscal squeeze, as seen in persistent revenue deficits, debt surge and high fiscal deficits in several large states; (ii) weak institutional capacity, reflected in mounting losses and operational deficiencies of utilities in power, water and urban transport sectors; and (iii) inadequate reforms and programmatic impetus to scale commercial financing and PPPs.

States need to address these constraints urgently if India is to have world-class infrastructure.

Without cardinal contribution from states, it will be tough for India's GDP growth to rebound and sustain above 7.5%, and infrastructure spending to increase to 6.0-6.2% of GDP in the coming decade.

Such a level of spending translates into ~Rs 235 lakh crore investments, or ~Rs 23 lakh crore per year. That would be thrice the average levels of this decade.

To boot, states will have to contribute close to half of this or Rs 110-125 lakh crore.

That means both Centre and states will have to pull out all stops, with states needing to redouble their efforts.

The investment trajectory of 15 large states will be crucial in this context. But given differences between them in terms of economic output, prosperity and fiscal capacity, they will need customised actions and sequencing to make material progress. For prescriptions, states are put in three qualitative buckets:

- Four 'frontrunner' states – Maharashtra, Karnataka, Tamil Nadu and Gujarat – are endowed on urbanisation, industrial base and per capita income fronts, but show some fatigue with respect to their

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[1] Capex includes capital outlays and loans provided by the government for social and economic services. This includes spending on bond issuances under UDAY scheme in fiscals 2016 and 2017. Excluding this, capex of states in fiscals 2016 and 2017 reduced to an estimated Rs. 3.3 lakh crore and Rs. 4.1 lakh crore, respectively. Share of energy in the sectoral split also declines correspondingly.

[2] Infrastructure investment covers core infra sectors, viz., energy, highways, ports, airports, water & sanitation, irrigation, urban development and housing, oil and gas pipelines, and telecom. The figures for fiscals 2011-2017 are based on NITI Aayog's mid-term appraisal of the Twelfth Five Year Plan. Figures for fiscals 2018-2020 are CRISIL estimates. This estimate includes investments by public sector enterprises and private sectors apart from capex from budgetary outlay of the Centre and states.

capex growth in recent years. They will need to be intrepid to push through structural and sectoral reforms, as this will be key to create new triggers for capital allocation and growth.

- Five 'middle-of-the-pack' states – Andhra, Kerala, Punjab, Haryana and Telangana – with lesser population weight, mirror front-runner states on endowments and can legitimately aspire to be the growth-leaders.
- Six climber states – Bihar, Madhya Pradesh, Odisha Rajasthan, Uttar Pradesh, and West Bengal – have seen sharp capex growth in the last five years, despite their lower incomes per capita. An accompanying debt surge could come in the way of sustaining this. Continuously upfront institution building to improve investment capacity in social and physical infrastructure will help create better conditions for growth.

In this yearbook, CRISIL identifies actions relating to three quintessential aspects that states in all these categories need to address:

A. Expand fiscal space to invest

Stabilise Goods and Services Tax (GST) • Tap asset monetisation • Deploy medium-term expenditure frameworks • Directed subsidy

B. Enhance state capability to implement

Nurture counterparty public institutions • Build project development rigour • Tap commercial financing & PPPs

C. Engender conducive policy and regulatory dexterity to lift investment momentum

Sectoral reforms • Make land available • Remove labour market distortions • Improve ease-of-doing business

On its part, the Centre needs to go for pro-active and purposeful engagements in areas requiring inter-state coordination and drive decision-making consensus, including critical sectoral and structural reforms (such as in the power sector, factor markets, and inter-state water resources sharing).

CRISIL InfraInvex 2019

Areas that require impetus are implied in the scores for CRISIL InfraInvex, the only index of its kind that tracks, measures and assesses the investment attractiveness and development maturity of infrastructure sectors, based on their 'drivers' and 'drags'.

A look at the InfraInvex scores show most sectors declined this year, not surprising given the economy's downtrend.

InfraInvex table

	Conventional generation	Renewables	Power transmission	Power distribution	Highways	Railways	Airports	Ports	Urban
2017	4.9	7.0	8.1	5.4	6.9	5.0	6.1	6.6	4.5
2018	5.1	6.8	7.9	5.6	7.4	5.0	6.4	6.7	4.6
2019	5.1	6.2	7.8	5.2	7.2	5.3	6.6	6.6	4.7

Airports and railways are the only sectors that saw some positive action at the start of this fiscal, with the successful award of contracts for modernisation of six airports and increased outlay and cost recovery in railways. Roads, which saw a sharp increase in 2018, have slipped a bit largely because of financing challenges. Ports continue to be affected by the flux in global trade and slowing exports.

Conversely, the renewable energy sector – which was among the drivers of CRISIL InfraInvex during the past two annual readings – has seen a substantial decline in its score this year on account of increased counter-party risk, renegotiation of power purchase agreements (PPAs), unviable tariff caps during auctions, and land acquisition issues.

Power transmission, a sector conducive to PPPs and asset monetisation at the level of states, saw its scores slip a tad because of missed targets last year. The thermal power sector flat-lined. To be sure, there were positive policy signals from, and show of intent by the Centre, but weak demand and precarious finances of discoms pulled back the score to 2018 levels. Power distribution, which saw some improvement last year on account of the impact of the Ujwal DISCOM Assurance Yojana (UDAY) on discom finances, slipped below 2017 levels, as gap in tariff recovery widened.

Persistent weakness and institutional bottlenecks to investments in urban infrastructure have consistently kept scores low for these segments. To overcome some of the drags, CRISIL identifies priorities for each sector. Implemented well, these can improve the InfraInvex scores for next year.

The 'centre' of gravity is shifting

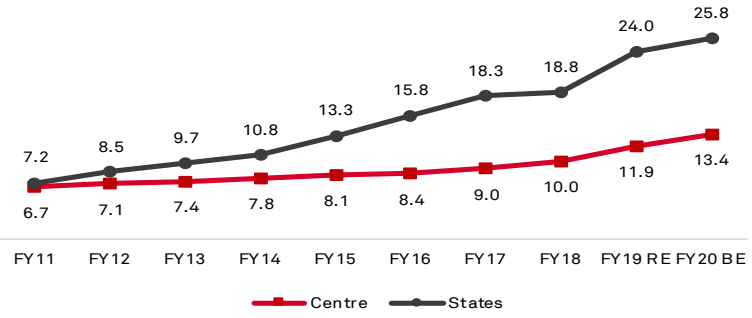
Indeed, states are becoming more central to India's infrastructure build-out every year. Barring a decline in fiscal 2018, their share in total development spend and capex – including by the Centre and states – has been on a secular uptrend for almost a decade now.

Development spend[3] by states increased 3.3 times between fiscals 2011 and 2019, from Rs 7 lakh crore to Rs 24 lakh crore, taking their share in total development spend up from 52% to 67%.

Capex[4], too, nearly quadrupled from Rs 1.7 lakh crore to Rs 6 lakh crore between fiscals 2011 and 2019. As a result, the share of states jumped from 52% to 65%. Eight sectors – transport (20%), irrigation (18%), energy (16%), agriculture & rural development (11%), urban development & housing (6%), water & sanitation (6%), education (3%), and health (3%) – accounted for 83% of the spend in fiscal 2019.

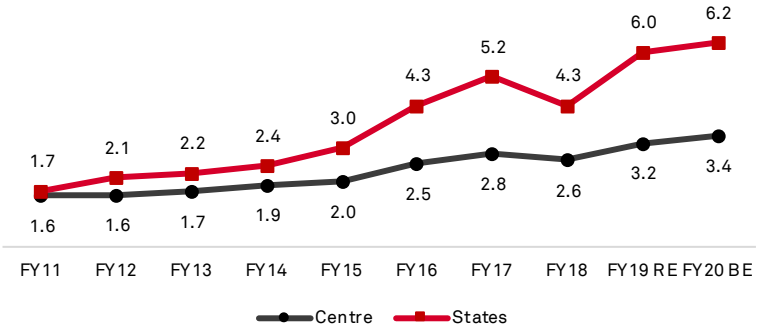
Share in development spend and capex has risen steadily

Development expenditure - Centre and states (Rs lakh crore)



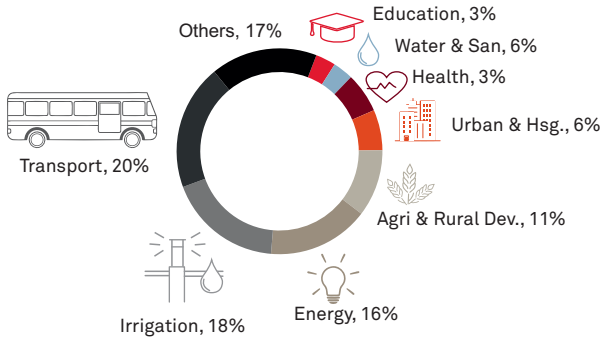
RE: Revised estimate; BE: Budget estimate
Source: Reserve Bank of India (RBI) State Finances report, 2019

Capex-Centre and states (Rs lakh crore)



RE: Revised estimate; BE: Budget estimate
Source: Reserve Bank of India (RBI) State Finances report, 2019

Eight sectors get ~83% of capex by states



In particular, **infrastructure investment**[5] by states in physical infrastructure is estimated at Rs 31 lakh crore, or 2.3% of GDP, during fiscals 2011 to 2020. This translates to 41% of the estimated infrastructure investment of Rs 77 lakh crore by the Centre, states, and the private sector taken together.

[3]*Development expenditure includes components of revenue expenditure, capital outlay and loans, advances under social and economic services.*
[4]*Capex includes capital outlays and loans provided by the government for social and economic services. This includes spending on bond issuances under the UDAY scheme in fiscals 2016 and 2017. Excluding this, capex of states in fiscals 2016 and 2017 reduced to an estimated Rs 3.3 lakh crore and Rs 4.1 lakh crore, respectively. Share of energy in the sectoral split also declined correspondingly.*
[5]*Infrastructure investment covers core infra sectors, viz, energy, highways, ports, airports, water & sanitation, irrigation, urban development & housing, oil & gas pipelines, and telecom. The figures for fiscals 2011 to 2017 are based on NITI Aayog's mid-term appraisal of the Twelfth Five Year Plan. Figures for fiscals 2018 to 2020 are CRISIL estimates. These figures include investments by public and private sectors apart from capex from budgetary outlay of Centre and states.*

While growing economic heft and rise in PCI underpin aggregate capex increase, states show divergence

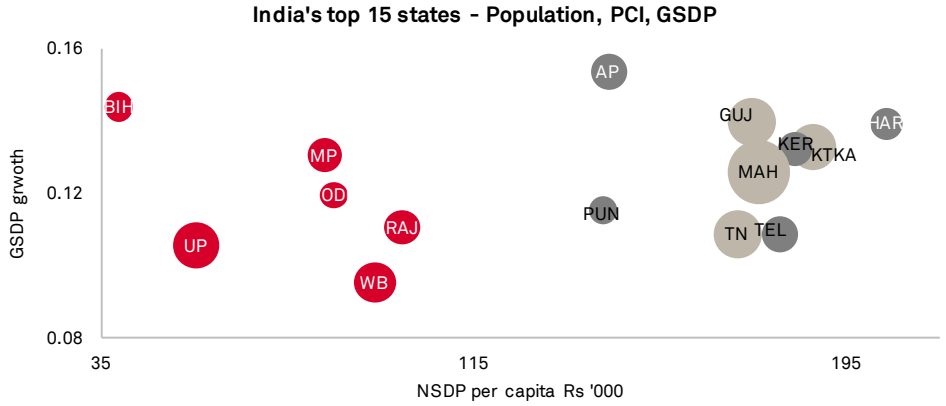
A disaggregated view of fiscal and economic indices at the level of individual states helps discern the drivers underlying growth in public spending better.

We looked at 15 most populous non-special category states[6], clubbing them under three clusters in terms of size of economy and PCI[7]: (i) four frontrunners: Gujarat, Karnataka, Maharashtra, and Tamil Nadu, with PCI greater than Rs 1.8 lakh per annum, and gross state domestic product (GSDP)[8] greater than 15 lakh crore; (ii) five middle-of-the-pack states: Andhra Pradesh Haryana, Kerala, Punjab, and Telangana, with PCI greater than Rs 1.5 lakh per annum, and GSDP less than Rs 10 lakh crore; and (iii) six climbers: Uttar Pradesh, Bihar, Madhya Pradesh, Odisha, Rajasthan, and West Bengal, with PCI less than Rs 1.25 lakh per annum.

These states have economic heft and accounted for ~87% of India's population and ~88% of its GDP. In fiscal 2019, 12 states had an estimated GSDP of over $100 billion each. Maharashtra ranked at the top with an estimated GSDP of $380 billion. Taken as a standalone economic unit, it would rank in the top 30 nations[9] globally. Four states that follow in the GSDP pecking order - Tamil Nadu, Gujarat, Uttar Pradesh, and Karnataka - have a nominal GSDP of over $200 billion, and would figure in the top 60 nations as standalone economic units. Nine of them were growth leaders, too, clocking higher GSDP growth vis-à-vis all-India GDP growth, between fiscals 2014 and 2019.

PCI of nine of 15 states enroute to upper-middle income threshold as defined by the World Bank. Nine of India's top 15 states and over half of all states could reach the upper-middle income threshold of $3,956 as defined by World Bank within the next 5-7 years. A few other states, including Delhi, Goa and Sikkim, have crossed this threshold already.

India's top 15 states: a diverse group with varied but growing economic clout



The frontrunners *GSDP FY19 > Rs 15 lakh crore and* *PCI > Rs 1.80 lakh p.a.*	***Gujarat, Karnataka, Maharashtra, Tamil Nadu*** *25% of population (Census 2011)* *39% of all India GDP in FY19* *27% of all-states capex during FY15-19*
The middle-of-the-pack *GSDP FY19 < Rs 10 lakh crore and PCI > Rs 1.50 lakh p.a.*	***Andhra Pradesh, Haryana, Kerala, Punjab, Telangana*** *14% of population (Census 2011)* *20% of GDP in FY19* *15% of all-states capex during FY15-19*
The climbers *PCI < Rs 1.25 lakh p.a.*	***Bihar, Madhya Pradesh, Odisha, Rajasthan, Uttar Pradesh, West Bengal*** *48% of India population (Census 2011)* *29% of all India GDP in FY19* *41% of all states capex during FY15-19*

BIH: Bihar; UP: Uttar Pradesh; MP: Madhya Pradesh; OD: Odisha; RAJ: Rajasthan; PUN: Punjab; AP: Andhra Pradesh; GUJ: Gujarat; MAH: Maharashtra; KER: Kerala; KTKA: Karnataka; TN: Tamil Nadu; TEL: Telangana; HAR: Haryana
Source: Handbook of Statistics on Indian States, RBI 2019, CRISIL analysis

[6] *As categorised by the RBI and based on Census 2011 population*
[7] *NSDP per capita as of 2019. Handbook of Statistics on Indian States 2019 and CRISIL estimates for Gujarat, Maharashtra and Kerala which have PCI > Rs 1.74 lakh as of 2018*
[8] *GSDP at current prices, fiscal 2019. Handbook of Statistics on Indian States 2019*
[9] *International Monetary Fund listing of countries by GDP, 2019*

The 15 largest states accounted for 83% of all the capex spend by states

Capex of the 15 largest non-special category states doubled from Rs 8.5 lakh crore over fiscals 2010 to 2014 to Rs 17 lakh crore from fiscals 2015 to 2019, and accounted for 83% of the 20.5 lakh crore spent by all states. This was supported by 73% growth in their revenue receipts, which grew from Rs 16 lakh crore in fiscal 2015 to Rs 28 lakh crore in fiscal 2019. A dissection of capex and revenue receipts across the three clusters of states as grouped earlier reveals:

I. The frontrunners saw subdued capex growth in fiscals 2014 to 2019 as revenue receipts growth moderated

The four leaders garnered 27% of revenue receipts of all states in fiscal 2019, and contributed 27% of capex between fiscals 2015 and 2019.

Their capex taken together grew 61% across two five-year periods (fiscals 2015 to 2019 over fiscals 2011 to 2015) and was considerably slower vis-à-vis the other two groupings of states profiled. Their share in all-India capex by states (32%) trailed their share in all-India GDP (39%).

Revenue receipts grew at 14.6% compound annual growth rate (CAGR) between fiscals 2015 and 2019. Among the four states, Gujarat and Karnataka could not translate relatively faster GSDP growth (13.1% and 13.9% CAGRs, respectively) into revenue buoyancy as revenue receipts growth moderated to 11.2% and 12.3%, respectively. Maharashtra and Tamil Nadu, the largest economies in this grouping, had subdued capex growth at 48% each across the two five-year periods.

II. Capex share of 'middle-of-the-pack' states was on par with that of their all-India GDP share

The four middle-of-the-pack states fetched 17% of revenue receipts of all states in fiscal 2019, and contributed to 15% of capex between fiscals 2015 and 2019.

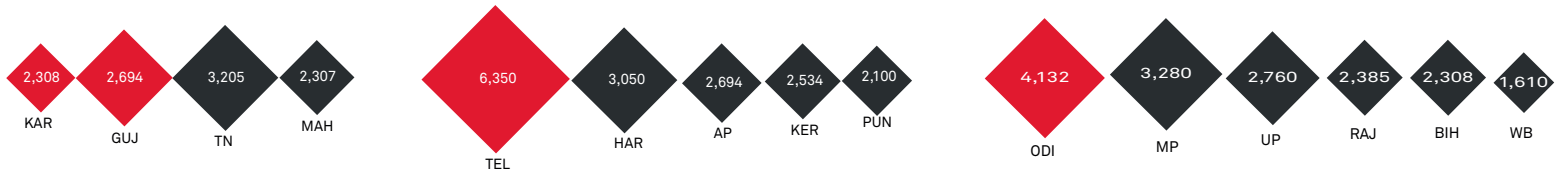
While revenue receipts growth moderated at 12.5% CAGR during this period, capex growth was relatively stronger at 113% across two five-year periods (fiscals 2015 to 2019 over fiscals 2011 to 2015). Telangana topped the capex sweepstakes in per capita terms among all 15 states, with average per capita capex of Rs 6,350 during fiscals 2015 to 2019, and 38% share of capex within this category.

III. The climbers reported the fastest growth in revenue receipts and capex among the three categories

The six climber states garnered 39% of revenue receipts of all states in fiscal 2019, and contributed 41% of all capex of all states between fiscals 2015 and 2019.

Revenue receipts of this cluster rose at 16.4% CAGR between fiscals 2015 and 2019. Capex grew 129% across fiscals 2010 to 2014 and 2015 to 2019. Odisha, in particular, witnessed strong growth. However, growth has also been accompanied by a sharp rise in debt levels in several of these states. That brings us to the constraints faced by states, detailed in the following section.

Average annual capex per capita (Rs): FY15-19



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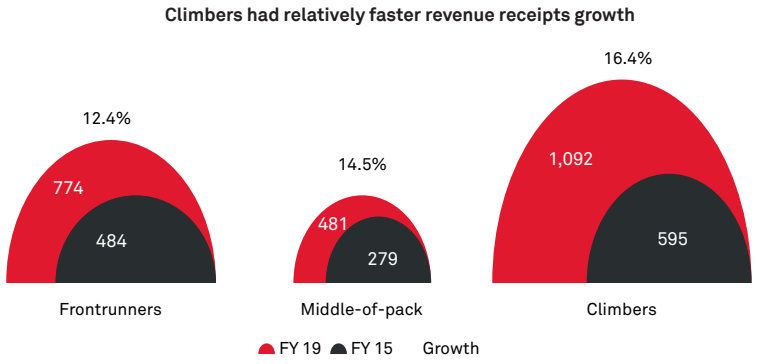
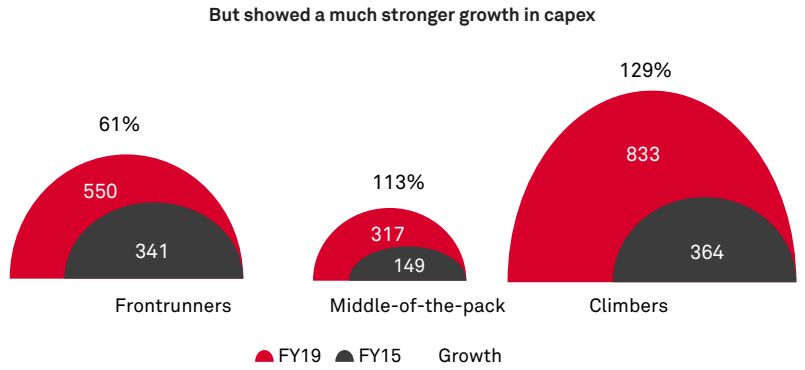
Source: RBI State Finances report, 2019

Revenue receipts (Rs '000 crore), CAGR %: FY15, FY19



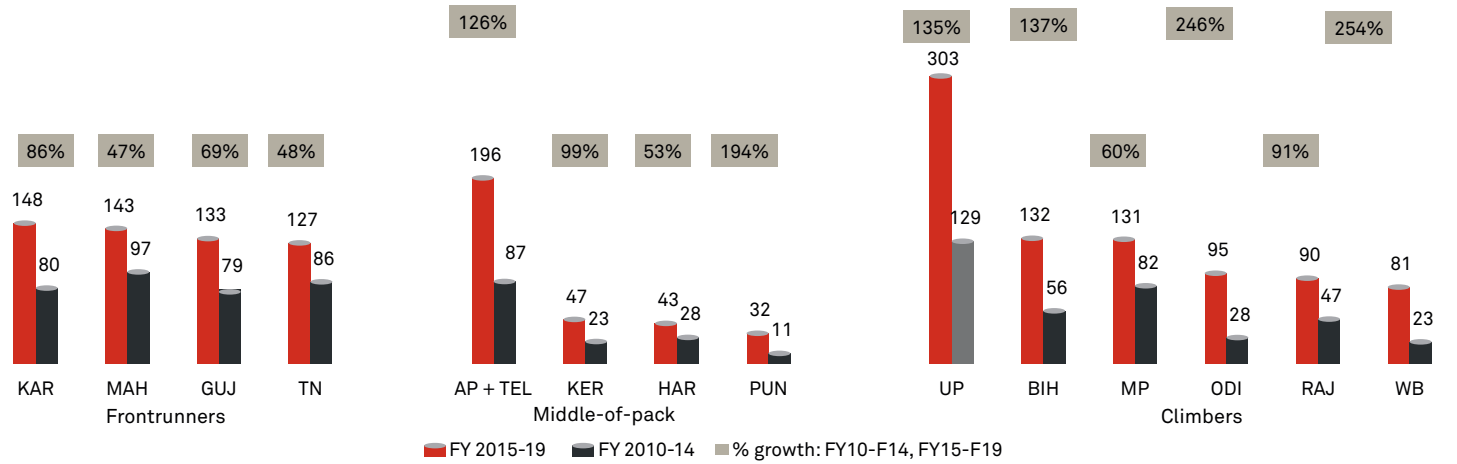
Source: RBI State Finances reports 2016-2019

Capex (Rs '000 crore), % growth: FY10-F14, FY15-F19



State-wise capex (Rs '000 crore), % growth: FY10-F14, FY15-F19

15 states accounted for ~83% of all India capex in FY19



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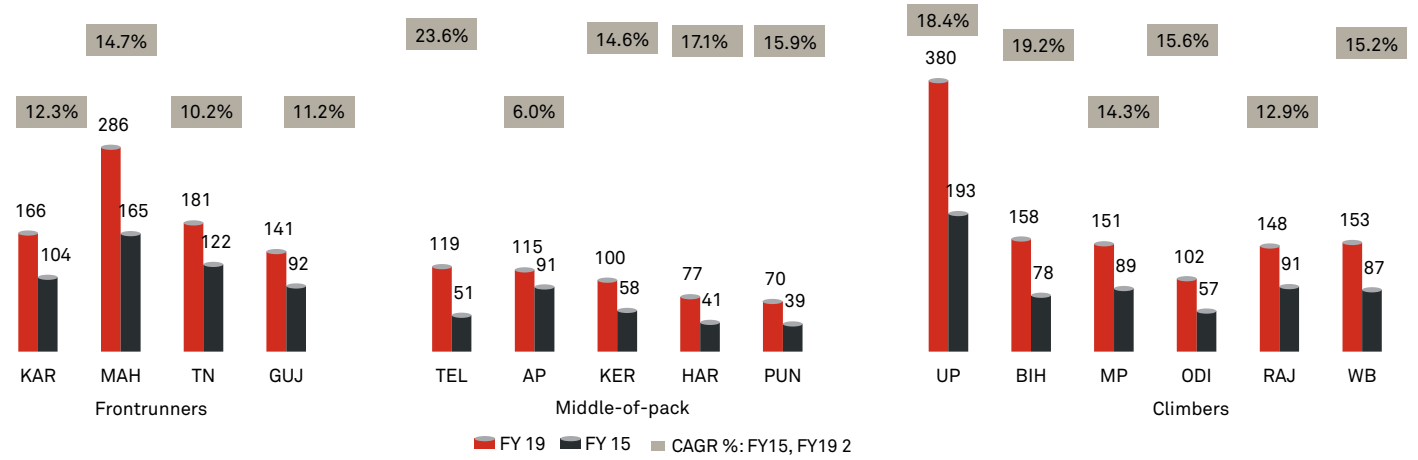
Source: RBI State Finances reports, 2016-2019

State-wise receipts (Rs '000 crore), CAGR %: FY15, FY19

15 states accounted for ~83% of all India revenue receipts in FY19



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Source: RBI State Finances reports, 2016-2019

Three factors curb sustained lift-off in infrastructure investment of states

A persistent fiscal squeeze could potentially limit expansion of states' investment capacity

For over a decade through fiscal 2015, tax buoyancy and fiscal prudence helped states channel a greater share of resources towards development. However, fiscal position of states has come under stress in recent years. Performance on three fiscal indicators reflect this trend:

i **Revenue deficit stickiness crowding-out space for capex:** States had reported revenue surplus for six out of seven years between fiscals 2007 and 2013. However, since fiscal 2014, they have swerved into revenue deficit. Even among the 15 states profiled, eight reported a revenue deficit in fiscal 2019. Seven of these reported it for three years in a row and one for two of the past three years.

At an aggregate level for all states, non-development expenditure increased 0.4% of GDP in fiscal 2019. Compounded by agri-loan waivers, income transfers, and other committed expenditures, own revenue as a percentage of revenue expenditure dropped from 56% in fiscal 2018 to 51% in fiscal 2019.

Solace can be drawn from growth in revenue receipts (15.8% CAGR) in the 15 largest states profiled being higher than that of revenue expenditure (15.11%) between fiscals 2015 and 2019. Moreover, revenue deficit declined from a near-term peak of Rs 45,704 crore in fiscal 2015 to Rs 12,797 crore in fiscal 2019.

ii **Fiscal deficits remain above the threshold even post UDAY spike in several states:** Gross fiscal deficit (GFD) of states as a percentage of their GSDPs (GFD-GDP) taken together has moderated in the past two years, post spike from UDAY bond issuances. It dipped to 2.7% and 2.9% in fiscals 2018 and 2019, respectively, from 3.5% in fiscal 2017. However, as many as six of the 15 states reported a GFD-GDP higher than the 3% FRBM (Fiscal Responsibility and Budget Management) threshold in fiscal 2019.

iii **Outstanding liabilities (OL), including debt and guarantees, rising sharply:** In all, 13 states had OL-GSDP ratio of over 30% in fiscal 2019. The spike in guarantees to 2.5% of GDP in the fiscal, representing a growth of 38% on-year, after a decline from 6.4% of GDP in fiscal 2005, is also a cause for concern.

Among the top 15 states, seven – Punjab, Uttar Pradesh, West Bengal, Rajasthan, Andhra Pradesh, Bihar, and Kerala – had an OL-GSDP ratio greater than 30%. Barring West Bengal, which remained near-static, the rest six saw their OL-GSDP ratio deteriorate between fiscals 2015 and 2017.

Another four states – Haryana, Madhya Pradesh, Odisha, and Tamil Nadu – had OL-GSDP of 26%, 25%, 23% and 22%, respectively, in fiscal 2019. Only four states - Karnataka, Gujarat, Maharashtra, and Telangana - remained below the OL-GSDP threshold of 20% through the past five years.

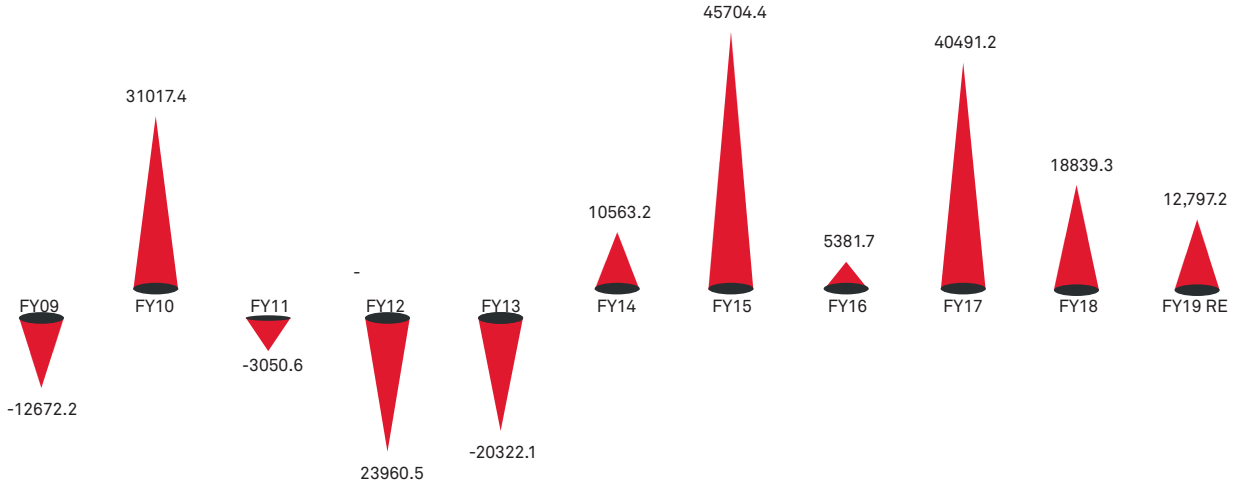
The immediate-term fiscal outlook for states remains muted in the face of a growth slowdown, delays in GST stabilisation, and impact of recent corporate tax cuts.

Under these circumstances, an aggregate revenue surplus for all states, as has been budgeted for fiscal 2020, looks improbable. In the medium term, other headwinds loom large. These include: a delay in economic recovery and effective reduction in devolution, given persistent increase in the share of cess in central government revenue.

Given these fiscal slippages on the three critical indices described, it is somewhat creditable that states managed to keep capex levels reasonably high during this period. However, when the stress becomes unmanageable, the axe invariably falls on productive capex and infrastructure investment. For instance, capex of all states taken together dropped 18% to Rs 4.3 lakh crore in fiscal 2018 from Rs 5.2 lakh crore a year earlier, although it picked up in the year thereafter.

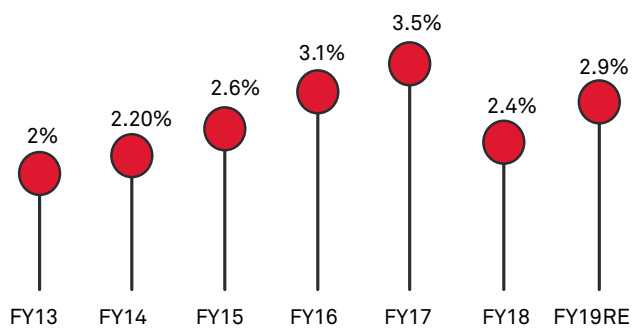
Reverting to and sustaining fiscal health is a necessary condition for resource flow into infrastructure investment. States face some hard times in the immediate term and tough choices to achieve that.

Revenue deficit (Rs crore)



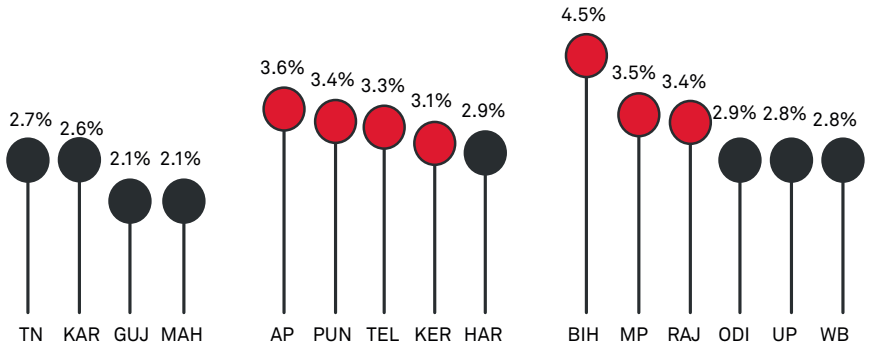
RE: Revised estimate

Fiscal deficit - All states (% of GSDP)



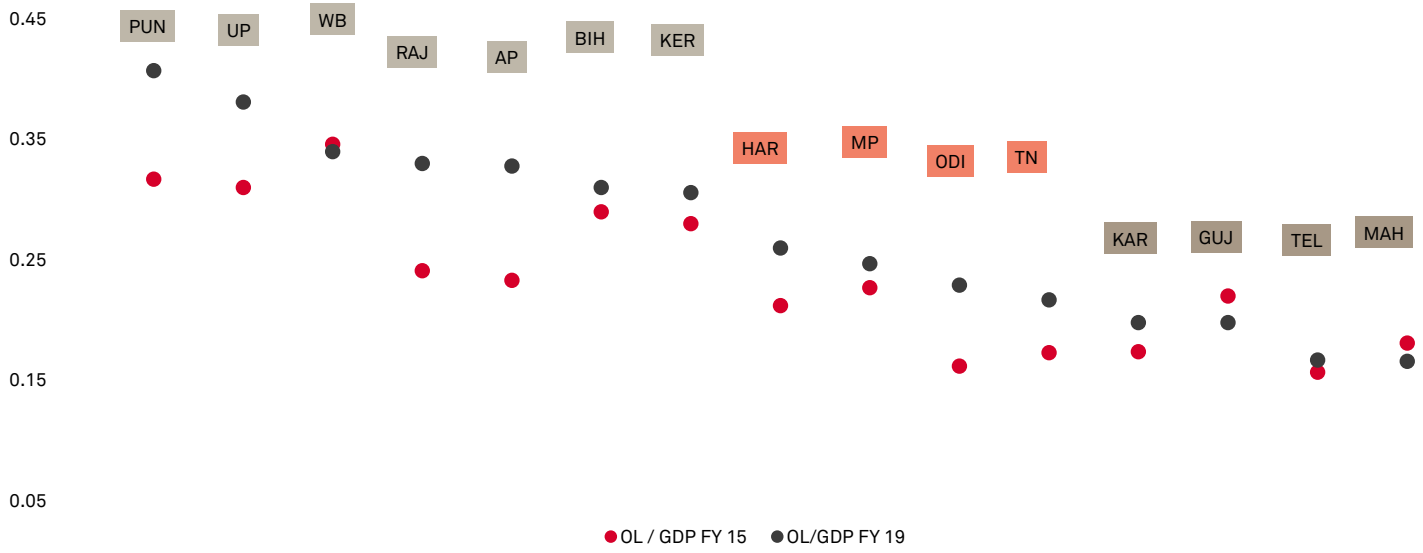
RE: Revised estimate

Fiscal deficit - 15 large states, FY19 (% of GSDP)



TN: Tamil Nadu; KAR: Karnataka; GUJ: Gujarat; MAH: Maharashtra; AP: Andhra Pradesh; PUN: Punjab; TEL: Telangana; KER: Kerala; HAR: Haryana; BIH: Bihar; MP: Madhya Pradesh RAJ: Rajasthan; ODI: Odisha; UP: Uttar Pradesh; WB: West Bengal
Source: RBI State Finances reports, 2016-2019

OL/GSDP ratio



PUN: Punjab; UP: Uttar Pradesh; WB: West Bengal; RAJ: Rajasthan; AP: Andhra Pradesh; BIH: Bihar; KER: Kerala; HAR: Haryana; MP: Madhya Pradesh; ODI: Odisha; TN: Tamil Nadu; KAR: Karnataka; GUJ: Gujarat; TEL: Telangana: MAH: Maharashtra
Source: RBI State Finances reports, 2016-2019

Lack of policy commitment and institutional drags consign infrastructure access and service delivery to a low-equilibrium trap

Exceptions aside, institutions dealing with infrastructure services, across a range of sectors, remain weakly regulated, institutionally incapacitated, and financially strained.

- **Power distribution companies:** The deleterious last-mile problem of state-owned electricity utilities stands in the way of universal electricity access and a vibrant power sector. Tremendous strides have been made in the power sector over the past decade, in terms of additions to generation capacity, surge in renewable capacity, and a connected transmission grid across the country. Yet, as average cost of supply (ACS) remains above average revenue realised (ARR) and elimination of ACS-ARR gap proves elusive, the power sector remains a massive drag on state finances.

  Progress on subsidy rationalisation and reduction in the ACS-ARR gap has been painstakingly slow, even in some larger states with relatively higher PCI and power consumption. With mounting delayed payments, threat of PPAs being reneged on, and bidding cancellations, the counter-party risks to investment remain high, barring exceptions. This is keeping a wider ecosystem of developers, lenders, and investors on tenterhooks.

  At some level, the ills of the power sector are a reflection of underlying policy and institutional constraints that afflict infrastructure provision. And while power utilities get noticed owing to sheer magnitude and scale of the challenge, a similar scenario plays out in agencies dealing with water supply, sanitation, public transport, etc

- **Public transport:** A study of 47 state road transport undertakings by the Transport Research Wing of the Ministry of Road Transport and Highways (MoRTH) observed that these entities made a loss of ~Rs 11,350 crore. While metro networks and bus rapid transit systems have sprung up in many cities, an integrated policy environment and institutional framework to tackle urban transport in a coordinated manner remain work-in-progress in some states, and yet to kick-off in many.

- **Urban water supply:** Notwithstanding some strong improvements in access provision, continuous metered 24x7 piped water supply remains elusive in even large Indian metropolitan cities. Cost recovery in urban water supply systems remains very low. Government public health and engineering departments continue to administer water supply provision without adequate institutional capacity and pathways to financial sustainability.

- **Functionally and financially weak local governments:** Even as India is expected to urbanise rapidly, the role, power, and capacity of city governments across most states remain vastly limited. Property tax revenue of India's cities constituted 0.2-0.3% of GDP in fiscal 2019, even lower than other developing country peers. Only 11 of 94 cities that were assigned credit ratings managed an issuer credit rating of AA- and above. While there has been some needle movement in a few cities, vast majority of local governments (even medium-to-large cities) continue to be institutionally weak and financially dependent on state and central government grants.

This is not to say that progress has not been made. A range of initiatives on infrastructure policy, institutions and financing hold promise, and present emulation worthy ideas for replication. The box - State-level initiatives – Infrastructure policy, institutions, and financing - captures a select list of state initiatives, some of which demonstrate the potential for scale-up and replication.

While there is a genuine case for subsidy to enable universal access, tariffs and government support to service delivery, institutions are often found wanting to meet costs. As operation and maintenance (O&M) obligations are not met despite capex being funded from central and state grants, a 'build-neglect-rebuild' asset creation syndrome afflicts public service provision, resulting in a severe compromise of universal access, efficient delivery and sustainability of infrastructure assets, perpetrating a low-equilibrium trap.

A weak institutional framework to manage and deliver infrastructure services is the Achilles' heel of infrastructure development in states. This needs to change, and change fast.

State-level initiatives: infrastructure policy, institutions and financing

- **Infrastructure legislation and nodal institutional frameworks:** Several states, including Andhra Pradesh, Telangana, Tamil Nadu, Gujarat, Punjab and Bihar, have enacted legislation to enable PPPs and catalyse infrastructure development. Some have followed up legislation with setting up state infrastructure development boards and formulating regulations and guidelines to implement policy initiatives. While such nodal agencies are no substitute for wider capacity creation in infrastructure utilities, they can facilitate policy coherence, project development rigour, and harmonisation of project procurement and contracting practices to enable PPPs, in particular. For instance, the Gujarat Infrastructure Development Board (GIDB) reports over 172 PPP projects involving an outlay of over Rs 39,000 crore have been executed, with another 59 projects worth Rs 15,931 crore under implementation as of 2016.
- **Efficiency gains in power distribution - Delhi privatisation and Bhiwandi distribution franchisee:** Strong project preparation, good data quality assessment, balanced risk sharing, and strong political support underpin the successful role of private partners in both these cases. Both had strong efficiency gains outcomes. The input- and investment-based Bhiwandi distribution franchisee arrangement saw aggregate technical and commercial (AT&C) losses drop from ~55% in 2007 to ~19% in 2018. In Delhi too, a loss-making public distribution utility with AT&C losses of over 50% was turned around within a few years.
- **Minor ports in Gujarat:** Gujarat formulated its minor ports policy in 1995, and reviewed and updated it in 2019. It has emerged as a role model for successful minor port development. It has been successful in attracting private investment into both multi-user and captive port facilities, and today has minor port facilities of scale that have facilitated port-led industrial development in the state. In fact, Gujarat's minor ports handle over 70% of all cargo handled by minor ports across the country.
- **Greenfield airports in Bengaluru and Hyderabad:** Bengaluru and Hyderabad raised the bar on setting up civil aviation facilities when they got new greenfield airports implemented by the private sector, backed by the state governments. Also, Kochi airport had earlier mobilised private financing, sowing the seeds for PPP-led modernisation of Mumbai and Delhi airports subsequently.
- **Non-guaranteed debt financing and user deposit financing of urban projects – Tamil Nadu Urban Development Fund:** Operational for over two decades, the Tamil Nadu Urban Development Fund (TNUDF) was set up to finance urban projects on a non-guaranteed mode. As of fiscal 2018, it had an asset book of Rs 2,610 crore, had mobilised over Rs 3,510 crore of long-term credit lines from multi-lateral agencies, and had a 99% loan recovery track record. It blends loans, capital grants and user deposits to finance water and sewerage projects, while using ring-fenced property taxes and user charges to sustain O&M and debt servicing, building on the Alandur sewerage project model, which helped scale water supply and sewerage access in cities.
- **International resource mobilisation – Tamil Nadu Infrastructure Fund Management Corporation and Kerala Infrastructure Investment Fund Board:** Tamil Nadu and Kerala have set up state-level resource mobilisation vehicles for infrastructure financing. The Tamil Nadu government promoted the Tamil Nadu Infrastructure Fund Management Corporation (TNIFMC) as an asset management company to raise and manage alternative asset funds focused on infrastructure and affordable housing. It is managing two alternative investment funds - Tamil Nadu Infrastructure Fund and Tamil Nadu Shelter Fund. The Kerala Infrastructure Investment Fund Board (KIIFB) has been set up as a government-owned institution to mobilise financing for infrastructure projects. The board successfully issued masala bonds on the London Stock Exchange and completed the first transaction by closing its Rs 2,150 crore masala bond issue in March 2019 – the first offshore issuance by a state entity from India.
- **Robust institutional arrangements and harmonised project development aiding a fast expanding metro rail ecosystem in cities:** Following the successful rollout of the Delhi metro through a joint venture (JV) model, a number of cities are fast setting up and expanding metro rail networks. It is estimated that over 600 km of metro rail networks are operational, with another 500 km on the anvil. Mumbai is constructing a metro rail network of over 230 km. States and cities ought to leverage these assets through nodal urban transport frameworks to better integrate metro rail with other public transport facilities for greater impact.

There's over-reliance on public outlays as PPPs and commercial financing pilots have not acquired scale and depth

Over the past couple of decades, states have been test beds of pilot initiatives in PPPs and commercial financing across a range of infrastructure sectors, such as urban water supply, municipal solid waste management, state highways, and power transmission. Some of these worthy initiatives have tended to languish as pilots without acquiring scale. A few highlights from the experience are given below:

- **24x7 urban water supply PPPs:** PPPs have been attempted in the water sector since the mid-1990s, starting with the Alandur sewerage project and Tiruppur water supply project in Tamil Nadu. There was a sharp increase in project starts during 2005 to 2010, when 24x7 water supply pilots were implemented in Hubli and a few other cities in Karnataka, and city-wide PPP concessions and management contracts were awarded in Nagpur, Mysore, etc. Many of these projects had their roots in individual champion-led initiatives or were under externally aided initiatives of multi-lateral programmes, without adequate anchoring and policy support from respective state governments. As projects started failing owing to a host of issues, including poor risk allocation, unbalanced contracts, weak counterparty capacity, and inadequate bidder due diligence, new project starts sharply dropped.
- **Limited scale-up of private role in power distribution:** Despite successful and well-managed private distribution companies operating in several cities such as Mumbai, Delhi, Ahmedabad, and Kolkata, the appetite for privatisation has remained tepid in the power distribution sector. Even the distribution franchisee model that has been adopted in a few cases presents a mixed bag, despite successful rollouts like Bhiwandi. Of the 18 franchisees awarded, only 11 were operating in Maharashtra, Uttar Pradesh, Odisha, and Rajasthan as of 2018.
- **Municipal bonds:** First issued in 1995, municipal bonds have been one of India's longest running development finance pilots. Yet, with just ~Rs 3,000 crore of issuances over the past couple of decades, the market remains shallow and small compared with the investment needs of our cities. The spurt of nearly Rs 1,400 crore in issuances in the past three years gives hope that this is an idea whose time has come. Scaling up this potentially game-changing idea will call for programmatic support from the Centre and state governments, and nudging the relatively credit-worthy cities to build capacity to create and implement bankable projects, and to tap markets regularly.
- **State-level nodal frameworks for resource mobilisation and commercial financing:** A few states, such as Tamil Nadu, Kerala, Karnataka, have experimented with state-level vehicles for infrastructure financing. These have set up state-level infrastructure funds either to channel resources from multi-lateral and externally-aided programmes (for instance, Karnataka Urban Infrastructure Development and Finance Corporation or KUIDFC and TNUDF), and to tap resources from capital markets and private investors in India and abroad for infrastructure (for instance, TNIFMC or KIIFB). A few have created nodal infrastructure boards (for instance, GIDB) to drive policy coherence and create a bankable pipeline of PPP projects.

These models could potentially usher in efficiency gains and expand service delivery. But most of them have not acquired scale and depth, despite successful pilots over several years, owing to inadequate project preparation capacity, weak counter-party institutions, enhanced risks because of weak sanctity of contracts, and slow pace of structural reforms. Other potential areas to unlock resources that have not yet entered states' policy priority adequately are asset monetisation and public sector enterprise reforms.

Building wholesome capacities to scaling avenues to tap commercial financing and PPPs ought to be integral to state-level infrastructure development plans

States need to invest Rs 100-110 lakh crore over fiscals 2021 to 2030

Nationally, restoring GDP growth to above 7.5% and sustaining it while increasing infrastructure spend to 6.0-6.2% of GDP ought to be top policy priorities

We step back here a bit to look at the national picture on infrastructure spending.

During fiscals 2011 to 2020, India invested an estimated Rs 77 lakh crore, or ~5.7% of its GDP, in infrastructure, with GDP growing at 6.7%[10], on average during the period.

The central government's initiative to set up a taskforce to identify a priority pipeline of projects worth Rs 100 lakh crore for the next five years signals policy commitment to the infrastructure agenda.

Getting there and moving forward on that trajectory calls for lifting the GDP growth to 7.5%, and sustaining it above that level through the next decade, and taking the infrastructure spend to ~6.0% of GDP. A glide path to these levels in the next few years will get us to thereabouts of ~Rs 235 lakh crore of infrastructure investment, or ~Rs 23 lakh crore per year, on average, during the next decade.

While both Centre and states need to pull out all stops to get there, we turn the spotlight on our thematic focus of the substantial role that states have to play in realising this investment potential.

The pathway to Rs 235 lakh crore infrastructure investments (FY21-FY30)

	Past trends			Scenarios (FY21-FY30)*		
	FY11-FY20	**FY16-FY20**	**FY18-FY20**	**I**	**II**	**III**
Avg GDP growth % CAGR	**6.7%**	**7.0%**	**6.3%**	**6.7%**	**7.5%**	**7.5%**
Infra spend % of GDP average	5.7%	5.7%	5.5%	5.7%	6.0%	6.25%
Total spend Rs lakh crore	77.8	49.3	31.6	**~215**	**~235**	**~245**
Avg annual spend Rs lakh crore	7.8	9.9	10.5	~22	~23.5	~25

[10]*This assumes a 6% GDP growth for fiscal 2019. Potential downside, if any, does not alter the narrative reflected here.*

States will need to seize the initiative to engineer India's decade of infrastructure transformation

We estimate that states will have to set their sights on a trajectory to invest Rs 100–110 lakh crore in infrastructure in the next decade. This translates to 2.3 times the average annual investment of the past five years. While this looks daunting, it has to be reckoned that states have done this during fiscals 2011 to 2020, when they doubled their average investment in the latter half, that too at a time when they were actually experiencing fiscal strain.

For sure, a business-as-usual approach is not sufficient to get us there. Realising and unlocking this investment potential will call for concerted actions on various fronts, including a renewed policy commitment to reforms, institution-building, and rigour in project development. We are cautiously optimistic that states will, indeed, rise up to the challenge.

While an all-hands-on-deck effort will be needed from all states, the 15 states profiled here will be crucial. These account for ~83% of the capex of all states put together, and, hence, will need to be the game changers driving this agenda with a renewed sense of purpose and missionary zeal.

We recognise at the same time that these 15 states come with different socio-economic, institutional, and fiscal contexts, and will have to prioritise their actions somewhat differently.

The next 10 years: how the task is cut out for the big 15

The frontrunners are Maharashtra, Gujarat, Tamil Nadu, and Karnataka

The adage 'with great power comes greater responsibility' applies to India's economic giants. Home to 25% of India's population, they churn out 39% of India's economic output and are endowed with relative higher per capita incomes, high urbanisation, infrastructure and institutional base. They will need to make their intrinsic advantages count.

To do that, these states will need to lead the way on structural reforms to find new triggers for growth given their larger economic base. With relatively high PCIs, they are in a better position to rationalise and direct subsidies to drive welfare impact.

They also need to show enterprise in raising the bar on land and labour reforms, and in making their agri-markets function better.

With higher urbanisation, they are well-placed to enhance revenue potential from cities, unlock asset monetisation potential, and raise resources from capital markets and through innovative financing.

Within this group, Maharashtra appears to have room and needs to raise capex investments sharply, while Tamil Nadu needs to urgently fix its power sector woes and return to fiscal prudence to re-energise flagging growth. Karnataka and Gujarat have managed to keep their fiscal position in good health, but need to renew focus on tapping commercial capital and private investment to step up the investment momentum.

With 39% of GDP, and relatively better economic and fiscal might, they had a relatively subdued 27% of capex in the last five years. They need to go all out to contribute 35-37% of the investment of all states in the next decade.

These giants will need to put their best foot forward and be intrepid for India's infrastructure story to get a move on.

The middle of the pack – Andhra Pradesh, Kerala, Haryana, Punjab, and Telangana

These five states have some of the endowments of higher PCI and relatively higher urbanisation levels of the big four, but lower population weight, which affords them to be nimble and agile. Not surprisingly, three of them – Andhra Pradesh, Haryana, and Telangana - have grown faster than the national average in recent years.

These states ought to target, being growth leaders, while reverting to and sustaining fiscal prudence. Also, given their higher levels of urbanisation, they will need to find ways to step up their investment in per capita terms sharply from current levels, as Telangana has managed to do. They will need to sustain 20% of capex.

These middle-rung states will need to punch above their weight and up their game.

The climbers – Uttar Pradesh, Bihar, Madhya Pradesh, Rajasthan, West Bengal, and Odisha

These six states accounted for 48% of the population, 29% of economic output, and, interestingly, 41% of capex of all states during the past five years.

With relatively lower PCI, they have vulnerable public finances, relatively weak institutional frameworks, and lower private sector presence in their economies. But the capex spike of these states possibly suggests their capacity to implement investments is improving. This, however, has come with side-effects. Barring Odisha, all states in this group either had OL-GSDP ratio higher than 30%, or fiscal deficit higher than the 3% FRBM threshold, or both, in fiscal 2019. Even Odisha has seen a sharp increase in OL-GSDP, though on a lower base.

These states will need to frontload actions to strengthen institutional capacities and improve fiscal vibrancy, while finding growth levers to play catch-up and sustain the infrastructure spending trend they have shown in the past.

The climbers will need to build endurance for the trek ahead.

States should be fiscally healthier, build institutional muscle, and develop regulatory dexterity

CRISIL identifies nine actions around three vectors for state governments to drive this transformation:

I. Expand fiscal space to invest

In the past five years, during the time of the Fourteenth Finance Commission awards, states have done well to belie concerns around their capacities to translate incremental untied transfers into productive capex. However, a moderating revenue receipts growth, increase in committed expenditures, and surging debt levels in the past few years have raised doubts about their ability to keep this going. Slowdown of the past couple of quarters has heightened these concerns. States have the hard task of balancing the need for continued capex stimulus with keeping their fiscal position in check. We believe concerted actions in three areas will help them manage the tightrope walk better.

1) **Revamp GST:** The GST should be transformed into a simple and buoyant revenue regime. The persisting teething issues around the regime need to be tackled expeditiously. Three issues require attention in particular:

   i. **Tax stability:** Tax rates ought to be stabilised around fewer slabs where feasible. The urge to tinker with the rates on individual items needs to be strongly resisted.

   ii. **Administrative effectiveness:** The process and workflows around tax administration need to be streamlined further and made user-friendly to support higher levels of compliance and timeliness of refunds to assess and award compensation to states.

   iii. **Greater compliance:** Actions such as operationalisation of invoice matching and related trails need to be expedited to promote greater compliance and timeliness of filings and returns.

2) **Exploit asset monetisation potential:** Asset monetisation could help states recycle capital into newer infrastructure spends without adding incremental debt. It has the potential to attract long-term private capital from a new class of investors and bring in management efficiencies.

   States should seek to identify and offload a pipeline of monetisable assets in a programmatic manner. Power transmission and tolled/tollable state highways are low-hanging opportunities in this regard. Unutilised land in industrial areas, non-core assets of state agencies, and disinvestment of state public-sector enterprises are other potential areas to target. These principles could be potentially applied across a range of sectors and sub-sectors, including water and wastewater treatment plants, and bus-terminals.

3) **Implement expenditure reforms** are particularly critical here.

   i. **Medium-term expenditure frameworks:** States should consider formalising the use of medium-term expenditure frameworks to make their annual budgets more effective and to facilitate departments and agencies take a multi-year perspective. Budgetary outlay on urban water supply, for example, has sharply increased in some states. However, adequate attention is not given to creating and ring-fencing revenue streams through user charges, tax allocation and transfers to meet the O&M obligations arising from this investment. Establishing such frameworks helps ensure that resource allocation in annual budgets is aligned to medium-term development priorities.

   ii. **Direct subsidy transfer:** States have an opportunity to improve targeting of subsidies by moving to a direct transfer mode where possible. The Aadhaar ecosystem now provides a simple and cost-effective way to do this. While this approach is already used by some states in areas such as pensions, using a direct transfer approach for disbursing subsidy in the power sector can be potentially game changing, and can help eliminate distortions and losses on account for giving unmetered connections and free power.

II. Enhance state capability to implement

Scaling up infrastructure investments will equally require sustained efforts to strengthen state capacities to plan, source, implement, and monitor infrastructure projects for universal access and efficient service provision. In this regard, we have identified three critical ingredients:

4) **Nurture creditworthy institutions and address counterparty risks squarely:** Capable, accountable, and credit-worthy public institutions are a pre-requisite to sustainable infrastructure provision. As is seen in the power sector, counterparty risk is among the biggest deterrents to private participation and external financing in the infrastructure sector.

   States ought to benchmark all infrastructure providers, including electricity distribution companies, public transport corporations, water boards, city governments and other civic agencies engaged in infrastructure provision, and work towards strengthening these so that they: (i) are corporatised and independently governed; (ii) have ring-fenced revenues and are well-capitalised; (iii) are equipped to attract, retain professional talent; and (iv) are seen and valued as credible counterparties that uphold sanctity of contracts by diligently and fairly enforcing contractual provisions, while honouring their own obligations.

5) **Build rigour in project development:** States ought to strengthen rigour in project development to translate the investment potential of Rs 100-110 lakh crore. This will call for: (i) dedicated funding, capacity and standards to create a prioritised shelf of key bankable projects upfront, and ensure all approvals and clearances are in place before bidding; and (ii) embedding climate resilience, sustainability, and technology leapfrogs.

   Project-specific special purpose vehicles (as was done for the ultra-mega power projects, or in the case of metro-rail projects) with accountability for project development, for securing approvals, and for driving financial sustainability could be set-up for all large mega-infrastructure projects. Apart from creating capacity early-on, these structures could then provide monetisation opportunities through stake-sale once operations commence.

6) **Tap avenues for commercial financing and PPPs[11]:** States should seek to programmatically expand avenues to attract the private sector and commercial financiers through: (i) sector/context-appropriate and balanced PPP models; and (ii) innovative structures for resource mobilisation.

   i. **Adoption of appropriate PPP models,** including looking beyond conventional build-operate-transfer (BOT) structures, at annuity variants, and investment-light models, while recalibrating risk-sharing to reflect sector and context appropriate models and contracts. For instance, in sectors such as urban water supply that tend to have sizeable viability gaps and offer scope for efficiency gains, performance-based contracting could be appropriate.

   ii. **Create/ vest responsibility in a state-level entity to steward innovative financing:** States should consider mandating a state-level entity to build necessary capacities to steer innovative financing in a programmatic manner. As mentioned earlier in this chapter, there have been a range of approaches adopted by some states in this regard, including sector-specific funds (TNUDF/ Odisha Urban Infrastructure Development Fund), nodal infrastructure development boards (TNIDB/GIDB), infrastructure financing entities, and alternative investment funds (KIIFB and TNIFMC).

   iii. **Empower cities and city governments to tap capital markets and private investment:** Municipal bonds have made a comeback recently, which provides an incentive for states to get their act together to empower city governments functionally and financially to tap capital markets effectively. Most city governments have revenue levels significantly below potential; nurturing a vibrant and well-governed third tier would make them relatively more self-reliant and reduce the pressure on state finances.

III. Engender a conducive policy and regulatory ecosystem to lift investment momentum

7) Implement **sectoral reforms** to unlock investment potential, especially in energy, transport, and urban services (including urban water and sanitation, and urban transport). These sectors typically account for 65-70% of infrastructure investment by states. While each state starts from a different context, a common set of action that states could implement in these key sectors are summarised in the box overleaf.

8) Improve **investment climate** by increasing the ease of doing business to global-best benchmarks. This includes enforcing the following actions:

   i. Operationalise **single-window frameworks** to facilitate fast-track resolution of issues. To start with, this can be limited to large infrastructure projects above a particular size, say Rs 100 crore.

   ii. Define **time limits for permissions and approvals** of various agencies while moving work flows online where possible. Disseminate actual performance with respect to these targets to promote transparency and incentivise efficiency.

9) Implement **structural reforms**, including in land and labour sectors. The focus should be on expanding land availability for infrastructure creation and plugging skill shortages.

[11] *Readers may also want to refer to the CRISIL Infrastructure Yearbook 2018 themed around the private investment imperative which covered some of these aspects in greater detail.*

Infrastructure Advisory

Energy

- Accord highest policy priority to eliminate ACS-ARR gap by fiscal 2021
- Completely phase out unmetered free power connections and shift to direct subsidy transfer
- Tap asset monetisation potential in power transmission and in rehabilitation and management of state-owned generation to unlock resources; ring-fence these funds to create new transmission and grid capability to handle higher share of renewable power
- Regulatory overhaul is desirable, including possibility of states/ regional benches appointed by the Centre
- Relook at PPP models in distribution, including distribution franchisee

Transport

- Aggressively explore opportunities to tap asset monetisation potential in state highways. Consider creating or designating accountability for this under an existing or new corporatised entity
- Restructure state-/city-level bus transport undertakings to expand their share of travel, improve their operational efficiency, and return them to financial vibrancy
- Develop greenfield airports for regional movement
- Prepare state-level integrated transport masterplan along with a prioritised pipeline of bankable projects
- Create logistics infrastructure - cold chains, warehouses, industry specific common facility centres, etc
- Develop mini freight and industrial corridors among states

Urban

- Strengthen state finance commissions and implement a stable formulaic devolution transfer regime
- Expand property tax revenue base to at least 0.75% of GSDP within the next 5-7 years and exploit land value capture financing potential
- Get cities with population greater than 20 lakh to tap capital markets and commercial financing
- Implement plans to reach global service benchmarks in water, wastewater and solid waste in the next 5-8 years
- Operationalise metropolitan transport authorities to aggressively drive public transport adoption


SA WORLD

How India's large states fare

State	Population 2011	GSDP FY19 (Rs lakh crore)	Average annual capex			In per capita terms			As % of GSDP FY19			Growth CAGR %		
			FY15-FY19 (Rs crore)	FY10-FY14 (Rs crore)	Growth %	NSDP FY18 (Rs)	Rev receipts FY19 (Rs)	Average capex FY15-FY19 (Rs)	Outstanding liabilities	Gross fiscal deficit	Revenue deficit	Nominal GSDP FY15-FY19	Revenue receipts FY15-FY19	Revenue expenditure FY15-FY19
	50	**9.3**	**73,462**	**86,557***	**126%****	**143,935**	**21,031**	**2,694**	**32.8%**	**3.6%**	**1.3%**	**15.4%**	**6.0%**	**2.4%**
		5.6	132,142	55,764	137%	38,631	13,804	2,308	31.0%	4.5%	-1.7%	13.3%	19.2%	19.6%
Gujarat	60	15.1	132,646	**78,652**	**69%**	**174,652**	**21,139**	**3,991**	**19.8%**	**2.1%**	**-0.1%**	**13.1%**	**11.2%**	**12.6%**
Haryana	25	7.1	42,521	27,795	53%	203,340	27,553	3,050	26.0%	2.9%	1.2%	12.6%	17.1%	14.8%
Karnataka	61	15.4	147,977	79,756	86%	187,649	24,687	4,404	19.8%	2.6%	0.0%	13.9%	12.3%	12.5%
Kerala	33	7.7	46,561	23,411	99%	184,000	27,217	2,534	30.6%	3.1%	1.7%	10.9%	14.6%	12.0%
Madhya Pradesh	73	8.1	130,994	81,907	60%	82,941	18,922	3,280	24.7%	3.5%	0.0%	14.0%	14.3%	16.4%
Maharashtra	112	26.6	142,599	96,807	47%	176,102	23,179	2,307	16.6%	2.1%	0.6%	10.6%	14.7%	14.1%
Odisha	42	4.9	95,384	27,535	246%	84,854	22,068	4,132	22.9%	2.9%	-2.2%	12.0%	15.6%	15.6%
Punjab	28	5.2	32,044	10,902	194%	142,644	23,070	2,100	40.7%	3.4%	2.3%	9.5%	15.9%	15.3%
Rajasthan	69	9.3	89,902	46,985	91%	99,487	19,654	2,385	33.0%	3.4%	2.7%	10.9%	12.9%	16.3%
Tamil Nadu	72	16.6	1,27,158	86,122	48%	171,583	22,761	3,205	21.7%	2.7%	1.2%	11.5%	10.2%	11.6%
Telangana	35	8.7	122,242	-	N.A	180,697	30,934	6,350	16.7%	3.3%	0.0%	14.4%	23.6%	23.8%
Uttar Pradesh	200	15.4	303,295	1,28,997	135%	55,456	17,291	2,760	38.1%	2.8%	-3.1%	11.1%	18.4%	17.1%
West Bengal	91	11.8	80,806	22,810	254%	93,711	15,202	1,610	34.0%	2.8%	0.6%	13.2%	15.2%	11.5%

**The capex is for erstwhile combined Andhra Pradesh. ** Growth figure is for Andhra Pradesh and Telangana taken together (FY15-FY19) over capex of erstwhile combined state.*
Source: RBI State Finances reports, 2015-2019, Handbook of Statistics on Indian States 2019, CRISIL analysis

CRISIL InfraInvex and sector scorecard

About CRISIL InfraInvex

The CRISIL Infrastructure Investability Index, or CRISIL InfraInvex, is a robust measure that tracks and assesses the development, maturity, and investment attractiveness of various segments of the infrastructure sector. It seeks to assess sectors with respect to enabling actions, grouped under four pillars: policy direction, institutional strength and regulatory maturity, financial sustainability, and implementation ease. While these pillars underpin the index, scoring is based on nine criteria:

Pillar 1: Policy direction (weightage 20%)

1. Policy consistency, including framework, extent of focus, definition of programmes, preparedness of the projects pipeline, and clarity of targets and actions, including phasing, milestones, and timelines

2. Public financing support, covering scale and growth in budgetary outlays, and availability other public instruments such as viability gap funding (VGF) where a sector is not de-licensed

Pillar 2: Institutional strength and regulatory maturity (weightage 30%)

3. Entity implementation capacity, covering capacity and autonomy of organisation(s) responsible for developing, implementing, and monitoring projects and programmes

4. Financing models, including the extent of mainstreaming of models for private sector participation (PPPs, too), and mobilisation of non-grant financing (access to capital markets, too)

5. Regulatory robustness, including presence, independence, and effectiveness of regulatory functions and agencies, upholding of contract sanctity, and arbitration process

Pillar 3: Financial sustainability (weightage 30%)

6. Cost recovery, including levels and targets for standalone cost recovery, status of tariff reforms, extent of cost recovery through direct tariffs, user charges, (wherever required) explicit subsidy – including policy for provisioning and ring-fencing of explicit subsidy, and timeliness of disbursement to meet standalone cost recovery gaps in the sector

7. Demand risk, including offtake and market risk in the sector

Pillar 4: Implementation ease (weightage 20%)

8. Track record, covering financial and non-financial outcomes, both in terms of improvement vis-à-vis past performance and targets set under various policy programmes

9. Externalities, including number and scale of approvals (land, too), and challenges that impact timeliness and cost effectiveness

Scorecard scale and interpretation

The CRISIL InfraInvex is a 10-point index with '1' reflecting least investment attractiveness and sector maturity, and '10' reflecting highest investment attractiveness and sector development maturity:

- 1-3: Poor
- 3-6: Weak
- 6-8: Stable
- 8-10: Mature

Sectors covered

The CRISIL Infrastructure Yearbook 2019 provides perspectives on various infrastructure sectors and scores for the following sectors based on the CRISIL InfraInvex:

1. Power, including conventional generation, renewable energy, transmission, and distribution
2. Highways
3. Railways
4. Ports
5. Airports
6. Urban infrastructure

Salient aspects of scoring methodology this year

Four pillars, nine criteria: Each sector was evaluated based on the nine criteria and four pillars. The scoring was done against each criteria based on information available in the public domain.

Micro- and macro-level data points: In sectors such as highways and power, where there is a rich history of private participation and potential to review performance of a portfolio of projects, the evaluation factors in granular data points available at the sub-sector/ project levels. For evaluating cost recovery, it factors in different methodologies followed by different sectors. For instance, while is based on commercial returns for the power and highways sectors, it is based on operation and maintenance cost recovery and/ or with subsidy and other provisions, for other sectors.

Sectors that continue to be dominated by public spending such as railways and urban infrastructure have been evaluated on the basis of macro-level information on national/sector-level programmes.

Sector-wise performance under national/flagship programmes evaluated: Scores for highways are based on the performance reflected in the programmes under the MoRTH. Scoring for urban infrastructure is largely a reflection of the efficacy of reforms, actions, and investments under the various flagship schemes of the Ministry of Housing and Urban Affairs (MoHUA).

Up-to-date with current developments: For this fiscal's evaluation, we have measured sectors against the criteria based on the performance of the sector during fiscal 2018 to provide a score for the sector. However, we have also taken into account important developments during the current fiscal (i.e., fiscal 2019).

Comparative perspective: The yearbook presents scores of the previous and current year to reflect the temporal movement. Summary scores presented here give, in a nutshell, the drags and drivers that have contributed to the movement. Detailed scores are presented at the start of each sector-specific chapter.

How CRISIL InfraInvex stays relevant: The index seeks to complement initiatives underway to capture, inform, and guide policy, strengthen institutions, build capacity, and enrich the dialogue on strengthening the foundations of Indian infrastructure. This helps to move towards sustained and durable economic growth, leading to an inclusive society with a high quality of living. The CRISIL InfraInvex will be reviewed periodically to keep it relevant and insightful.

CRISIL InfraInvex 2019 snapshot

	2017	2018	2019	Drags and drivers impacting score in 2019
Conventional generation	4.9	5.1	5.1	+ Policy push - Centralised procurement, coal linkage and mandatory letter of credit - Drop in demand, poor cost recovery in exchange and elongated receivable cycle
Renewables	7.0	6.8	6.2	+ Policy push at central level through exemption of charges, centralised procurement and favourable changes in bid guidelines - Reopening of past PPAs, tariff caps, bid aggression and rising payment delay risk
Power transmission	8.1	7.9	7.8	+ GoI scheme for augmenting inter-state capacity as well as green energy corridors to evacuate renewable energy - Dual role of PGCIL in planning and execution; continued allocation of projects to PGCIL as well as in states on nomination basis
Power distribution	5.4	5.6	5.2	+ GoI draft plan to appoint multiple franchise as well as proposed tariff policy - Target missed under UDAY scheme and increase in tariff gap
Highways	6.9	7.4	7.2	+ Large number of stalled projects cleared, preventing Rs 3 lakh crore potential NPA - Financing issue - Banks shying away because of past experience
Railways	5.0	5.0	5.3	+ Increased investment outlay with thrust on modernisation and baby steps to increase private participation - Freight continues to be cross-subsidised and operationalisation of freight corridors delayed
Airports	6.1	6.4	6.6	+ Continued thrust on greenfield airport development and successful asset monetisation - Lack of separate dispute resolution authority; also, AERA capacity needs to be augmented
Ports	6.6	6.7	6.6	+ Unlocking of resources and increase in allocation for Sagarmala-identified projects - With downturn in trade, many ports faced with overcapacity and potential cost pressure
Urban	4.5	4.6	4.7	+ Increased devolution and usage of central funds for key programmes such as Smart Cities - Institutional capacities have not kept the pace needed for reforms and better utilisation of funds


Power

2017 score	2018 score	2019 score
4.9/10	**5.1/10**	**5.1/10**

Summary: Conventional generation

Parameters	Drivers	Drags
Policy direction	• Mandatory letter of credit (LC) mechanism for payment security to independent power producers (IPPs) • Medium-term centralised power procurement for 2,500 MW • Phasing out of old thermal power plants to reduce oversupply, leading to efficient utilisation of assets • Announcement of mechanism for grant of coal linkage to plants irrespective of power purchase agreements (PPAs) • Appellate Tribunal for Electricity or APTEL's order to allow compensation for domestic coal shortages due to change in coal distribution policy	• Delay in resolution through the National Company Law Tribunal (NCLT) process
Institutional maturity and strength	• APTEL rejected the plea to reduce tariff as suggested by state electricity regulatory commissions (SERCs) for a project bid out through the NCLT route • Central Electricity Regulatory Commission or CERC's order to allow compensatory tariff to imported power plants are a reflection of regulatory maturity	• Poor redressal and arbitration framework leading to elongated resolution timeframe and thereby financial stress • Continued allocation of PPAs and coal to central generation companies through the MoU route does not provide a level playing field to IPPs
Financial sustainability	–	• Drop in demand, poor financial health of distribution companies (discoms), lower cost recovery in short-term power market led by drop in prices on the power exchange
Implementation ease	–	• Raising of finances to implement flue gas desulfurization (FGD) is challenging owing to poor market dynamics

Parameter	Evaluation criteria	Weightage	InfraInvex score		
			2017	2018	2019
Policy direction	Policy consistency	10	4	5	6
	Public financing support	10	5	5	5
Institutional maturity and strength	Entity implementation capacity	10	7	7	7
	Financing models	10	5	5	5
	Regulatory robustness	10	4	3	4
Financial sustainability	Cost recovery	20	6	7	6
	Demand risk	10	2	3	2
Implementation ease	Track record	10	10	10	10
	Externalities	10	6	6	6
		100	**49**	**51**	**51**

2017 score	2018 score	2019 score
7.0/10	**6.8/10**	**6.2/10**

Summary: Renewable energy

Parameters	Drivers	Drags
Policy direction	• Continuation of exemption of inter-state transmission charges and losses for solar and wind projects to aid the sector • Inclusion of large hydro as renewable to aid hydro capacity addition • Issuance of letter by Ministry of New and Renewable Energy to states to ensure 'must-run' status of solar and wind projects is reassuring • Revised bidding guidelines for wind and solar projects to aid project execution and operations; strict enforcement, a monitorable • Central financial assistance to implement KUSUM and rooftop solar program phase II to aid capacity addition	• Modification in Solar Energy Corporation of India Ltd (SECI) clauses in PPA that passes through discom risk to IPPs • Uncertainty around duties on modules post expiry of safeguard duty • Lack of integrated energy plan including under-developed ancillary service market
Institutional maturity and strength	• Centralised procurement leads to relatively strong counter-party and provides a long-term vision	• Reopening of past PPAs and negotiation by few states as well as by SERCs creates negative investment sentiment among renewable energy (RE) developers • Tariff caps create artificial constraints and hinder market mechanisms
Financial sustainability	• 100% curtailment of power by discoms to be compensated under new guidelines	• Continued bid aggression by IPPs to constrain financial sustainability vis-à-vis risk associated • Curtailment, tariff caps, delay in payments
Implementation ease	• Modification in bidding guidelines a positive, but, on-ground enforcement a key monitorable	• Land acquisition and power evacuation remain key challenges • Financing constraint due to the banking crisis

Parameter	Evaluation criteria	Weightage	InfraInvex score		
			2017	2018	2019
Policy direction	Policy consistency	10	6	5	4
	Public financing support	10	8	8	8
Institutional maturity and strength	Entity implementation capacity	10	7	7	7
	Financing models	10	8	8	8
	Regulatory robustness	10	6	6	4
Financial sustainability	Cost recovery	20	13	12	12
	Demand risk	10	6	6	5
Implementation ease	Track record	10	10	10	9
	Externalities	10	6	6	5
		100	**70**	**68**	**62**

2017 score	2018 score	2019 score
8.1/10	**7.9/10**	**7.8/10**

Summary: Power transmission

Parameters	Drivers	Drags
Policy direction	• Power evacuation arrangement for 34 solar power parks of ~20 GW capacities has been envisaged under Green Energy Corridor (GEC) II • The Government of India (GoI) approved transmission schemes of ~Rs. 43200 crore for RE zones with a potential capacity of 66.5 GW to be achieved by 2022	• Slow state level planning results in evacuation constraints
Institutional maturity and strength	• Strong execution capability of Power Grid Corporation of India Ltd (PGCIL) • Private sector participation through competitive bidding • Higher number of awards as compared with last year for inter-state projects	• Dual role of PGCIL - Transmission planning and execution of inter-state transmission projects result in conflict • Continued allocation of projects to PGCIL as well as in states on a nomination basis
Financial sustainability	• Assurance of regular revenue streams for inter-state projects	–
Implementation ease	–	• Environment and forest clearances continue to be the key issues for project development

Parameter	Evaluation criteria	Weightage	InfraInvex score		
			2017	2018	2019
Policy direction	Policy consistency	10	8	6	6
	Public financing support	10	8	8	8
Institutional maturity and strength	Entity implementation capacity	10	7	7	7
	Financing models	10	9	9	9
	Regulatory robustness	10	7	7	7
Financial sustainability	Cost recovery	20	18	18	18
	Demand risk	10	10	10	10
Implementation ease	Track record	10	7	7	6
	Externalities	10	7	7	7
		100	**81**	**79**	**78**

2017 score	2018 score	2019 score
5.4/10	**5.6/10**	**5.2/10**

Summary: Power distribution

Parameters	Drivers	Drags
Policy direction	• Government support expected to continue. Ujwal DISCOM Assurance Yojana (UDAY) II scheme under discussion • The Ministry of Power (MoP) released draft plan for appointing multiple franchisees under more favourable conditions	• UDAY unable to achieve desired results because of lack of policy alignment with discoms, regulators and political support
Institutional maturity and strength	• Formation of National Electricity Distribution Company by PGCIL and NTPC may augur well; however, treatment of losses, PPA and universal service obligation are key monitorables	• Poor governance structure and lack of regulatory independence adversely impact the entire power sector value chain • Implementation issues in encouraging private participation
Financial sustainability	–	• Miss on AT&C loss reduction target, increased average rate of return (ARR)- average cost of supply (ACS) gap, inadequate and delayed tariff hikes and non-targeted subsidy
Implementation ease	• 100% household electrification along with 100% feeder metering, 86% distribution metering (urban) and 61% distribution transformer metering (rural) have been completed	• Limited achievement of targets under UDAY

Parameter	Evaluation criteria	Weightage	InfraInvex score		
			2017	2018	2019
Policy direction	Policy consistency	10	6	6	6
	Public financing support	10	7	7	7
Institutional maturity and strength	Entity implementation capacity	10	4	4	4
	Financing models	10	5	5	5
	Regulatory robustness	10	4	4	3
Financial sustainability	Cost recovery	20	8	9	7
	Demand risk	10	7	8	7
Implementation ease	Track record	10	4	4	4
	Externalities	10	9	9	9
		100	**54**	**56**	**52**

Sector performance and trends

Conventional power generation

- **Installed capacity**
  Installed capacity of conventional power generation in India expanded at a CAGR of 4.2% (net of retirement) between fiscals 2015 and 2019. Slower growth, particularly over the past two fiscals, was owing to muted demand, large untied capacities, domestic fuel availability issues, and stretched balance sheets of private players.

  The private sector's share in capacity addition plunged to 22% in fiscal 2019 from a peak of 67% in fiscal 2014.

  The fuel mix of conventional power generation continues to be dominated by coal, which accounted for 72% of the installed capacity base in fiscal 2019. This is despite the retirement of ~9 GW old coal-based power plants over the past two years. Hydro power additions have been slow owing to major rehabilitation issues and high costs. Nuclear power capacity addition, too, has been tepid owing to issues related to clearances.

Trend in conventional power installed capacity (GW)

	FY15	FY16	FY17	FY18	FY19
Coal	164.6	185.1	192.1	197.1	200.7
Gas	24.2	25.5	26.2	25.7	25.5
Nuclear	5.8	5.8	6.8	6.8	6.8
Hydro	41.3	42.8	44.5	45.3	45.4
Retired capacity	0.2	0.7	3.3	2.5	2.5
Total (net of retirement)	236.0	259.3	269.6	275.0	278.4

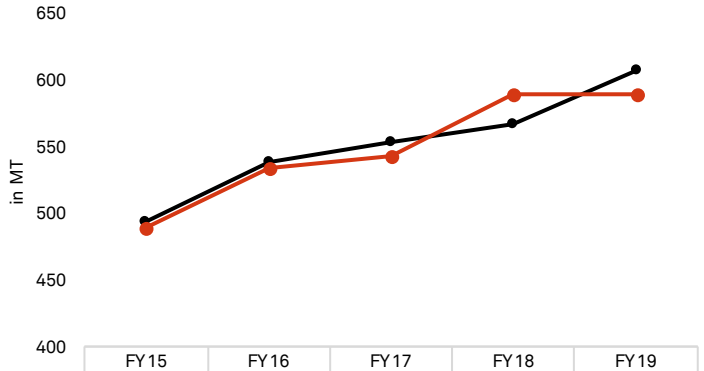
Source: Central Electricity Authority of India (CEA)

- **Availability of domestic coal**
  Coal-based power continues to dominate India's electricity generation with ~80% share as of fiscal 2019. While limited domestic coal availability in the past had increased the import of this fuel, the scenario has gradually improved as the production of Coal India Ltd (CIL) and Singareni Collieries Company Ltd (SCCL) logged ~5.3% CAGR over fiscals 2015-2019. Moreover, through the Scheme for Harnessing and Allocating Koyala Transparently in India (SHAKTI) scheme, projects with PPAs have already been awarded 30.2 million tonne per annum (MTPA) over two auction rounds. For plants without PPAs, auctions are expected to be undertaken in the near future.

  On the captive coal front, after a steep decline in production to 29 MTPA in fiscal 2016 following the deallocation of mines, production picked up to 50 MTPA in fiscal 2019. Production during fiscal 2019 was driven by government-owned power producers, including NTPC.

  Production of private IPPs remains negligible as most of them returned their mines owing to lack of economic feasibility given the aggressive bidding.

Coal production and offtake in India



	FY15	FY16	FY17	FY18	FY19
Production	494	539	554	567	607
Offtake	489	534	543	589	589

Source: Annual reports, Ministry of Coal

- **Plant load factor of thermal plants**
  A declining trend in plant load factor (PLF) of coal-based power plants has been a key concern in the sector for the past few years. Large-scale capacity additions, slack demand from discoms owing to weak financial health, economic slowdown, and constrained domestic coal availability led to downward pressure on PLF. In fact, over April-September 2019, their collective PLF fell 270 bps on-year to 57.8% owing to a slowdown in power demand from industrial customers and an extended monsoon.

  As can be seen in the table below, the national average PLF was 60.9% in fiscal 2019. Central government projects led by NTPC operated at a relatively healthy PLF of 72.8% during the fiscal owing to PPAs with discoms and better domestic coal availability. On the other hand, the state and private players operated at an abysmally low average PLF of 56.5%. The discrimination towards private players and the lack of a level-playing field with government entities remain concerns.

Trend in coal-based PLF (%)

	FY15	FY16	FY17	FY18	FY19
Central	74.0	72.5	72.0	72.4	72.8
State	59.8	55.4	54.4	56.8	58.1
Private	60.6	60.5	55.7	55.3	54.9
All-India PLF	64.5	62.2	59.9	60.7	60.9

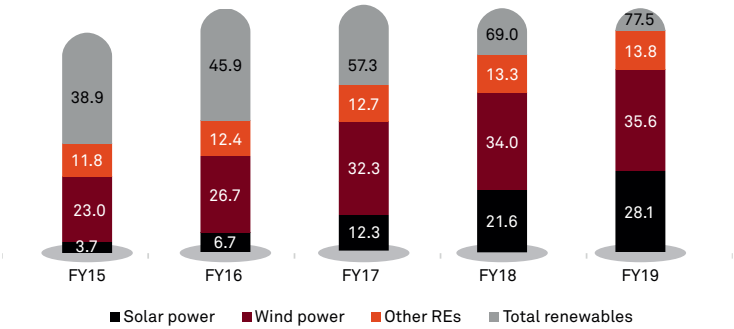
Source: CEA

RE generation

- **Installed capacity (GW)**
  RE capacity additions, after having increased at a robust pace over fiscals 2015-2018, hit a speed bump in fiscal 2019. The pace of capacity additions slowed down during the fiscal to 8.6 GW compared with close to 12 GW in the previous year, underpinned by non-availability of cheaper finance, aggressive bids, contract issues and tariff caps in auction and delayed payments from discoms. These factors have led to under-subscription in tenders, delay in project awards and project cancellations. For instance, in fiscal 2019, only a third of the tenders were awarded, which reflects ongoing concerns among investors.

  The issue has spilled over to the current fiscal with capacity additions in solar and wind sectors in April-September flat at the year-ago level. In fact, policy and regulatory uncertainties significantly heightened this fiscal with Andhra Pradesh seeking review and renegotiation of PPAs of already contracted solar and wind power projects. Uttar Pradesh also stopped buying power from 650 MW of wind power because tariffs were not approved by the Central Electricity Regulatory Commission (CERC). While the Centre has intervened to resolve these issues, fears of dishonouring contracts have materially impacted sentiment towards future investments. The issue should be ironed out at the earliest.

RE installed capacity (GW)



Power supply position

Electricity demand between fiscals 2015 and 2019 increased at a slow pace of 4.5% per annum owing to the weak financial position of discoms and slow growth in power demand from industrial users. Meanwhile, growth in energy availability was higher at 5.3%, driven by strong capacity additions. This led to a decline in energy deficit to 0.6% in fiscal 2019 from 3.6% in fiscal 2015. The peak deficit also contracted to 0.9% from 4.7% during the period.

Power supply position

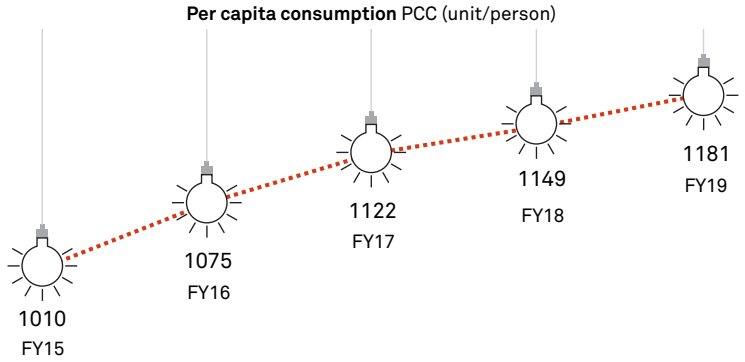
	FY15	FY16	FY17	FY18	FY19
Energy requirement (BU)	1068.9	1114.4	1142.9	1213.3	1274.3
Energy availability (BU)	1030.8	1090.9	1135.3	1204.7	1267
Surplus/ deficit (%)	-3.6	-2.1	-0.7	-0.7	-0.6
Peak demand (GW)	148.2	153.4	159.5	164.1	176.9
Peak met (GW)	141.2	148.5	156.9	160.8	175.5
Surplus/ deficit (%)	-4.7	-3.2	-1.6	-2	-0.9

Source: CEA

While the reported energy supply position makes India almost balanced (no power surplus/ deficit), the existing demand does not capture unmet factors such as planned and unplanned load shedding. The deficit numbers, which look near surplus at present, would potentially widen if latent demand is factored in.

Generation growth is stunted despite such large latent demand. Over April-September 2019, energy requirement grew only 4% over the same period last fiscal owing to slowdown in the economy that adversely impacted power demand from industrial consumers.

- **Per capita consumption**
  Per capita consumption of power increased at a CAGR of 4% to 1,181 kilowatt hour (kWh) in fiscal 2019 from 1010 kWh in fiscal 2015.



Source: CEA

Although India's per capita electricity consumption has witnessed healthy growth over the years, it remains far below the global average (estimated at over 3,283 kWh/capita in 2018), underscoring the country's potential.

In fact, even Gujarat – one of the most developed and industrialised states of the country – had a per capita power consumption of ~2,329 units in fiscal 2018, which is considerably lower than the global average. The comparable figures for relatively under-developed Bihar and Uttar Pradesh were an abysmal ~280 and ~594 units[12], respectively.

Power transmission

The pan-India transmission line capacity logged 7.1% CAGR between fiscals 2015 and 2019, led by improving inter-regional transmission capacity and system strengthening.

The share of PGCIL in transmission line (in circuit km or ckm) averaged ~45% over the period, with states accounting for a large proportion of the balance. The share of the private sector rose to 7.4% in fiscal 2019 from 0.3% in fiscal 2015. In fiscal 2019, Rural Electrification Corporation and Power Finance Corporation (PFC) awarded nine projects on the basis of tariff-based competitive bidding (TBCB). Significant upscaling is required to meet capacity requirements. However, despite mandatory

[12] *CRISIL analysis*

awarding of inter- and intra-state transmission projects through the TBCB route, projects continue to be awarded on a nomination basis to PGCIL. Providing a level-playing field to all players is critical to ensure adequate investments and timely capacity augmentation in the transmission sector. Going forward, it is desirable that PGCIL should mandatorily compete under the TBCB and auction route.

Year-wise transmission lines addition (ckm)

	FY15	FY16	FY17	FY18	FY19
HVDC (800 kV & 500 kV)	0	3506	2618	0	0
765 kV	7548	5601	6995	3819	6750
400 kV	9992	11181	10657	13813	9146
220 kV	4561	7826	6030	5487	6541
Total	22101	28114	26300	23119	22437

Source: CEA

To push RE capacity, the GEC project is being implemented in Andhra Pradesh, Gujarat, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, and Tamil Nadu. The project is scheduled to be completed by the end of 2020, with the funding mechanism consisting of 40% National Clean Energy Fund (NCEF) grant, 40% KfW loan (500 million euros) and 20% state contribution. The GEC targets to add ~3,200 ckm of inter-state transmission lines and ~18,000 MVA transformation capacity. While it is running behind schedule[13], once complete it will facilitate evacuation from solar parks and large-scale grid-connected solar and wind projects.

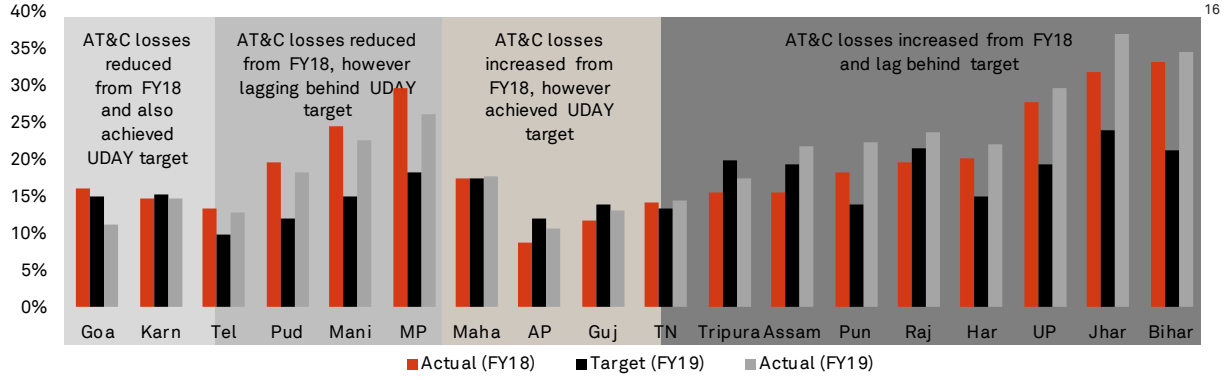
Power distribution

- **AT&C loss levels**
  One of the key objectives of UDAY, launched four years ago, was to reduce aggregate technical and commercial (AT&C) losses to improve operational efficiency of state-owned discoms. While some discoms have managed to reduce the loss, the performance of many remains a concern.

  The overall AT&C loss of utilities selling directly to consumers reduced to 22% in fiscal 2020[14] from 24.6%[15] in fiscal 2015, which underscores the distribution sector woes. While there has been a marginal reduction as per the UDAY portal, data collection and appropriate reporting of data are critical to get a clear picture of the actual loss.

  The figure below shows that only three states have managed to achieve the UDAY target.

Progress of AT&C losses as compared to target and historical performance



[16]

[13] *As per the standing committee report on energy "Demand for Grants (2018-19)" submitted in the Lok Sabha*

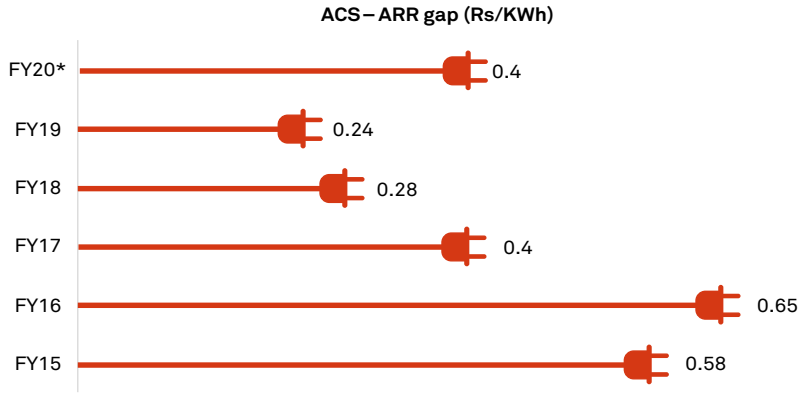
[14] *Source: UDAY website (data as of September 2019; does not include Mizoram, Nagaland, the Andaman and Nicobar Islands, and Lakshadweep)*

[15] *Source: PFC report on The Performance of State Power Utilities*

[16] *Guj - Gujarat, Karn - Karnataka, MP - Madhya Pradesh, Jhar - Jharkhand, UP - Uttar Pradesh, TN - Tamil Nadu, Mani - Manipur, Maha - Maharashtra, Har - Haryana, Raj - Rajasthan, Tel - Telangana, AP - Andhra Pradesh, Pun - Punjab, Pud - Puducherry*

- **ACS-ARR gap**
  The gap between ACS and ARR, a key indicator of the financial health of discoms, has been negative primarily owing to high AT&C losses and inadequate tariff hikes.

  The gap over the past five years is shown below.

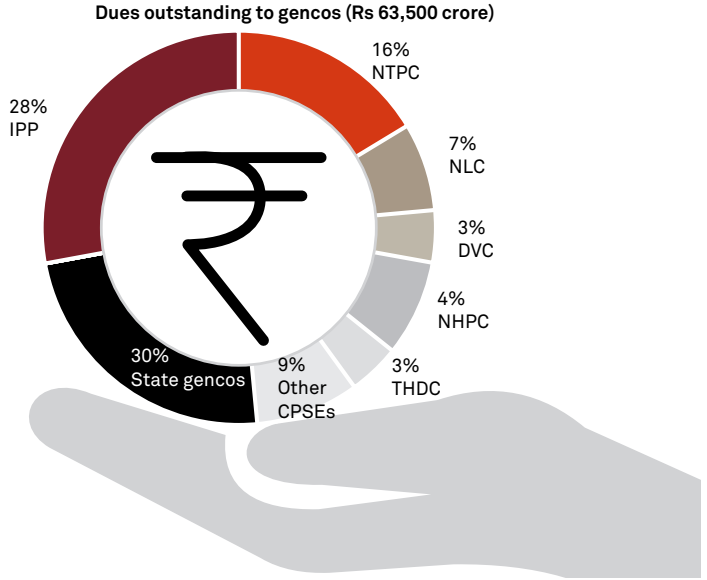


** Data from UDAY website as on October 30, 2019*
Source: UDAY, PFC

As can be seen from the above graphic, the gap between ACS and ARR narrowed owing to takeover of discom debt by the respective state governments under the UDAY scheme. This substantially reduced the interest expenses of discoms. Moreover, reforms including provision of grants under Integrated Power Development Scheme (IPDS) and Deendayal Upadhyaya Gram Jyoti Yojana for network development also lent some support. Despite the improvement, under-recovery of Re 0.4/ unit (as on October 30, 2019, as per UDAY website) continues, which is a concern as it adversely impacts the entire power sector value chain by constraining demand and delaying payments.

- **Outstanding payments to gencos**
  Payment delays from state discoms have been a key concern in the power sector. Such delays are creating significant working capital challenges for IPPs and, in turn, affecting the banking sector. Deterioration in the financial position of discoms over the past 12-18 months has significantly increased the outstanding dues to IPPs.

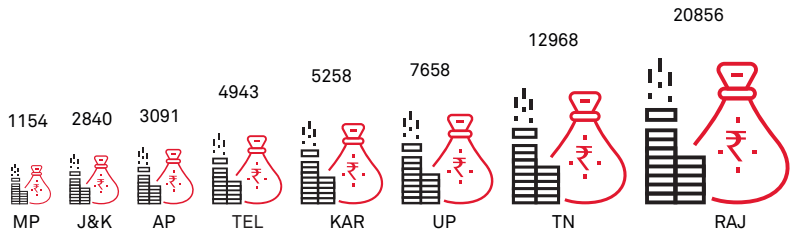
  As per the PRAAPTI dashboard, the outstanding discom dues to generators were almost Rs 81,000 crore as of September 2019, and the overdue amount (due after 60 days of grace period) was around Rs 63,500 crore to conventional generating companies (gencos).



DVC: Damodar Valley Corporation; CPSEs: Central public sector enterprises
Source: PRAAPTI (as of September 2019)

Discoms in Rajasthan, Tamil Nadu, Uttar Pradesh, and Karnataka account for 73% of the due amount.

Top states' dues outstanding (Rs crore)



Source: PRAAPTI (as of September 2019)

For RE generators, the outstanding amount, as per CEA, was Rs 6,100-9,700 crore to solar plants and Rs 3,600 crore to wind plants. Andhra Pradesh, Tamil Nadu and Telangana discoms account for 68% of this. However, it is estimated that the figure is higher at about Rs 15,000 crore.

- **Electrification drive**
  In order to achieve 100% electrification and 24x7 power-for-all objective, the Saubhagya scheme was launched in September 2017. The scheme has helped achieve 99.93% household electrification in India.

Sector outlook

Conventional power generation - Muted outlook due to offtake risk and coal availability issues

- Energy requirement growth: We expect energy requirement to gradually pick up and register a CAGR of ~6% over fiscals 2019-2024. However, over the next 12-18 months, growth is expected to be muted owing to weakness in the manufacturing sector arising from the overall slowdown in the economy. Over the long term, growth will be led by increasing hours of supply, gradual pick-up in manufacturing and emerging drivers such as uptake of electric vehicles (EVs). On the other hand, penetration of roof-top solar and improving energy efficiency will be constraints
- **Capacity addition:** Addition of conventional power capacity is expected to significantly slow down compared with the past five years. This is mainly owing to underutilisation of existing assets, poor electricity demand, continued increase in RE capacity and ongoing financial stress of the IPPs.

  As per our estimates, 36 GW of capacities are expected to be added over fiscals 2020-2024, mostly by central and state utilities. However, over the same period, we expect 9-10 GW of old and inefficient capacities to be retired, which is in line with the proposal under the National Electricity Plan.

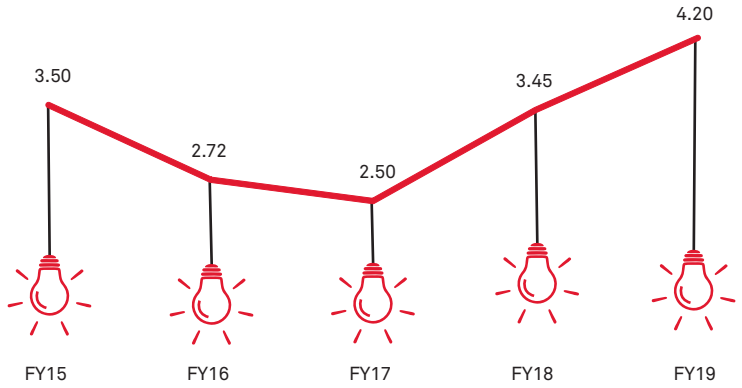
  Capacity expansion by central and state generators is expected to heighten the woes of private power firms that already have operational capacities languishing without PPAs. It would also hurt discoms saddled with large fixed cost payouts from already signed PPAs. Moreover, PPAs from the expansion projects of central and state utilities would be cost-plus, which would come at a premium over the market discovered price through an auction/ bid process. Therefore, a calibrated expansion approach needs to be adopted to avoid further financial stress in the sector
- Domestic coal availability: We expect domestic coal production to increase at 6.0-6.5% CAGR driven by CIL and SCCL on the back of gradual start of new mines, ramp-up in existing mines and commissioning of critical railway links. This would increase coal availability. Also, large captive mines awarded to government-owned players will contribute to growth in production. The recently released new coal linkage policy, SHAKTI, is expected to ease the constraints on fuel supply further, providing some relief to thermal power producers. Despite this, coal imports by the power sector are expected to continue, albeit at lower levels.

  However, under the SHAKTI scheme, government-owned gencos continue to be offered coal linkages at notified prices, while private entities are made to pay a premium (via auctions). This creates an unlevel playing field in the sector. Also, timely availability of coal to

all, irrespective of PPAs, as per the SHAKTI scheme B (vii) (a) is critical to ensure cash flow and debt servicing of such projects.

- PLF to rise gradually: Coal-based PLF is expected to rise to 69-71% by fiscal 2024 driven by a pick-up in demand, significant slowdown in capacity addition, retirement of old projects and gradual improvement in domestic coal availability
- Merchant power prices: We expect merchant power prices, which trended up over the past two years, to decline in fiscal 2020 (prices fell ~27% on-year during April-October 2019) owing to weak demand and extended monsoon-led high hydro generation. Prices are expected to remain muted in fiscal 2021, as the pick-up in demand will be gradual. Subsequently, we expect them to rise owing to:
  - Demand growth
  - Increase in domestic coal prices, related duties and taxes and cost of risk
  - Higher costs owing to FGD capex
  - Gradual recovery of past cost overruns and losses in the sector
  - Rising RE penetration also leading to higher operating and maintenance (O&M) costs

Average electricity prices on power exchanges (Rs/kWh)



Source: CERC

At an overall level, as can be inferred from the above analysis, key market-related parameters – demand-supply gap, domestic coal availability and merchant power prices – are expected remain subdued over the next 12-18 months and move in a positive direction thereafter. However, key monitorables include government support to boost demand, coal availability for all (irrespective of PPAs), speedy tariff approval owing to change-in-law and a calibrated capacity expansion programme. The high level empowered committee set up to resolve key issues of the power sector is also a positive. However, what is crucial is timely on-ground implementation of its recommendations.

RE generation- Sluggish outlook due to tariff caps and increased risk perception

- **Capacity addition:**
  By fiscal 2024, we expect the grid-connected installed RE capacity to be 130-135 GW compared with about 78 GW in fiscal 2019. This will be driven by solar power accounting for slightly over half of the installations, followed by wind.

  However, in order to ensure growth in installations, ongoing issues must be ironed out.

  The government should take the following steps:
  - Remove tariff caps and allow market mechanisms to determine bid prices
  - Address payment delays by discoms to maintain working capital cycle of IPPs
  - Disallow tariff renegotiation and PPA cancellation post awarding of a project
  - Fast track implementation of an alternative option for RE generators to sell power in exchange through Green Term Ahead Market
  - Design robust contract structure with bankable PPAs
  - Seamless RE integration to avoid any back down of power

  At the same time, IPPs should:

- Be rational while bidding
- Execute the project in a timely manner and have quality control

We believe the aforementioned factors would provide adequate confidence not only to investors, but also lenders, which is important for sustained investments in the sector.

- Sustained pick-up in distributed generation will need to address weak spots: We expect distributed generation to gain traction over the medium term, underpinned by: expected rise in commercial and industrial tariffs, poor supply and transmission constraints in rural areas, poor electricity demand, and anticipated fall in storage costs. However, limited finance availability, poor distribution infrastructure, and discoms' unwillingness to let go of profitable customers need course-correction to support future growth
- Domestic solar cell/module manufacturing to remain insignificant: Imported modules account for ~90% of total consumption in India. The government has initiated some measures in an attempt to reverse this trend, through levy of safeguard duty and domestic manufacturing-linked tendering of 7 GW solar development (with 2 GW of manufacturing capacity). Under this, solar manufacturing capacity of 2 GW needs to be set up over a maximum period of two years from date of letter of award. However, we believe this is not expected to materially benefit the domestic solar cell and module manufacturers
- Availability of low-cost financing will be a challenge area, going ahead: Given aggressive bidding for RE projects, on one hand, and rising non-performing assets (NPAs) and liquidity crisis in the financial sector, on the other, domestic debt availability has been slightly constrained
- Structuring of favourable projects, ironing out of policy-related issues, and addressing concerns related to payment delays and renegotiations will be critical to the availability of low-cost financing for the RE sector
- Moreover, relatively untapped sources of financing such as green bonds and infrastructure investment trusts (InvITs) are also expected to gain traction. The bond market needs to be developed not only for renewables, but for the entire infrastructure sector as an easier financing option
- Incentives could taper off: With RE technology maturing and tariffs becoming competitive with other fuel sources, the incentives currently available are expected to be phased out gradually

Against this backdrop, the sector is set to see significant consolidation. Five to six large players emerge, as smaller players are unable to compete, given lack of scale and higher financing cost. Strong government support in terms of long-term policy and regulatory certainty, rationale bidding by IPPs, and availability of low-cost funding will be critical for sustainability.

Power transmission: GEC needs more funds, private players a better playing field

- **GEC making slow headway:** The GEC – the Centre's transmission infrastructure project for evacuation of RE from generation points to load centres – is under execution. As of July 2019, of the target of 9,400 ckm under intra-state and 3,200 ckm under inter-state transmission system to be achieved by March 2020, only 2,168 ckm and 2,467 ckm, respectively, had been completed. Apart from right of way issues, the Standing Committee on Energy states in its report[17], the GEC is underfunded, leading to delays in project execution. Timely completion is critical to ensure sustainable investment flow in the RE sector.
- **PGCIL earmarks large capital outlay:** PGCIL has planned an outlay of Rs 19,000 crore[18] for fiscal 2020, for strengthening transmission infrastructure and augmenting transmission capacity. This amount will be used for construction of new projects. Until now, of the 42 projects awarded under TBCB route, PGCIL has been awarded 13, with one being an intra-state transmission project won last fiscal.
- **Private participation rising, but no level playing field yet:** The government is expected to continue encouraging private sector participation in inter- and intra-state transmission to ensure adequate fund availability as well as benefit from their execution experience. In fact, REC Power Distribution Company Ltd and PFC together have awarded about nine inter-state transmission projects

[17] *Demands for Grants, 2018-19*
[18] *PGCIL Annual Report, 2018-19*

under the competitively bidding route in fiscal 2019, which is higher than the preceding year's.

However, while the focus has shifted towards competitive bidding, projects continue to be awarded to PGCIL on a nomination basis. This restricts competition. The dual role of PGCIL in inter-state transmission planning and execution also does not provide a level playing field. These issues need to be addressed to boost private sector investments.

Several states have taken initiatives for setting up intra-state transmission lines through PPPs based on the model concession agreement and standard bidding documents. These include: Uttar Pradesh, Maharashtra, Madhya Pradesh, Bihar, and Jharkhand. These PPP projects are likely to boost the flow of private investments in the sector. However, slow planning at the state level poses a roadblock to such investments.

Power distribution: more misses than hits on the road less taken

- **Revised scheme to strengthen discoms' financials on the anvil:** The ACS-ARR gap of state-owned discoms is expected to remain high in the near term with addition of rural/subsidised consumers to the grid under the Saubhagya scheme, slower rise in demand from commercial and industrial consumers owing to economic slowdown, rising power purchase cost, and overall tepid increase in tariffs. However, the government is in the process of structuring a revised scheme with an aim to turn around the financial health of discoms. We believe the new scheme announced could be linked to the operational performance of discoms and would need to be regularly monitored for successful implementation
- IPP receivables burgeon as discoms run late: As of September 2019, receivables for conventional power generators from discoms was ~Rs 63,500 crore. Generators have been facing a liquidity crunch, owing to delayed payments from discoms. That has led to excessive dependence on borrowed funds and, consequently, rise in finance costs
- New order puts the ball in discoms' court, but consumer may bear the final brunt: To improve the situation for IPPs, the MoP mandated discoms to open and maintain adequate LCs, as payment security mechanism under PPAs from August 2019. The mechanism is expected to cap any further rise in outstanding dues of gencos. However, the order does not make any provision for the colossal outstanding dues
- On the other hand, it would increase the interest burden of discoms, given that they would need to borrow further for timely payments to IPPs. Given the frail financial position, discoms could even opt for load shedding
- UDAY falls short of targets as implementation proves tricky
  - Target of reduction in AT&C losses to 15% by fiscal 2020 is likely to be missed given constrained institutional and financial ability of discoms to take necessary steps in time
  - Target of bringing the ACS-ARR gap to zero by fiscal 2020 is likely to be missed, as tariff increase in terms of timeliness and adequacy is expected to remain a bone of contention for state regulators
  - Extensive rural electrification under '24x7 Power for All' is also expected to put pressure on the ACS-ARR gap
  - As the gap remains, debt levels of discoms in 15 states (accounting for 85% of aggregate losses) is expected to rise to about Rs 2.5 lakh crore[19] by this fiscal-end
  - Further, certain state discoms continue to grapple with the problem of high regulatory assets, which stood at Rs 1,35,000 crore[20] for all states as of June 2019

Thus, reduction of AT&C losses along with 'automatic' tariff increases are critical for financial turnaround of discoms

Power distribution reforms need to align tariff with cost of supply, introduce direct benefit transfer, rework PPP models, and work towards supply-retail separation

[19] *Demands for Grants, 2018-19*
[20] *PGCIL Annual Report, 2018-19*

In a bid to revitalise the power distribution segment, the government has proposed amendments to the Electricity Act, including installation of smart meters, direct benefit transfer of subsidies, as well as separation of carriage and content. In the light of challenges to the passage of the proposed amendments, the government is also evaluating the franchisee route with more favourable guidelines to introduce competition and improve efficiency in the distribution sector. However, the form and timeliness of implementation of these amendments will determine the sector's turnaround.

Moreover, NTPC and PGCIL have formed a 50:50 JV – National Electricity Distribution Company – with an objective to undertake the business for distribution of electricity and other related activities in distribution circles in various states and union territories. This entity would benefit from strong bargaining power in PPAs, limited influence of state governments on keeping consumer tariffs low, as well as stronger balance sheet for infrastructure upgradation. However, treatment of existing financial losses/ regulatory assets, transfer of existing PPAs and universal service obligations, are a few aspects that need to be addressed for successful implementation.

Lastly, competition in distribution sector through retail and supply separation is critical. This needs creation of appropriate regulations and policies guidelines.

Building storage for stationary applications and EV-readiness

- Recently, the Union Cabinet approved setting up a National Mission on Transformative Mobility and Battery Storage. The mission aims to localise manufacturing across the whole supply chain for EVs, including battery and cell manufacturing. It envisages launching a five-year phased manufacturing programme (till 2024) for batteries and EVs
- The inter-ministerial steering committee chaired by NITI Aayog CEO is responsible for the mission. NITI Aayog has drawn timelines, according to which contracts are expected to be awarded to battery manufacturers by 2020 and manufacturers are expected to commence operations by 2022. Gradual scale up to full committed capacity is targeted by 2025
- With strong thrust on RE, grid stability is also gaining traction. SECI has announced the following major tenders that include setting up of projects using energy storage solutions:
  - 1.2 GW of solar-wind storage project with assured peak power supply
  - 1.2 GW of solar photovoltaic combined with 3,600 MWh of energy storage connected to the national grid
  - Round-the-clock supply of 400 MW RE with energy storage to New Delhi Municipal Council, New Delhi, and Dadra & Nagar Haveli
- To ensure uptake of energy storage, it is critical to invest in research and development, forge strong global technology tie-ups, ensure availability of battery raw material, and facilitate demand through a favourable policy and regulatory regime

Key challenges and way forward

Power offtake concerns and poor domestic fuel availability

With sluggish demand growth in the industrial and commercial sectors, and lack of capacity contracting by discoms, a significant quantum of thermal capacity is rendered surplus and without PPAs. In addition, central generating companies continue to sign PPAs with discoms under the MoU route, even after the exemption provided to such entities have expired. Poor offtake from discoms has put downward pressure on PLFs, which, in turn, has adversely impacted the financial position of IPPs.

Domestic coal supply has also been a pain point, owing to slow growth in production by CIL, de-allocation of captive coal blocks, as well as coal evacuation issues owing to constrained rail capacity.

What we think: To address power off-take issues, immediate attention to the financial health of discoms would provide the much required shot in the arm. Other measures could include: complete removal of

cross-subsidy penalty on discoms for load shedding, and mandatory closure of diesel gensets.

Timely clearances, use of technology to increase output per man-shift, and improving evacuation infrastructure is critical to boost domestic coal availability.

Pass-through of changes in taxes and duties needs firm handling

- With the lack of appropriate pass-through mechanism in the PPAs, many developers face difficulties passing on the rise in costs due to change in law (taxes and duties) to the discoms. As a result, they are anguished over poor project cash flows. In this regard, the MoP has urged the CERC to treat change of cost related to change in duties, taxes, cess, etc, as pass-through, and issue orders giving calculation for per unit impact within 30 days of filing of a petition.

  What we think: The ministry's directive is a low hanging fruit, which needs immediate attention and can alleviate cash flow related issues of IPPs.

Disruptive renegotiation of PPAs, a strict no-no

- Recently, the Andhra Pradesh government decided to review and renegotiate tariffs of already contracted solar and wind power projects, given their high cost. This is expected to place over 5 GW of projects under significant risk. Also, Uttar Pradesh stopped purchasing 650 MW of wind power citing that the PPA tariff had not been adopted by CERC.

  What we think: Such moves of dishonouring contracts post project commissioning, adversely impacts investor confidence, making it challenging to sustain investments.

Solar and wind players need to tone down their aggressive bidding

- Large developers in the RE segment have prioritised building a portfolio over project returns. As a result, solar and wind power has witnessed aggressive bidding.
- The aggressive bidding risk, when coupled with on-ground variance in wind patterns and irradiance levels, could adversely impact the economics. Moreover, higher-than-anticipated module degradation and delay in payments could lead to more fragile returns.

  What we think: Rational bidding with focus on project returns is critical to avoid debt servicing issues by IPPs in the near future.

Higher cost of RE integration needs to be factored in by discoms

- The actual cost of RE is higher, if one considers the impact of fixed cost for backing down thermal power, purchase of additional peak power, loss of cross subsidy (solar rooftop), etc. As per our estimates, the additional impact cost of producing RE is expected to be ~Re 1 per kilowatt-hour (kWh).[21] This would vary by state considering various factors such as average power purchase cost and RE cost, solar rooftop impact, backing down of thermal projects, balancing/ peaking cost, demand-side management impact and interstate charges.

  What we think: The cost of integrating renewable energy with conventional energy, along with ancillary and grid support, needs to be factored in while formulating an integrated plan

Maze of challenges in UDAY needs creative way out

- Various discoms have missed the targets set under UDAY, both in terms of tariff hikes and AT&C loss reduction. Slippages in target would result in significant cash losses for discoms, leaving them gasping for working capital financing
- UDAY remains silent on the working capital requirements of discoms, in case they keep on missing the target set under the scheme. While losses of the discoms would be taken up in a graded manner by the state governments, several have hit their FRBM limits, making it challenging for them to take on further debt
- Increase in tariff, as prescribed under UDAY, is proving to be a major challenge as many state regulators appear undecided on such tariff hike. While tariff orders for 25 of the 27 states[12] have been approved,

[21] *CRISIL analysis*

the adequacy of tariff hikes remains questionable. Moreover, there continues to be large outstanding regulatory assets (Rs 1.35 lakh crore as of May 2019). Subsidy and cross-subsidy levels of discoms was estimated at ~Rs 1.2 lakh crore for fiscal 2018

What we think: A sustainable solution, including different PPP models with appropriate risk sharing and separation of retail and supply, needs to be implemented. Besides, though retail tariff is a state subject, it needs to reflect the cost of supply.

What needs to be done to boost private participation in distribution?

- Adequate focus on encouraging private participation through the PPP route
- Evaluation of adequate risk-sharing mechanisms for the financial turnaround of the segment
- Correction of baseline data
- Targeted subsidy through direct benefit transfer (DBT), along with a Universal Service Obligation Fund
- Cost reflective tariff structure and separation of regulatory affairs from adjudication for sustainability of discoms
- Appropriate policy and regulatory guidelines for encouraging competition in the sector

States as counterparties in power

State distribution – Government support, PPP models hold the key

States discoms are final counterparties in the electricity value chain, given that distribution of electricity is controlled by states. Therefore, their role in the sector is among the most crucial. Unfortunately, the frail financial health of state discoms weakens the entire value chain.

Why are discoms in bad shape?

Mainly the high degree of control from respective state governments, given power is a politically sensitive subject. As a result, tariff increases over the years have been tepid, resulting in under-recovery of revenue (ACS-ARR gap was Re 0.4/ unit on October 30, 2019). Thus, cost reflective tariffs are critical for sustainability of discoms.

Other challenges:

- Significant dependence on disbursement of subsidies, given the low tariffs set for agriculture and low income domestic consumers. In fiscal 2016, subsidy booked was 14.7% of discoms' revenue. More importantly, these subsidies are mostly not disbursed in a timely manner thereby straining their already stretched financial position
- Discoms need to clear a large outstanding of regulatory assets (Rs 1.35 lakh crore as of May 2019). The levels of subsidy and cross-subsidy is estimated at ~Rs 1.2 lakh crore (end-fiscal 2018). This has made the sector unviable for financing by the state or by the other consumers. Cross-subsidy levels and tariffs for commercial and industrial consumers are among the highest in the world. This needs to be reviewed to make these consumers globally competitive
- Discoms face significant delays in electricity bill payments from state government departments. As per the latest available data (as of March 2018) from the MoP, outstanding dues from state government departments was Rs 30,000 crore. Even after netting out electricity duty, the outstanding amount would be a staggering Rs 16,000 crore

Unpaid dues: What state government departments owe discoms (Rs crore)

State	Outstanding government dues	Electricity duty payable to state government
Uttar Pradesh	11,176	7,057
Maharashtra	5,419	4,435
Telangana	5,125	0
Andhra Pradesh	3,768	165
Chhattisgarh	1,451	45
Tamil Nadu	1,396	716

Data as of March 2018, sample of six states based on their significant outstanding dues
Source: MoP

[22] *UDAY portal (as on September 13, 2019)*

- While SERCs are set up to discharge functions autonomously, their independence comes under a cloud given the strong influence of the respective state governments. This has led to inaction against discoms for not filing tariff petitions, lack/ limited tariff hikes, build-up of regulatory assets, as well as constraining competition through unfair charges and levies.
- **Clearly, the distribution sector is in need of a massive overhaul. We suggest:**
  - Automatic inflationary pass-through (say, on a monthly/ quarterly basis) to reflect power losses in costs
  - Formulation of subsidy transfer to beneficiary consumers under the DBT mode
  - Budgetary cut to the concerned state government department delaying payment of power bills
  - Regulatory overhaul – regional benches or arm's length distance from discom management, including appointment of independent directors and professionals
  - Different PPP models – distribution franchisee (with a recast framework), city/town-based licensees, among others
  - Gradual separation of retail and supply business

State generation – Sizeable share, but significant headroom for efficiency improvement

State generation sector accounted for ~30% of total installed capacity base in fiscal 2019. However, state-based projects operate at sub-optimal PLF given several old and inefficient plants operating at sub-optimal PLF (merely 58%), on the back of poor O&M.

The state generation sector operates on a model where installed power projects by the respective state gencos enter into a PPA with the state discom on a nomination basis and generated power is mostly sold within the state. All these PPAs are cost-plus in nature, with a fixed return on equity of 15.5%. Therefore, the operating and financial inefficiencies of state gencos get passed on to end-consumers.

With ~18 GW of capacity additions expected across different states (led by Telangana and Uttar Pradesh) between fiscals 2020 and 2024, their share in total generation is expected to rise. However, this is also expected to translate to higher fixed costs for discoms, which are already saddled with significant cost burden.

Also, coal linkages are made available through CIL /SCCL or blocks are allocated to state gencos/ mining departments instead of being auctioned (as done for private sector gencos). Given the constrained availability of domestic coal, it is critical that the resources are effectively utilised.

In the light of the above anomalies in state generation, we suggest:

- Optimum O&M of state genco-based projects and focus on ramp up in utilisation of operational assets
- Retirement of old and inefficient capacities
- Effective utilisation of allocated mines and available coal linkages. If warranted, models such as tolling and/ or rationalisation could be evaluated
- Privatisation and monetisation of existing generating assets

State transmission – Adequate planning, timely clearances, private participation critical

The state transmission sector includes planning, implementation, and operations of intra-state transmission lines. The share of the state transmission sector in the installed base of transmission lines (in ckm) was as high as 54% in fiscal 2019.

A state transmission company executes its transmission lines on a fixed return on equity basis, as in the case of generation. However, from January 2013, it was mandated that intra-state transmission lines must be awarded on a TBCB model. Rajasthan, Maharashtra, Uttar Pradesh, and Madhya Pradesh have been at the forefront in terms of project awards under the TBCB route. However, this has not been undertaken uniformly across states. Attracting private sector and leveraging on their financial and execution capabilities would be critical for timely capacity augmentation.

Several states face significant congestion for intra-state transmission of power. Seamless flow of electricity across states in the country requires adequate ramp-up in these intra-state links. Timely clearances for land acquisition and managing right of way issues are also actionables.

For sustainable growth in the state transmission sector, we suggest:

- Long-term planning taking into account new supply, fuel/ source mix, demand profile, loss levels, etc
- Ironing out right of way issues and aiming for single window clearances
- Awarding projects through competitive bidding, robust structuring of contracts, utilising the model concession agreement in case of TBCB bids
- Monetising existing state transmission, either through InvITs, or other models for revenue mobilisation

Roads & highways

2017 score	2018 score	2019 score
6.9/10	**7.4/10**	**7.2/10**

Summary

Parameters	Drivers	Drags
Policy direction	• Well-defined national programmes such as Bharatmala and Setu Bharatam • Continued focus on asset monetisation • Large number of stalled projects cleared, preventing Rs 3 lakh crore of debt becoming NPAs	• Relatively slow progress in construction of expressways • Land acquisition continues to be a challenge
Institutional maturity and strength	• The AAA-rated National Highways Authority of India (NHAI) driving large part of implementation • The highways sector accounts for over 70 secondary market asset transactions; the NHAI is supportive of such initiatives	• The engineering, procurement and construction (EPC) model dominates contracts with 55-60% share, putting significant strain on the NHAI's finances • Banks unwilling to lend due to past experience of project delays and weak developer balance sheets; the hybrid annuity model (HAM) most affected • No clear regulatory separation; the NHAI is both owner and regulator
Financial sustainability	• Fairly stable toll regime and policy; all toll plaza lanes to be electronic tolling collection (ETC)-enabled by December 2019 • Introduction of new class of investors, such as private equity and pension funds, through the toll-operate-transfer (TOT) model	• Rapid increase in debt and the NHAI's contingent liabilities • Share of BOT-toll bids almost zero; new BOT-toll policy / concession still in discussion stage
Implementation ease	• Steady reduction in delays in project completion due to more efficient land acquisition	• Low quantum of bidding in the first half of fiscal 2020 • Land acquisition cost almost tripled from Rs 80 lakh per hectare to Rs 2.38 crore per hectare

Parameter	Evaluation criteria	Weightage	InfraInvex score		
			2017	2018	2019
Policy direction	Policy consistency	10	8	8	9
	Public financing support	10	8	8	7
Institutional maturity and strength	Entity implementation capacity	10	7	7	7
	Financing models	10	8	9	7
	Regulatory robustness	10	7	7	7
Financial sustainability	Cost recovery	20	14	16	15
	Demand risk	10	5	5	7
Implementation ease	Track record	10	7	8	7
	Externalities	10	5	6	6
		100	**69**	**74**	**72**

Sector performance and trends

Growth of national highways network

- National highways, with a network of 1,32,500 km, have considerably improved hinterland connectivity. The network caters to 40% of the country's total road traffic

Increasing length of national highways (km)

Financial year	2014	2015	2016	2017	2018	2019
Length of national highways	91,287	97,830	1,01,010	1,14,158	1,26,500	1,32,500

Source: Annual reports, MoRTH

- Since 2014, national highways have expanded significantly owing to ~25,000 km of state roads and highways reclassified as national highways
- The NHAI initiated NHDP in 1998 for systematic and phase-wise development of the national highways network
- The NHDP programme has given way to 'Bharatmala Pariyojana', which aims to enhance road connectivity across economic corridors, rural roads, ports, and borders
- The budget outlay for the first phase of Bharatmala for further upgradation / development of 34,800 km of highways is pegged at Rs 5,35,000 crore. The awards are expected to be completed by fiscal 2022. The NHAI has already awarded 7,703 km under Phase I of Bharatmala since initiation of the programme on October 24, 2017, up to June 2019, which requires investment of ~Rs 1.92 lakh crore

Planned versus achieved targets

- Budgetary allocation for the roads sector was increased to Rs 83,000 crore for fiscal 2020 from Rs 78,600 crore (revised estimates) in fiscal 2019. This exhibits added thrust of the government towards the sector
- Bharatmala, Setu Bharatam, Char Dham connectivity, economic corridors will be the biggest investment drivers. Approximately Rs 7 lakh crore is envisaged to be invested over the next 5-6 years under these programmes
- The Ministry of Road Transport and Highways (MoRTH) constructed a record 10,855 km of highways in fiscal 2019, at a per day construction rate of 30 km. The rate is increasing steadily, bringing it close to the construction target of 45 km per day
- Construction of national highways has more than doubled to over 30 km a day over the past five years, with the total investment in the sector increasing 2.5 times

Achievement rate of targets set by the MoRTH

Financial year	2013	2014	2015	2016	2017	2018	2019
Targeted construction (km)	6,187	6,330	6,300	10,950	15,000	15,000	15,000
Achieved construction (km)	5,732	4,260	4,410	6,029	8,142	9,829	10,855
Km per day construction	16	12	12	17	23	27	~30

Source: MoRTH

Trends in private sector participation

- Significant reforms marking the evolution of PPP models witnessed since the 1990s with growing demand for private sector funding in the highways sector
- The BOT-toll model was initially introduced to increase private sector investment in roads and highways. For the development of non-viable stretches, models such as BOT-annuity and BOT-toll + annuity were introduced
- The BOT-toll model initially helped channel private investment in the highways sector, but caused significant financial stress as developers found it difficult to complete projects given significant issues related to land acquisition and other regulatory approvals
- Based on learnings from BOT-toll and BOT-annuity projects, the HAM was introduced in fiscal 2016. HAM involved pre-determined revenue streams related to project construction, financing and operations, as well as well-defined risk distribution between the government and private players. HAM helped restart the roads sector PPP programme and increased the momentum of project awards. The value of HAM project award rose from Rs 7,000 crore in fiscal 2016 to Rs 21,278 crore in fiscal 2019
- EPC model and HAM account for over 90% of projects awarded. This is in line with the government's decision to execute future projects via HAM, EPC and BOT in the ratio of 60:30:10
- Asset recycling through TOT is a new PPP transaction mode being undertaken by the NHAI. This PPP mode has been identified as a means of financing new projects in the highways sector by attracting patient capital in operational highway stretches. Seventy-five operational stretches have been identified for bidding under TOT, aggregating 4,500 km
- The NHAI successfully bid out the first bundle under TOT, comprising nine stretches. A consortium comprising MAIF Investments India Pvt Ltd and Ashoka Buildcon Ltd was awarded the project bundle at ~50% mark-up on the NHAI's initial estimated concession value (IECV) of Rs 6,258 crore
- TOT bundle 2 was cancelled owing to mismatch between the investors and the NHAI's expectations, leading to bids coming in significantly below (>10% difference) the IECV estimated by the NHAI
- TOT bundles 3 and 4 are in the process of being bid out. The NHAI envisages to attract Rs 4,998 crore and Rs 4,170 crore, respectively, for these bundles

Sector outlook

- **MoRTH has ambitious plans under the Bharatmala Pariyojana**

  As part of the Bharatmala initiative, the MoRTH is aiming to implement projects that will improve connectivity of key production and consumption centres across the country. Some of the key initiatives include:

  – Constructing ring roads totalling Rs 36,290 crore in 28 major cities, including Bengaluru, Delhi, Lucknow, Ranchi, and Udaipur

  – Detailed project reports (DPRs) are in progress for 21,392 km of highway projects

  – Development of multiple greenfield corridors across the country

  – Construction of the Delhi–Mumbai expressway is expected to start in earnest from the fourth quarter of 2019, with a completion timeframe of three years. The cost of the project is ~Rs 90,000 crore

- **Project awarding slowed in the first half of fiscal 2020**

  After a brisk growth from fiscal 2015, the pace of awarding of highway projects is expected to slow down in fiscal 2020. This is because the focus is shifting to completing over 50,000 km of awarded projects

Growth of awarded length (km)

Financial year	2013	2014	2015	2016	2017	2018	2019
Length awarded	1,916	3,169	7,980	10,098	15,948	17,055	5,493

Source: MoRTH, Press Information Bureau

- Speedy recovery of stalled projects
  A number of stalled projects, valued at ~Rs 3 lakh crore, have been addressed. This was possible through a series of measures undertaken by the MoRTH to either revive or terminate the projects. Some of the policy initiatives undertaken by the NHAI and the MoRTH in this regard are:
  - Modification in concession structure via:
    - Premium deferment: The concessionaire has been allowed to restructure the premiums committed through the life of the concession to revive projects under financial stress
    - 100% equity disinvestment: The concessionaire is allowed 100% equity divestment after two years of construction completion for all BOT projects, irrespective of the year of award
    - Harmonious substitution: Substitution of existing concessionaires in BOT projects is allowed, thereby allowing an exit policy for project developers facing liquidity crunch and financial stress
    - One-time fund infusion: Financial assistance in the form of loans by the NHAI for languishing BOT projects
  - Rationalised compensation: Extension of the concession period / compensatory annuities for projects languishing owing to reasons not attributable to the concessionaire
  - Early release of mobilisation advance: For HAM projects, out of the 10% mobilisation advance, 5% is now available any time after the appointed date, thus providing a level of comfort to the concessionaire
  - Release of construction grant linked to physical progress: Construction grant for HAM projects is linked to the achievement of physical progress of 10%, 30%, 50%, 75% and 90%, respectively, thereby ensuring construction schedule
  - Securitisation of BOT projects: Concessionaires can raise subordinate debt on the strength of future surplus cash flows of operational BOT projects
  - Release of 75% arbitral award: Release of 75% of arbitral award against bank guarantee
- Improving arbitration process instils investor confidence
- The NHAI has significantly streamlined the arbitration process by introducing the Society for Affordable Redressal of Disputes. In addition, as per its latest standard operating procedure, the NHAI is completing the arbitration processes in a time-bound manner.
- Introduction of new class of investors through TOT
- The TOT model has been successful in attracting sovereign funds, wealth funds and private equity investors, which have a long investment horizon and are looking for operational road assets with reduced construction risk. With the successful bidding of the first bundle of TOT and raising of Rs 9,681 crore, the NHAI has bid out three more bundles. The third and fourth bundles are currently in the bidding process. This model is beneficial for investors as there is operational history of the asset, and for the NHAI as well, as it gets upfront monetary benefit for its operational asset.
- Slow performance of listed infrastructure investment trusts (InvITs) and pick-up in establishment of private InvITs
- Private investment is expected to play a major role in financing ambitious targets set out in Bharatmala. Significant liquidity in the capital markets and demand for investments in real assets opened new funding avenues - InvITs. A few InvITs, such as the IRB InvIT Fund, were launched with much fanfare, but are trading at a discount to their issue price, primarily because of misconceptions about the nature of the product and the expected returns.

- However, relaxation of InvIT regulations by the Securities and Exchange Board of India (SEBI) and relaxation of leverage norms by the Reserve Bank of India (RBI) have accelerated the adoption of InvITs. Companies are progressively taking the private route for establishing InvITs as it allows them to tailor the financial offering as per the requirements of large international financial players.

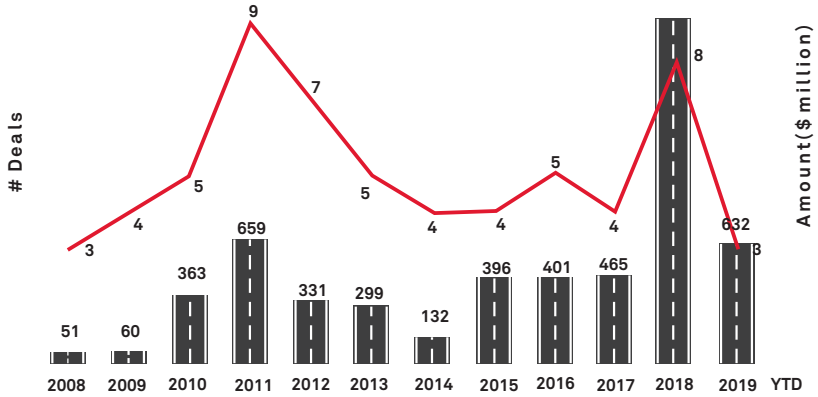
Major operationalised InvITs

InvIT	Main / anchor investors	Funds raised
IndInfravit Trust (L&T)	CPPIB and Allianz Capital Partners	~$940 million
Oriental InvIT	AIIB, DEG, IFC and HEG	~$240 million
Reliance Infra InvIT	Cube Highways	~$510 million
IRB InvIT	GIC	~$630 million

Source: CRISIL analysis

- **Steady interest in secondary market transactions in the highways sector**
  With the relaxed exit norms, many infrastructure funds are investing in the highways sector. Over 60 transactions, involving over 80 assets, were recorded in the past decade. Interest is set to increase as more operational assets are put up for TOT by the NHAI.

Exits in highways sector over the last 10 years



Source: The Economic Times

- **Rapid implementation of ETC system**
  ETC uses electronic tags and tokens to enable automatic identification and classification of vehicles. These are issued to users at point of sale terminals. FASTag is the radio-frequency identification (RFID) technology adopted by the NHAI for making toll payments. The tag can be bought at State Bank of India, ICICI Bank, Axis Bank, Federal Bank, and Syndicate Bank. It can also be ordered from the NHAI's website.

This will help reduce wait times at toll plazas, thereby decreasing travel time. In fact, it will be a game changer for the logistics sector by ensuring smooth fleet movement. To ensure seamless traffic and prevent congestion at the toll plazas, the MoRTH has declared that all lanes at toll plazas on national highways will be tagged as 'FASTag lanes' by December 2019.

State initiatives in the highways sector

Many states are recognising the importance of highways and expressways in realising their development objectives. Maharashtra and Uttar Pradesh have taken the initiative to create a system of expressways, such as Maharashtra Samruddhi Mahamarg and Integrated Transit Corridor Development, respectively, for taking development into the hinterland. Such state-level initiatives are expected to augment the central government's efforts towards highways development.

Key expressway/ highway projects coming up through state initiatives are as follows:

- Mumbai-Nagpur Super Communication Expressway, also known as Maharashtra Samruddhi Mahamarg, is under construction. The 701-km-long, eight-lane expressway, connecting Nagpur and Mumbai, will cross 10 districts, 26 tehsils and 390 villages in the state, and is expected to cut travel time between the two cities to eight hours
- The Lucknow-Azamgarh-Ballia Expressway, renamed Purvanchal Expressway, is an under-construction six-lane divided and access-controlled highway, in Uttar Pradesh. It

will connect the historic towns of Azamgarh and Ballia with the state capital, Lucknow. It is to be developed by the Uttar Pradesh Expressway Industrial Development and Authority (UPEIDA)

- The UPEIDA is also responsible for developing the Bundelkhand Expressway, a 296-km, four-lane access-controlled highway. The broad route will start from Bundelkhand's Chitrakoot Dham (Karwi), move along Banda, Rath-Orai-Jalaun-Auraiya- Etawah, where it will join the Agra-Lucknow Expressway

Key challenges

Continued delay in achieving financial closure for new projects

Banks are becoming conservative in lending to private players in the roads and highways sector, given the challenges related to project delay in the infrastructure sector. The challenges are especially acute for mid-sized players that have recently won projects from the NHAI. Banks have reservations with regards to the balance sheet strength of these players and their ability to take a financial hit in case the projects are delayed. Banks are also wary of the wide difference in costs estimated by the bidder and the NHAI in several cases.

Limited appetite for PPP projects

Existing Indian developers have stretched balance sheets as the claims made to the authority on breach of the concession agreement remain pending. A large number of developers have had issues with respect to PPP projects in the past, as is evidenced by over Rs 55,000 crore of claims filed against the NHAI (mainly related to PPP projects).

Slow pace of awarding owing to lengthy approvals and clearance

The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, or LARR Act, has made the land acquisition process lengthier and more challenging. In addition, land acquisition cost has tripled from ~Rs 80 lakh per hectare to almost Rs 2.40 crore per hectare. Also, the clearance and approval process requires the consent of multiple entities for environment, irrigation, utility, etc, which further causes delays in project commencement. To avoid such delays, the NHAI bids out projects only after 80% of the land acquisition is complete. However, the lengthy process has led to a slowdown in project awarding as limited tenders are being issued.

Lack of road infrastructure maintenance leading to fatalities

State and national highways together account for 63% of all road fatalities. One of the factors attributable to these fatalities is ill-maintained roads and vehicles. Extreme weather conditions also deteriorate road conditions. In addition, lack of medical attention along the highway network leads to significant delay in treatment. Hence, the casualty rate in case of accidents on highways is very high.

State policies a stumbling block for the highways sector

- **Variable toll policies and holidays:** Toll policies vary widely across the states, creating uncertainty in the business environment. In addition, state governments have from time-to-time abolished toll on state highways, which hugely incentivises commuters to use only state highways. This considerably deteriorates the financial viability of national highways in the vicinity. These issues combine to dampen investor enthusiasm in the highways sector

- **Development of parallel roads:** Many states are developing their own network of state highways, which often run parallel to national highways. This effectively splits the traffic between parallel roads, significantly reducing the financial viability of all the routes. In addition, the threat of possible future parallel road / highway also acts as a deterrent to private investments
- **High cost of land acquisition:** Land acquisition cost for infrastructure projects is exceedingly high in certain states, with land cost being as high as 50-60% of the total project cost. Such high land acquisition cost reduces the effectiveness of outcomes given the limited public budgets available for infrastructure development

Way forward

Need for capital-generating financing instruments

With 95% projects awarded on EPC and HAM basis, there has been an increase in requirement for public funding. Given the general reluctance of banks to lend, the government is exploring the following funding options:

- TOT model: A bundle with nine highway stretches was successfully bid out with an upfront payment of Rs 9,681 crore to the NHAI. The third and fourth bundles are in the tendering process, and are expected to fetch Rs 4,998 crore and Rs 4,170 crore, respectively. The success of these bundles will go a long way in ensuring financial sustainability of future NHAI plans
- InvITs: Till now, there has been subdued response to InvITs owing to lack of understanding of the financial products and expected returns. Private InVITs with mature global investors as major partners have, however, been more successful. Hence, the MoRTH should work with SEBI and the RBI to roll out measures that boost the ability of developers to monetise their existing assets through InVITs. This will considerably help mend the balance sheets of developers
- Infrastructure debt funds (IDF): Specialised infrastructure institutional investors can provide long-term funding for infrastructure projects. However, to make this initiative a success, a different class of investors, such as sovereign wealth and pension funds, will have to be tapped. In addition, lending regulations for IDFs need to be eased by the RBI so that they are allowed to invest

State involvement and sharing of land acquisition cost

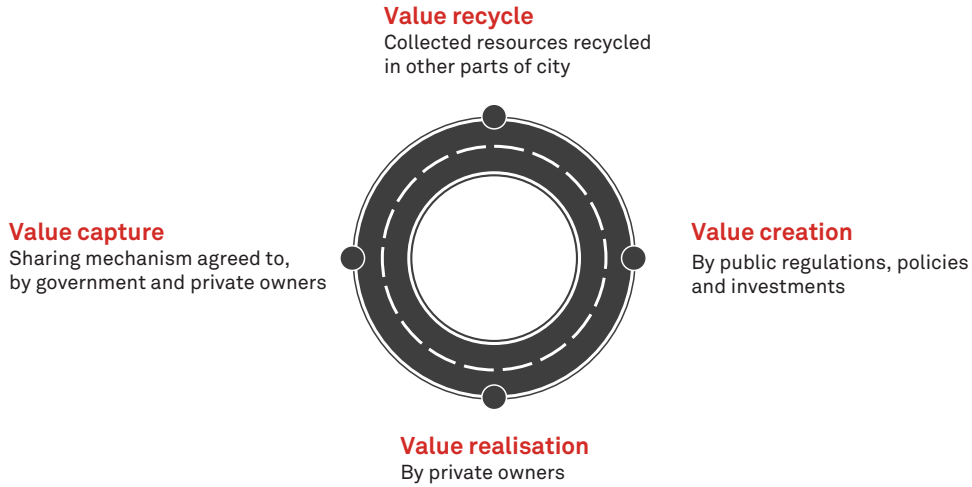
As discussed earlier, with the passage of the LARR Act, the MoRTH's cost of land acquisition has increased ~300%, making many projects unsustainable. The MoRTH will have to work closely with state governments and prioritise projects in which the state government is willing to bear at least some portion of the land acquisition cost. Without such support, it will be difficult for the MoRTH to sustain its ambitious agenda of developing 34,800 km of highways under Bharatmala. Concepts such as land bonds, as being tried in Kerala, should also be looked at to finance land acquisition

Collaboration with states and value capture finance

Development of highways has led to significant appreciation in real estate value across the country, as evidenced by significant suburban and ribbon development along major highways. Due to this, the MoRTH and the NHAI are forced to pay ever-higher land acquisition prices, while not being able to monetise land value appreciation in a meaningful manner.

The MoRTH and the NHAI should instead work with progressive state governments in using tools under value capture financing, such as land value tax, purchasable floor area index, betterment levy, etc, to raise additional resources through non-conventional means. This will kickstart a virtuous cycle of creating, realising, capturing and recycling the incremental value of the infrastructure project.

Kickstarting a virtuous cycle



Source: CRISIL analysis

Measures for improving road safety and reducing accidents

Redesigning the highway network and road geometry can go a long way in reducing accidents and fatalities. The MoRTH is aware of the issue and has identified over 789 accident-prone 'black spots' across the country. Work is being undertaken to improve road geometry and to eliminate black spots. In addition, a dedicated highway police patrol force, along the lines of Government Railway Police, needs to be established as local authorities have proven to be inadequate in enforcing traffic discipline on highways. There is also a dire need to formulate remedial measures to improve road safety. A rating system that measures the quality of infrastructure developed can be one of the measures as it will keep a check on adherence to safety norms by the developer.

Simplification of land acquisition rules

Land acquisition continues to be the biggest challenge in a number of national and state highway projects. A few state governments have taken suitable measures to make the process simpler through land acquisition acts and rules within the ambit of the LARR Act.

Railways

2017 score	2018 score	2019 score
5.0/10	**5.0/10**	**5.3/10**

Summary

Parameters	Drivers	Drags
Policy direction	• Investment outlay with a thrust on modernisation • Baby steps to increase private sector participation	• Limited progress on decentralisation of decision making and accounting reforms
Institutional maturity and strength	• The Indian Railways enjoys monopoly, and has technical and administrative capability to conceptualise and implement programmes • Exploring funding avenues for non-revenue generating projects of safety and modernisation	• No regulator; Railway Development Authority yet to be established • Limited progress in the ambitious station redevelopment programme
Financial sustainability	• Improvement of operating ratio from 98.4% in fiscal 2018 to 96.2% in fiscal 2019 • Commissioning of dedicated freight corridors (DFCs) in the near term to curtail operating costs and improve operating ratio	• Freights continue to substantially cross-subsidise passengers • No concrete plan to monetise non-core assets • Profitable passenger segments face stiff competition from the aviation sector
Implementation ease	• Electrification of lines gained momentum	• Land acquisition a big hurdle • Long gestation period for approvals; new DFCs yet to receive Cabinet approval

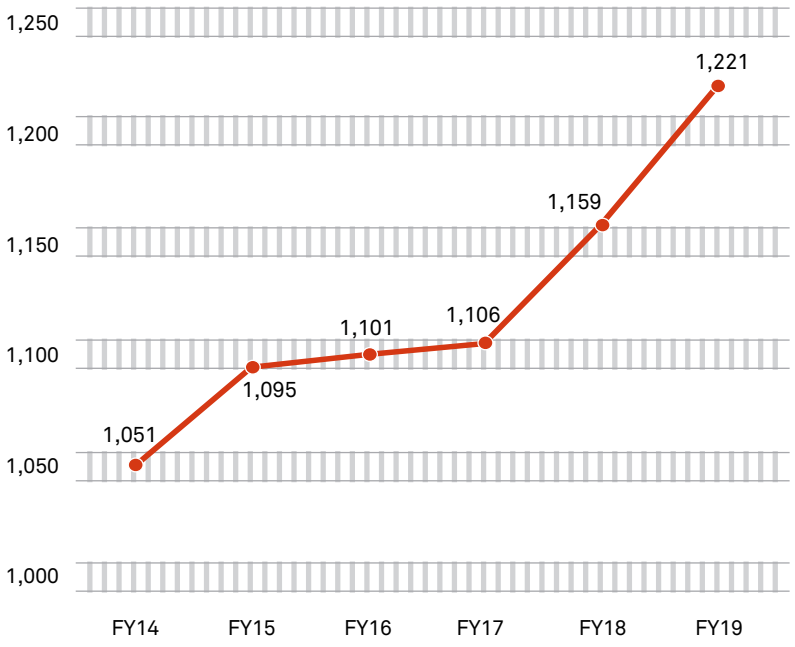
Parameter	Evaluation criteria	Weightage	InfraInvex score		
			2017	2018	2019
Policy direction	Policy consistency	10	6	5	6
	Public financing support	10	7	7	8
Institutional maturity and strength	Entity implementation capacity	10	6	6	5
	Financing models	10	5	4	5
	Regulatory robustness	10	5	5	5
Financial sustainability	Cost recovery	20	8	7	8
	Demand risk	10	4	4	4
Implementation ease	Track record	10	5	7	7
	Externalities	10	4	5	5
		100	**50**	**50**	**53**

Sector performance and outlook

Freight and passenger traffic

- The Indian Railways' freight traffic logged 3% CAGR over fiscals 2014-2019. In fiscals 2018 and 2019, growth was comparatively better at 4.8% and 5.4% on-year, respectively. The uptick can be largely attributed to revival of coal, cement and container volumes (constituting 60-65% of total freight traffic) after a fall in traffic in fiscals 2016 and 2017.

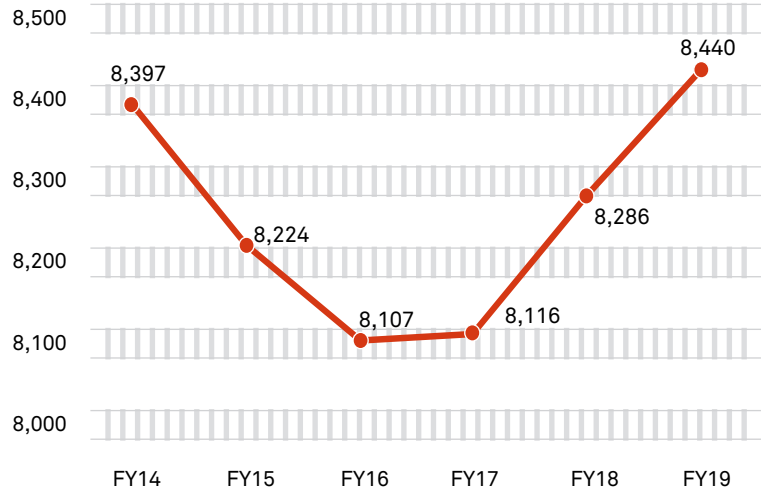
Freight traffic (MT)



Source: Indian Railways Annual Statistical Statements, Indian Railways Yearbook, Indian Railways Monthly Evaluation Report

- During April-October of fiscal 2020, freight traffic was ~681 million tonne (MT) compared with ~691 MT in the corresponding period last fiscal. The ~1.5% decline can be attributed to ~4% drop in domestic coal traffic, 10% in cement traffic and 6% fall in other commodities.

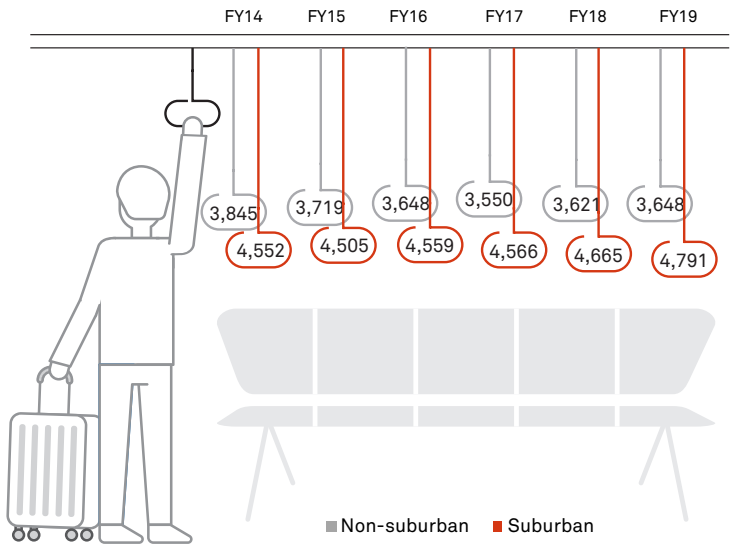
Passenger traffic (in million)



Source: Indian Railways Annual Statistical Statements, Indian Railways Yearbook, Indian Railways Monthly Evaluation Report

- On the other hand, passenger traffic grew ~2% on-year during fiscals 2018 and 2019 – a positive sign as it had either declined or remained flat during fiscals 2015, 2016 and 2017. During these years, suburban and non-suburban traffic had fallen. While non-suburban traffic recouped from fiscal 2018, suburban traffic saw growth from 2017. However, growth in overall traffic can be largely attributed to increase in suburban traffic.

Suburban and non-suburban passenger traffic (million)



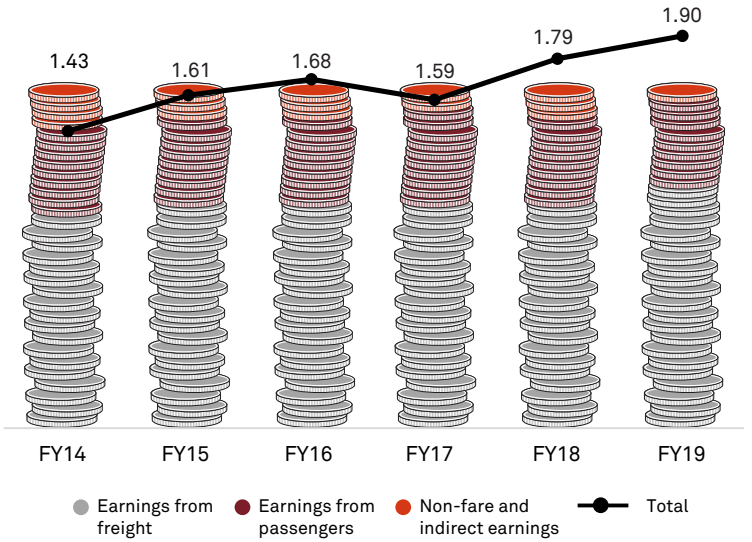
Source: Indian Railways Annual Statistical Statements, Indian Railways Yearbook, Indian Railways Monthly Evaluation Report

- In the current fiscal until September, passenger traffic printed at 4,173 million compared with 4,229 million in the corresponding period last fiscal. Weak growth in the passenger segment can be attributed to growth in the aviation sector and decreasing modal competitiveness for short distances

Financial performance

- Gross revenue receipts of the Indian Railways clocked 5.8% CAGR over five years from fiscal 2014 to reach ~Rs 1.90 lakh crore in fiscal 2019[23]. Its earnings from both passenger and freight segments logged ~7.2% CAGR during the period. The decrease in revenue CAGR can be attributed to a decline in its non-fare and indirect earnings in fiscal 2019
- Gross revenue receipts until September in fiscal 2020 amounted to Rs 85,800 crore compared with Rs 83,400 crore in the corresponding period last fiscal

Earnings (Rs lakh crore)

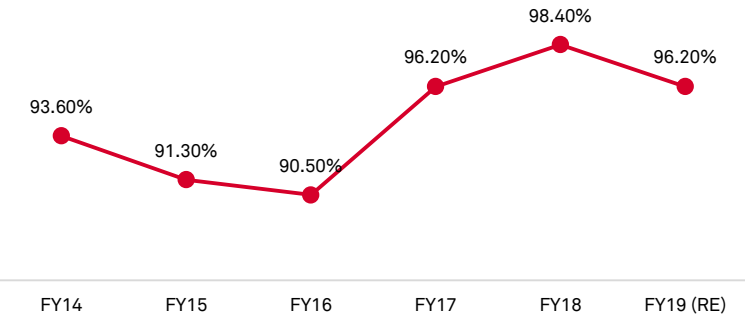


Source: Indian Railways Annual Statistical Statements, Indian Railways Yearbook, Indian Railways Monthly Evaluation Report

[23] *Indian Railways Statistical Summary, 2016-17*

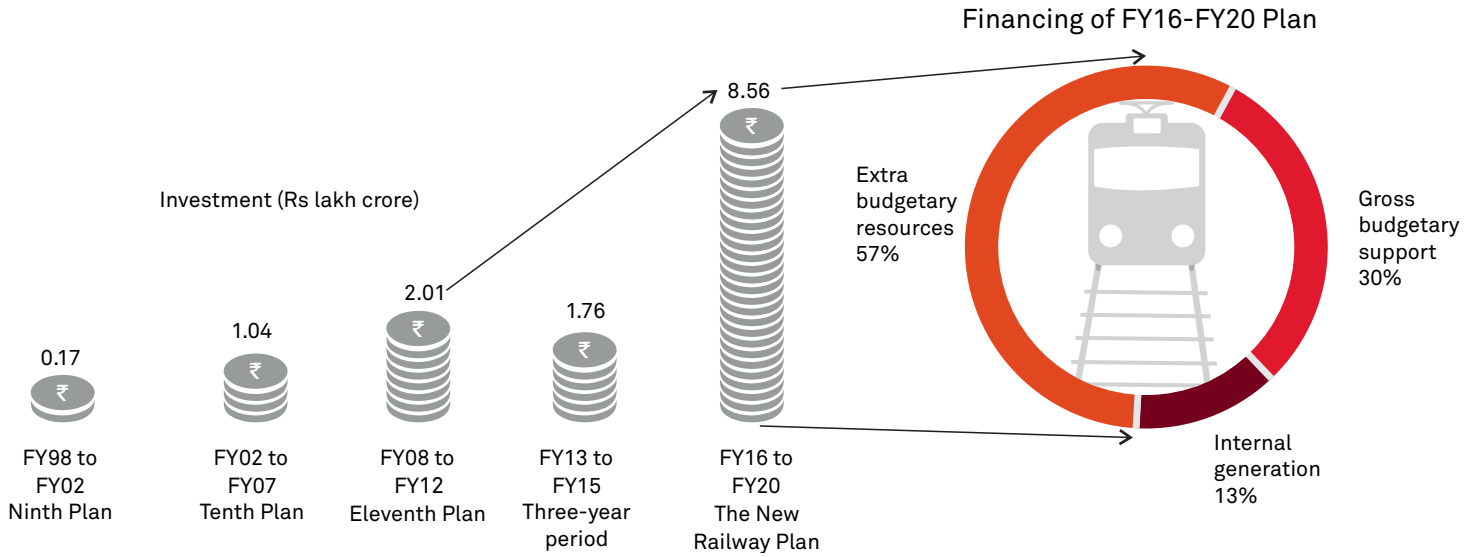
- The Indian Railways' operating ratio, which has been a concern over the past few years, saw a slight improvement in fiscal 2019 to 96.20% from 98.4% in fiscal 2018 – the worst level since fiscal 2001
- The ratio has constantly been under pressure owing to declining growth in passenger and freight traffic. Cross-subsidisation of the passenger segment with freight has worsened it. A look at the difference in the operating ratios of passenger and freight segments reveals the magnitude of the problem of cross-subsidisation. In fiscal 2018[24], the operating ratio of freight business was 58.83% and that of passenger business 181%

Trend in operating ratio (%)



Source: Expenditure Profile, Union Budget 2019-20, PRS

Investment trends

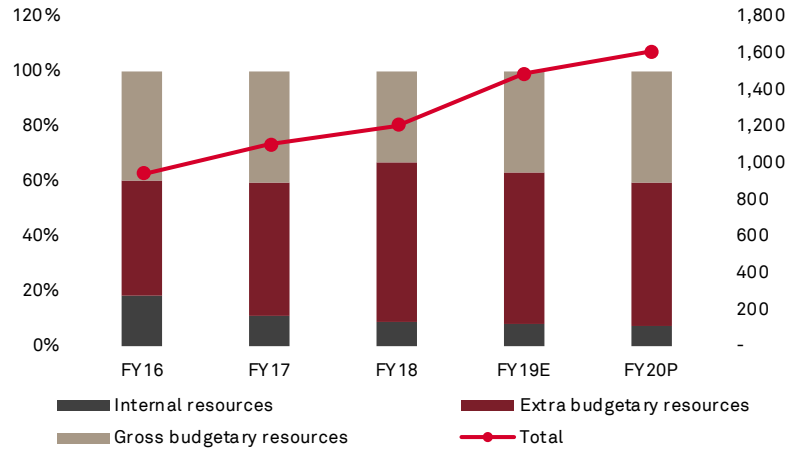


Source: Indian Railways

[24] *Indian Railways Yearbook, 2017-18*

- The investment plan for fiscals 2016-2020 envisaged a course correction and addressed the issue of underinvestment in railways. The plan covered various aspects of railway infrastructure and services. Although capital outlay and budgetary support increased significantly in the past five years, investments still appear to have missed the target
- Investments made in the five years (~Rs 6.32 lakh crore) is 25% short of target (assuming investments in fiscal 2020 will meet the target). However, budgetary expenditure over the period increased at 15.4% CAGR from Rs 32,300 crore in fiscal 2015 to Rs 66,100 crore in fiscal 2020

Capital outlay of Indian Railways (Rs '00 crore)



Source: Indian Railways, Union Budget 2019-20

- The major reasons for missing the investment target are shortfall in investments from internal resources and limited realisation of PPP projects and state joint ventures (JVs). As per the actual investments over fiscals 2016-2018 and revised estimates for fiscal 2019, the total investment through extra-budgetary resources has been ~Rs 2.43 lakh crore. Of this, 34% or ~Rs 81,600 crore comes through PPP projects, 28% through institutional financing and 38% through market borrowings

Major initiatives by Indian Railways

The Indian Railways has rolled out multipronged initiatives and projects to transform the sector and enhance its competitiveness. They include tariff rationalisation, capacity augmentation, safety, technology upgradation, improvement in passenger experience, energy efficiency, and research and development. A snapshot of some of the recent and ongoing initiatives and programmes are given below.

Freight rate-related measures

In view of the weak growth in freight volumes and earnings, the Railways announced numerous measures in September 2019. The important ones among them are:

- Deferment of busy season surcharge that is levied at 15% from October (except iron ore and petroleum-oil-lubricant or POL)
- Waiver of supplementary charges of 5% applicable on loading of mini and two-point rakes to attract smaller cargo sizes
- Round trip charging for container traffic expected to reduce the cost of transport of containers by 35% for short distances (within 50 km)
- De-notification of commodities for container traffic, making freight all kind (FAK) rates applicable for 597 commodities that are lower than container class rates
- Implementation of electronic transmission of railway receipts and weighment-related reforms

Introduction of private passenger train operations

- Ending its near monopoly in running passenger trains, the Railways has decided to open up the segment to the private sector. This will be the first such initiative in the non-luxury segment given that the Railways has been allowing private participation in the freight segment through various schemes. The Indian Railways, railway public sector units (PSUs), and state tourism development corporations have already roped in private players in the passenger segment, but their participation has been limited to luxury trains where they provide specific services such as hospitality

- Under the initiative, the Railways plans to introduce 150 private passenger trains in 50 high-demand passenger routes, including long distance, inter-city and sub-urban services along the Golden Quadrilateral
- Although the specifics of the concession or contract are not public, it is likely that private players will have freedom to fix fares and be allowed to run imported coaches and locomotives or lease them from the railways. Further, they would be able to undertake functions such as ticketing, catering, luggage pick-ups, etc, like the Indian Railway Catering and Tourism Corporation (IRCTC). The railways can, meanwhile, charge haulage fees (transportation fees) from private players for using its network, stations, signalling and other infrastructure
- As a proof of concept, the IRCTC has been entrusted with the operations of Tejas Express between select routes. The train started service between Lucknow and Delhi on October 4, 2019. The next Tejas service between Mumbai and Ahmedabad is about to be commissioned

Rejig and acceleration of key ongoing projects and programmes

- **Station redevelopment programme:** After the programme received lukewarm response from the private sector, various changes have been made to its implementation model and project structure. The Indian Railway Stations Development Corporation (IRSDC) has been made the nodal and main project development agency. The procedures have been simplified, adapting various business models and a longer lease tenure of up to 99 years with the option to sublease. Also, the Ministry of Finance has accorded station redevelopment infrastructure status[3] in order to make it attractive for the private sector.
- **Acceleration of eastern and western DFCs and phase-wise commissioning:** Dedicated Freight Corridor Corporation of India Ltd (DFCCIL) is working on phase-wise commissioning of eastern and western DFCs. The Ateli-Phulera (192 km) and the Madar-Kishangarh-Balawas (306 km) sections on the western DFC have been commissioned. The section between Rewari and Palanpur is expected to be completed by March 2020. On the eastern DFC, the Khurja–Bhadan (194 km) section has been commissioned. DFCCIL is expected to commission the entire project by December 2021.
- **Electrification to reduce carbon footprint, operating costs:** Considering the cost benefits of electric traction (20% for locomotives and 30% in EMUs)[26], the Indian Railways has set the target of 100% electrification by 2022. This will help the Railways save Rs 13,510 crore per year. Historically, electrification is undertaken by the Central Organisation for Railway Electrification, Rail Vikas Nigam Ltd and zonal railways. The Indian Railway Construction Company, RITES, and Power Grid Corporation of India Ltd have also been allowed to undertake electrification projects. This is likely to expedite the pace of electrification. Further, the Railways is in the process of availing a loan from the Asian Development Bank for part-funding the programme.

Sector outlook

Freight traffic outlook for fiscal 2020

- In fiscal 2020 until October, freight traffic declined around 1.5% on-year, primarily because of ~3% and ~10% fall in coal and cement movement, respectively; both account for 60% of railway freight
- Freight traffic for the entire fiscal is expected to be flat due to slowdown in the cement and coal segments

[25] *Presentation by Director – Operations and Business Development, DFCCIL, July 9, 2019*
[26] *Indian Railways: Re-birth of the Colossus, by Edelweiss*

DFCs a game-changer in the medium to long term

- The DFCs are largely intended to help the railways regain the freight share lost to road transport. They have features that are expected to considerably reduce turnaround time (TAT) and logistics costs, which are expected to compel industries to rework their logistics strategies. The freight corridors will help the railways gain a competitive edge over road, especially in the case of bulk freight and containers. Also, their efficiencies may have a positive impact on the operating ratio of railways

- With increased time reliability, the DFCs could attract sectors such as cold chain for transportation of perishable commodities and express distribution. The DFCCIL expects the share of port and inland container deport (ICD) rail traffic to rise from 25% to 31% with the DFCs. This is owing to increased container movement on the DFC because of double-stack operations, assured transit time and faster speeds

- The share of cement traffic is expected to improve from 30% to 38% on account of better service by the DFCs and resolution of issues related to multiple handling. Overall, it is estimated that the eastern and western DFCs may increase the market share of railways in the freight segment from ~30% to more than 50%[27]

- Further, the commissioning of the DFCs will prompt the private sector to make investments in development of private freight terminals, logistics parks, and rail sidings, among others. The setting up of these facilities will result in consolidation and movement of cargo through the DFCs from regions that are not directly connected with the corridors

[27] *Presentation by Director – Operations and Business Development, DFCCIL, July 9, 2019*

Projected traffic on DFCs

Freight traffic (MTPA)	C+2 years	C+5 years	C+10 years	C+30 years
Traffic due to IR	235	269	304	523
Additional traffic (non-IR)	163	284	515	1272
Total traffic	398	553	819	1795
Eastern DFC	141	193	366	995
Western DFC	257	360	453	800

'C' represents the year of commencement; IR - Indian Railways
Source: DFCCIL

Key challenges

High operating ratio leading to limited capability to generate internal resources

The Railways has been struggling to generate internal surplus for the past few years. The operating ratio has constantly been higher than 90%, limiting its capability to generate operational surplus that can be reinvested. One of the major reasons behind this is weak growth in earnings from its core business of running freight and passenger trains owing to limited growth in traffic. Further, the railways is also losing its share in both freight and passenger segments to other competing modes.

On the other hand, its salary expenditure has been consistently increasing due to the Pay Commission's revisions. Further, it has a pension expenditure that does not generate any revenue. The pension bill is expected to rise further in the next few years as about 40% of its staff was above the age of 50 years in fiscal 2017[28].

Further, social service obligation is another factor that affects the operating ratio. As per the trends in fiscals 2017 and 2018, the social service obligation of the Railways ranges from ~17% to 19% of the

total revenue earnings or total working expenditure. This is primarily on account of carriage of essential commodities below cost, concession in passenger fares (cheaper tickets for army veterans and senior citizens), losses on electric multiple units, suburban services, operations of uneconomic branch and new lines, operation of strategic lines, and pricing of passenger fares below cost.

It is estimated that the pricing of passenger fares below the cost alone accounts for more than 95% of the social service obligation. In order to manage its financial position, the Railways ends up using profits from its freight business to meet these obligations resulting in higher freight tariffs affecting its competitive positioning in the segment.

Limited private sector participation

As Finance Minister Nirmala Sitharaman highlighted in the Union Budget for fiscal 2020, scaling up the private sector's participation is imperative for the railways to meet its long-term capex requirements. However, its success on this front has been limited compared with other transport sectors such as highways and ports. These sectors have seen large-scale implementation of projects through PPPs. The ambitious programmes of the Railways that banked upon extensive private sector participation such as station redevelopment have also seen limited progress. Some of the major reasons for this are:

- Absence of independent regulatory mechanism: The Indian Railways is the regulator and the commercial operator of the railway infrastructure in the country. Hence, private players believe their concerns are not getting addressed, especially with respect to tariffs and charges. Although the Cabinet has approved the setting up of a Rail Development Authority as an independent regulator, it is yet to be established. Independent regulator is an imperative to increase private sector participation as the practicality of freedom to fix fares under various projects shall depend on it
- Absence of performance-based costing system: At present, the Railways uses absorption costing in the form of fully distributed cost which has its own limitations in terms of compilation process of cost data, generating precise cost information, among others. The challenge in the current scenario is the difficulty in ascertaining the costs for various activities that shall enable evaluation and monitoring of function-wise efficiency or line profitability. Availability of precise information on various costs associated with operations, maintenance and other functions is of utmost important for the private sector as it enables the players to assess the profitability of a project
- Challenges in schemes for investments in rolling stock: The private investment schemes for rolling stock have been in place for long but the investments by private players have been limited. The General Purpose Wagon Investment Scheme (GPWIS), launched in 2018, is expected to gain significant traction among private players owing to the huge requirement by the user industries. However, a few conditions have kept a large portion of private players from investing. As per the conditions of the GPWIS, only circuits with an empty return ratio (ERR) at par or better than the zonal railway in which it is running would be approved. This condition acts as a constraint for user industries such as power plants and mine operators that usually have higher ERR. Further, the scheme allows the wagons to run only on pre-approved circuits which cannot be changed before a given time period. This scenario makes it difficult for logistics companies to invest under the scheme as they need to be responsive to changing markets conditions
- Slow implementation of reforms and policies: The railways and various committees have proposed a series of reforms and policies aimed at changing the landscape of the sector and to attract significant private investments. However, the pace of reforms such as revisiting the method of cost calculation and fare fixation for passenger business, in unifying and streamlining the recruitment process and rationalising the manpower, in decentralisation and delegation of powers and adoption of performance-based costing has been relatively slow

[28] *13th Report: Demand for Grants (2017-18)', Standing Committee on Railways*

Land acquisition a major hurdle in the implementation of projects

Land acquisition has historically been a major impediment for implementation of large-scale railway projects. The implementation of the eastern and western DFCs has not been different. Notably, the DFCs were approved in 2006 and the work commissioned in 2009. However, both the DFCs are yet to be commissioned even after a decade. The ambitious Mumbai-Ahmedabad high speed rail project is also facing implementation issues due to hurdles in land acquisition. As per various media reports, the National High Speed Rail Corporation Ltd has been able to acquire only around 50% of the land required with farmers in Gujarat and Maharashtra opposing the project. Given the scenario, it appears that it would be difficult to operationalise the Surat-Bilimora section of the corridor by August 15, 2022, as targeted by the government.

Way forward

The Indian Railways has been making substantial efforts to transform the railways sector in the country. The initiatives have been multifaceted focusing on various aspects of the sector. However, the Railways may consider the following elements for success of its initiatives:

- Expedite the process for creating an independent regulator and establishing the right pricing model
  - The pricing model of the railways is based on cross-subsidisation of passenger fares with freight fares. India has the lowest fare-to-freight ratio (the ratio of passenger fare and freight rates) of 0.24 compared with several other countries including Japan (1.9), Germany (1.5) and China (1.2)[29]. As per a recent Brookings India report, coal freight is overpriced by 31%, which increases the cost of power, on average, by ~10 paise per kWh[30]. Skewed pricing has implications on inflation for the entire economy as well leading to diversion of traffic to roads, resulting in revenue loss for the railways. One of the major reasons behind this skewed pricing is the social obligation of the railways, which cannot be denied completely
  - To optimise the pricing mechanisms for various services and create a conducive environment for the private sector, the Ministry of Railways (MoR) should expedite the process of establishing the Railways Development Authority as the independent regulator
  - The Railways Development Authority's mandate should essentially include decision on pricing of services, quality of services and competition issues. Similar entities have been established in many countries, especially those that have vertical separation between infrastructure providers and train operators
- Focus on core activities
  - The Railways may consider focusing on setting up core infrastructure and disengage itself from ancillary functions. It may also consider the vertical separation of infrastructure provider and train operator as has been followed in many developed countries of the world. This shall enable operations and maintenance by private players. Operations and maintenance by private players without vertical separation may also be considered
  - Notably, wages, pension and energy constitute more than 50% of the operating expenses of the railways. Engaging the private sector may bring in greater efficiency and also enable the railways to finance projects that are essential but cannot be funded by the private sector
- Moving forward on private passenger train operations
  - The opening up of passenger train operations for the private sector is a welcome move. The timing could not have been better as the near commissioning of the DFCs shall free up capacity on the high-traffic Golden Quadrilateral and enable efficient operations of passenger trains on the same

[29] *Indian Railways and Coal: An Unsustainable Interdependency, by Brookings India*
[30] *Indian Railways and Coal: An Unsustainable Interdependency, by Brookings India*

- In order to enable success of the initiative, the railways may need to develop a clear and unambiguous programme for rolling out various routes for operations. Further, best practices from other sectors should be inculcated in the project structure such as easy exit clauses and substitution, equitable risk sharing on termination, clearly defined obligations of the concessioning/ contracting authority, among others
- The proposed model is expected to follow the track access charge model. Generally, in case of such models the haulage rates should be priced not according to cost recovery but market situation – taking account of what operators can pay and remain competitive. It should be considered that a private player who may import/lease rolling stock for introduction of such services shall need to manage operational expenses, administrative expenses, lease charges/interest and profit margins from the revenue after deduction of haulage charges. Nevertheless, the limited or inadequate cost recovery due to lower haulage charges might be partly or completely set-off by the premium/revenue share that can be offered by the private player for running the trains in case of lower haulage charges, resulting in enhanced profitability
- Given that the there is no independent regulator in the sector unlike others such as Airports Economic Regulatory Authority of India for aviation, CERC and SERCs in the power sector, a robust regulatory mechanism has to be set up for determination of tariffs. Further, the absence of independent regulator shall make a well-defined and convincing dispute redressal mechanism imperative
- It is expected that consortiums of financial investors, train operators and rail equipment manufacturers shall be interested in bidding for the operations. Therefore, consortiums should be allowed to bid. Further, the railways may also explore the possibility of bundling various routes together and offer them to private players similar to the TOT model that has been followed by the NHAI in the roads sector. This will encourage cross subsidisation among routes and the railways will not to be left alone with the low profitability/ cost recovery routes

- Focus on customer experience
  - Given the increasing competition from the aviation industry, providing superior customer experience in all interfaces – ticketing, station touch points and on-board travel engagement (cleanliness, food and beverage, in-coach facilities, etc) – will be of utmost importance
  - Passengers prefer convenience, cost-effectiveness, and timeliness. There is enough empirical evidence to suggest a large segment of passengers is willing to pay more for the right services
  - Considering the consumer has many choices, the railways will have to offer differentiators by reinventing customer experience

- Focus on targeted subsidy
  - As of now, the Railways recovers only 53%[31] of the cost of passenger fare, incurring a loss of about Rs 33,000 crore every year[32] in subsidising passenger fares. But, there is a section of customers who may be happy to pay more for the services. Recently, the Railways introduced the 'Give it up' scheme for concessional fare for senior citizens, in line with the campaign on cooking gas subsidy. In the past two years, almost 40 lakh senior citizen passengers have given up the subsidy voluntarily. This example corroborates that there is a section of consumers who can afford to pay the right price provided the desired service levels such as reliability, comfort and safety are offered
  - Hence, a targeted subsidy may be an important aspect to consider. The railways may restrict subsidy to consumers having more than certain level of income as has been done for the cooking gas subsidy. However, the mechanism for determining the level of subsidy and target populace for the same would need to be deliberated upon

[31] *https://economictimes.indiatimes.com/industry/transportation/railways/railways-want-subsidy-to-go-on-train-tickets/articleshow/69889892.cms?from=mdr*

[32] *https://www.ndtv.com/india-news/railways-to-extend-give-it-up-scheme-to-all-categories-availing-fare-subsidy-1841224*

Role of state government in railways

Introduction

Railway projects, especially greenfield ones, are capital intensive and generally entail large capital costs. Further, improved rail connectivity enhances the economic prospects of a geographic location through better access to an economic mode of transportation. Such a scenario outlines the business case for the participation of states in financing and development of railway projects. One of the marquee examples of participation of states in the development of railway projects is the Konkan Railways Corporation Ltd, which was implemented through joint financing of the MoR (51%) and the state governments of Maharashtra (22%), Karnataka (15%), Goa (6%), and Kerala (6%). Notably, the Konkan Railway project was one of the most difficult projects of its time owing to the difficult terrain that required construction of numerous tunnels and bridges. The Mumbai-Ahmedabad High Speed Rail Corridor is being developed through joint financing by the MoR and the governments of Maharashtra, Gujarat, and Dadra & Nagar Haveli.

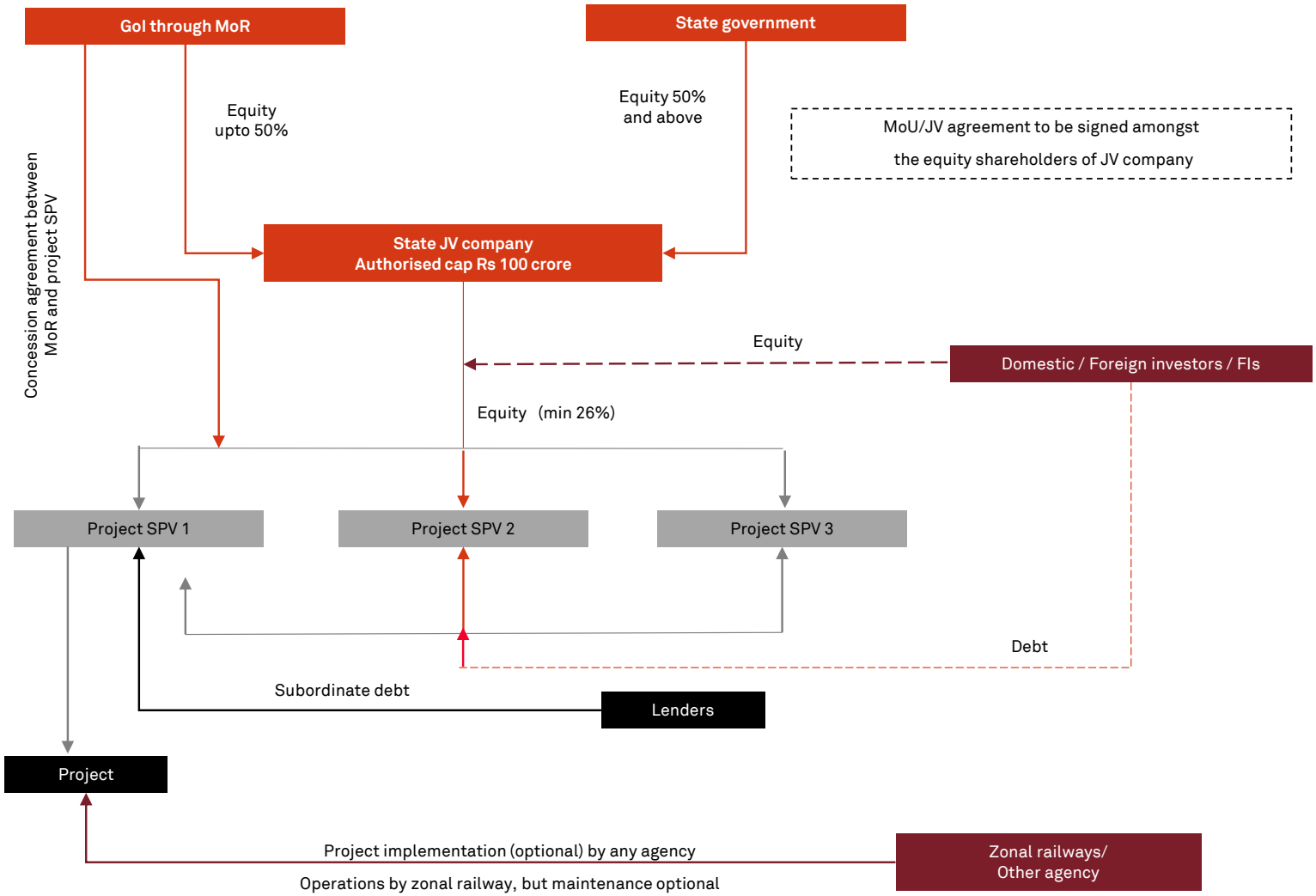
Apart from the Konkan Railways, the state governments have been involved in financing of various projects such as gauge conversion projects and port connectivity projects. However, these projects were conceived and implemented on a case-to-case basis in the past, primarily under the participative models for rail connectivity provided by the MoR.

In 2016, the railways introduced a model for formation of JV companies with state governments to institutionalise a framework for states to participate in identification, financing and implementation of railway projects. Since its inception, around 20 states have signed up for the programme. Of these, Andhra Pradesh, Assam, Chhattisgarh, Gujarat, Haryana, Jharkhand, Kerala, Madhya Pradesh, Maharashtra, and Odisha have already formed JV companies with the Railways.

Key features of JVs

The proposed model enables the state government to play a larger role in development of railway infrastructure within the state. Further, it also provides a leeway for financing by other entities including private players, lenders and multilateral agencies. Key projects that can be undertaken by JV companies include port connectivity, mine connectivity, new line, suburban railway, or other critical projects mutually identified by the ministry and state governments. The existing sanctioned projects such as new line, doubling and gauge conversion may also be taken up by the JVs. The companies can take up numerous projects by incorporating multiple project special purpose vehicles (SPVs).

General structure of a JV company funding multiple projects



Key features of JV companies of MoR with state governments

Sr. no.	Particulars	Features
1	Objectives of the JV	• Development, implementation and financing of mutually identified commercially viable railway projects • Prioritisation of critical connectivity and capacity augmentation projects for various states
2	Structure of the JV	• State JV company is a government company by the virtue of its shareholding, i.e., 49% equity shareholding by MoR and 51% by state government
3	Activities to be undertaken by the JV companies	• Incorporation and equity funding of SPVs incorporated to undertake specific projects • Undertaking railway projects after establishing project viability or VGF to enable optimal utilisation of funds
4	Enhancement of viability	• State government may provide land for the project free of cost, if necessary • Project scope may entail other non-railway revenue streams such as commercial exploitation of land for robust business model
5	Applicability of investors other than MoR and state government	• Other investors may contribute a maximum of 74% equity, and MoR and state government will maintain at least 26% equity share in individual project SPVs
6	Other funding sources	• Project SPV may avail debt from lenders/multilateral agencies

Key benefits of the proposed JV companies

The proposed JV companies create a win-win situation for both the ministry and respective state governments. The ministry gets support in project conceptualisation, implementation, financing and coordination from the state government. On the other hand, the states can have a bigger role in the entire lifecycle of the projects. It also enables the state governments harness synergies through coordinated planning of other infrastructure in the state, for instance, rail connectivity for new or existing industrial zones. Further, it enables the state government to play a role in rail infrastructure development on a consistent, and not the erstwhile case-to-case basis.

Apart from state governments, the programme is also drawing interest from several companies and private investors. Companies with manufacturing units located in the hinterland are looking at rail connectivity for transportation. An example is automobile major Maruti, which requires broad gauge connectivity for movement of its vehicles produced in the Sanand manufacturing plant in Gujarat. The company is working with Gujarat Infrastructure Development Corporation and G-RIDE (a JV of the Gujarat government and MoR) on a ~Rs 500 crore project to convert the Kalol-Katosan-Chanasma-Ranuj line from meter to broad gauge. Similar projects have been identified in Chhattisgarh, which will benefit various coal and cement companies.

Way forward

Commercial viability of projects is one of the most important criteria for the projects to be identified and implemented by the JV companies. The establishment of commercial viability of the project is relatively easier in case of industrial connectivity, mine connectivity or port connectivity projects, as there is a level of certainty of goods traffic that can make the line viable. Further, the prospective commercial viability is better for gauge conversion, doubling or tripling projects as there is pre-established traffic on the line. In case of new lines, it might be comparatively difficult to establish the commercial viability due to lack of traffic history and involvement of comparatively higher capex. Therefore, it appears that JV companies will be better placed to undertake mine/ port/industry connectivity projects, doubling, tripling or fourth line.

Further, as the formed JVs have the mandate of undertaking railways infrastructure development on a continuous basis and will often have a pipeline of projects, they may require robust policy frameworks and processes for effective implementation. These frameworks shall include mechanisms for identification, conceptualisation, prioritisation, appraisal, and financing (to identify strategic investors) of projects.


Airp rt

Infrastructure Advisory

2017 score	2018 score	2019 score
6.1/10	**6.4/10**	**6.6/10**

Summary

Parameters	Drivers	Drags
Policy direction	• Continued thrust on greenfield airport development • Hike in foreign direct investment (FDI) in airlines to provide impetus to Air India divestment • Continued focus on asset monetisation	• Need to fast-track brownfield expansion • No update on adoption of pre-determined structure for development of greenfield airports
Institutional maturity and strength	• Broad basing of private developers – set to manage 60% of overall traffic • State government agencies active in undertaking greenfield airport development • Parliament passed Airports Economic Regulatory Authority or AERA (Amendment) Bill, which is expected to reduce regulatory delays	• Need to significantly augment capacity of AERA. Also, delay in tariff orders is a concern for privatised airports and has to be addressed • Need for a separate dispute resolution entity
Financial sustainability	• PPP airports garner high revenue margins from non-aeronautical activities • Implicit assurance of aero revenue for the developers	• Temporary pause in traffic growth • Tariff uncertainty affecting airports' financials • Need to reduce airlines' cost – bring aviation turbine fuel (ATF) under GST, leader in maintenance, repair and overhaul (MRO)
Implementation ease	• Returns from airports have been high for private players • Under the NextGen Airports for Bharat (NABH) Nirman initiative, efforts to minimise approval risks are being considered	• Delay in statutory approvals, especially for land acquisition, has significant impact on project cost • Delay in operationalisation of routes awarded under the Ude Desh ka Aam Naagrik (UDAN) scheme; only a quarter of the routes are operational

Parameter	Evaluation criteria	Weightage	InfraInvex score		
			2017	2018	2019
Policy direction	Policy consistency	10	7	7	7
	Public financing support	10	6	6	6
Institutional maturity and strength	Entity implementation capacity	10	8	8	8
	Financing models	10	6	7	8
	Regulatory robustness	10	5	6	7
Financial sustainability	Cost recovery	20	12	14	14
	Demand risk	10	6	6	5
Implementation ease	Track record	10	6	5	6
	Externalities	10	5	5	5
		100	**61**	**64**	**66**

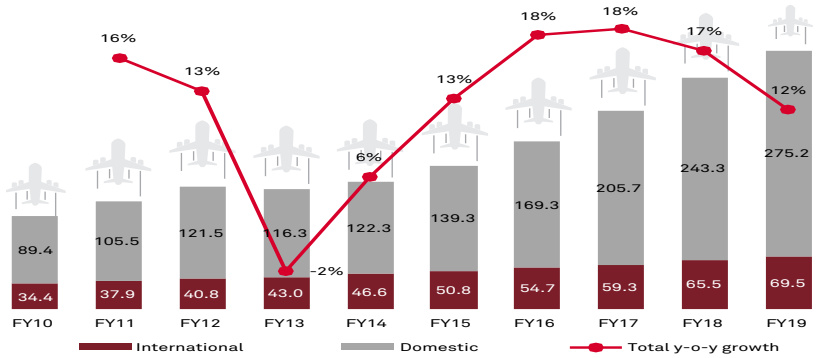
Sector performance and trends

India's aviation passenger traffic grew the fastest in the world for the fourth consecutive year, surging 18.6% on-year in 2018, followed by China's 11.7%, as per the International Air Transport Association. The position of India and China in the top three by passenger throughput alone establishes the global shift towards the Asia-Pacific region. The global air passenger traffic shift to the Asia-Pacific region could be attributed to a number of factors: robust economic growth, rising per capita income, urbanisation, increasing domestic pairs, and affordable air services, to name some.

- Between fiscals 2009 and 2019, international passenger traffic in India carried by scheduled carriers increased at 8.2% CAGR to 69.5 million passengers. Domestic passenger traffic rose at 13.5% CAGR to 275.2 million passengers

Growth in passenger traffic

Growth in passenger traffic of scheduled carriers in India (million)



Source: AAI

- Though the sector showed persistent growth till fiscal 2019, growth has been muted in the current fiscal with only 0.3% on-year increase in total traffic in the first half

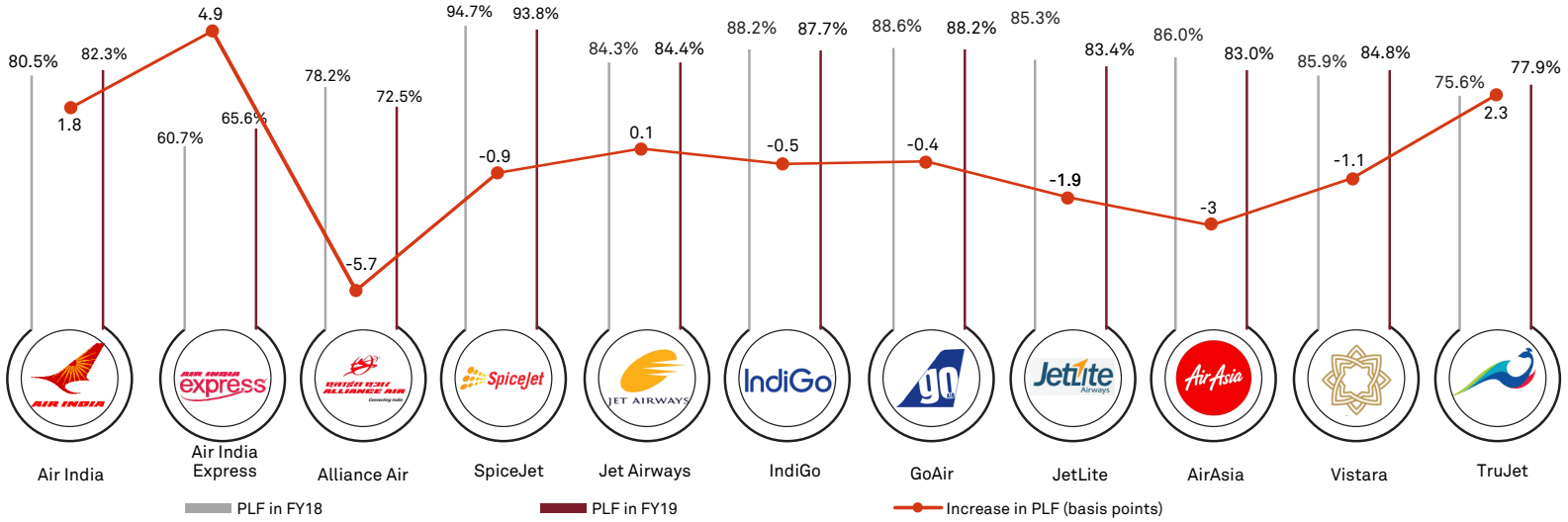
- After the cessation of services by Jet Airways in the current fiscal, 13 airline operators[33] are operating domestic flights (passenger and freight). In fiscal 2019, IndiGo continued to be the market leader with 42% share, followed by Jet Airways at 14% and SpiceJet at 13%. Loading was over 80% for all three that year[34]. SpiceJet had the highest passenger load factor (PLF) among all scheduled airlines at 94%. Strong growth in domestic passenger traffic was also reflected across overall PLFs for majority of airlines

- Post grounding of Jet Airways, IndiGo, and SpiceJet gained the most; their current market shares as of September 2019 stood at 49% and 15%, respectively

[33] *Source: Fleet Statistics of Scheduled Indian Operators, Directorate General of Civil Aviation (DGCA)*

[34] *DGCA*

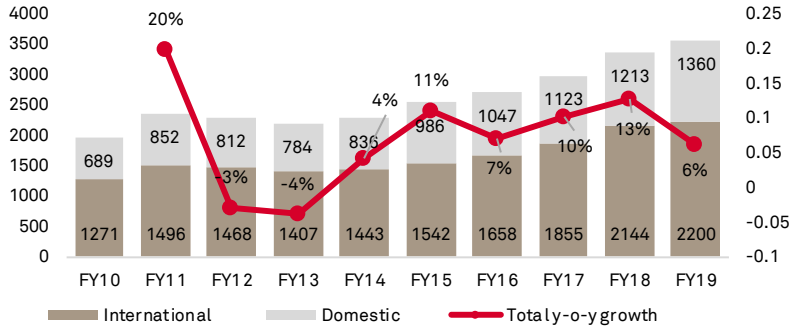
Comparison of domestic PLF across scheduled carriers (FY19 versus FY18)



Source: DGCA

Growth in air cargo

Growth in freight traffic of scheduled carriers ('000 tonne)



Source: AAI, DGCA

- International air cargo traffic increased at 6.3% CAGR between fiscals 2010 and 2019, to 2.2 million tonne, whereas domestic grew 7.8% to ~1.36 million tonne
- Air freight capacity of all airports in the country is ~4.63 million tonne[35] with overall utilisation at ~75% as of 2018
- The National Air Cargo Policy aims at boosting air cargo traffic majorly driven by growing e-commerce and improved air connectivity to smaller airports in the country

[35] *Source: https://timesofindia.indiatimes.com/business/india-business/air-cargo-volumes-to-grow-by-60-infra-still-a-concernreport/articleshow/63596183.cms, April 3, 201; accessed on September 10, 2018*

Passenger traffic across major metro airports

- Overall passenger traffic in the six metro airports in India grew 8% on-year in fiscal 2019, crossing the 200-million mark to 219 million. Delhi handled the highest traffic
- As per recent rankings released by the ACI, Bengaluru (at first place) and Hyderabad (third) were among the fastest growing airports in the world, in the above-15-million passengers category
- The six airports handle ~60% traffic in the country, with Delhi and Mumbai routing ~30%

Private sector participation

Performance of private airports

- The Airports Authority of India (AAI) manages 128 airports across India, which includes 11 international airports and over 80 domestic airports besides custom airports and civil enclaves at defence airfields. The AAI also provides air traffic management services over the entire Indian airspace and adjoining oceanic areas, with ground installations at all airports and 25 other locations to ensure safety of aircraft operations
- However, five airports - Delhi, Mumbai, Hyderabad, Bengaluru, and Kochi - are privately operated and cater to over 50% of the country's passenger traffic
- The increase in revenue of these PPP airports has been more than 10% on-year, owing to robust growth in the domestic market as well as improvement in operational efficiency
- Even the AAI's revenue receipt from these private airports increased at 22% CAGR between fiscals 2007 and 2017, thereby almost doubling its share in the revenue pie to 31% from 14%
- Mumbai and Delhi airports have been consistently ranked highest in the best airports category and best passenger service by Airport Service Quality in 2018 as well
- The Navi Mumbai International Airport, which is again a PPP airport, commenced construction in February 2018. Other airports, including Nagpur, Pune, Jewar, and Bhogapuram, are in various stages of development through the private mode
- Recently, the AERA Act was amended and the threshold for definition of a major airport raised to 3.5 million passengers per annum. This move will significantly bring down the number of airports that will fall under AERA's purview, thereby addressing the capacity constraints at AERA airports, resulting in speedy tariff determination process and dispute resolution

New models of private sector participation

- The central government is actively pursuing privatisation of government-owned airports in a bid to increase operational efficiency and develop city-side infrastructure
- Even though the award of O&M process by the AAI for Ahmedabad and Jaipur airports last year received a lukewarm response from private players, the drive to completely privatise six airports (Ahmedabad, Jaipur, Lucknow, Mangalore, Trivandrum, and Guwahati) received an overwhelming response. Many established players, including GMR Airports, Autostrade Indian Infrastructure Development Pvt Ltd, PNC Infratech Ltd, National Investment and Infrastructure Fund-Zurich Airport International AG, AMP Capital, Adani, I-Investment Ltd, and Kerala State Industrial Development Corporation, and Cochin International Airport participated in the bid process, despite a tight submission schedule
- The transaction involved privatisation with a change in the bid parameter from revenue share to per passenger fees to be offered to the authority
- Adani emerged as the highest bidder and won the concession to operate, manage, and develop all the six airports. The process of transfer of these airports is in progress. On the back of a successful round one of privatisation, the authority is preparing for the next round, of another six airports. The tentative list includes Indore, Raipur, Bhubaneshwar, Tiruchirapalli, Varanasi, and Amritsar

Sector outlook

For the airlines industry

- Air passenger traffic growth has slackened from double-digits in fiscal 2019 to 3-4% in the current fiscal
- Around 13 private carriers (excluding Jet Airways) and three national carriers posted aggregate operating loss of Rs 7,088 crore in fiscal 2019, as per a Lok Sabha query reply
- A key cost component for airlines in India is aviation fuel and, now, maintenance cost. As the fleet is aging, maintenance cost as a proportion of total cost is shooting up, directly impacting profitability. IndigGo's second quarter results for this fiscal show maintenance cost has shot up $250 per hour on-year
- Moreover, weak market sentiment prevails. Although the average ticket price has inched up, revenue has plummeted. As per the Centre for Asia-Pacific Aviation, though, demand is expected to pick up in fiscal 2021 and smoothen out the dips in earnings of these airlines
- Both IndiGo and SpiceJet are planning heavy expansion, evident from their order books. Over 850 aircraft are pending for delivery
- Going forward, stability in currency and ATF prices should ensure a stable long-term positive outlook for the sector

For regional connectivity scheme UDAN

- The Centre has promised a fund allocation of Rs 1,200-1,800 crore annually to sustain UDAN in next few years
- In the three rounds of bidding under the scheme, 128 routes were bid out in the first round, 325 in the second, and over 350 in the third
- UDAN 3.0 also includes tourism routes, seaplanes for connecting water aerodromes, and routes in the north-east
- Almost one quarter of the routes awarded under UDAN are operational till date. The scheme is steadily establishing the much-needed air connectivity in the underserved and unserved areas
- The Ministry of Civil Aviation also announced UDAN International for international air connectivity between select international destinations and Indian states. Under the draft scheme, eight routes were identified - six from Guwahati and two from Vijayawada. SpiceJet operated its first flight between Dhaka and Bangkok in July, 2019
- The government has offered subsidies in the form of VGF to incentivise the operators of UDAN routes. Some of the states have also announced incentives such as tax reimbursement, underwriting of non-VGF seats, and exemption from certain airport charges

For airports

- The Centre plans to invest Rs 1 lakh crore over the next five years to build 100+ airports. The move is to strengthen connectivity with small towns and also a few villages, which will ultimately provide impetus to economic development of these regions
- The NABH Nirman initiative, announced in the Union Budget 2018-19, aims to expand airport capacity by more than five times, to handle 1 billion trips a year in the next 10-15 years
- The government is actively pursuing the plan of privatising a few existing airports to enhance operational efficiency as well as develop city-side infrastructure
- Both Centre and states are working in conjunction to address the need for providing a second airport in metro cities, where existing airports are nearing saturation
- The government had granted in-principle approval for the construction of 20 greenfield airports, of which three airports in Durgapur (West Bengal), Shirdi (Maharashtra), and Pakyong (Sikkim) have been commissioned

- The AAI has pledged to invest Rs 25,000 crore[36] by fiscal 2023, in new terminals, terminal expansion, runway extension, strengthening and resurfacing of runways, etc.
- Pushing ahead on modernisation and digitalisation of existing airports, the government has launched 'DigiYatra' on a pilot basis at various airports
- The government is also aiming at training 600 pilots each year and double the fleet size to 1,220+ aircraft by 2025

Key challenges

- **Mandatory route dispersal guidelines**
  Under these, airlines are mandated to fly a certain percentage of flights in smaller, unprofitable air routes. This creates over-capacity on certain routes owing to anomalies in demand-supply in these markets. A plausible solution may be a demand-supply and auction-driven award of routes under Regional Connectivity Scheme (RCS) to provide relief to the airlines.
- **High cost, low yield**

  Airlines are saddled with high cost elements such as airport charges, maintenance, employee cost, taxes and fuel cost. This, combined with cut-throat competition, results in lower yield per passenger, in turn affecting profit margins.
- **Tax burden on ATF**

  Talks are on to bring ATF under the GST regime. But the current tax burden has been hurting the aviation industry for a while now. ATF prices are inclusive of 11% basic excise duty. An additional 5% basic customs duty and 11% additional customs duty is also applicable in case of imported ATF. State sales tax ranging from 20% to 30% is levied on top, with the exception of a few states (Andhra Pradesh for example), and city-specific relaxation provided by respective state governments.
- **UDAN – Not soaring high yet**
  As mentioned earlier, only 25% of the awarded routes have been operationalised under UDAN, mainly owing to lack of slot availability at major airports to serve the growing traffic of passengers and delay in development of infrastructure at regional airports.
- **Delay in capacity enhancement**
  The country's top six metro airports, catering to more than 50% of passenger traffic, are operating well above 100% capacity. Though most of them have planned capacity expansion in the past few years, regulatory delay and lower allowable yield have affected progress.

Way forward

- **Bring ATF under GST**
  Since ATF contributes 30-40% of an airline's expenses, including it under GST would provide relief by lowering the tax burden by 20-25%. The Centre is gearing up for discussions on GST 2.0, where bringing ATF under GST's ambit will be a priority.
- **Implement policy framework for MRO, and aircraft financing and leasing**
  Indian airlines are already incurring high cost of maintenance due to aging fleet. That, coupled with limited MRO facilities domestically, is a double whammy for the industry. Additionally, ~80% of aircraft in India are on operating lease from Ireland. The Union Budget 2019-20 had a sharp focus on the development of MRO facilities as well as the ecosystem of aircraft financing and leasing. The time is ripe for formulating and implementing a suitable policy framework for this sector, with desired interventions in a time-bound manner.
- **Curate a project prioritisation list**
  Unlike developed countries, where the government comes out with a list of priority projects annually (or half yearly), the focus on

[36] *AAI*

planned development is still rudimentary in India. Related ministries must urgently identify project pipelines based on current capacity utilisation and targeted traffic growth to address the demand-supply gap. The government is planning to privatise a second round of six airports, but if this is undertaken in a planned manner with announcement of projects well in advance, it will help private players plan their investments and business models efficiently.

- **Encourage collaboration between the government and private sector**
  An investment of $45-50 billion is required by 2030, to achieve the target set by the government for the sector. However, the government alone cannot make such a huge investment. Increased investment from the government and private players to achieve holistic development -- with private players investing in commercially attractive airports and government funding development of Tier 2 and three non-profitable airports -- is the need of the hour.

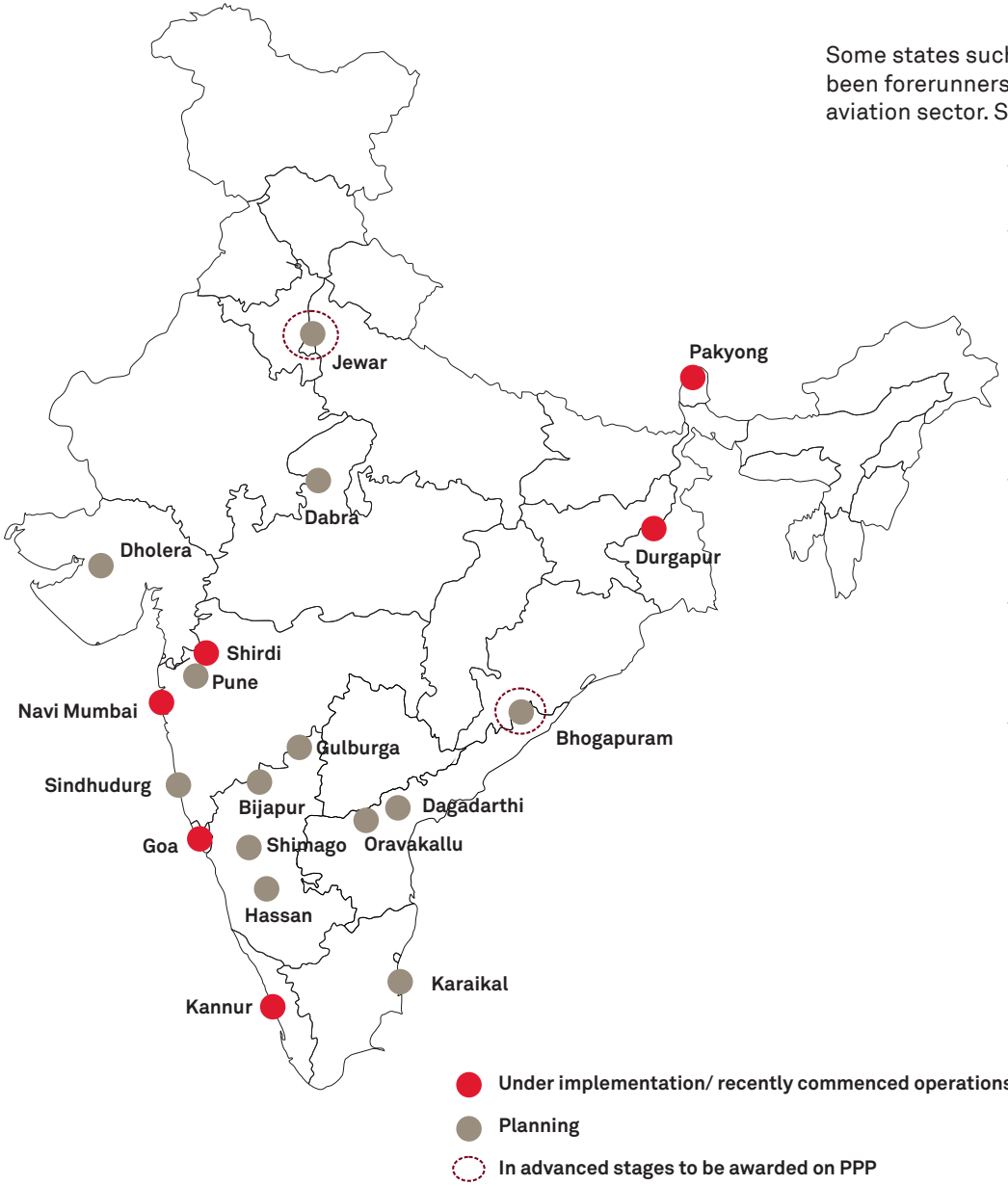
Role of state governments in the civil aviation sector

Connectivity and airport infrastructure are focus areas

Development of the civil aviation sector is important in achieving the government's ambitious target of making India a $5 trillion economy by 2025, and the role of state governments in facilitating growth needs to be underscored. In recent times, states have played a vital role in the augmentation of UDAN.

Besides, the Centre may not be able to achieve and implement all the initiatives and measures laid out in the National Civil Aviation Policy, 2016, for establishing strong air connectivity in the country, without adequate support from the states. State governments, through their agencies, have invested in various airports in the country, for example, Karnataka State Industrial and Infrastructure Development Corporation Ltd in Bangalore International Airport, Government of Andhra Pradesh in Hyderabad International Airport, City and Industrial Development Corporation in Navi Mumbai International Airport, etc.

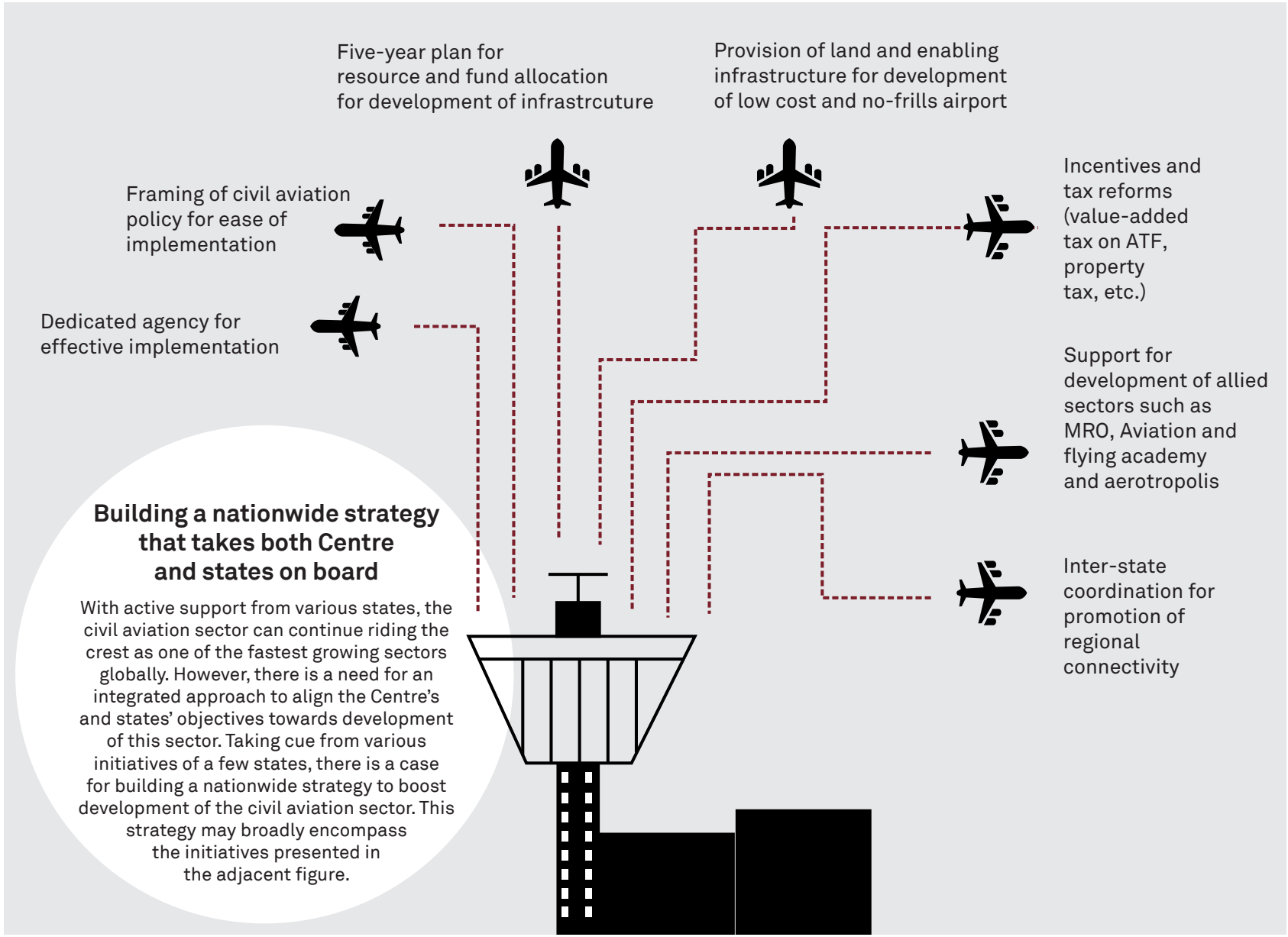
In fact, at present, state-led agencies are running the show for development of airport infrastructure and establishing connectivity, be it second airports in metro cities (Navi Mumbai, Jewar, Pune, Goa) or greenfield airports (Shirdi, Bhogapuram, Dholera), as charted in the following figure.



Some states such as Gujarat, Maharashtra, and Andhra Pradesh have been forerunners in implementing measures to actively promote the aviation sector. See the table below for details.

Measures	Example of schemes implemented by states
Establishing an independent aviation agency	Gujarat State Aviation Infrastructure Company Ltd, Maharashtra Airport Development Corporation, Andhra Pradesh Aviation Development Corporation Ltd
Drafting state-specific civil aviation policy	Gujarat, Andhra Pradesh, Rajasthan, Maharashtra
Incentives to boost regional connectivity	Madhya Pradesh, Uttar Pradesh, Andaman & Nicobar Islands

Source: CRISIL analysis



Building a nationwide strategy that takes both Centre and states on board

With active support from various states, the civil aviation sector can continue riding the crest as one of the fastest growing sectors globally. However, there is a need for an integrated approach to align the Centre's and states' objectives towards development of this sector. Taking cue from various initiatives of a few states, there is a case for building a nationwide strategy to boost development of the civil aviation sector. This strategy may broadly encompass the initiatives presented in the adjacent figure.

Ports & shipping

2017 score	2018 score	2019 score
6.6/10	6.7/10	6.6/10

Summary

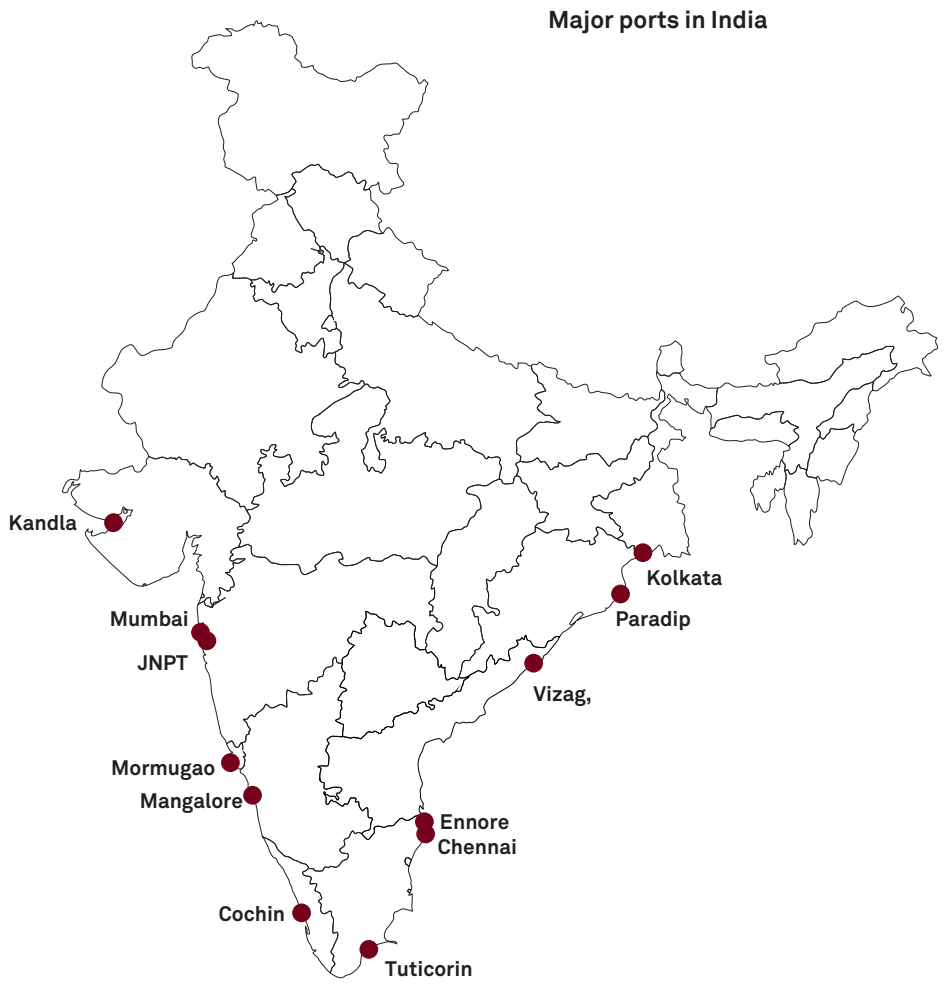
Parameters	Drivers	Drags
Policy direction	• Nominal increase in budget outlay • Better utilisation of assets in major ports – land, berth and cargo push • Big positive changes in the model concession agreement	• Interchangeability of cargo not allowed even in the revised model concession agreement • Need to create and empower maritime boards at the state level
Institutional maturity and strength	• Significant thrust by the Ministry of Shipping (MoS) on apex port bodies such as major ports trusts and Sagarmala Development Company Ltd (SDCL) to build/improve port infrastructure and traffic	• Tariff Authority for Major Ports (TAMP) guidelines disadvantage for existing PPP operators in major ports (tariff not market-linked, gets revised every three years) • Major Port Authorities Bill has still not been passed; hence, corporatisation of major ports has not taken off, and TAMP has not been abolished
Financial sustainability	• Most PPP projects have transferred market risk to the private sector, making the player responsible for the traffic	• With downturn in trade, many ports experiencing over-capacity; there is an increase in cost pressure
Implementation ease	• The government's push for direct port delivery, RFID solution and port community system is helping in seamless movement of traffic; it is reducing dwell time and transaction cost • Improvement in TAT from 82.32 hours in fiscal 2017 to 60.48 hours in fiscal 2019	• Slow pace of Sagarmala; only one-fifth of the project completed • Environmental clearances for greenfield projects are a concern • Time taken for concept-to-implementation of greenfield ports inordinately long

Parameter	Evaluation criteria	Weightage	InfraInvex score		
			2017	2018	2019
Policy direction	Policy consistency	10	7	8	7
	Public financing support	10	6	6	7
Institutional maturity and strength	Entity implementation capacity	10	7	7	7
	Financing models	10	8	8	7
	Regulatory robustness	10	6	6	6
Financial sustainability	Cost recovery	20	13	13	12
	Demand risk	10	6	6	6
Implementation ease	Track record	10	7	7	8
	Externalities	10	6	6	6
		100	**66**	**67**	**66**

Sector performance and trends

Indian ports - Key characteristics

- India has a 7,517 km long coastline, interspersed with 12 major ports and about 200 non-major ports, of which only one-third are operational
- Most cargo ships that sail between East Asia and America, Europe, and Africa pass through Indian territorial waters
- Indian ports handle more than 95% of the country's foreign trade in volume terms and 70% in value terms; thus, they play an important role in India's export-import (exim) trade
- Major ports are under the jurisdiction of the GoI and governed by the Major Ports Trust Act, 1963, with the exception of Ennore Port, which is the only corporatised major port and is governed by the Companies Act, 1956. Non-major ports fall under state governments
- 14,500 km of potentially navigable inland waterways also present a great opportunity towards providing alternate mode of transport for domestic movement of cargo, which is also energy and cost-efficient



Cargo traffic scenario

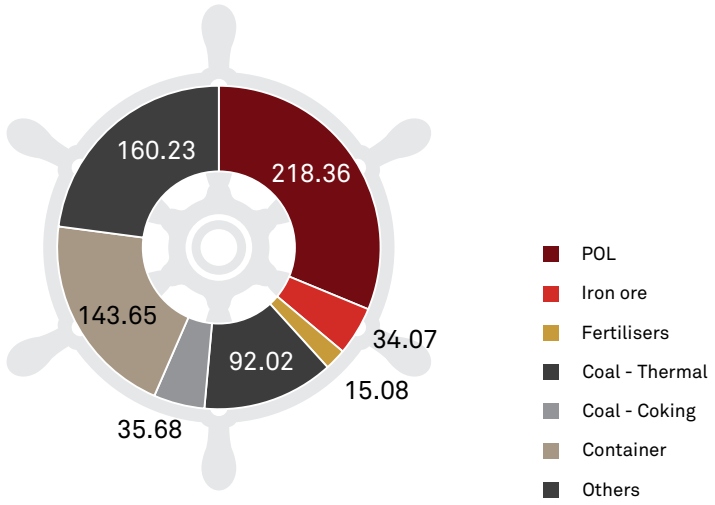
- Cargo traffic at ports logged 5% CAGR between fiscals 2014 and 2019, and 6.1% last year. In the past one year, non-major ports have shown much higher growth rate (10.2%) compared with major ports (2.9%)

General cargo traffic at Indian ports (MT)

	FY14	FY15	FY16	FY17	FY18	FY19	Growth y-o-y %
Major ports	555.5	581.3	606.5	648.4	679.4	699.05	2.9
Non-major ports	417	471	465.9	485.3	528.56	582.59	10.2
Total traffic	**972.5**	**1,052.2**	**1,071.8**	**1,133.7**	**1,207.93**	**1,281.69**	**6.1**

Source: MoS, Indian Ports Association

Composition of cargo traffic at major ports in FY19 (MMTPA)

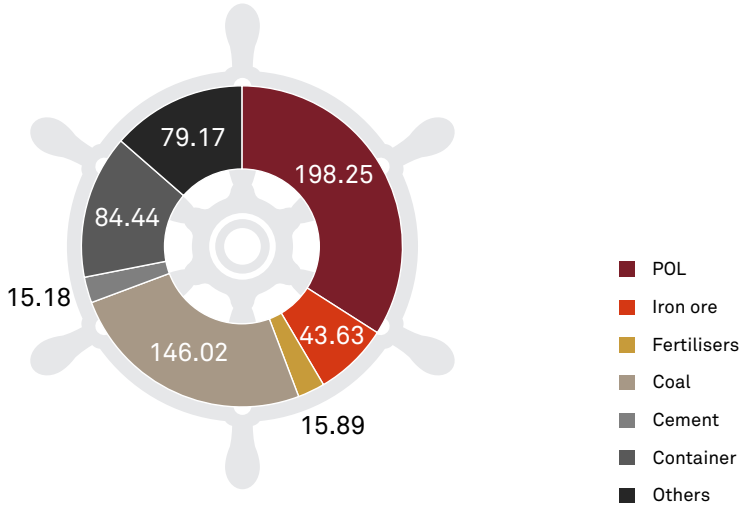


MMTPA - Million metric tonne per annum
Source: Indian Ports Association

- Cargo traffic at major ports clocked a meagre 4.6% CAGR between fiscals 2016 and 2019. On-year growth came down in the past one year to 2.9% (from 4.7% during fiscals 2017 and 2018); slump in iron ore along with flat growth in petroleum, oil and lubricants (POL) pulled down the overall volume
  - Traffic in POL (almost one-third of cargo traffic) showed flat on-year growth of 3%
  - Iron ore traffic through major ports tumbled 17% as exports slowed in the previous fiscal
  - Fertilisers grew only 1.5% in fiscal 2019 as against 6% in the previous one
  - Growth of coal traffic, one of the key contributors, remained subdued at 3% (6%)
  - Container traffic grew at a pace of 9%, lower than the previous year's double-digit growth of 13%

- Non-major ports witnessed 7.7% growth between fiscals 2016 and 2019, and 10.2% growth in the past two fiscals
  - POL showed flat on-year growth of 3%
  - Iron ore and fertilisers traffic at non-major ports grew 18% and 24%, respectively, in fiscal 2019 (compared with 14% and 4% during fiscal 2018, respectively)
  - Coal traffic growth was subdued at 1% (8%)
  - Container traffic grew at 13%, much lower than the previous fiscal's growth of 29%
  - Cement witnessed stupendous growth of 15% compared with a 2% decline in the previous fiscal

Composition of cargo traffic at non-major ports in FY19 (MMTPA)



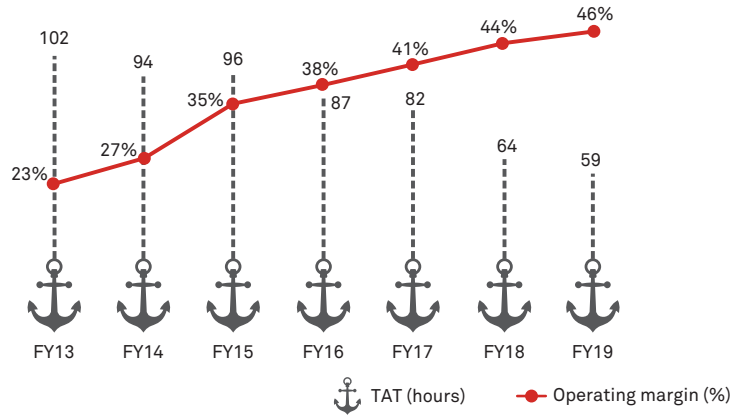
Source: Indian Ports Association

- **Growth in container traffic**
  - Container traffic over the past few years has been affected by slowdown in international trade
  - Though container traffic in the recent past has been witnessing a bumpy ride owing to geopolitical factors and downturn in domestic economic activity, the overall positioning and growth story of India remain strong and situation is likely to improve in the medium term

Operational efficiencies of major ports

Reduction in TAT has improved operating margin at major ports significantly from 23% in fiscal 2013 to 46% in fiscal 2019. TAT (measured by the total time spent by a ship from entry into a port until departure) declined at a rapid pace from 102 hours in fiscal 2013 to 59 hours in fiscal 2019. Drop in capacity utilisation has also helped in the improvement of TAT to some extent. Average output per ship berth day increased from 13,156 tonne in fiscal 2016 to 16,541 tonne during fiscal 2019.

Increase in operating margin with decrease in TAT



Source: MoS

Key efficiency parameters, such as average TAT and average output per ship berth, have improved because of policy interventions, procedural changes and mechanisation by the MoS. The average TAT at India's major ports reduced to 2.52 days from 3.43 days in the three fiscals to 2019, and berth productivity increased to 16,166 tonne per day from 14,576 tonne per day. In contrast, the average TAT at Rotterdam, Shanghai, and Singapore is significantly lower at 1.25, 0.83 and 1.33 days, respectively.

Thus, the road is still half travelled with respect to modernising vessel traffic management systems, digitalisation and elimination of manual forms, ensuring direct port delivery, installing container scanners, e-delivery orders, RFID-based gate-automation systems, etc. Port modernisation is also a key initiative under the Sagarmala Programme.

Private sector participation

- **Status of private sector participation**
  - Private sector participation in the ports sector has remained subdued in the past one year owing to various factors such as narrow-ranged port cargo growth of 4-5% and overcapacity
  - FDI of up to 100% under the automatic route is already permitted in the sector. This has resulted in several PPP port development and port modernisation projects coming up at major ports in the past; 32 PPP projects at an estimated cost of Rs. 27,300 crore and capacity 264.77 MTPA are under implementation[37]. However, the past two years have seen more or less restrained activity from private
- **Shift from service model to landlord port model**
  - The government plans to convert 11 of the 12 government-owned ports to the landlord model. Ennore Port in Tamil Nadu is already corporatised
  - Though there have been talks on this over the past 2-3 years, not much has happened on the ground
  - Under the current service model, the port authority is responsible for operations of port assets. It also performs regulatory functions and employs labour for cargo handling amongst other things
- **Key policy initiatives**
  - Direct port delivery: This initiative was introduced with the objective of minimising delivery time, regularising the process of storing containers at ports and reducing logistics cost. The World Bank considers it as one of the key indicators of ease of doing business. Post implementation at Jawaharlal Nehru Port Trust (JNPT), it has been introduced at other ports as well. However, various other ancillary issues related to stakeholders, such as container freight station operators, transporters, and importers/exporters, are cropping up, which would require some re-modelling on the concept by the government.
  - Push for monetisation of land at major ports: Major ports hold 2.58 lakh acres of land, a fifth of which is believed to be surplus. Much of this land falls in prime cities such as Mumbai, Kolkata and Chennai. As part of the larger government plan to monetise public assets, the Department of Investment and Public Asset Management is preparing 6-7 models for monetisation of brown-field assets with the public sector, including those with major ports.

Inland waterways

Inland water transport (IWT) is widely recognised as an environment-friendly and cost-effective mode of transport. As per the RITES report of 2014 on "Integrated National Waterways Transportation Grid", some of the important benefits of IWT mode compared with rail and road transportation are fuel efficiency and cost savings; 1 L of fuel moves 24 tonne-km on road, 95 tonne-km on rail and 215 tonne-km on IWT. The rupees per tonne comparative cost of movement of freight by road is Rs 2.5, rail Rs 1.36 and waterways Rs 1.06. In addition to the economic and environmental benefits, inland waterways are aimed at creating an alternative mode of transport to road and rail.

The Inland Waterways Authority of India is the implementing agency to ensure that projects on national waterways (NWs) are qualitatively executed in a time-bound manner.

[37] *https://www.ibef.org/download/Ports-September-2019.pdf*

Major NWs

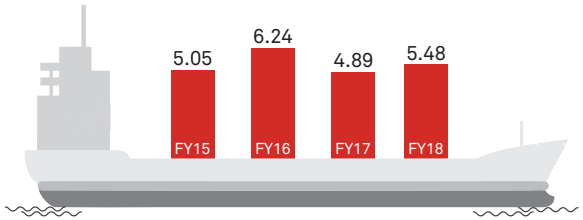
NW	Details of stretch	Length (km)	Year declared as NW
NW-1	Ganga–Bhagirathi–Hooghly river system, from Allahabad to Haldia in Uttar Pradesh, Bihar, Jharkhand and West Bengal	1620	1986
NW-2	Brahmaputra River from Sadiya to Dhubri in Assam	891	1988
NW-3	West Coast Canal from Kottapuram to Kollam, along with Udyog Mandal and Champakara canals in Kerala	365	1993
NW-4	Kakinada–Puducherry Canal along with Godavari and Krishna rivers in Andhra Pradesh, Maharashtra, Karnataka, Tamil Nadu and Puducherry	1095	2008
NW-5	East Coast Canal integrated with Brahmani River, and Mahanadi River Delta in West Bengal and Odisha	588	2008

- **Jal Marg Vikas Project - NW-1**

  The Inland Waterways Authority of India has entered into a loan agreement with the World Bank for $375 million for the Jal Vikas Marg Project. Under this project (NW-1 on River Ganga), the government has undertaken:

  – Augmentation of navigation capacity on the Varanasi-Haldia stretch; construction of multi-modal terminals at Varanasi, Haldia, and Sahibganj; and construction of new navigational lock at Farakka being developed at a cost of Rs 1,327 crore

Cargo traffic on NW-1 (MMT)



Source: Inland Waterways Authority of India

– Identification of technology for easier navigation across waterways such as open river technique, night navigation facilities, modern river information system, and modern methods of channel marking

– The Jal Vikas Marg Project, which is expected to be completed by March 2023, is being implemented with the financial and technical support of the World Bank. The project will enable commercial navigation of vessels of capacity of 1500-2,000 tonne on NW-1

– The first consignment containing food and beverages set sail from Kolkata to Varanasi in October 2018

– The project entails construction of three multi-modal terminals (Varanasi, Sahibganj and Haldia), two inter-modal terminals, five roll-on roll-off terminals, new navigation lock at Farakka in West Bengal, assured depth dredging, integrated vessel repair and maintenance facility, differential global positioning system and river information system

Apart from NW-1, infrastructure development works in NW-2 (Brahmaputra), NW-3 (Kerala), NW-5 (East Coast Canal in West Bengal and Odisha), NW-16 (Barak in Assam), NW-37 (Gandak in Uttar Pradesh and Bihar), NW-40 (Ghaghra in Uttar Pradesh and Bihar), NW-58 (Kosi in Bihar), NW-97 (Sundarbans in West Bengal), NW-68 (Mandovi in Goa), NW-111 (Zuari in Goa), and NW-27 (Cumbarjua in Goa) are under progress.

Implementation of Sagarmala Programme

The GoI launched the Sagarmala Programme in July 2015 to address the gaps and undertake port modernisation, better port connectivity, port-led industrialisation and coastal community development. The programme is based on these four key pillars and comprises 574 projects across 19 states.

Sagarmala Programme - Overview[38]

Theme/pillar	Number of projects	Value of projects
Port modernisation	236	Rs 118,376 crore
Port connectivity	235	Rs 235,708 crore
Port-linked industrialisation	57	Rs 240,234 crore
Coastal community development	66	Rs 7,369 crore

Source: SDCL website

- **Port modernisation**
  - Projects have been identified to increase capacity above 3,500 MMTPA to cater to the projected traffic of 2,500 MMTPA by 2025
  - 116 projects have been identified across 12 major ports to unlock 100 MTPA capacity, of which, 96 initiatives have been implemented, unlocking 80 MTPA
  - RFID-based gate-automation system is being implemented at all major ports
  - Direct port delivery system is being implemented for faster clearance
- **Port connectivity**
  - More than 50% of rail connectivity projects under Sagarmala are under implementation through various agencies such as Indian Port Rail Corporation Ltd, a JV between major ports and Rail Vikas Nigam Ltd
  - 112 road projects of length 8,584 km, which will enhance last mile connectivity, have been identified
  - More than 20% of the projects are in various stages of implementation
  - 15 multi-modal logistics park projects have been identified, of which, 10 are under implementation
- **Port-led industrialisation**
  - Total 57 industrialisation projects have been identified, of which, 18 are under implementation
  - Port-linked special economic zone under implementation at JNPT is expected to attract investment of ~Rs 12,000 crore. However, progress on other coastal economic zones has been slow
- **Coastal community development**
  - 26 fishing harbour projects worth ~Rs 4,000 crore have been identified, of which, only seven are under implementation

Though the Sagarmala Programme and the projects identified have been conceived with a holistic view of port and maritime infrastructure development, the progress is slow. There is a lot of dependence on state government institutions for land and policy matters, which is causing delays. Subdued interest from the private sector in the recent years has added to the take-off problem.

Sector outlook

- **Container segment - Key growth drivers**
  The next phase of growth in cargo capacity handled is expected to be led by the container segment. Though global container movement has been sluggish over the past few years, it is expected to recover over the next 2-3 years. We also expect a pick-up in containerisation of wider variety of cargo in India. We expect container traffic to log 8-10% CAGR to reach ~21 million twenty-foot equivalent units (TEUs) in the next five years from current 13 million TEUs.
- **POL - Another key segment of growth**
  India's petroleum refining capacity stands at 230-250 MMTPA. Petroleum and its products account for ~30% of the exim volume of India. We expect the POL to be the major growth segment for overall growth of cargo capacity handled by ports.

[38] *As of September 2019*

Key challenges

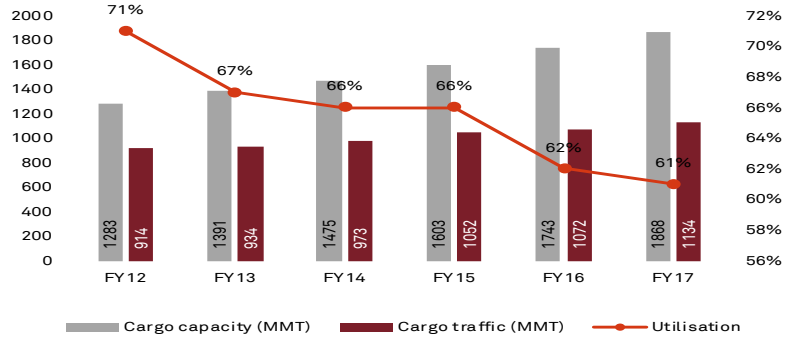
Overcapacity at ports

- Slowdown in cargo traffic in recent years
  - Slowdown in international trade has resulted in curtailed container traffic growth
  - Fall in coal imports following higher domestic production has lowered coal traffic
- Overcapacity has decreased capacity utilisation

Owing to a challenging global trade scenario in the past five years, India's port traffic logged a meagre 4% CAGR, whereas port cargo capacity clocked 8% CAGR. This resulted in a significant drop in capacity utilisation, from 71% in fiscal 2012 to 61% in fiscal 2017. In certain pockets, capacity utilisation fell below 50%.

Capacity utilisation at major ports dropped to 61% in fiscal 2017 from 80% in fiscal 2012.

Capacity utilisation at Indian ports



Source: MoS, Indian Ports Association

- **Existing players face problems with huge idle capacities**

  On the container front, the total container throughput is close to 13 million TEUs, but capacity is ~21 million TEUs, resulting in utilisation of ~65%.
  What is more concerning is further capacity addition, which is under construction and will get added in the short to medium term. With Adani Ports setting up container capacity at Vizhinjam on the west coast, and Dhamra and Ennore ports on the east, a mismatch between container terminals and cargo is imminent and a fight for volume is in the offing. Together, the three container terminals will add over 6 million TEUs.

  The upcoming container capacity on Indian shores is threatening the prospects of existing players, whose capacities are already idling. Many private operators are planning to exit and venture into other segments such as crude oil or cars.

Key initiatives and way forward

Policy related

- The Major Ports Authority Bill, the biggest structural reform of the major ports in India, was introduced in the Parliament in 2016, and was referred to the Standing Committee, which gave its recommendations in July 2017. But the bill is yet to be approved. Once passed in its current form, it will grant greater autonomy and flexibility to the major ports that are currently run as 'trusts'. Under the new provisions, the major ports will be run as authorities which is expected to professionalise their governance structure, helping towards speedier decision making and equipping them better to compete with private ports. This will also give autonomy to all the major ports to fix charges independently depending on competition as the regulatory framework will be handed over to the ports (currently, it is under TAMP, where any change in tariff has to be approved by the regulator). This would mean faster reaction to competition

- While the new model concession agreement has many positives for the private sector, such as change in equity holding to provide exit route, refinancing provision, provision of commercial operations before commercial operations date and many more, the absence of flexibility for change of cargo type is hurting private operators. The government can probably evaluate the same and do the needful to help existing private concessionaires

Role of states in facilitating Sagarmala Programme

- Though the MoS's Sagarmala Programme looks at holistic economic development through maritime development, projects identified under the four pillars of Sagarmala require support from state government agencies for faster implementation, more so for projects identified under port-led industrialisation and port connectivity to hinterland projects
- Since these projects will require support on land, industry, labour, etc, states' backing is crucial for the successful and faster development of projects. In fact, states need to come forward and push SDCL for faster implementation of projects as this would ultimately benefit the state economy the most

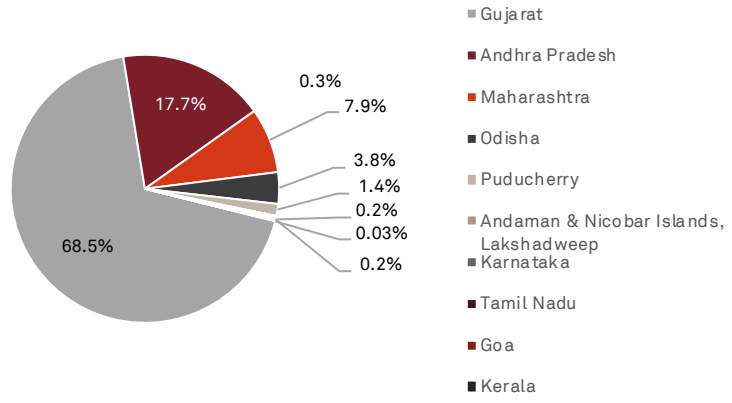
Contribution of states in maritime sector development

All coastal states have played a pivotal role in developing maritime infrastructure of India. While major ports fall under the administrative control of the MoS, non-major ports come under respective state maritime boards or governments.

In maritime states such as Gujarat, Maharashtra, and Tamil Nadu, port assets are transferred to respective maritime boards. Individual port facilities are either controlled by the board or leased out to port operating companies for terms ranging from 20 to 99 years.

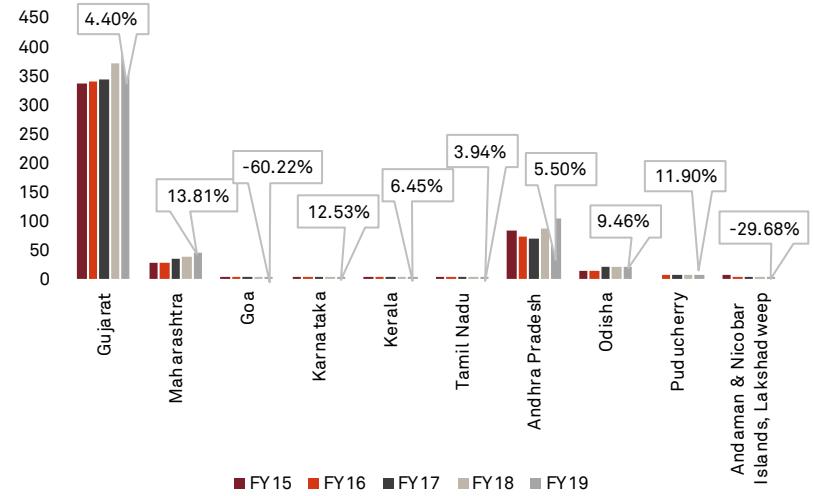
Out of the 200 non-major ports spread over nine states and four union territories, only about 50 are operational and manage 45% of the total cargo handled at Indian ports. The cargo at non-major ports clocked 8.11% CAGR in the past 10 years. Gujarat is the front-runner among maritime states, followed by Andhra Pradesh, Maharashtra and Odisha. Gujarat's non-major ports have become a hub for handling POL (50% of Gujarat's non-major port cargo). Maharashtra has seen the highest growth of more than 13% CAGR in the past five years owing to increase in iron ore and coal traffic, up at 23% and 9% CAGR, respectively.

State-wise share in non-major port cargo in FY19



Source: Indian Ports Association

State-wise 5-year traffic growth (MMTPA) and CAGR



Source: Indian Ports Association

Majority of non-major ports' growth comes from private cargo terminals at Mundra, Hazira, Dahej, Kandla, Dharma, Kattupalli, Pipavav, and Krishnapattanam.

Evidently, Gujarat has been most successful in development of port capacity among other maritime states. Formed in 1982, the Gujarat Maritime Board has been able to promote integrated port-led development supported by last mile connectivity and effective implementation of PPP in privatising port services, private jetties, joint venture ports, and greenfield ports. The board adopted various models for development such as captive jetties under the build-operate-maintain-transfer model, private ports under build-own-operate-transfer, private jetties under BOT, development projects in private terminals, rail linkage through private investments, development of shipbuilding and ship repair yards, coastal area development / ro-pax project and private participation in port services.

In order to promote the state maritime sector, different states have introduced maritime policies with the following strategic objectives:

- Ensure conducive environment for private sector investments in the maritime sector
  - Developing maritime infrastructure in the state through a mix of public funding and PPPs
  - Enhancing viability of maritime projects by mitigating competitive risks and providing fiscal incentives
  - Ensuring adequate connectivity infrastructure for maritime projects
  - Institutionalising transparency and fairness in awarding projects
  - Handholding private developers undertaking maritime sector projects
- Promote development and use of coastal shipping and inland waterways
- Ensure optimal utilisation of state's shoreline, coastal land and riverside
- Position the state as a prominent location in terms of industrial activity
- Develop and promote coastal and river tourism
- Develop and strengthen skills of local populace

States such as Gujarat, Maharashtra and Andhra Pradesh have revised their port and maritime policies in the past 3-4 years to address the new aspects of doing business. Recently, Gujarat government has adopted a policy for unlocking value in existing port infrastructure by allowing existing captive jetty holders to handle third-party cargo. The new policy emphasises on utilisation of in-place capacity of captive jetties which are under-utilised and also creates opportunity for new players to invest on development of new captive jetties. The Maharashtra government has pushed for port development by increasing the concession periods for development of greenfield ports and multi-purpose jetties from 35 years to 50 years, lowering the port and wharfage charges and permitting exim from multipurpose jetties. Other states also need to follow suit and

prepare robust policies and eco-system for the development of new-age ports and maritime infrastructure. Andhra Pradesh and Odisha, states with a vast coastline, need to push forward for setting up long-pending state maritime boards, which will act as a single-window facilitator to expedite development of minor ports.

A comprehensive development plan is required for around 150 non-operational minor ports by identifying their downstream industry, inter-related businesses and services in nearby regions. On similar lines, inter-state coordination is also essential to lay down common rules and guidelines to increase the movement of barges between states. This will lead to increase in conversion of coastal cargo into exim cargo. The MoS's proposed plan to create a national port grid and maritime clusters should necessarily address the aforesaid issues. Also, port connectivity (by road and rail) to the hinterland remains an area to be addressed, as it is severely affects port success. Further, identification and development of new inland waterways (non-nationalised) could provide connectivity to land-locked states, providing an efficient mode of inter-state cargo movement. The government needs to provide adequate support to private developers of non-major ports, as these matters can be best addressed by government bodies. State government policy support on land, industry, labour, etc, also plays a vital role in the success of projects, especially those taken up by the private sector.


Urban

Infrastructure Advisory

2017 score	2018 score	2019 score
4.5/10	**4.6/10**	**4.7/10**

Summary

Parameter	Drivers	Drags
Policy direction	• New focus areas: urban transport (Metrolite trains, FAME-2 scheme), waste-to-energy, and Climate Smart Cities programme	• Utilisation has not kept pace with the increased fund flow
Institutional maturity and strength	• Big push for data-driven e-governance • Staffing and skill augmentation of SPVs	• Institutional capacities have not kept the pace needed for reforms
Financial stability	• Increasing devolution of central funds • Continued interest in municipal bonds • Incremental investments from the private sector	• Gains from value capture financing and property tax reform initiatives are still elusive
Implementation ease	• Innovations in monitoring systems (Municipal Performance Index 2019, GIS mapping of cities)	• Pace of execution increased, but still short of expectations

Parameter	Evaluation Ccriteria	Weightage	InfraInvex score		
			2017	2018	2019
Policy direction	Policy consistency	10	6	6	6
	Public financing support	10	6	6	7
Institutional and maturity and strength	Entity implementation capacity	10	4	4	5
	Financing models	10	4	4	4
	Regulatory robustness	10	4	4	4
Financial stability	Cost recovery	20	9	9	9
	Demand risk	10	4	4	4
Implementation ease	Track record	10	4	5	4
	Externalities	10	4	4	4
		100	**45**	**46**	**47**

Cutting the Gordian knot

The Constitution (Seventy-Fourth Amendment) Act passed in 1992 came as a long overdue recognition of grassroots democracy and the scale and challenge of reforming urban India. It came into force on June 1, 1993, some 46 years after independence. More than 50% of the states ratified it.

Yet, urban local bodies (ULBs) have become weak and ineffective owing to a variety of reasons – absence of empowered local leadership, prolonged supersessions, and inadequate devolution of powers and functions, to name some. Thus, they are unable to perform effectively as vibrant democratic units of self-government, or be fully equipped to cope with the urbanisation challenge, a good 26 years on.

ULBs are, in fact, still seen functioning as extensions of state governments. State governments' approval is required even on matters of purely local jurisdiction, such as property tax revision.

The absence of functional and fiscal autonomy to discharge their responsibilities manifests in the form of local government revenues not being commensurate with their expenditure obligations. According to CRISIL Infrastructure Advisory, at 1% of GDP, India's urban local government revenues, including fiscal transfers, are woefully short of the minimum requirement of 3% of GDP.

On their part, ULBs have faltered in matters purely under their control, too. The archaic financial and accounting systems, the absence of regular financial audit, inadequate revenue mobilisation, and irresponsive city administration are some areas requiring anything from considerable improvement to a complete overhaul.

What about spending by states?

As per the Economic Survey for fiscal 2018, the net state domestic product (NSDP) at current prices increased from Rs 78.19 lakh crore in fiscal 2012 to ~Rs 122.37 lakh crore in fiscal 2016. Maharashtra and Tamil Nadu have the highest NSDP.

In terms of national revenue expenditure, the share of urban development in development expenditure rose to 4.98% in fiscal 2018 from 3.64% in fiscal 2016. The share of urban development in total expenditure rose to 3.17% from 2.34%. In terms of capex, urban development expenditure increased to 4.57% to 3.06%.

As per the RBI's State Finances: A Study of Budgets of 2017-18, Gujarat (12.71%), National Capital Territory of Delhi (6.48%), and West Bengal (6.46%) had the highest percentage share of budget for urban development in their total development expenditure in fiscal 2016. Assam (0.21%), Punjab (0.28%), Nagaland (0.37%), Meghalaya (0.67%), Kerala (0.74%), and Tamil Nadu (0.82%) had the lowest share.

As per the Thirteenth Finance Commission (2010-2015), the average per capita municipal income was Rs 1,708.71 and the average expenditure was Rs 1,747.78 in 2003-2005 across the country. The figures increased to Rs 2,493.25 and Rs 2,461.91, respectively, during 2006-2008, with Maharashtra (Rs 6,193.71), Chhattisgarh (Rs 3,789.65), and Gujarat (Rs 3,426.29) in the lead.

Central schemes and national missions as the drivers

Recognising the importance of urban development for sustained economic growth, the Centre has, over the years, launched several schemes to develop urban infrastructure and influence its course (see box/annexure: Early central government schemes). Schemes have evolved by incorporating learnings from the past, the intent being that grant funding will improve the quality of infrastructure, urban governance and services.

Utilisation of mission funds has seen an upward trend, with several projects now in implementation and completion phases. However, the capacity of ULBs continues to severely constrain fund utilisation. Last year saw high devolution of funds to most schemes. However, fund utilisation and project completion languish.

Atal Mission for Rejuvenation and Urban Transformation (AMRUT) shifts focus from penalisation to incentivisation

The AMRUT framework, launched in 2015, tried avoiding the pitfalls

of the erstwhile Jawaharlal Nehru National Urban Renewal Mission, or JnNURM (see box JnNURM – The big scale-up of central funding), by earmarking 10% of the allocation as an incentive for the intended reforms, in place of linking funding to the reform milestones to be achieved. AMRUT has a budgetary allocation of Rs 1 lakh crore, covering ~500 cities.

Another departure from JnNURM was that state governments were empowered to approve project funding instead of the Centre. This was required as the state government, being closer to the ground, is in a better position to gauge and influence project implementation rather than a distant central government ministry.

As many as 500 cities with more than 1 lakh population housing approximately 60% of the urban population in the country have been selected for AMRUT. The mission focuses on development of basic urban infrastructure in these cities in order to improve the quality of life.

Against the total plan size of Rs 77,640 crore of all state annual action plans (SAAPs), Rs 39,011 crore (50%) has been allocated to water supply, Rs 32,456 crore (42%) to sewerage and septage projects, Rs 2,969 crore (4%) towards drainage projects, Rs 1,436 crore (2%) for non-motorised urban transport and Rs 1,768 crore (2%) for green spaces and parks.

AMRUT status

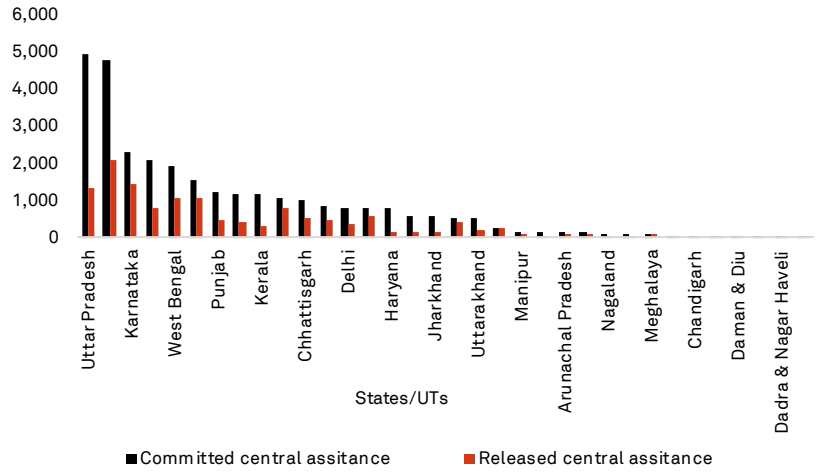
Particular	DPR approved	NITs issued	Contracts awarded	Completed
Water supply sector (no of projects, value)	357 projects, Rs 10,562 crore	540 projects, Rs 12,878 crore	593 projects, Rs 12,851 crore	205 projects, Rs 1,819 crore
Sewerage and septage management sector	292 projects, Rs 10,514 crore	324 projects, Rs 10,014 crore	286 projects, Rs 13,416 crore	65 projects, Rs 919 crore
Drainage sector	534 projects, Rs 800 crore	675 projects, Rs 1,572 crore	672 projects, Rs 1,730 crore	136 projects, Rs 111 crore
Urban transport sector	137 projects, Rs 189 crore	206 projects, Rs 373 crore	230 projects, Rs 585 crore	22 projects, Rs 35 crore
Green space and park sector	520 projects, Rs 248 crore	824 projects, Rs 503 crore	1,140 projects, Rs 797 crore	699 projects, Rs 392 crore
Total	1,840 projects, Rs 22,313 crore	2,569 projects, Rs 25,340 crores	2,921 projects, Rs 29,379 crore	1,127 projects, Rs 3,276 crore

DPR: Detailed project report; NIT: Notice inviting tender
Source: MoHUA Annual Report, 2018-19

The mission aims to provide 100% water supply coverage (64% at start of the mission) and 62% sewerage network coverage (31% at start of the mission). In total, 48.07 lakh water tap connections have been provided against the target of 139 lakh.

Under AMRUT, of the total committed central assistance of Rs 35,990 crore, about 48% or Rs 17,167 crore was given to state governments and union territories (UTs). As shown in the following graph, the top six states showing high amount of devolution of funds are Tamil Nadu (Rs 2,072 crore), Karnataka (Rs 1,435 crore), Uttar Pradesh (Rs 1,335 crore), Rajasthan (Rs 1,085 crore), West Bengal (Rs 1,063 crore), and Gujarat (Rs 783 crore).

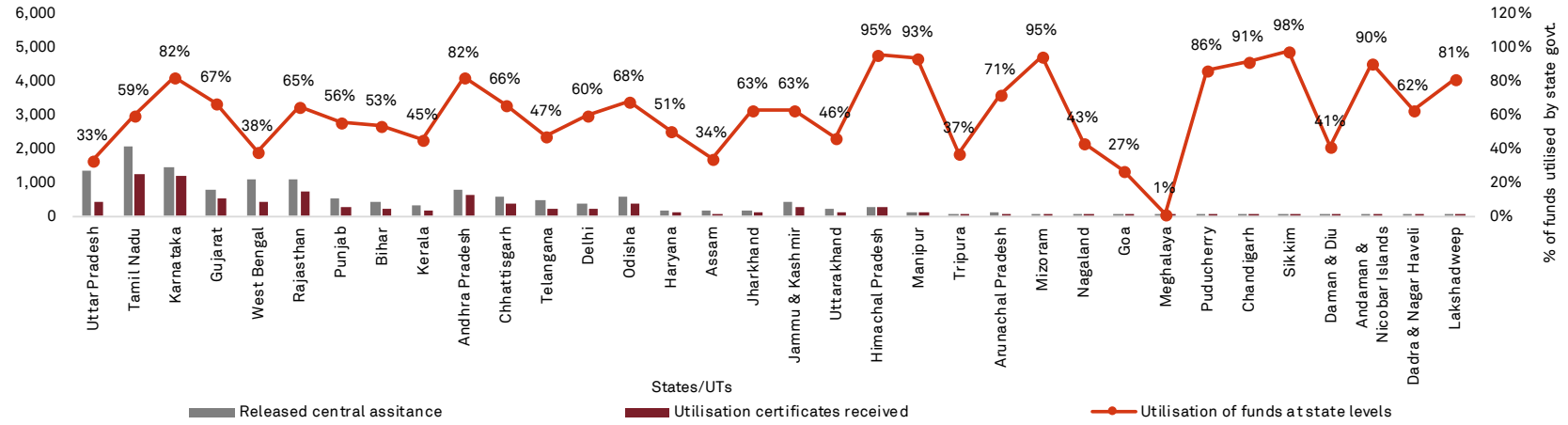
AMRUT status - Devolution of funds from central to state governments (Rs crore)



Source: Handbook on Urban Statistics, July 2019, MoHUA

On average, the utilisation rate of central funds under AMRUT has been 60% (Rs 10,264 crore out of Rs 17,167 crore). Utilisation of funds has been high by states with smaller central assistance (see the next graph) such as Sikkim (98%, Rs 11 crore), Himachal Pradesh (95%, Rs 244 crore), Mizoram (95%, Rs 76 crore), and Manipur (93%, Rs 93 crore). Among the states with large central assistance amount, utilisation has been good by Karnataka (82%, Rs 1,175 crore), Andhra Pradesh (82%, Rs 628 crore), Odisha (68%), Gujarat (67%, Rs 523 crore), Chhattisgarh (66%, Rs 357 crore), and Rajasthan (65%, Rs 701 crore).

AMRUT status - Utilisation of funds by state governments



Source: Handbook on Urban Statistics, July 2019, MoHUA

Smart Cities Mission

The selection of 100 cities to participate in the Smart Cities Mission was completed by June 2018. All the cities have constituted SPVs, appointed the project management units, and formed city-level advisory forums. The cities under the mission are proposed to execute 5,151 projects worth Rs 2,05,018 crore in five years from their respective dates of selection.

Snapshot of Smart Cities Mission

Detail	Round 1	Round 2	Round 3	Round 4	Total
No of cities selected	20	40	30	10	100
Period of selection	Jan 2016	May to Sep 2016	Jun 2017	Jan 2018	
Total number of projects	829	1,959	1,891	472	5,151
Investment (Rs crore)	48,064	83,698	57,393	15,863	205,018
Average SCP size (Rs crore)	2,403	2,092	1,913	1,586	2,050

Source: Handbook of Urban Statistics, 2019, MoHUA

Distribution of funding envisaged from different sources

Source	Percentage	Amount (Rs crore)
Central and state governments	45%	93,552
Convergence funding from other missions, programmes of the central/state governments and/or ULBs	21%	42,028
Funds from PPP	21%	41,022
Loans/debt	4%	9,843
Own sources	1%	2,644
Other sources	8%	15,930
Total	100%	205,018

Source: Handbook of Urban Statistics, 2019, MoHUA

Status of the Smart Cities Mission (April 11, 2019)

Status	Number of projects	Cost (Rs crore)
Work completed	546	14,324
Projects under implementation	1,880	72,524
Projects in tendering stage	3,469	131,892

Source: MoHUA Annual Report, 2018-19

Some of the projects that have a higher rate of implementation include Integrated Command and Control Centres, Smart Roads, Smart Water, Solar Rooftops, and Vibrant Public Spaces.

Pradhan Mantri Awas Yojana – Urban

The Pradhan Mantri Awas Yojana – Urban (PMAY-U), part of Housing for All by 2022, aims to provide financial assistance to states and UTs to meet the housing requirements of the urban poor. Coverage of the scheme has been extended from 4,041 statutory towns to all areas falling within notified planning / development area. It is intended to meet the demand of 120 lakh houses. Of this, 93 lakh units have been sanctioned. Almost 30% of the sanctioned units, about 28 lakh units, stand completed.

PMAY-U	Houses sanctioned	House grounded for construction*	Houses completed*	Houses occupied*
Total	9,300,949	5,540,801	2,806,465	2,558,164

** Including incomplete houses of earlier JnNURM; break-up for 46,043 beneficiaries and subsidy of Rs 1,358.45 crore*
Source: PMAY Progress Report, November 2019, MoHUA

The table below shows the financial and physical progress of PMAY-U in states and UTs. The government has sanctioned a total of ~Rs 1.46 lakh crore under the scheme. Of this, Rs 57,896 crore (40%) has been released.

As shown in the table below, the states that got the largest amount are Uttar Pradesh (Rs 7,717 crore), Andhra Pradesh (Rs 6,873 crore), Gujarat (Rs 6,587 crore), Madhya Pradesh (Rs 6,282 crore), Maharashtra (Rs 5,141 crore), and Tamil Nadu (Rs 4,031 crore).

In order to measure the performance of the scheme in states and UTs, houses completed against houses sanctioned is considered as an indicator. The states that have performed well are Gujarat (58%, 3.43 lakh houses completed), Tripura (48%, 38,761 houses completed), Kerala (45%, 56,657 houses completed), Telangana (45%, 95,798 houses completed), Madhya Pradesh (39%, 2.94 lakh houses completed), and Odisha (38%, 54,727 houses completed).

Swachh Bharat Mission

The Swachh Bharat Mission (Urban) has two primary components: 100% open defecation free (ODF) status and 100% scientific processing of solid waste in all statutory towns in the country. During fiscal 2019, a total of Rs 2,491.08 crore was released by the Centre to states under various components of the mission. Urban areas of 23 states and UTs have achieved ODF status.

The mission has very strong information, education, and communication, or IEC, and information and communications technology interventions, under which ~134 lakh people have participated in 63,075 events organised across the country.

Swachh Survekshan 2019 covered 4,237 cities, whereby Indore emerged as the cleanest city and Chhattisgarh, the best performing state.

Swachh Bharat status

Particular	Target	Achievement	% Progress
ODF status (no of ULBs)	4,378	4,115	93.99%
Individual household latrines (no of units)	66.42 lakh	63.43 lakh (constructed and / or under construction)	95.50%
Public and community toilets (no of units)	5.08 lakh	5.21 lakh (constructed and / or under construction)	102.64%
100% door-to-door solid waste collection (no of municipal wards)	84,420	76,101	
No of municipal wards practising source segregation		53,076	62.87%

Source: MoHUA Annual Report, 2018-19

Some highlights

- Currently, 53.19% of the total waste generated is processed
- There are 685 functional waste-to-compost plants (centralised) with capacity to process 189 lakh tonne waste per annum and another 232 plants are under construction, with approximate input capacity of 46.6 lakh tonne per annum
- Additionally, there are two functional refuse-derived fuel plants with input capacity of 3.1 lakh tonne per annum; 30 biogas and biomethanation plants are also functioning
- Seven waste-to-electricity plants are functional with input capacity of over 20.8 lakh tonne per annum and output capacity of 88.4 MW, and 56 waste-to-electricity plants are under construction with output capacity of 415 MW
- There are six functional construction and demolition plants with input capacity of 12.92 lakh tonne per annum and three are under construction

Under the mission, out of the total committed central assistance of Rs 14,623 crore, ~60% (Rs 8,721 crore) was given to state governments and UTs. Uttar Pradesh (Rs 1,031 crore), Maharashtra (Rs 834 crore), Gujarat (Rs 730 crore), Madhya Pradesh (Rs 721 crore), Tamil Nadu (Rs 687 crore), and Rajasthan (Rs 611 crore) received the most amount.

Urban transport

Vehicle population in India increased from 3.06 lakh in 1951 to ~11.5 crore in 2009. As per the National Transport Development Policy Committee 2013 report, larger cities (with more than 5 million population) rely on public transit (15-57%) more and smaller cities (less than 5 million population) on walking (24-57%) and two-wheelers (16-38%).

As of February 2019, 27 metro projects were under various stages of development across 19 cities. Of these, 585 km of metro rail is operational and 830 km, under construction. A total of Rs 59,048 crore has been released for various metro rail projects.

S no	Project	Approximate length (km)	Approved project cost (Rs crore)
1	Delhi Metro Rail Project Phase I, II, III and extensions including NCR	350	85,077.07
2	Bangalore Metro Project Phase I	42	13,845.01
3	Bangalore Metro Project Phase II	72	26.405.14
4	Chennai Metro Rail Project Phase I	45	14,600.00
5	Extension of Chennai Metro Rail Project Phase I	9	3,770.00
6	Lucknow Metro Rail Project	23	6,928.00
7	Kochi Metro Rail Project Phase I	26	5,181.79
8	Ahmedabad Metro Rail Project Phase I	36	10,773.00
9	Nagpur Metro Rail Project	38	8,680.00
10	Mumbai Metro Line III	34	23,136.00
11	Noida-Greater Noida Metro Rail Project	29	5,503.00

S no	Project	Approximate length (km)	Approved project cost (Rs crore)
12	Bhopal Metro Rail Project	28	6,941.40
13	Indore Metro Rail Project	32	7,500.80
14	Pune Metro Rail Project	31	11,420.00
15	Jaipur Metro Phase I (state initiative)	12	3,149.00
16	Kolkata Metro Corridor (under Ministry of Railways) including East-West Corridor of 16.55 km at an estimated cost of Rs 4,875.00 crore, which is a JV of Ministry of Railways and MoHUA with equity participation in the ratio of 76:24	135	21,390.00
17	Mumbai Metro Line 1 (PPP mode)	11	2,356.00
18	Hyderabad Metro (PPP mode)	72	14,132.00
19	Pune Metro Line 3 (PPP mode)	23	6,124.00
20	Rapid Metro Gurugram Phase I: Sikanderpur and NH-8	5	1,239.00
21	Rapid Metro Gurugram Phase II: Sikanderpur to Sector 56	6	2,396.00
22	Patna Metro Rail Project	31	13,365.77
23	Navi Mumbai Metro implemented by City & Industrial Development Corporation	11	3,064.00
24	Mumbai Monorail (Mumbai Metropolitan Region Development Authority or MMRDA)	20	2,460.00
25	Other metro projects in Mumbai (MMRDA initiative)	132	54,126.00
26	Agra Metro Rail (recommended by the Public Investment Board for Cabinet approval)	29	8,379.62
27	Kanpur Metro Rail (recommended by the Public Investment Board for Cabinet approval)	32	11,076.48

Source: Handbook of Urban Statistics 2019, MoHUA Annual Report

Financial reforms

Under AMRUT's reform-based incentives, credit rating works have been awarded for 485 cities and completed in 466 cities. Of these, 163 cities have received investment grade rating (IGR) and others are envisaged to opt for enhancement of creditworthiness.

There are 36 cities spread across 12 states with rating of 'A-'and above. They have higher potential to issue municipal bonds. In 2018, credit rating has been awarded for three cities and completed in 103 cities.

As many as 19 more cities under the mission have received IGR, including seven with 'A-' and above rating.

Seven AMRUT cities – Amravati, Bhopal, Hyderabad, Indore, Pune, Visakhapatnam, and Surat – have issued municipal bonds amounting to Rs 3,390 crore. These cities have been awarded an incentive of Rs 181 crore for the issuance of municipal bonds.

How AMRUT's reform-based incentives and credit rating system has worked

	Pune	Indore	Hyderabad	Amravati	Bhopal	Visakhapatnam	Ahmedabad
Issuer (Year)	Pune Municipal Corporation (2016)	Indore Municipal Corporation (2018)	Greater Hyderabad Municipal Corporation (2018 – 2 tranches)	AP Capital Region Development Authority (August 2018)	Bhopal Municipal Corporation (September 25, 2018)	Greater Visakhapatnam Municipal Corporation (December 21, 2018)	Ahmedabad Municipal Corporation (January 10, 2019)
Loan size (Rs crore)	200	140	Rs 395 crore (Rs 200 crore in February and Rs 195 crore in August 2018)	2,000	175	80	200
Coupon	7.59%	9.25%	8.90% and 9.38%	10.32%	9.55%	10.00%	8.7%
Tenure	10 years	10 years (call/ put option in 7 years)	10 years	10 years (5-year moratorium)	10 years (with put/ call option at the end of 7th year)	10 years	5 years
Credit rating	AA+(SO) by India Ratings and CARE Ratings	AA (SO) by Brickwork Ratings and SMERA	AA by CARE Ratings and India Ratings	AA-(SO) by Brickwork Ratings A+(SO) by CRISIL	A-	AA	AA+
Guarantee	No	No	No	State guarantee	NA	NA	NA
Structured payments	Escrow of property tax, debt service reserve account, and sinking fund account	Escrow of property tax, debt service reserve account, and sinking fund account	Escrow account for debt servicing	Bond servicing account, debt service reserve funds, followed by guarantee	NA	NA	NA
Issue of proceeds	24/7 water supply scheme	AMRUT project	Strategic road development plan	City infrastructure	NA	NA	NA

NA: Not available
Source: CRISIL analysis; Handbook on Urban Statistics, MoHUA - July 2019

Incentive funding schemes empower, but focus may shift to expenditure goals

The central government has, through several funding schemes, continued to try influencing the course of development of the urban sector, though this is technically the state government's domain. The schemes have ranged from small funding grants to large capital grant funding linked to reforms achieved. The expectation was that larger grant funding would propel implementation of urban reforms in earnest. But challenges in monitoring and information asymmetry have created a situation where reforms are reported as implemented, but the on-ground situation is different.

AMRUT shifted the project-approving powers from the Centre to the state government. The belief was the state government, being closer to the ground, would be able to monitor the situation better and, consequently, achieve tangible and irreversible outcomes.

The incentive funding schemes are aimed at cities achieving reform milestones in return for grant funding. But, in reality, incentive funds are used to achieve expenditure targets rather than accomplish the targeted reform outcomes. This is because city-level ownership for the reform commitments is usually low while the ministry concerned is compelled to showcase expenditure as a measure of progress.

For instance, one of the reform outcomes under the JnNURM was the implementation of modern and transparent budgeting, accounting and financial management systems designed and adopted for all urban services and governance functions by the end of the extended JnNURM tenure of March 2014. Many cities reported this reform to be completed, though in reality, these are far from having adopted a modern financial management system.

Thus, even after 14 years of an elaborate reform process being initiated, outcomes continue to be rudimentary and the programme success is measured in the amount of funding utilised rather than outcomes.

In this context, the Fourteenth Finance Commission (2015-2020) identified two reform conditions: (a) cities need to have their accounts audited, and (b) they have to report on their service levels.

A plan of action

Here are some steps we believe the state governments can take, which will go a long way in making urban local governments an effective tier of governance. Some financial empowerment reforms of urban local governments can be seen in some states, but political empowerment is also essential for making these reforms effective. The core of urban reforms calls for the following plan of action to be implemented in unison and not on a piecemeal basis for the city administration to act as an effective tier of government in the country. It is for the state governments to herald this long-standing requirement, which will make the 74th Amendment a landmark legislation.

Build a sustainable financial framework for cities

- Current revenue sources of local governments are inadequate to meet their expenditure requirements. Devolutions are far from predictable and timely for them to undertake long-term capex and implementation activities
- Most urban local governments do not have revenue visibility beyond a year. This hinders them from undertaking medium- and large-scale infrastructure projects. They do not have the absorptive capacity to utilise grant funding in an optimal manner. They are mission-driven – planning from one mission to another – but hardly ever on mission mode
- A sustainable and empowering urban financing framework merits a mix of consumption-based and income-based taxation, and wealth or property-based transactions to build the much-needed financial capacity
- Property tax is the most fundamental form of local revenue. ULBs need to be empowered to fix and revise the property tax rates without requiring approval from the state government. The property tax revenue can be made buoyant, though in a limited way, by linking tax assessment to market value of the property which is updated annually
- Cities lack a revenue source which is linked to the economic activities they are increasingly expected to foster. They will need to have a share of the GST collected within their jurisdiction. This will fulfil the need for a buoyant revenue source

- Profession tax is another source of income that needs to be devolved to them

Remove vertical and horizontal fiscal imbalance

- Vertical imbalance occurs when the expenditure and revenue amounts, and responsibilities are inappropriately divided between different levels of government. This happens as the larger, more buoyant taxes are more efficiently and equitably administered at a higher level of government, while many services are more efficiently administered at the lower levels
- This means the central and state governments have more than sufficient funds for their services, while the local government does not have adequate funds for its share of the burden. This creates a fiscal gap, which can be addressed by an appropriate percentage share of GST revenues between the central, state and local governments
- A problem of horizontal imbalance exists owing to differences in the ability of ULBs to raise revenues, because respective costs of providing public services differ (e.g., GST). This imbalance needs to be addressed by a horizontal fiscal equalisation policy, which uses a formula to disburse funds to ULBs as per need and its ability to raise own revenue. The state finance commissions (SFCs) should work towards addressing both these imbalances

Make SFCs effective

- Functional devolution to the SFCs would need to be accompanied by financial devolution for making urban local governments more effective
- Just as the Central Finance Commission decides on the revenue shared between the Centre and states, the SFCs were expected to financially empower the urban local governments. They, however, have not been able to play this role. This is because: either the SFCs have not been constituted in time or the recommendations lack analytical rigour, or are too weak for the state governments to implement. This needs to be addressed

Make mayors matter, empower council with decision-making powers

- The leader of the city is the mayor, who is directly elected. But in India, the mayor's role in city governance is largely ceremonial. Empowering him/her by making them the effective head of the city administration can make the office more accountable to local citizens
- The municipal commissioner, on the other hand, is appointed by the state government and often has a very short tenure. This impedes the longer-term initiatives which cities usually require for proper urban infrastructure development and management

Early central government schemes

A. Integrated Development of Small and Medium Towns (IDSMT)

- Launched in 1980 and discontinued in December 2005
- Applicable to towns/cities with a population of up to 5 lakh where elections to local bodies had been held and elected bodies were in place
- Towns identified and prioritised by the state governments and UTs

B. Accelerated Urban Water Supply Programme (AUWSP)

- Initiated in fiscal 1994 for towns with a sub-20,000 population (as per the 1991 Census) to provide safe and adequate water supply facilities
- The MoHUA and respective state governments shared the project cost equally

C. Centrally Sponsored Scheme for Infrastructural Development in Mega Cities (Mega Cities Scheme)

- Initiated in fiscal 1994
- Primary objective was to undertake infrastructure development projects of city-wide/regional significance covering water supply and sewerage, roads and bridges, city transport, and solid waste management

- Scheme applicable to Mumbai, Kolkata, Chennai, Bengaluru, and Hyderabad
- Funding shared between the central and state governments in the ratio of 25% each; the balance 50% was met from the institutional finance/capital market
- Scheme discontinued in April 2007

D. Urban Reforms Incentive Fund (URIF)

- The Union Budget 2002-03 called for setting up a URIF with an initial outlay of Rs 500 crore per annum during the Tenth Five Year Plan
- The URIF provided incentives to state governments to carry out reforms; each reform area was assigned a special weightage
- States entered into a memorandum of agreement (MoA) with the Ministry of Housing and Urban Poverty Alleviation for carrying out the reforms. On signing the MoA, 50% of the allocation was released as incentive and balance 50% was released on milestone achievement
- States that did not wish to undertake all seven reforms could sign an MoA covering less than the complete reform package
- Funds under URIF were released as additional central assistance to the states. The allocations were based on the share of each state's urban population compared with the total urban population
- Out of the 24 states, only nine agreed to undertake all seven reforms; eight agreed for six reforms; two states for five, and five states for only four reforms. According to the states, these reforms required wider consensus and progress in achieving milestones in the short term could not be shown

Given the size of the urban population, the amount of funds made available under all these schemes was grossly inadequate to make a significant impact on the country's urban infrastructure requirements.

Early government schemes in urban development

Initiative	Tenure	Disbursed (Rs crore)	Type of scheme	
			Investment support	Reform linked
IDSMT (for <5 lakh population)	1980-2005	1,070	Yes	No
AUWSP (for <20,000 population)	1994-2006	695	Yes	No
Mega Cities Scheme (for five metros excluding Delhi)	1994-2007	1,754	Yes	No
URIF	2003	186	No	Yes
Total	1980-2007	3,705		

Source: CRISIL analysis

Of all these schemes, URIF was the only one that linked urban reform outcomes to funding available to the cities.

But on the downside, it gave the state an option to pick and choose the reform areas. Also, the size of funding, at Rs 500 crore, was not significant enough to incentivise the states to embrace the reform elements in a comprehensive manner. What's more, the local government, which was the core of the reform process, was not directly involved in the reform commitments.

Thus, there was a need for a scheme that fulfilled three major requirements – 1) it should be sizeable enough to make an impact on urban infrastructure investments; 2) it should bring together all the three key stakeholders – central government, state government, and the ULB – to achieve a common purpose; and 3) it should view the needs of urban development in a comprehensive manner.

JnNURM – The big scale-up of central funding

In December 2005, the Centre launched the JnNURM with an allocation of ~Rs 66,000 crore to fund urban infrastructure development covering 63 cities. It subsumed the ongoing IDSMT and Mega City Scheme. It had a seven-year time frame and defined 23 reform milestones. It was conceived as an incentive scheme wherein cities and their respective state governments would jointly sign an MoA with the Centre. The outcome mix was to be achieved by both.

Broadly, the expected outcomes were:

a. Modern and transparent budgeting, accounting, financial management systems designed and adopted for all urban services and governance functions

b. City-wide framework for planning and governance to be established and made operational

c. All urban residents to be able to obtain access to a basic level of urban services

d. Financially self-sustaining agencies for urban governance and service delivery to be established

e. Local services and governance to be conducted in a manner that is transparent and accountable to citizens

f. E-governance applications to be introduced in the core functions of ULBs/parastatals, resulting in reduced cost and time of service delivery processes

The JnNURM did provide a significant fillip to urban infrastructure creation. However, there were considerable challenges in reform implementation. Non-achievement of the reform milestones meant cites could not avail of funding for subsequent milestones. But moral hazard compelled funding in several cases to be released, with leniency in reform evaluation.

Notes

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CRISIL Risk and Infrastructure Solutions Limited (A subsidiary of CRISIL Limited)
CRISIL House, Central Avenue, Hiranandani Business Park, Powai, Mumbai – 400076. India
Phone: + 91 22 3342 3000 | Fax: + 91 22 3342 3001 | www.crisil.com
/company/crisil @CRISILLimited /CRISILLimited /user/CRISILLimited /lifeatcrisil