

**CRISIL  
Infrastructure  
Yearbook 2018**

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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

# Infrastructure Advisory

## Foreword

The CRISIL India Infrastructure Conclave was launched last year as a platform to track, highlight and deliberate on emerging issues, challenges and opportunities in the domestic infrastructure sector.

*The CRISIL Infrastructure Yearbook 2017*, which was brought out on the occasion, had emphasised how deeper capital markets and access to funding were the key facilitations required to broad-base infrastructure financing.

The yearbook also reiterated the need to draw private investments for sustainable acceleration in infrastructure spending. However, overall risk appetite in the private sector continues to be subdued amid the debt overhang, even though the renewables and highways sector have done relatively well.

To be sustainable, India's infrastructure build-out requires support from both, a vibrant private sector and healthy capital markets. And to bring investor confidence back, there is a need for a material change in public private partnership frameworks by addressing legacy challenges in policy, institutional capacity, project structuring, recalibration of risks, and flexible contracts. Deepening the financial sector to reduce over-reliance on bank financing is as critical. So both, the demand and supply sides of infrastructure financing need resolute tackling.

This edition of the yearbook also updates the CRISIL Infracore scores, which is arrived at after assessing the drivers and drags of private investments.

I am sure this report will provide useful perspectives to all stakeholders.

I am also hopeful that some of the insights here will help advance the dialogue that would make India's infrastructure sector more resilient, sustainable and vibrant.

Season's greetings, and warm regards,



**Ashu Suyash**  
Managing Director & CEO  
CRISIL Ltd



## Foreword

We take great pleasure in presenting the second edition of the CRISIL Infrastructure Yearbook, which comprehensively chronicles progress across sectors, and measures their attractiveness in terms of private investments using CRISIL Infracore, our unique investability index.

Last year, CRISIL had estimated that India needs to spend ~Rs 50 lakh crore in five fiscals between 2018 and 2022 to build out infrastructure.

The government has had to do much of the heavy lifting, with private investment capacity and risk appetite sharply down. Although private investments have been strong in the renewables and road construction sectors, several challenges remain, which impede broad-based revival and acceleration of public private partnerships (PPPs).

Ramp-ups in PPPs continue to be constrained by weak public counterparty institutions, inadequate project development rigour, and proximate factors such as land acquisitions and clearance. Additionally, prolonged debt overhang has limited private risk appetite and financing. These challenges require expeditious redressal, as government spending alone is inadequate to address the massive gaps. Getting PPPs back on track is critical to bridge infrastructure deficits sustainably.

Reason why this *CRISIL Infrastructure Yearbook 2018* has 'private infrastructure investment imperative' as its theme. It traces the progress of India's PPP programme and distills measures for its sustainable revival and acceleration. Chapters on sectors, too, reflect this focus.

We have also updated the CRISIL Infracore scores. With a record length of highway projects awarded under the hybrid annuity model and a successful debut of toll-operate-transfer in fiscal 2018, the road construction sector has leapt ahead. Renewables also remain a bright spot for investments, although recent headwinds have dragged the sector's score down.

Power transmission remains a balanced risk investment destination, but *suo motu* allocation of projects to government entities reduces potential for private investment. The railways sector sees tangible progress on the dedicated freight corridor and electrification, but weakening operating ratio is a red flag. Urban infrastructure is weighed down by weakness in implementation capacity.

I am sure you will love perusing this yearbook, which reflects our commitment to contribute to the growing body of knowledge and insights to help take India's infrastructure development agenda forward.

Warm regards,



**Sameer Bhatia**  
President  
CRISIL Infrastructure Advisory





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## Executive summary

Between fiscals 2008 and 2017, private investments in infrastructure was estimated to be ~Rs 20 lakh crore, or nearly a third of all infrastructure spending during the period. This had transformational impact in several sectors.

And by 2012, India's public-private partnership (PPP) programme also acquired significant scale. So much so, the World Bank's Private Participation in Infrastructure (PPI) database ranked India on top among developing nations between fiscals 2008 and 2012.

However, since then, a raft of risks manifested, exposing lacunae in the PPP architecture, leading to a spike in stalled projects and stressed debt, which muted risk appetite in the private sector.

But there are some bright spots, too. To wit, a step-up in public spending has hastened the construction of highways, while proactive policies have unclogged stalled projects. Recalibrated PPP models, including the hybrid annuity and toll-operate-transfer, have helped draw some private investments.

Similarly, in renewables, largely favourable policies and market conditions have led to 18 GW capacity being added in fiscal 2018 alone. Today, the private sector also has a dominant share of airport and port traffic management.

On the other hand, thermal generation is in distress, with ~35 GW of capacity stranded on account of slow demand growth, domestic fuel constraints and delay in pass-through of charges in duties and taxes. As pressure builds to push stressed assets through the National Company Law Tribunal (NCLT) process, sharp haircuts loom. Here, policy actions, including centralised procurement, improving coal availability, decommissioning of old projects and pass-through of costs can alleviate pain.

Also, private investments remain concentrated. Critical sectors such as railways and urban infrastructure have not been able to make fast-enough progress to attract private monies despite their size and potential, while viability of power distribution remains critical to the sector value chain.

No surprise, therefore, that infrastructure spending declined from ~7% of GDP during fiscals 2008-2012 to about 5.8% in 2013-2017. It could fall even more if private investments aren't spurred.

That infrastructure investments have a positive impact on economic growth, productivity and competitiveness is well-established. But accelerating India's infrastructure investment to ~6% of GDP over a medium-to-long-term has become vital. While increases in public spending remain necessary, they won't suffice.

A revival and sustainable acceleration of PPPs in infrastructure has become *sine qua non*. This will require redrawing of the PPP framework in double-quick time and paving the path for private investments. Five facilitations are crucial here, which we detail in this edition of the yearbook:










1. Step up the scale and rigour of project development, build capacity to create a bankable pipeline of at least \$150 billion worth of projects annually.
2. Employ a wider range of PPP models with recalibrated risk-sharing and balanced contracts. There is a need to look beyond conventional build-operate-transfer models to annuity and investment-light models such as performance-based management contracts. To do so would require recalibrating risk-sharing that reflects sectoral needs and context, aggressively tapping asset monetisation of operational assets, and reworking contracts with clear performance metrics and flexibility to handle changes, terminations and exits.
3. Nurture empowered counterparties. PPPs are efficient only when implemented by capable and empowered public counterparties. However, discoms, water utilities, transport corporations and municipal bodies remain financially and institutionally incapacitated. Changing this script will need political commitment and persistent reforms. The role of states is crucial to this transformation.
4. Create supply-side enablers to deepen the debt market and encourage innovative financing. The CRISIL Infrastructure Yearbook 2017 talked of this. A deep, diversified and resilient financing ecosystem at the fulcrum of the Great Indian Build-Out is imperative.

# Infrastructure Advisory

5. Accord specific thrust to deepening private participation in power distribution, railways and urban infrastructure. Despite potential, broad-basing PPPs remains a challenge in these sectors. In this regard, we recommend focused and programmatic thrust to implement:

- A scaled-up railway station modernisation programme to upgrade 1,000 stations within a decade
- A programme to implement 100% access to 24x7 water supply and waste-water reclamation in all state capitals within 10 years
- A battery of PPP and privatisation projects for power distribution entities, to improve operating efficiencies and aid in a sustainable financial turnaround.

## CRISIL InfraInvex update 2018

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

## The private infrastructure investment imperative

India's tryst with private investments is a 'glass half-full' story

### Private infrastructure has risen sharply in past decade

Private investment in infrastructure accounted for an estimated Rs 20 lakh crore, or nearly a third of the estimated Rs 60 lakh crore investment in India's infrastructure, between fiscals 2008 and 2017. Other than telecom, power and transport sectors have dominated private investment.

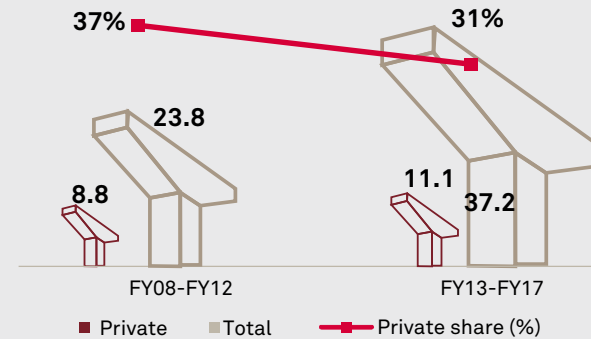
### Diverse sectors have seen positive contribution by private sector

Telecom was the first off the block among the sectors, transitioning from being fully owned and managed by the government to becoming predominantly privately owned and managed in just a couple of decades. In the last 10 years, highways and power generation (thermal and renewables) have accounted for a lion's share of private sector investment.

- Thermal power:** The private sector added 76 GW of thermal generation capacity between fiscals 2008 and 2017, which was 53% of the total capacity added. While a sizeable portion of this capacity is under stress, gradual improvement in market dynamics – power demand, domestic fuel availability, and merchant power prices – coupled with recent policy initiatives such as constitution of High Powered Committee, could enable a gradual resolution of these constraints towards bringing this capacity into productive use.

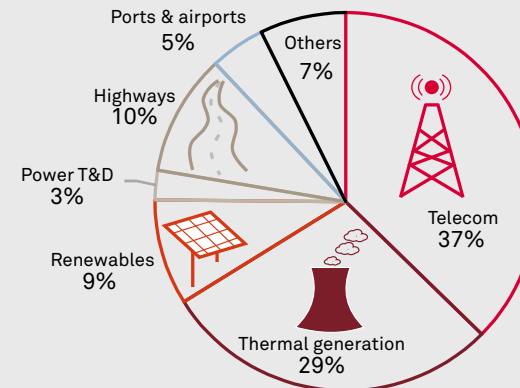
### Share of private investment has come off a notch lately

(Rs lakh crore)



Source: NITI Aayog, CRISIL Infrastructure Advisory estimates

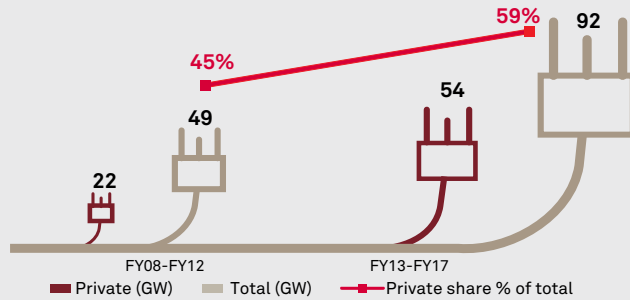
### Power, highways garnered major share



Source: NITI Aayog, CRISIL Infrastructure Advisory estimates

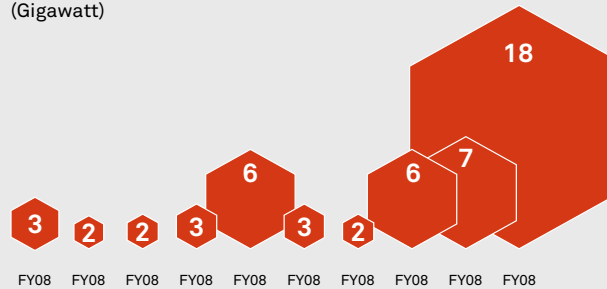
## Private sector contribution by infrastructure sector

**Thermal generation: 76 GW added, 54% share**



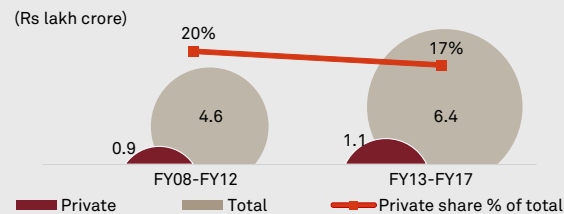
Source: Central Electricity Authority

**Renewable energy: 50 GW added (Gigawatt)**



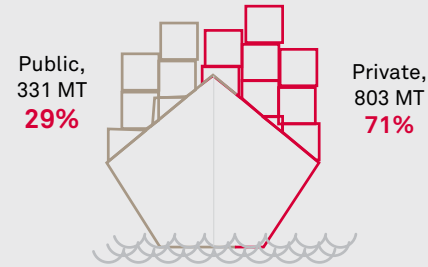
Source: Central Electricity Authority

**Highways: Rs 2 lakh crore investment, 15% share**



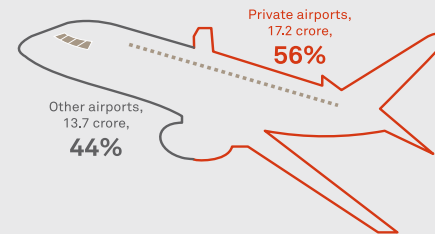
Includes national and state roads and highways investment  
Source: NITI Aayog, CRISIL Infrastructure Advisory estimates

**Ports: 803 MT, 71% share in FY17**



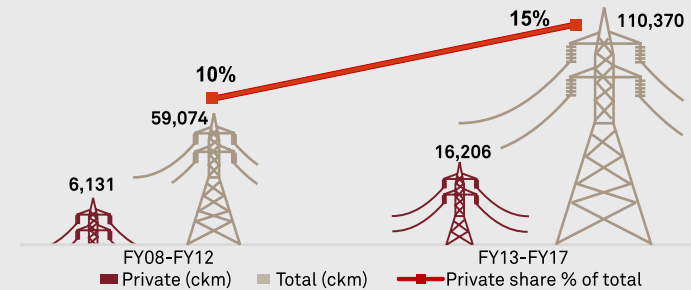
Source: Indian Ports Association statistics, CRISIL estimates

**Airports: 17.2 crore passengers flown, 56% share as of FY18**



Source: Airports Authority of India, CRISIL estimates

**Power transmission: ~22,300 ckm, 13% share**



Source: Ministry of Power, Government of India

- **Renewable energy:** India added nearly 50 GW of wind and solar capacity during fiscals 2008-2017 – of which 33 GW was added in the second half of the decade – reflecting intrinsic growth potential. This was ably supported by strong government thrust in terms of favourable policy initiatives and incentives.
- **Highways:** The National Highways Development Project (NHDP) led to public-private partnerships (PPPs) in national highways getting mainstreamed. Notwithstanding challenges in the interim, the National Highways Authority of India (NHAI) has attracted private investment through an array of models including build-operate-transfer (BOT) – including BOT-annuity and BOT-toll – and introduced the hybrid annuity model (HAM) in the last few years as a derisked model to bring back private investment. NHAI also successfully monetised its first brownfield assets bundle under the toll-operate-transfer (TOT) model this year with more bundles in the offing.
- **Airports:** Privately managed airports, including in Bengaluru, Hyderabad, Kochi, Delhi and Mumbai, now account for over 55% of India's passenger traffic, and are growing at a fast pace. Mumbai and Delhi airports have seen sharp service-level improvements which reflect in their consistently superior performance on service level rankings among global airports, post privatisation. Greenfield airports of Bengaluru and Hyderabad have also been built with private investment and have seen sharp increases in traffic as well.
- **Ports:** India's minor ports, built almost entirely in PPP mode, accounted for 42% of India's port traffic in fiscal 2018. Also, with several terminals at major ports being handled on PPP mode, an estimated 70% of all of India's port traffic is now handled either at private minor ports or port terminals managed in PPP mode at major ports.
- **Power transmission:** Over fiscals 2013-2017, private sector investments in transmission grew sharply, adding over 16,000 circuit km (ckm) of incremental capacity (translating to ~15% share). A sharp increase in transmission demand needed to handle a higher share of infirm renewable energy flows and increase in cross-regional flows, could potentially create more opportunities for private sector investment in future.

By the turn of the last decade, India's PPP programme in infrastructure had acquired scale and a semblance of diversity. The World Bank

reported that between 2008 and 2012, India was the top recipient of investments through PPPs globally, and accounted for over half of all PPP project investment reported in developing countries in 2011.

The Economist Intelligence Unit's 2015 Infrascope report, 'Evaluating the Environment for PPPs in Asia-Pacific 2014', ranked India first in operational maturity for PPP projects, third in sub-national PPP activity, and fifth overall in terms of having an ideal environment for PPP projects.

## Yet, as risks and constraints played out, private investments declined and risk appetite has remained subdued ever since

There is now a general consensus that stakeholders across the board – policymakers, advisors, developers, and financial institutions – had taken leaps of faith in the heady years of investment boom, and had overlooked several risks and constraints that loomed large even earlier. These, together with gaps in policy, project structures, institutional capacity and contracts, led to a spike in stalled projects and debt levels, and a dip in the investment momentum.

Early signs of an impending slowdown were visible by fiscal 2012. The Reserve Bank of India (RBI) in its annual report for 2013 identified revival of infrastructure investment among medium-term challenges for the Indian economy, as investment envisaged in infrastructure fell from Rs 2.2 lakh crore in fiscal 2011 to Rs 1 lakh crore in fiscal 2012, and bank credit growth to infrastructure fell from a high 38% to 14%. Sector after sector, the size and value of stalling projects spiked, as policy ambiguity, weak project preparation, unbalanced contracts, bidding exuberance and excessively leveraged balance sheets took a toll.

- National highways, an early driver of PPP projects, saw a sharp slowdown in fiscal 2013 as delays on account of land acquisition and clearances, irrational bids and stress on private balance sheets began to bear down on muted private sector response to project bids. After awarding nearly 6,500 km projects in fiscal 2012, a peak till then, NHAI saw over 30 PPP bids go without response in fiscals 2013 and 2014. Stress in awarded projects and a decline in new PPP project starts had set in

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- Thermal power generation, the largest area of private investment activity, also saw risks unfold. The first Ultra Mega Power Project in Mundra faced the debacle of a flare-up in coal prices and by fiscal 2014 (prior to the peak private capacity addition years), thermal generation figured prominently in India's stalled projects problem with 80 projects – with an estimated outlay of Rs 1.5 lakh crore – stalled primarily due to fuel-supply problems
- Problems surfaced in other sectors, too. PPPs in urban water supply fell off the cliff in 2010 as early sub-scale projects in Tier 2 and 3 cities with weak capacity and local finances failed due to inadequate preparation, poor project structuring, and over-reliance on user charge based revenue models

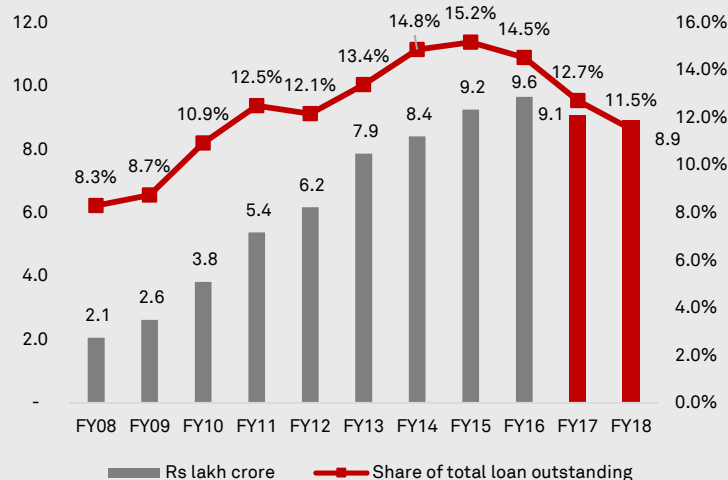
Even as a large pool of projects stalled, new project starts on PPP mode or with private investment declined as well. The World Bank's PPI database reported a sharp fall in PPI activity from the peak level of \$45 billion worth project awards in 2010. As infrastructure projects began stalling, the stress in heavily indebted corporate balance sheets spilled over into the balance sheets of banks and financial institutions which had sizeable exposure to the sector. After all, bank lending to infrastructure had grown at a compound annual growth rate (CAGR) of 32% between fiscals 2008 and 2012, with the share of bank outstanding credit to infrastructure increasing from 8% to 12%

The Government of India's Economic Survey 2014-15 had observed that 'stalled projects especially in the private sector had grown at an "alarming rate" in the previous five years, affecting balance sheets of both the corporate sector and banks, thus constraining future investment, completing a vicious circle, characterised by an investment slowdown leading to less financing and weak investment'. It concluded that 'combining the situation of Indian public sector banks and corporate balance sheets suggests that the expectation that the private sector will drive investment needs to be moderated'.

The share of bank outstanding credit to infrastructure, after peaking at 15.2% in fiscal 2015, fell sharply to 11.5% in fiscal 2018. Since fiscal 2016, bank outstanding credit to infrastructure has actually declined in absolute terms, reflecting both the stickiness of the stressed assets problem and deceleration in new bankable projects.

The economic survey also recommended an increase in public outlays as a necessary step to crowd in private investment, given that expected private investment may not fructify in the short run. It also identified concurrent policy and institutional efforts to revitalise and remodel PPPs to attract private investments in infrastructure going forward.

## Fall in bank credit to infrastructure reflects persistent stress



Source: RBI

The Kelkar Committee report (2015) also reviewed factors impeding private investment and recommended measures to revive private sector participation. It reiterated that 'India's success in deploying PPPs as an important instrument for creating infrastructure in India will depend on a change in attitude and in the mindsets of all authorities dealing with PPPs, including public agencies partnering with the private sector, government departments supervising PPPs, and auditing and legislative institutions providing oversight of PPPs. This change in attitude requires (1) moving away from a narrow focus on transactions to focussing on the relationship and on service delivery for citizens, (2) building in an approach of "give and take" between private and public sector partners, and (3) developing a mechanism for dealing with uncertainties inherent in long-time contracts'.



Key recommendations of Economic Survey 2014-15 and Kelkar Committee report

**Economic Survey 2014-15**

**Restructuring PPP framework**

**Flaws in existing design**

- Focus on fiscal benefits than efficiency gains
- Neglect principles in risk allocation
- User charges as default revenue stream and viability gap funding, provides limited recourse against non-performance
- No ex-ante structures for renegotiation
- Contracts over-dependent on market wisdom

**Recommended changes in contract design**

- Encourage PPPs over engineering, procurement and construction to incentivise quality
- Equitable and appropriate risk allocation
- Facilitate access to pension / insurance funds

**Suggestions to restructure existing contracts**

- Restructuring burden should be shared
- Guiding principle for restructuring contracts should be project revenue, differentiating between temporary illiquidity and insolvency. For example, electronic tolling and escrow of toll from stressed highway projects with a revised order of priority, with long-term bullet bonds, at risk-free government rate, to the extent of debt. After operations and maintenance, order of priority of payments could be interest payments, debt repayment with equity as the residual claimant

**Kelkar Committee Report on Reviving PPPs, 2015**

**Select recommendations**

**Re-balancing risk sharing**

- Assess ease / efficiency of risk management
- Cost effectiveness of managing risk
- Modelling to assess/provide for risk occurrence
- Full disclosure of long-term costs, risks and benefits
- Comparison with financial position of government

**Resolving legacy issues**

- Statutorily empowered institutional mechanisms
- De-scoping for land procurement and clearances
- Cancellation for non-achievement of progress

**Generic, including legacy projects**

- Umbrella guidelines for stressed projects
- Finalisation of a national PPP policy document
- Discourage unsolicited proposals
- PPPs not for small projects given transaction costs

**Policy, governance and institutional capacity**

- Amend Prevention of Corruption Act, 1988
- Set up 3PI institution (a PPP institute of excellence) and independent regulators
- Discourage government participation in PPP special purpose vehicles

**Scaling up finance**

- Restrict banks in consortium
- Monetisation of viable projects with stable revenues
- Allow equity divestment in completed projects

## Sector-level picture mixed, with a few bright spots & some serious challenges

### Proactive policy action and recalibration of risks revive private investment in national highways

For a long time, the national highways sector has been a leader in attracting private sector participation through an array of models, and holds out lessons for other sectors, even as it has managed a smart recovery in private investment.

Not long back, the sector faced severe challenges in attracting private participation. Proactive policy actions including unclogging stalled projects through exits and restructuring, upfront project awards in the engineering, procurement and construction (EPC) mode with public investment and risk recalibrating with the HAM have revived investments. In fiscal 2018, NHAI awarded 7,400 km of projects, of which 3,396 km (outlay of Rs 67,500 crore) were awarded on HAM and 209 km (outlay of Rs 2,500 crore) were awarded in toll mode.

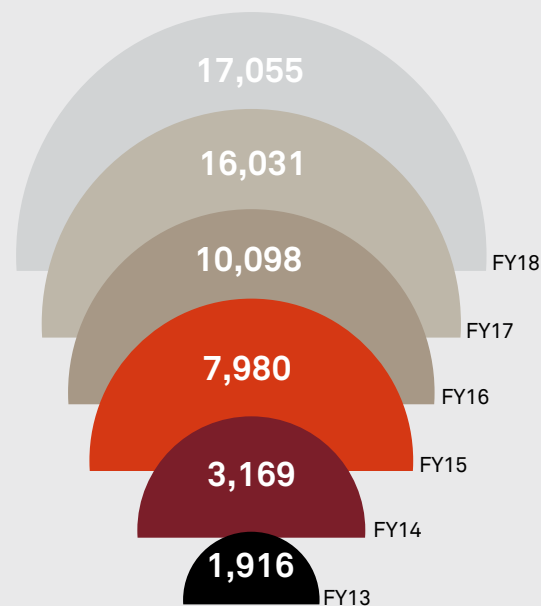
The continuation of a programmatic approach with the launch of a scaled-up Bharatmala programme has helped affirm policy continuity and the successful award of the first bundle under TOT potentially creates a new de-risked avenue for a new class of investors to enter the sector. Besides concerns around dependence on government spending (projects under HAM have 40% budgetary spending upfront) and increasing cost of land acquisition, further improvements are needed in contract enforceability, renegotiating flexibility and dispute resolution. All the same, actions in the last few years have surely helped revive investor confidence.

### Renewable energy has been a bright spot, notwithstanding headwinds lately

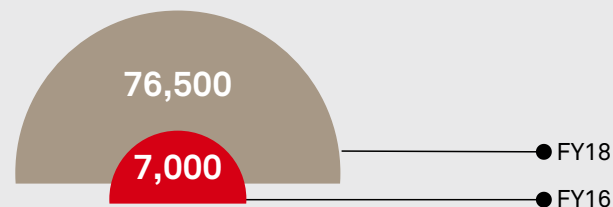
Backed by favourable government policies, rapid decline in tariffs and availability of low-cost foreign funds, the grid-connected renewable energy capacity continues to grow sharply. Over 18 GW of wind and solar capacity was added in fiscal 2018, on the back of 50 GW added between

### Highways: Private investment stages a smart recovery

EPC + PPP awarded length (km)



### Sharp increase in value of projects awarded on HAM (Rs crore)



Source: NHAI, Ministry of Road Transport and Highways, Press Information Bureau

fiscals 2008 and 2017, reflecting the buoyant investment momentum. However, in recent past, imposition of customs duty, currency depreciation, and cancellation of 2,400 MW bids by Solar Energy Corporation of India have posed headwinds. Policy consistency and sustained bidding momentum will remain critical to sustained growth of renewable capacity.

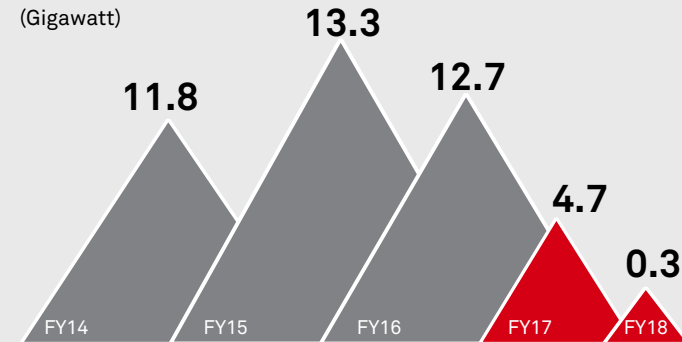
### Thermal power generation in the eye of a perfect storm

The stress in thermal generation accompanies a massive capacity ramp-up of 99 GW of thermal generation capacity (with private sector contributing to 49 GW or 60%) between fiscals 2012 and 2016. Capacity addition has since fallen to 11.5 GW (private addition 4.7 GW) in fiscal 2017 and 3.4 GW (private addition 300 MW) in fiscal 2018. Plant load factor (PLF) of private thermal units remains unsustainably low.

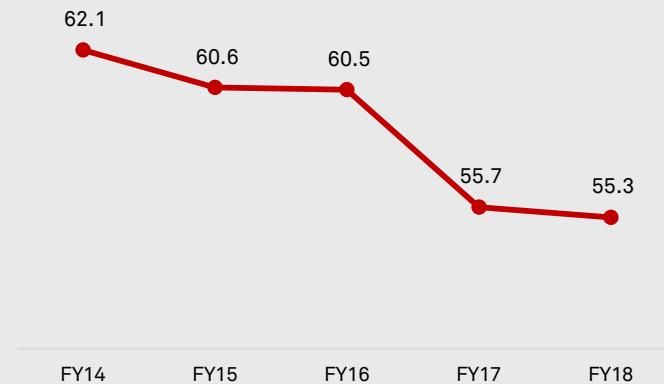
The sector finds itself in the eye of a perfect storm, facing a host of challenges including an oversupply scenario, competition from a sharp renewables ramp-up, coal and water availability constraints, and weak discom finances, leading to stranded assets, and non-performing loans. An estimated 35 GW of completed thermal power projects are idling, with question mark over an estimated ~22 GW under construction. With the National Company Law Tribunal (NCLT) axe looming, there is a scramble to expeditiously resolve issues for at least some of the thermal generation assets, even as the rest of stranded capacity base stares at steep haircuts.

India's journey with private participation in infrastructure has thus been a mixed bag; we have stellar successes in some sectors, even as constraints have derailed momentum in others. There are instructive lessons to be gleaned from these experiences as we set our sights on a higher investment trajectory and as we seek to deliver even greater bang for the buck in terms of providing infrastructure services universally, affordably and efficiently.

### Thermal capacity addition falls off a cliff with sub-optimal utilisation of private plants



### PLF of private thermal plants remains sub-optimally low (%)



Source: Central Electricity Authority, Ministry of Power

## A broad-based revival and acceleration of private investment is vital

Lately, the private sector's weak investment capacity and muted risk appetite – given their stretched balance sheets and banks' reluctance to fund infrastructure projects, which they perceived as risky – has been offset partly by a sharp increase in public spending.

The Government of India's outlay on infrastructure, including internal and extra-budgetary resources (IEBR), was close to Rs 6 lakh crore in fiscal 2018, a 21% jump from nearly Rs 5 lakh crore in fiscal 2017. These outlays, especially for the highways and railways sectors, represent a multi-fold increase in government spending in just a few years.

Despite this increase, infrastructure spending actually declined from an estimated 7% of gross domestic product (GDP) during fiscals 2008-2012 to about 5.8% during fiscals 2013-2017. As private spending fell further in the tail years of this period, infrastructure spending in GDP terms has come down further.

Given this, a ramp-up in infrastructure spending to the vicinity of 6% of GDP is necessary to bridge infrastructure deficits and support accelerated economic growth. And this is clearly not attainable with public investments alone.

In the context, an expeditious revival and sustained acceleration of private investment and PPPs in infrastructure becomes an absolute imperative for India's infrastructure build-out.

The experience gained from India's tryst with PPPs, both successes and setbacks, holds instructive lessons. A re-tooling of our PPP framework factoring these lessons will help prepare the ground to tap private investment and capabilities more consistently and sustainably.

## We identify five facilitations that can set us on this journey

### 1. A programmatic thrust while driving scale and rigour in project preparation

The Government of India should build capacity to create a bankable pipeline of shovel-ready strategic infrastructure projects worth \$100-150 billion annually. This will involve (i) creating an in-house team with specialist capabilities in project preparation, (ii) ring-fenced budgets for project preparation, (iii) guidelines to empanel/engage consultants and transaction advisors for preparatory studies, (iv) a rigorous multi-stage, multi-disciplinary review process that leads to bankable and ready-to-implement projects.

The relative success of private participation in national highways and renewables underscores the utility of a programmatic sectoral transformation effort in which private sector engagement strategy is embedded. A programmatic sector-level thrust with ambitious targets signals policy commitment, and forces attention on key enabling factors including sector reforms, and institution-building actions, that tend to be get side-stepped in case of one-off privatisation or PPP initiatives. This also forces attention to build capacity to handle scale and bring rigour and effectiveness in project preparation.

Project preparation needs to be preceded by a systematic assessment of investment needs and translating the same into project concepts which are screened and prioritised for detailed development. Inadequate rigour in project preparation stymies project implementation and adds to costly scope-creep, rework and time overruns.

## Lessons from global experience in project preparation

CRISIL Infrastructure Advisory is working with the G20 Global Infrastructure Hub in preparing a reference tool for project preparation for infrastructure. The first output, the Global Overview Report, distils critical lessons from practices in project preparation from five countries, as summarised below.

- **Lesson 1: Building public sector capacity to deliver on globally accepted procedures**  
For instance, the United Kingdom (UK) has a tool to help individuals identify areas of development in their skillsets in line with capabilities to deliver infrastructure projects outlined in their Project Delivery Capability Framework. Based on training needs identified, civil servants undergo training at UK's Major Projects Leadership Academy, considered a gold standard of training in project management.
- **Lesson 2: Availability of a robust project identification framework with a multi-year capital investment planning horizon**  
Mexico's National Development Plan has identified 743 projects for implementation during 2016-2021. The UK National Infrastructure Commission, set up in 2016, not only outlines a strategic vision for infrastructure investment over 30 years, but also holds the government to account for implementation of the project pipeline.
- **Lesson 3: Availability of a sustainable source of funds for project preparation**  
National and regional project preparation facilities have been established in South Africa, such as the National Treasury's Project Preparation Fund. Availability of dedicated financing for project development for the Renewable Energy Independent Power Producer Procurement Programme (REIPPP) has been critical in its successful implementation

- **Lesson 4: Strong process orientation and quality assurance**  
In South Korea, PIMAC sets up multi-disciplinary independent reviews of project proposals, with clear transparent assessment criteria covering economic, policy and regional development.
- **Lesson 5: Adoption of standard guidance documents and templates**  
The UK's Her Majesty's Treasury (HM Treasury) provides guidance documents for all stages of the project lifecycle. Critical documents include the Green Book, Integrated Assurance and Approval Plan Guidelines, and the Project Initiation Route Map.
- **Lesson 6: Transparency in processes and continuous market appetite testing**  
In the Netherlands, details on planning and implementation of government projects are published in the annual budget and are accessible to the public. All decisions taken on government projects are required to be presented to the House of Representatives, along with periodic progress updates
- **Lesson 7: Upfront stakeholder identification and continued involvement**  
In South Korea, PIMAC's PFS studies are guided by a transparent stakeholder engagement process, known as the 'Five Meetings Rule', which requires at least five review meetings to be conducted at various check points in the project preparation process with representatives from the Ministry of Economy and Finance, line departments, PIMAC and private sector field specialists.
- **Lesson 8: Establishing distinct structures with clearly defined governance arrangements**  
To implement South Africa's REIPPP, the Department of Energy and the National Treasury's PPP Unit established the DOE IPP Unit, which functioned outside the department, staffed with cross-functional experts.

The report can be accessed at <https://www.github.org/resources/publications/initial-report-national-processes-facilitating-project-preparation/>.

## 2. Embrace varied PPP models with nuanced risk-sharing and balanced contracts

There is a need to look beyond the conventional BOT format and evaluate other formats, including annuity/variants and other investment-light models such as performance-based management contracts.

- Recalibrate risk-sharing to reflect sector-specific requirements and contextual factors
- Aggressively tap asset monetisation potential from public infrastructure assets with stable revenues
- Re-wire contracts with clear performance metrics, and flexibility to handle changes, terminations and exits

### Embrace varied PPP models with nuanced risk-sharing

- **Consider a range of PPP models with varied risk-sharing, depending on development objectives and sector-specific factors**

In the national highways sector, the HAM and TOT models were conceptualised in the backdrop of a fall in private investment capacity and risk appetite. Under HAM, the NHAI has sought to scale up project bidding without demand risks being passed on with a higher upfront EPC spending. However, this creates additional fiscal cost for the government and as investment momentum improves, the NHAI could possibly revert to a higher share of BOT-toll/ BOT-annuity approaches, or HAM, with a lesser upfront EPC component.

Synchronisation with development objectives and bidder ecosystem is also critical. For instance, creating a world-class asset/ customer experience (as in the case of Delhi/ Mumbai airports) will call for a different approach and even possibly targeting different bidder ecosystem vis-à-vis say modernising terminals of smaller airports.

Similarly, in the power distribution sector, while some success has been seen in privatisation and distribution franchise models, this needs to be revisited with objective of better scale, and adopting risk mitigation mechanism, especially with regard to the data quality issue and cost pass-through.

Selection of PPP models and risk sharing will therefore have to be done based on contextual factors, development objectives and the bidder ecosystem being targeted. Also, given that PPP projects involve sizeable transaction costs in project preparation and bidding, a threshold scale of project(s) is critical.

- **Tap asset monetisation in sectors/ assets with stable revenue**  
Asset monetisation in sectors such as state highways and power transmission (with identifiable assets and stable revenues) could help recycle capital for spending on infrastructure without adding incremental debt, crowd in long-term private capital and bring efficiencies in management.
- **Explore adoption of investment-light models**  
There has been limited effort to engage the private sector with a purely efficiency gap focus. Sectors such as urban water supply and power distribution, where there are sizeable viability gaps, should consider a scale-up of adoption of investment-light PPP options, including franchise arrangements and performance-based contracts.

### Re-imagine contracting frameworks

- **Benchmark and update contractual frameworks with best practices**  
While there have been some important revisions to contracting frameworks across sectors, it is critical to continually benchmark our procurement with the best-in-class practices. Specific challenges that PPP contracts have posed include:  
(i) Defining/ enforcing conditions precedent (e.g., land acquisition timelines and clearances on the public side, timely financial closure on private side) and performance metrics,  
(ii) Flexibility to handle changes including changes in scope, law and unforeseen situations, and  
(iii) Handling termination, exit and compensation for these events.
- **Strengthen performance monitoring**  
Performance monitoring in PPP projects is critical given that, by principle, the private partner is to be compensated on the basis of outcomes. Apart from monitoring by concessioning authority, additional third-party monitoring and oversight mechanisms ought to be defined at the stage of project bidding.

### **Effective independent regulation**

Regulatory separation and independence assume tremendous importance as PPPs acquire scale. Although sectors like power and ports, and more recently airports, do now have regulators, in many cases, these regulators themselves face capacity limitations. In railways, although the intent to set up a regulator has been announced, it is yet to be formally implemented. Others, such as highways, continue to be regulated by the concessioning authority.

As a principle, sectors that acquire a level of scaled-up private participation ought to be brought under an independent and empowered regulatory framework. Where the public counterparty is also vested with regulatory role, institutional mechanisms to enable clear separation of contract enforcement and overall regulatory roles should be put in place.

### **3. Create corporatised, well-capitalised, and functionally empowered counterparty agencies while getting states to do more**

PPPs are more effective when implemented by empowered public counterparty organisations. Both central and state governments need to do more towards this critical aspect.

Public institutions across sectors – whether power distribution entities, water utilities, transport corporations or municipal bodies – are severely constrained financially and institutionally. To address this, both central and state governments should intensify reforms and ensure institutional capacity building and decentralisation/ delegation of powers.

States account for over two-thirds of the development expenditure by the centre and states put together. They also play a greater role in implementation across sectors – urban infrastructure, water supply & sanitation, health, education, power distribution, etc. In several central flagship programmes, the state governments play a crucial role. Yet, barring a few, states have not stepped up PPP programmes and private participation adequately enough.

There is a need for institutional mechanisms to build greater consensus and coordination among states to raise the bar on enabling reforms, particularly in land and labour markets, and wholesome taxation and tariff reforms across sectors, including at the level of city governments.

### **4. Create supply-side enablers to deepen capital markets and innovative financing**

Creating a deep, diversified and resilient financing ecosystem to facilitate a shift from over-reliance on bank-led financing, remains an important work-in-progress facilitation.

The Insolvency and Bankruptcy Code is a big positive. Building certainty and capacity to implement the framework will be key to its effective implementation.

Positive developments in recent past include policies to encourage new instruments such as infrastructure investment trusts (InvITs) and infrastructure development funds (IDFs), and use of PPP models (including HAM and TOT) to attract newer classes of investors. Creation of allied guarantee instruments for strengthening bond markets and scaling up of the National Investment and Infrastructure Fund are other critical facilitations needed.

## 5. Accord specific thrust to deepen private participation in power distribution, railways and urban infrastructure

Despite their importance and scale, and showing promise on standalone initiatives, broad-based adoption of private investments and PPPs has been elusive in these sectors. This needs a reversal and specific thrust from the government in these sectors.

Some possible actions are:

### Railways

- Operationalise the proposed sector regulator to signal a positive bias for reforms
- Expedite implementation of a scaled-up railway station modernisation programme to upgrade 1,000 stations within a decade
- Consider creating a dedicated well-staffed PPP unit directly under the supervision of the Railway Board to identify and drive opportunities for PPP projects and private investment

### Power distribution

- Identify distribution entities and regions with large operational efficiency gaps and aggregate technical and commercial (AT&C) losses and explore implementation of PPPs to drive a timebound turnaround
- Create a robust baseline data as prerequisite for private sector participation

### Urban infrastructure

- **World-class water management programme for state capitals**  
Recently, the NITI Aayog in its report on composite water management index observed that even large urbanised states such as Maharashtra, Tamil Nadu and Kerala have significant gaps in urban water supply and that a median value of just 33% of waste-water is being treated. A programme to fix water management in state capitals can possibly help drive focused impact, given that these urban agglomerations together accounted for over 25% of India urban population in 2011. Given that these projects will have scale, the know-how and capacity build-up from this programme could also catalyse replication in other cities and towns.
- **Nudge state governments to empower urban local bodies**  
The capacity of city governments has not kept pace with urban growth, in both functional and financial terms, and remains constrained to unlock revenues from the economic potential of areas within their jurisdiction. Key interventions could include (i) a zero-base assessment and correction of staffing, (ii) formulaic devolution through an independent and timely constituted State Finance Commission and (iii) rationalisation of own income streams including property taxes, and user charges. These actions can potentially help transform city governments into credible counter-party organisations, and help unlock economic potential, to bring in private investment and know-how into infrastructure in our cities.



## CRISIL Infracore and sector scorecard

### About CRISIL Infracore

The CRISIL Infrastructure Investability Index, or CRISIL Infracore, is a framework to track, measure and assess 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, namely, policy direction, institutional strength and regulatory maturity, financial sustainability, and implementation ease. While these underpin CRISIL Infracore, scoring is based on nine criteria:

#### Pillar 1: Policy direction (weightage 20%)

1. Policy consistency, including extent of focus, the framework, clear programmes, well-prepared projects pipeline, and well-spelt out actions and targets, including phasing, milestones and timelines
2. Public financing support, covering scale and growth in budgetary outlays, and through other public instruments such as viability gap funding 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 and (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 relative to past performance and versus 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 Infracore 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 2018 provides perspectives on various infrastructure sectors and scores for the following sectors based on the CRISIL Infracore:

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 for this year's update

Each sector was evaluated based on the nine criteria and four pillars. Scoring was done against each criterion based on information available in the public domain. In terms of underlying 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. As for cost recovery, while it is based on commercial returns for the power and highways sectors, for others it is based on operation and maintenance cost recovery and/ or with subsidy and other provisions.

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.

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 (2019).










The yearbook presents scores of last year and current year to reflect the temporal movement. While the summary of scores presented below sums up the drags and drivers that have specifically contributed to the temporal movement, detailed scores are presented at the start of each of the sector-perspective chapters later in this document.

This fiscal, sectoral evaluations continue to be based largely on performance under national programmes. For instance, the scores for highways are based on the performance reflected in the programmes of the Ministry of Road Transport and Highways. On the other hand, scoring for urban infrastructure is largely a reflection of the efficacy of actions, reforms and investments under schemes of the Ministry of Urban Development.

The CRISIL InfraInvex 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 so that there is 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 update 2018 – Snapshot

	2017	2018	Drags and drivers impacting score in 2018
 <b>Conventional generation</b>	4.9	5.1	+ Centralised power procurement, directive to pass changes in cess and taxes, revision in coal escalation, rise in overall PLF and merchant power prices, old plant decommissioning - Stranded assets challenge remains, discoms still financially vulnerable
 <b>Renewables</b>	7.0	6.8	+ Robust investment interest, especially from global funds - Safeguard duty, rising costs, currency depreciation, bid cancellations
 <b>Power transmission</b>	8.1	7.9	+ Private transmission catching up in states; growth in project awards - Preferential allotments to PGCIL and its dual role in planning and operation
 <b>Power distribution</b>	5.4	5.6	+ Electrification progress, policy support to universal access, ACS-ARR gap down - Slow pace of operating improvement, discoms remain financially vulnerable
 <b>Highways</b>	6.9	7.4	+ Record PPP awards in FY18, successful TOT bid - Increase in land acquisition costs
 <b>Railways</b>	5.0	5.0	+ Step-up in public investment, sharp pace of electrification to yield savings - Decline in operating ratio, slow progress in PPP projects
 <b>Airports</b>	6.1	6.4	+ Strong traffic growth, ongoing changes to PPP framework - Slow progress in PPP bids
 <b>Ports</b>	6.6	6.7	+ Window to migrate old PPP terminals to new regime, cabotage law changes - Slowing traffic growth and capacity overhang
 <b>Urban</b>	4.5	4.6	+ Municipal bonds in a few cities, slow pick-up in flagship government schemes - Implementation capacity limitations continue to constrain absorption

# Power





**Conventional generation**

Parameter	Drivers	Drags
Policy intent	<ul style="list-style-type: none"> <li>Set-up of High Level Empowered Committee for stress resolution</li> <li>Centralised power procurement of 2,500 MW medium-term PPA to benefit projects with untied capacities</li> <li>Directive to CERC to allow pass-through of duties and taxes to lead to timely decision-making</li> <li>Phasing out of old thermal power plants to reduce the oversupply and lead to efficient utilisation of assets</li> <li>Revision in coal escalation index to improve cost-recovery</li> </ul>	<ul style="list-style-type: none"> <li>Allocation of PPAs to central gencos through the MoU route and domestic coal through the SHAKTI scheme does not provide a level playing field</li> <li>Lack of integrated energy plan, which could lead to uncertainty as well as reduce the efficiency of investment</li> </ul>
Institutional capacity and regulatory maturity	<ul style="list-style-type: none"> <li>Establishment of DEEP (Discovery of Efficient Electricity Price) portal by the government for short-term power purchase by states with an objective of uniformity and transparency in procurement</li> </ul>	<ul style="list-style-type: none"> <li>Poor redressal and arbitration framework leading to elongated resolution timeframe and financial stress</li> </ul>
Financial sustainability	<ul style="list-style-type: none"> <li>Improved cost recovery in short-term power market led by sharp rise in prices on the power exchange</li> <li>Gradual pick-up in power demand resulting in higher PLFs</li> </ul>	<ul style="list-style-type: none"> <li>Limited fresh PPAs versus untied capacity</li> <li>Limited domestic fuel availability</li> <li>Aggressive bids in the past resulting in under-recovery</li> <li>Offtake risk, a concern due to weak discom financials</li> </ul>
Implementation track record		<ul style="list-style-type: none"> <li>Delay in approvals resulting in time and cost overruns, which, in turn, adversely impact project returns</li> <li>Raising finance a challenge due to poor market dynamics</li> </ul>

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



## Renewable energy

Parameter	Drivers	Drags
Policy intent	<ul style="list-style-type: none"> <li>Policy push to promote renewables sector - 175 GW by fiscal 2022</li> </ul>	<ul style="list-style-type: none"> <li>Levy of safe-guard duty on cells and modules imported from China and Malaysia to reduce competitiveness against other power sources leading to slower capacity addition</li> <li>Lack of integrated energy plan, which could lead to uncertainty as well as reduce the efficiency of investment</li> </ul>
Institutional capacity and regulatory maturity	<ul style="list-style-type: none"> <li>Centralised procurement leads to strong counter-party and provides a long-term vision</li> <li>Large scale and moderate returns attract private financing, which in turn facilitates growth</li> </ul>	<ul style="list-style-type: none"> <li>Lack of regulatory alignment between centre and states leads to bottlenecks</li> </ul>
Financial sustainability	<ul style="list-style-type: none"> <li>Strong supply of low-cost financing from multilateral agencies and other global funds reduces costs</li> <li>Gradual fall in levelised cost of energy</li> </ul>	<ul style="list-style-type: none"> <li>Aggressive bidding to build a portfolio hurts returns</li> <li>Curtailment of power by discoms and renegotiation/ cancellation of PPAs to result in uncertainty as well as dent project profitability</li> </ul>
Implementation track record	<ul style="list-style-type: none"> <li>Plan to set up solar parks (of 40 GW) and expedite execution as land and evacuation infrastructure, both, time consuming activities are managed</li> </ul>	<ul style="list-style-type: none"> <li>Given large land requirement and small average land parcel holding size makes land acquisition challenging</li> <li>Transmission availability is an issue given the intermittency in renewable energy and the fact that renewable energy projects are typically located in far-flung areas</li> </ul>

Parameter	Evaluation criteria	Weightage	InfraInVex score	
			2017	2018
Policy direction	Policy consistency	10	6	5
	Public financing support	10	8	8
Institutional maturity and strength	Entity implementation capacity	10	7	7
	Financing models	10	8	8
	Regulatory robustness	10	6	6
Financial sustainability	Cost recovery	20	13	12
	Demand risk	10	6	6
Implementation ease	Track record	10	10	10
	Externalities	10	6	6
<b>Total</b>		<b>100</b>	<b>70</b>	<b>68</b>



**Power transmission**

Parameter	Drivers	Drags
Policy intent	<ul style="list-style-type: none"> <li>• \$3.5 billion investment in Green Energy Corridor Project by fiscal 20 to improve transmission capacity for renewable energy projects</li> <li>• Implementation of General Network Access to alleviate transmission congestion</li> </ul>	<ul style="list-style-type: none"> <li>• Continued allocation of some projects to PGCIL on a nomination basis</li> <li>• Slow state level planning results in evacuation constraints</li> </ul>
Institutional capacity and regulatory maturity	<ul style="list-style-type: none"> <li>• Strong execution capability of PGCIL</li> <li>• Private sector participation through competitive bidding. Higher number of awards as compared to last year</li> </ul>	<ul style="list-style-type: none"> <li>• Dual role of PGCIL- transmission planning and execution of interstate transmission projects results in conflict</li> </ul>
Financial sustainability	<ul style="list-style-type: none"> <li>• Assurance of regular revenue streams</li> </ul>	<ul style="list-style-type: none"> <li>• Less than expected improvement in financial position of discoms</li> </ul>
Implementation track record	<ul style="list-style-type: none"> <li>• Doubling of inter-regional transmission capacity between fiscals 2013 and 2018</li> </ul>	<ul style="list-style-type: none"> <li>• Right of way issues</li> </ul>

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

2017 score

5.4/10



2018 score

5.6/10



## Power distribution

Parameter	Drivers	Drags
Policy intent	<ul style="list-style-type: none"> <li>Central schemes - UDAY, IPDS, DDUGJY, 24x7 Power for All, Saubhagya - with an objective to boost growth and improve operational and financial position of discoms</li> </ul>	<ul style="list-style-type: none"> <li>Lack of policy alignment between central and state agencies constraints turnaround of the sector</li> </ul>
Institutional capacity and regulatory maturity	<ul style="list-style-type: none"> <li>Pockets of success of PPP models such as DF</li> </ul>	<ul style="list-style-type: none"> <li>Poor governance structure &amp; lack of regulatory independence adversely impact the entire power sector value chain</li> <li>Poor baseline data quality, monitoring and reporting mechanisms</li> </ul>
Financial sustainability	<ul style="list-style-type: none"> <li>Slight improvement in recovery because of UDAY, particularly with reduction in interest expenses</li> </ul>	<ul style="list-style-type: none"> <li>Miss on AT&amp;C loss reduction target, inadequate and delay in tariff hikes and non-targeted subsidy</li> </ul>
Implementation track record	<ul style="list-style-type: none"> <li>100% feeder metering, 64% feeder segregation and more than 50% distribution metering completed</li> </ul>	<ul style="list-style-type: none"> <li>Limited achievement on UDAY and 24x7 Power for All targets</li> </ul>

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





## Sector performance and expected growth

### Trends in the past five years

#### Conventional power generation

- **Installed capacity**

India's installed capacity in conventional power clocked a healthy compound annual growth rate (CAGR) of 6.5% between fiscals 2014 and 2018. The last two fiscals, however, saw a slowdown in capacity addition, given muted growth in power demand, large untied capacities, domestic fuel availability issues, and stretched balance sheets of the private sector.

There has been a sharp fall in the private sector's share in capacity addition to 49% in fiscal 2018, after peaking at close to 67% in fiscal 2014.

The fuel mix continues to be dominated by thermal power, which accounted for 81% of the installed conventional capacity in fiscal 2018. Hydropower additions remain slow owing to major rehabilitation issues and high costs. Nuclear power capacity addition, too, has remained tepid owing to issues related to clearances.

#### Installed capacity headed north (GW)

	FY 14	FY 15	FY 16	FY 17	FY 18
Thermal	168.3	188.9	210.7	218.3	222.9
Nuclear	4.8	5.8	5.8	6.8	6.8
Hydro	40.5	41.3	42.8	44.5	45.3
Total	213.6	236.0	259.3	269.6	275.0

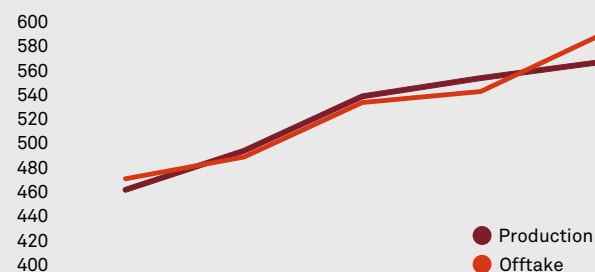
Source: Central Electricity Authority (CEA)

- **Availability of domestic coal**

Coal-based power remains the largest contributor with a share of ~79% in electricity generation in fiscal 2018.

In the past, limited availability of domestic coal had pushed up coal imports. However, in the last five years, availability has improved with Coal India Ltd's production logging a CAGR of ~5.3% and offtake clocking a CAGR of ~5.7%. Moreover, through the SHAKTI scheme, projects with power purchase agreements (PPAs) have already been awarded domestic coal, while for those without PPAs, auctions are expected to be undertaken in near future.

#### Coal production and offtake in India (MT)



	FY 14	FY 15	FY 16	FY 17	FY 18
Production	462	494	539	554	567
Offtake	471	489	534	543	589

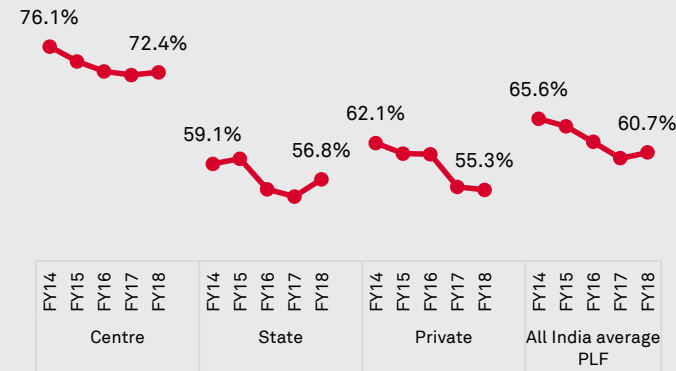
Source: Coal India annual reports

- **PLF of thermal plants**

A declining trend in plant load factor, or PLF, of coal-based power plants has been a key area of concern and has threatened the power sector's financial viability in the last few years. Large-scale capacity additions, slack in demand from discoms owing to weak financial health and constrained domestic coal availability have led to PLFs plummeting over the last five years.

Average PLFs have declined 500 basis points (bps) to 60.7% over fiscals 2014-2018. Central government projects, led by NTPC, operated at relatively healthy PLFs of 72.3% in fiscal 2018 owing to contracted capacities (PPAs) with discoms as well as better domestic coal availability. However, the state and private players operated at abysmally low average PLFs of about 55%.

**State and private utilities have seen a sharp fall in PLFs**



Source: CEA

That said, PLFs have improved in fiscal 2018 and in the first five months of fiscal 2019, driven by slowdown in capacity addition, gradual pick-up in demand, and improved domestic coal supply to power plants.

**Renewable energy generation**

• **Installed capacity**

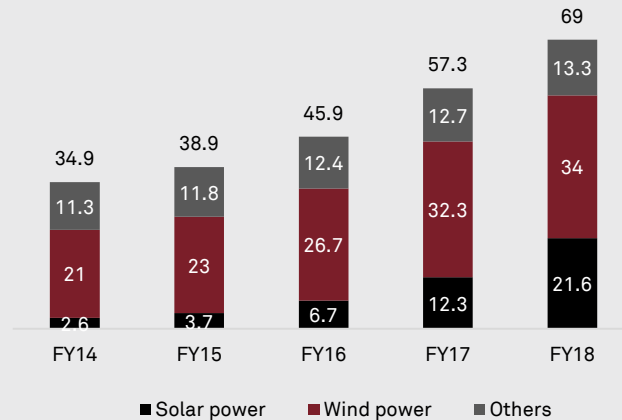
Backed by strong government thrust, favourable policies and incentives, as well as falling levelised cost of energy, particularly for wind and solar power, the installed capacity of renewable energy sector has witnessed a CAGR of 18.5% between fiscals 2014 and 2018.

Major traction was observed in solar power, whose installed capacity grew at a breakneck speed to ~22 GW in fiscal 2018

– over 8x compared with fiscal 2014. This has been driven by cost-competitiveness achieved due to falling module prices, centralised procurement from creditworthy central government entities such as Solar Energy Corporation of India (SECI) and NTPC Vidyut Vyapar Nigam Ltd, and availability of finance at lower costs.

Wind power has grown at a steady pace in the past five years, though it witnessed a slowdown in fiscal 2018. This was mainly due to uncertainty among developers, delayed approvals, and renegotiations from discoms as the sector migrated to a competitive bidding mechanism for award of capacities from the erstwhile feed-in-tariff regime.

**Renewable energy installed capacity (GW)**



Source: CEA, MNRE

**Power supply position**

Between fiscals 2014 and 2018, the requirement of electricity logged 4.9% CAGR. However, with a CAGR of 5.8%, energy availability outpaced energy requirement, supported by strong capacity addition.

This has led to a decline in energy deficit to 0.7% in fiscal 2018. The peak deficit has also come down to 2% in fiscal 2018 from 4.5% in fiscal 2014.

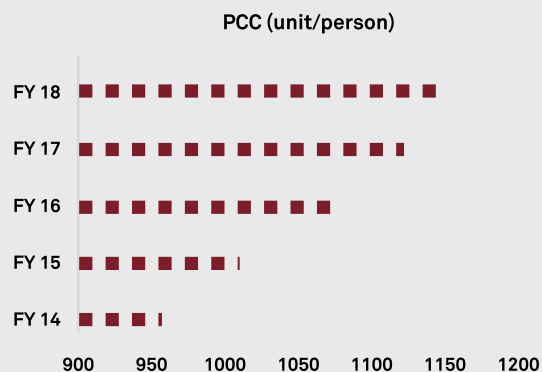
Power supply position	FY14	FY15	FY16	FY17	FY18
Energy requirement (BU)	1002.3	1068.9	1114.4	1142.9	1213.3
Energy availability (BU)	959.8	1030.8	1090.9	1135.3	1204.7
Surplus/ deficit (%)	-4.2	-3.6	-2.1	-0.7	-0.7
Peak demand (GW)	135.9	148.2	153.4	159.5	164.1
Peak met (GW)	128.8	141.2	148.5	156.9	160.8
Surplus/ deficit (%)	-4.5	-4.7	-3.2	-1.6	-2

Source: CEA

While the reported energy supply position makes India almost balanced (no power surplus/ deficit), current demand reporting does not capture unmet demand factors such as planned and unplanned load shedding, unconnected households and large-scale back-up captive generation. The reported deficit numbers, which look near surplus at present, would increase considerably in case the latent demand factors are considered in the reporting.

- **PCC**

The per capita consumption (PCC) increased to 1,149 kWh in fiscal 2018 from 957 kWh in fiscal 2014, logging a CAGR of 4.7%.



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 3,200 kWh per capita in fiscal 2018. In fact, Gujarat, a developed and industrialised state, had a per capita consumption of ~2,280 units as of fiscal 2017. The scenario in less developed peers such as Bihar and Uttar Pradesh was far worse, with per capita electricity consumption at ~272 and ~585 units<sup>1</sup>, respectively. This underscores the growth potential.

## Power transmission

Transmission lines in circuit kilometre (ckm) have clocked a healthy 12.4% CAGR between fiscals 2014 and 2018, led by improving inter-regional capacity and system strengthening.

Power Grid Corporation of India Ltd's (PGCIL) share in transmission lines averaged ~45%, with states accounting for a large proportion of the balance. However, private sector participation has also risen over the years.

Transmission lines (ckm)	FY14	FY15	FY16	FY17	FY18
HVDC (800 kV & 500 kV)	0	0	3506	2618	0
765 kV	4637	7548	5601	6995	4600
400 kV	7777	9992	11181	10657	15219
220 kV	4334	4561	7826	6030	6887
Total	16748	22101	28114	26300	26706

Source: CEA

With rising renewable energy penetration, grid integration could become a challenge unless addressed in a timely and effective manner.

The Green Energy Corridor Project, under implementation in Andhra Pradesh, Gujarat, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, and Tamil Nadu, has a total outlay of ~Rs 10,000 crore spread over four years through fiscal 2020. Though running behind schedule<sup>2</sup>, it will facilitate evacuation from solar parks and large-scale grid-connected solar and wind projects once complete.

<sup>1</sup>CEA, <sup>2</sup>As per Standing Committee Report on Energy Demand for Grants (2018-19) submitted in Lok Sabha

## Power distribution

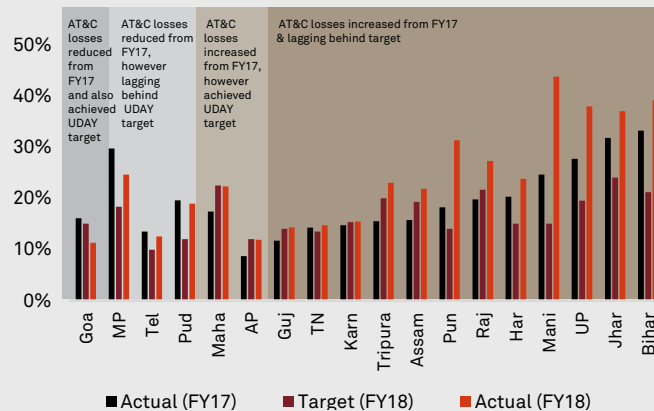
### AT&C loss levels

The aggregate technical and commercial (AT&C) losses of utilities selling directly to consumers increased to 23.08% in fiscal 2019<sup>3</sup> from 22.58%<sup>4</sup> in fiscal 2014, underscoring the distribution sector woes. We believe that this goes to indicate poor data quality and reporting issues at the discom end.

A key aspect of Ujwal Discom Assurance Yojana (UDAY), launched nearly three years ago, is to reduce AT&C loss levels consistently to improve the operational efficiency of state-owned discoms. While some discoms have managed to reduce the AT&C loss level, the performance of many is of concern. Only three states have managed to achieve their UDAY targets.

While the fiscal 2018 data is as provided by discoms as part of UDAY monitoring, the actual losses are likely to be much higher.

### Progress of AT&C losses compared with target & historical performance

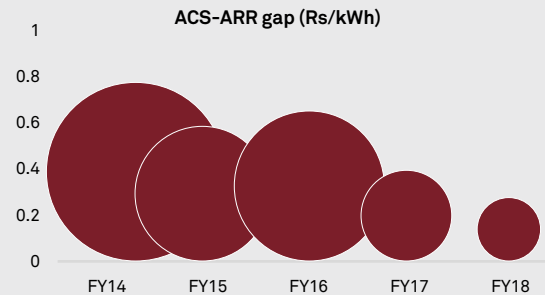


Guj- Gujarat, Karn- Karnataka, MP- Madhya Pradesh, Jhar- Jharkhand, UP- Uttar Pradesh, TN- Tamil Nadu, Mani- Manipur, Maha- Maharashtra, Har- Haryana, Raj- Rajasthan, Tel- Telangana, AP- Andhra Pradesh, Pun- Punjab, Pud-Puducherry

Source: UDAY dashboard

### ACS-ARR gap

The difference between the average cost of supply (ACS) and the average revenue realised (ARR) – called the ACS-ARR gap, a key indicator of the financial health of distribution companies – is negative in the last five years due to high AT&C losses and inadequate tariff hikes.



Source: UDAY, PFC

Introduction of various reforms (UDAY, provision of grants under Integrated Power Development Scheme and Deen Dayal Upadhyaya Gram Jyoti Yojana for network development, etc) to revamp the performance of state utilities have contributed to the improvement. All the same, under-recovery, at Rs 0.28/unit as of fiscal 2018, remains a concern as it adversely impacts the entire power sector value chain in terms of constrained demand and delay in payments.

### Electrification drive

As of April 2018, 100% village electrification has been achieved. However, there are un-electrified households in many states. To achieve 100% electrification and 24x7 Power for All objective, the Pradhan Mantri Sahaj Bijli Har Ghar Yojana, or Saubhagya, has been launched to electrify the remaining households (3.2 crore as of October 2017).

<sup>3</sup>UDAY website (data as of September 2018; does not include data of Mizoram, Nagaland, Andaman and Nicobar Islands, and Lakshadweep), <sup>4</sup>PFC report, The Performance of State Power Utilities

However, the government's target of 100% household electrification by December 2018 appears challenging given that only ~45%<sup>5</sup> of un-electrified households have been electrified as of September 2018.

The willingness of discoms to undertake the capex required – given the profile of marginal customers – and hurdles posed by the large geographical area and difficult terrain are also among challenges.

While Gujarat, Andhra Pradesh, Tamil Nadu, Punjab and Kerala have connected all households, states such as Uttar Pradesh, northeast states, Jammu & Kashmir and Jharkhand lag behind significantly.

## Sector outlook

### Conventional power generation

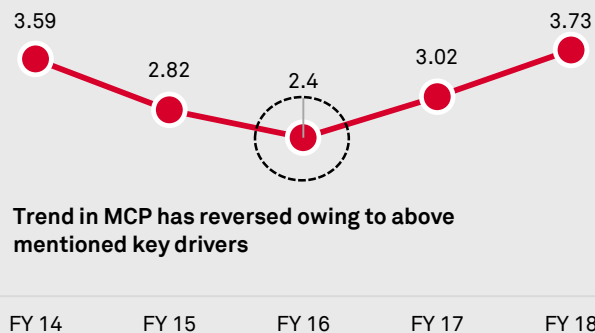
- **Energy requirement growth:** We expect energy requirement to gradually pick up and log a CAGR of ~6.5% over fiscals 2019-2023. This will be led by increasing hours of supply and intensive electrification drive, as well as emerging drivers such as uptake of electric vehicles. On the other hand, penetration of roof-top solar and improving energy efficiency will constrain energy growth.
- **Capacity addition:** Conventional power capacity additions are expected to slow down significantly given low utilisation of existing assets, rising share of renewables, and financial stress in the sector. In fact, well-capitalised players are opting for the inorganic route to expand capacity as assets are available at attractive valuations.

We expect an estimated 26-28 GW to be added over the next five years. These additions will be dominated by central and state utilities, with share of private sector expected to less than 20%.

- **Domestic coal availability:** We expect domestic coal production to clock 6-7% CAGR, driven by Coal India and large captive mines awarded to government-owned players. This, coupled with the new coal linkage policy, SHAKTI, could ease constraints on fuel supply. That said, under SHAKTI scheme, too, government-owned generating companies continue to be offered coal linkages at notified prices, whereas private entities have to purchase coal at a premium (via auctions), indicating a level playing field is still lacking.

- **Slight pick-up in PLF level:** Thermal PLF is likely to remain range-bound at ~60% in the short term, but rise over the medium-to-long term, driven by pick-up in demand, significant slowdown in capacity addition, retirement of old projects, and improvement in domestic coal availability.
- **Merchant power prices:** We expect merchant power prices, which have spiked over the last two years, to rise further in the next five years. This will be driven by:
  - Demand growth outpacing supply
  - Imminent central and state elections
  - Higher costs owing to capex on flue gas desulphurisation, or FGD, as well as gradual recovery of past cost-overruns
  - Higher O&M costs resulting from rising renewable energy penetration

### Market clearing price (MCP) (Rs/kWh)



Trend in MCP has reversed owing to above mentioned key drivers

Source: Indian Energy Exchange

As can be inferred from the above analysis, at an overall level, key market related parameters – demand-supply gap, domestic coal availability and merchant power prices – are expected to trend in a positive direction. However, along with this, government support is critical to boost demand, ensure coal for all (irrespective of PPA), expedite tariff approval owing to change-in-law, phase out old capacities and ensure calibrated capacity expansion, especially of renewable energy. The High Level Empowered Committee set up to resolve key areas of concern in the power sector is also a key positive.

<sup>5</sup>Saubhagya (as of Sep 2018)

## Renewable power generation

- **Renewable energy capacity addition:** Continued government thrust, expected drop in levelised cost of energy, and economical tariffs compared with conventional sources are expected to benefit the renewable energy juggernaut. The government's global commitment to reduce carbon emissions will also support growth of renewable energy. Availability of foreign funding – debt and equity – at attractive rates, too, will drive investments in renewable energy.

By fiscal 2023, we expect the grid-connected installed renewable energy capacity to be around 140 GW. Solar power is likely to account for ~50% of this, followed by wind power with ~40%.

- **Distributed generation:** We expect distributed generation to gain traction over the medium term given high commercial and industrial tariffs, large existing geographical and transmission constraints, and falling storage costs. However, limited finance availability, lack of robust grid and discoms' unwillingness to let go of profitable customers are some key issues plaguing this segment.
- **Bid tariffs:** We believe that while capital costs are expected to go downwards, the levy of safeguard duty, hardening interest rates and rupee depreciation are expected to play spoilsport. As a result, project returns are expected to be under pressure as developers give preference to build a portfolio.
- **Domestic solar cell and module manufacturing:** Imported modules account for about 90% of total consumption in India. The government has initiated some measures to reverse this trend, including levy of safeguard duty and domestic manufacturing linked tender of 10 GW solar development (with 3 GW manufacturing capacity). However, the move is not likely to materially benefit the domestic solar cell and module manufacturers as it is applicable only for two years. Also, developers are not likely to be very keen to set up manufacturing capacity given that it is a non-core activity. Thus, at an overall level, domestic manufacturing is not expected to significantly upscale.
- **Financing:** Given aggressive bidding for renewable energy projects and rising non-performing assets in the banking system, domestic debt availability has been slightly constrained in the current context.

However, renewable energy continues to attract funds from other sources (both debt and equity) including from multilateral agencies, private equity and pension funds. Relatively new sources of avenues including green bonds and infrastructure investment trusts are also expected to gain traction.

- **Incentives:** We believe that with renewable energy technology maturing and tariffs becoming competitive with other fuel sources, the incentives currently available would be phased out gradually.

Given the dynamics expected to play out, we believe the market will witness significant consolidation and 5-6 large players will emerge. This is mainly because smaller players are unable to compete with the established players given lack of scale and higher financing costs. While we have already seen some deals in the past, several large deals are in the pipeline.

## Power transmission

- **Green Energy Corridor:** The critical Green Energy Corridor Project for evacuating renewable energy is under execution. However, the Standing Committee on Energy in its report (Demands for Grants 2018-19) noted that the project is underfunded, which has led to delay in project execution. In light of potential grid constraints, renewable energy capacity additions could be delayed. Hence, timely implementation of the corridor project is crucial.
- **Large capital outlay from PGCIL:** For strengthening the transmission infrastructure and augmenting transmission capacity, PGCIL has planned an outlay of Rs 25,000 crore<sup>6</sup> for fiscal 2019, of which over Rs 19,000 crore will go into new projects. So far, of the 41 projects awarded under the tariff-based competitive bidding route, PGCIL has been awarded 12 projects, including two in fiscal 2018. Over the medium term, too, investments from PGCIL are expected to be robust at ~Rs 25,000 crore annually.
- **Private sector participation:** The government is expected to continue to encourage private sector participation in the inter- and intra-state transmission segment to ensure adequate fund availability and to benefit from their execution experience. In fact, Rural Electrification Corporation and Power Finance Corporation (PFC) together have

<sup>6</sup>Power Grid Annual Report 2017-18

awarded six inter-state transmission projects through the competitive bidding route in fiscal 2018, higher than that in the preceding year. However, some projects continue to be awarded to PGCIL on nomination basis, which constrains exploiting full potential of private sector.

Also, several states have taken initiative for setting up intra-state transmission lines through PPPs based on model concession agreement and standard bidding documents. These include Rajasthan, Uttar Pradesh, Haryana, Maharashtra, Madhya Pradesh and Jharkhand. Several such PPP projects are likely to boost the flow of private investments in the sector.

## Power distribution

- **Improvement in discom financials:** Debt restructuring of distribution utilities under UDAY and lower cost of power purchases due to improved domestic coal availability and coal rationalisation are likely to improve discoms' financials in the medium term. As a result, we believe the ACS-ARR gap, will shrink from Rs 0.28/unit in fiscal 2018, but will persist even in fiscal 2020.
- **Improvement in receivable days:** Improvement in discom financials is expected to provide some relief to the independent power producers through a reduction in the receivable cycle.
- **UDAY targets likely to be missed due to implementation challenges**
  - 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 Rs 0/kWh by fiscal 2020 is likely to be missed as tariff increase in terms of timeliness and adequacy is expected to remain the bone of contention for state regulators
  - Extensive rural electrification under '24x7 Power for All' is also likely to result in bigger ACS-ARR gap

- Further, certain state discoms continue to grapple with the problem of high regulatory assets

In a bid to revitalise the power distribution segment as well as benefit the entire value chain of the power sector, the government has proposed amendments to the Electricity Act. Under this, the government is considering new initiatives such as penalty for load shedding, installation of smart meters, penalty on violation of PPAs, Direct Benefit Transfer of subsidy, and separation of carriage and content (though it is still in a nascent stage). The form and timeliness of implementation will be crucial for turnaround of the sector.

## Active push towards storage

- To increase the reliability of renewables and reduce the grid disturbances, the Ministry of New and Renewable Energy has introduced the draft National Energy Storage Mission through which 15-20 GWh of grid connected storage plants will be set up in the next five years
- NITI Aayog has proposed a three-stage solution (creating an environment for battery manufacturing growth, scaling supply chain strategies and scaling of battery cell manufacturing)<sup>7</sup> approach for achieving these targets. Increase in storage plants will also reduce dependence on conventional fuels

## Financing requirement

- **Financing the '24x7 Power for All'** and other initiatives is expected to be a major concern for the sector, given increased burden on state finances due to UDAY and the discoms' poor financial health today
- **Finance requirement over five years through fiscal 2023 of Rs 13.2 lakh crore**
  - Generation\* – Rs 6.8 lakh crore
  - Transmission – Rs 3.4 lakh crore
  - Distribution – Rs 3 lakh crore

<sup>7</sup>NITI Aayog – India Energy Storage Mission, \*Includes conventional and renewable energy (solar and wind). Also includes capex for FGD installation



## Key challenges

### Power offtake concerns and domestic fuel availability

Sluggish demand growth in the industrial and commercial sectors and lack of capacity contracting by discoms have rendered a significant quantum of thermal capacity surplus, and without PPAs. In addition, central generating companies continue to sign PPAs with discoms through the memorandum of understanding (MoU) route which creates level playing field issues. Given this – and financial distress and technical constraints – discoms have resorted to load shedding, resulting in suppressed demand and lower capacity offtake.

Domestic coal supply has been an area of concern owing to slow growth in production by Coal India Ltd, de-allocation of captive coal blocks, and coal evacuation issues owing to constrained rail capacity.

### Timely pass-through of change in taxes and duties

- Given a lack of appropriate pass through mechanism in the PPAs, many developers are facing difficulties in passing on the rise in costs due to changes in law (taxes & duties) to the discoms. This has resulted in poor project cash flows, leaving the developers anguished. If this situation persists, it will have a negative impact on growth in capacity addition. In this regard, the Ministry of Power has directed the Central Electricity Regulatory Commission to treat change of cost related to change in duties, taxes, cess, etc, as pass-through and issue order for pass through with calculation of per-unit impact within 30 days of filing of petition
- As per our estimates, these factors (including fuel supply and offtake concerns) have led to a rise in stress for over 35-40 GW of installed thermal assets and over 20 GW of under-construction thermal projects

### Renegotiation of LoAs

- The spate of bid cancellations post discovery of tariff at auctions continued in 2018
- In recent past, Uttar Pradesh cancelled a solar tender where the lowest tariff was Rs 3.48/unit on the ground that the central bids were achieving a much lower tariff of Rs 2.44/unit. Further, SECI has also partially cancelled a 3 GW tender where the only bidder to have quoted Rs 2.44/unit was awarded, while others, with tariffs of Rs 2.71/unit were disqualified. Gujarat Urja Vikas Nigam Ltd, too, recently scrapped a 500 MW solar auction as the price discovered was higher at Rs 2.98/unit compared with Rs 2.65/unit in the previous 500 MW auction
- Such moves adversely impact market sentiment and make it challenging for the industry in terms of long-term planning

### Caution required in solar and wind bidding

- Large developers in the renewable energy segment have prioritised building a portfolio over project returns. As a result, solar and wind power have 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 also hurt returns
- Therefore, aggressive bidding could result in significant financing challenges, especially given the frail financial position of domestic banks

## Higher cost of renewable energy integration

- The actual cost of renewable energy is higher considering the impact of fixed cost for backing down thermal power, purchase of additional peak power, loss of cross subsidy (solar rooftop) etc. We estimate the additional cost impact of producing renewable energy to be Rs 1-1.5 per kWh<sup>8</sup> depending on the state, considering factors such as Average Power Purchase Cost, solar rooftop impact, backing down of thermal projects, balancing/ peaking cost, Deviant Settlement Mechanism impact, and interstate charges

## UDAY challenges

- Slippages in UDAY target would result in significant cash losses for discoms, which would make working capital financing a challenge
- Increase in tariff, as prescribed under UDAY, is proving to be a major challenge as many state regulators appear undecided on tariff hike. While tariff orders for 25 of the 27 states<sup>9</sup> have been approved, the adequacy of tariff hikes remains questionable. The success of UDAY will therefore hinge on the role of state regulators in addressing this.
- State governments of Uttar Pradesh, Haryana, Punjab and Rajasthan are facing funding shortfalls due to factors such as takeover of liability under UDAY, poor rating, and fiscal responsibility and budget management limits
- Various discoms have missed the targets set under UDAY, both in terms of tariff hikes and AT&C loss reduction. UDAY remains silent on working capital requirements, in case they keep on missing the target set under the scheme. However, the losses of the discoms would be taken up in a graded manner by state governments

We believe adequate focus is required, given the criticality and financial condition of the distribution sector. Encouraging private participation through the PPP route could be evaluated for financial turnaround of the segment. While there have been pockets of private participation in this space, there has been some hiatus and this clearly needs a relook. Accordingly, in a subsequent section, we have delved deeper into PPP in power distribution to assess key learnings from the past and potential ways of successful implementation in the future.

## Recharging the distribution paradigm

### Financial health of power distribution utilities remains frail

Power distribution is the weakest link in the power sector value chain. The financial position of discoms is dismal, with accumulated losses at Rs 4.1 lakh crore in fiscal 2016.

### Losses mounting at all-India level

Year	FY14	FY15	FY16
Accumulated losses (Rs crore)	3,06,317	3,58,581	4,13,933

Source: PFC report on Performance of State Distribution Utilities

While, there have been two bailout packages in a little over five years, with focus on cost reduction and improvement in operational efficiency, impact on financial status of distribution companies has been limited.

In fact, as per the UDAY dashboard, the ACS-ARR gap remains negative at Rs 0.28/unit<sup>10</sup> as of September 2018. Also, state owned discoms continue to log high AT&C losses of ~23% against a target of 15% by the end of fiscal 2019 set under UDAY.

### Privately owned discoms have fared better

Private discoms operating in Kolkata, Delhi, Mumbai, Ahmedabad, Surat and Greater Noida have a relatively superior operating and financial position. Indeed, the AT&C losses of some of these are less than the national target under UDAY.

Clearly, private participation in distribution sector offers potential advantages the government-owned discoms may not be able to bring in. Some of these are:

<sup>8</sup>CRIS analysis, <sup>9</sup>UDAY portal (as on 13.09.2018), <sup>10</sup>As per UDAY portal (depicts data of 22 states as of Sep 2018)

### AT&C losses of private discoms

Year	FY13	FY14	FY15	FY16	FY17 (P)
Tata Power Delhi Distribution Ltd	10.7%	10.6%	10.4%	9.4%	9.1%
BSES Yamuna Power Ltd	21.1%	22.2%	19.4%	16%	13.2%
BSES Rajdhani Power Ltd	17.7%	16.9%	13.7%	11.9%	11.4%
Noida Power Company Ltd	8.1%	8.4%	8.0%	8.0%	8.0%
Torrent Ltd (Ahmedabad)	7.3%	7.3%	7.3%	7.2%	6.8%
Torrent Ltd (Surat)	4.2%	4.3%	4.1%	3.9%	3.9%
Tata Power Mumbai	5.5%	5.1%	5.0%	4.4%	4.0%

P – Provisional  
Source: Tariff orders of respective utilities

- Better management practices
- Operational excellence
- Independent and profit-oriented approach
- Isolation from political involvement

### Operational distribution franchisees (DF) in India

State	Discom	Circle/ town	DF	Year
Maharashtra	MSEDCL	Bhiwandi	Torrent Power Ltd	2006
		Nagpur	Spanco Nagpur Discom Ltd^	2011
Uttar Pradesh	DVVNL	Agra	Torrent Power Ltd	2009
Odisha	CESU	Khurda, Balugaon, Puri, Nayagarh	FEDCO	2013
		Kendrapara, Jagatsinghpur, Dhenkanal, Talcher, Angul	Enzen Global	
		Nimapara	Seaside Utilities Pvt Ltd*	
Rajasthan	JVVNL	Cuttack, Athagarh, Salepur	Riverside Utilities Pvt Ltd*	
		Kota	Kota Electricity Distribution Ltd**	2016
	AVVNL	Bharatpur	Bharatpur Electricity Distribution Ltd**	2016
		Bikaner	Bikaner Electricity Supply Ltd**	2017
	AVVNL	Ajmer	Tata Power Ajmer Distribution Ltd	2017

MSEDCL: Maharashtra State Electricity Distribution Company Ltd, DVVNL: Dakshinanchal Vidyut Vitran Nigam Ltd, CESU: Central Electricity Supply Utility of Odisha, JVVNL: Jaipur Vidyut Vitran Nigam Ltd, AVVNL: Ajmer Vidyut Vitran Nigam Ltd  
^ Subsidiary of Essel Utilities  
\* SPV owned by SPIS Utilities Pvt Ltd  
\*\*Subsidiaries of CESC Ltd

Despite these advantages and on-ground performance, unfortunately, no new circles have been fully privatised in the last decade. This is mainly because state governments are loath to loosen their grip on consumer tariffs, given its political sensitivity.

### Leveraging private sector expertise the need of the hour

In the context, PPP models like distribution franchise (DF) gains prominence as it allows the state-owned discom to retain control over tariffs as well as remain the owner of the assets. At the same time, it helps bring in efficiency and management expertise from the private sector.

### Experience in implementing distribution franchises a mixed bag

The experience of implementing this model has been mixed, with a few succeeding and others unable to yield the desired results. While 18 DFs have been awarded so far, only 11 DFs are operating in four states – Maharashtra, Uttar Pradesh, Odisha and Rajasthan.

While some franchisees were aborted at the bidding stage, the others were terminated owing to various challenges, including non-payment of dues or inadequate investments. These were mainly in Madhya Pradesh, Bihar, Jharkhand and Maharashtra.

Given the criticality of power distribution in the value chain, a thrust on the PPP model is the need of the hour.

## **Bhiwandi distribution franchisee**

The appointment of the first private power distribution franchisee, Torrent Power, in the Bhiwandi area of MSEDCL was touted as a success story. It was the first input & investment-based franchise to be executed in India.

When Torrent Power took over operations in Bhiwandi, in fiscal 2007, it had AT&C losses of over 55%, high levels of load shedding and unregistered consumers.

The company improved the distribution network by investing in metering, changing the low tension or LT network, installing efficient transformers, feeders, substations, etc, and most importantly, maintaining an up-to-date database of its consumers.

With the correct mix of factors in play, including good consumer base and effective investments at the right time, these initiatives have helped make the DF a success story. There has been considerable reduction in AT&C losses, to ~19% in fiscal 2018.

The consumer mix of Bhiwandi has offered its own advantages, with industrial and power loom consumers accounting for ~46% of the pie. State government support in terms of tariff hikes as well as legal support to tackle theft cases has helped, too. Besides, the cost of power purchase compared with the average tariff in the Bhiwandi circle has ensured adequate headroom for cost recovery.

## **Redressal of issues critical to encourage private sector participation**

We have analysed different private sector participation projects awarded so far and collected key learnings from each. Basis these, aspects that need to be addressed prior to engaging the private sector have been summarised below.



## Issues and potential solutions

Parameter	Key issue	Potential solution
<b>Quality of baseline data</b>	Inaccurate baseline data in request for proposal can distort the average billing rates and render these unremunerative for the bidders. These parameters include: <ul style="list-style-type: none"> <li>• AT&amp;C losses</li> <li>• Number of consumers</li> <li>• Consumer mix</li> </ul>	An independent audit by a third party must be undertaken prior to awarding of projects to private players
<b>Consumer profile</b>	Certain areas may be highly populated by subsidised consumer categories such as agricultural and residential. This could adversely impact cost recovery for the distribution franchisee	Private player should be allowed to charge the full tariff, with direct benefit transfer provided to the subsidised consumer Benchmark input rate set by the discom needs to adequately factor the customer profile
<b>Government support</b>	Power theft, administrative bottlenecks and force majeure issues could derail operations	Relevant support from state electricity regulatory commissions and state governments is crucial for smooth operation
<b>Tariff revision</b>	Lack of adequate and timely tariff revisions could lead to under-recoveries impacting returns of the private player adversely	Adequate support from discoms and regulators in terms of timely tariff filling and just approval of tariff is crucial
<b>Benchmark input rates</b>	In a bid to maximise revenues, discoms set high benchmark input rates while inviting bids	The benchmark input rate must be: <ul style="list-style-type: none"> <li>• Set in a transparent manner taking into account realistic data points</li> <li>• Reasonable to ensure that the private party has adequate headroom to recover its costs</li> </ul>
<b>Selection criteria</b>	Players with no track record in similar business have been awarded projects in many cases, leading to failure in operations	Stringent operational and financial qualification criteria must be set to ensure superior quality of participation Quality & cost-based selection could be considered instead of L1 bidding
<b>Contract duration</b>	Shorter contract duration is detrimental to the interest of the discom as well as the private player as it encourages short-term investments (without meeting the long-term objectives)	Contract tenure of 15 years or more should be provided to ensure that long-term capex in strengthening distribution infrastructure is undertaken

Apart from the above, we believe some fundamental aspects of private sector participation should be taken care of. Below, we have enlisted some key ones:

### Customised PPP models based on local market conditions

- Take into account factors such as consumer profile, AT&C losses, per capita consumption, terrain, etc

### Adequate scale of projects

- Skin in the game is critical to generate private sector interest
- Models with equitable risk sharing

- Skewed contracts with high downside risk leads to lukewarm response to opportunities

### Strong contract frameworks to attract private capital

- Contract structure that allows for clear performance metrics, laid-out renegotiation terms, termination and exit clauses

# Roads & highways





Parameter	Drivers	Drags
Policy intent	<ul style="list-style-type: none"> <li>Well-defined national programmes: NHDP, Bharatmala, Setu Bharatam</li> <li>Clear pipeline and targets (~40 km/day of construction)</li> <li>Earmarked outlays (Bharatmala: Rs 3.85 lakh crore)</li> <li>Commensurate increase in budgetary support</li> <li>Expeditious resolution of stalled projects</li> </ul>	<ul style="list-style-type: none"> <li>Relatively slow progress on expressways, although first set of contracts under preparation</li> </ul>
Institutional capacity and regulatory maturity	<ul style="list-style-type: none"> <li>NHAI, an AAA-rated entity driving PPP implementation</li> <li>HAM and TOT helping revive private investment strongly</li> </ul>	<ul style="list-style-type: none"> <li>EPC still dominates contracting</li> <li>Financing challenges in stressed projects and some awarded under HAM</li> <li>NHAI's status as owner-regulator continues</li> <li>Scope for improving pace of dispute resolution</li> </ul>
Financial sustainability	<ul style="list-style-type: none"> <li>Sizeable VGF and increased public allocation</li> <li>Fairly stable toll regime, electronic tolling stepped up</li> <li>Attracting new investor category through TOT</li> </ul>	<ul style="list-style-type: none"> <li>Increase in fiscal burden as BOT-toll share dips</li> <li>Irrational bidding remains a concern</li> </ul>
Implementation track record	<ul style="list-style-type: none"> <li>Construction up 64% between fiscals 2016 and 2018</li> <li>Reduction in median delays in project completion</li> <li>Improvement in land acquisition status prior to award</li> </ul>	<ul style="list-style-type: none"> <li>Dip in project awards in first half of fiscal 2019 a concern</li> <li>Increasing land acquisition cost, almost tripling from ~Rs 80 lakh per hectare to ~Rs 2.4 crore</li> </ul>

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

## Sector performance and trends

### Growth of the national highways network

- National highways have improved hinterland connectivity, covering 115,435 km. This network caters to 40% of total road traffic in the country

#### Increase in length of national highways (km)

Year	2013	2014	2015	2016	2017	2018
Length of national highways	79,116	92,651	96,214	100,475	103,933	115,435

- Since 2014, the national highways network has seen significant expansion with ~25,000 km of state roads and highways reclassified as national highways
- The National Highways Authority of India (NHAI) initiated the National Highways Development Project (NHDP) in 1998 for systematic and phase-wise development of the national highways network
- The NHDP programme has given way to the 'Bharatmala Pariyojana', which aims at enhancing road connectivity across economic corridors, rural roads, port connectivity and border connectivity
- The budget outlay for the first phase of Bharatmala for further upgradation/development of 34,800 km of highways is pegged at Rs 535,000 crore. Projects in this phase are expected to be awarded by fiscal 2022

- The government has already awarded 6,461 km under Phase I of Bharatmala, since the initiation of this programme from October 24, 2017, which will require an estimated investment of Rs 1.44 lakh crore

### Planned versus achieved targets

- Budgetary allocation for the roads sector was increased to Rs 71,000 crore for fiscal 2019 from Rs 65,000 crore in fiscal 2018 - a clear indication of the government's thrust on this sector
- Mega projects such as Bharatmala, Setu Bharatam, Char Dham connectivity, economic corridors and toll-operate-transfer (TOT) will be the biggest investment drivers in the sector. Over the next 5-6 years, ~Rs 7 lakh crore is envisaged to be invested under these programmes
- The Ministry of Road Transport and Highways (MoRTH) constructed a record 9,829 km of highways in fiscal 2018 with a per day construction rate of 27 km. The rate of construction is increasing steadily, bringing it close to the target of 45 km per day
- MoRTH achieved the highest-ever award of 51,073 km of national highway projects and highest-ever construction length of 28,531 km over a four-year period from fiscals 2015 to 2018
- Construction of national highways has more than doubled to over 27 km a day with the total investment in the sector increasing by 2.5 times



**Achievement rate of targets set by MoRTH**

	FY13	FY14	FY15	FY16	FY17	FY18
Targeted construction (km)	6,187	6,330	6,300	10,950	15,000	15,000
Achieved construction (km)	5,732	4,260	4,410	6,029	8,142	9,829
km/day construction	16	12	12	17	23	27

Source: MoRTH

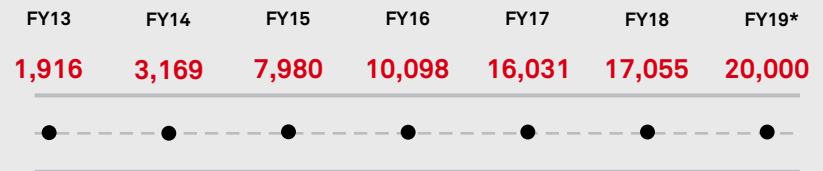
**Trends in private sector participation**

- Significant reforms marking the evolution of public-private partnership (PPP) models witnessed since the 1990s with growing demand for private sector funding in highways sector
- Build-operate-transfer (BOT)-toll model was initially introduced as a means to increase private sector investment in the roads and highways sector. Models such as BOT (annuity) and BOT (toll + annuity) were introduced for development of non-viable stretches
- BOT-toll model initially helped in channelling private investment in the highways sector but also caused significant financial stress as developers found it difficult to complete projects because of problems pertaining to land acquisition and seeking other regulatory approvals
- Momentum of awarding projects gained pace with the introduction of the hybrid annuity model (HAM) in fiscal 2016, involving pre-determined revenue and risk distribution between the government and private players. About 50% of all projects awarded in fiscal 2018 by the NHAI were awarded

through HAM mode. In value terms, the HAM projects awarded multiplied from Rs 7,000 crore in fiscal 2016 to a whopping Rs 76,500 crore in fiscal 2018

- The engineering, procurement and construction (EPC) and HAM modes account for 90% of projects awarded. This is in line with the government’s decision to execute future projects through HAM, EPC and BOT in a ratio of 60:30:10
- Asset recycling process, through the TOT model, has been identified as a means to finance new projects in the highways sector. 75 operational stretches have been identified for bidding under TOT, aggregating to a length of 4,500 km
- NHAI has successfully bid out the first bundle under the TOT model, comprising nine stretches. A consortium of MAIF Investments India Pvt Ltd and Ashoka Buildcon Ltd was awarded the project at an ~50% mark-up on NHAI’s initial estimated concession value of Rs 6,258 crore
- The second TOT bundle is in the process of bidding with the request for proposal issued on August 6, 2018. NHAI expects to receive Rs 5,362 crore by awarding this bundle

**Growth in awarded length (km)**



\*Targeted length

Source: MoRTH, Press Information Bureau release

## Sector outlook

- **MoRTH targeting ambitious projects under Bharatmala Pariyojana**

As part of the Bharatmala Pariyojana initiative, MoRTH aims to implement projects that will improve connectivity of key production and consumption centres across the country. These involve:

- Constructing ring roads worth Rs 36,290 crore across 28 major cities including Delhi, Lucknow, Bengaluru, Ranchi, and Udaipur. Detailed project reports (DPRs) are in progress for projects worth Rs 21,100 crore. DPRs for projects worth Rs 4,700 crore will be awarded soon
- Development of greenfield corridors across the construction of the Delhi–Mumbai Expressway is expected to start in December this year with a completion period of three years. The cost of the project is estimated at Rs 1 lakh crore

- **Project awarding has slowed in first half of fiscal 2019**

Because of the focus on project completion in the current year, the pace of awarding of projects is likely to slow down. In the first four months of fiscal 2019, NHAI has hardly awarded any projects.

- **Speedy recovery of stalled projects**

Decision to revive or terminate stalled projects worth ~Rs 3 lakh crore have been taken after a series of measures by the MoRTH. Currently, among infrastructure sectors, the roads and highways sector has one of the least number of non-performing assets and stalled projects. Some of the policy initiatives undertaken by NHAI and MoRTH in this regard are:

- **Premium deferment:** Concessionaire allowed to restructure premiums committed to, once during the life of concession
- **100% equity disinvestment:** Concessionaire allowed

100% equity divestment after completion of two years of construction for all BOT projects irrespective of year of award

- **Harmonious substitution:** Substitution of existing concessionaires allowed in BOT projects
- **One-time fund infusion:** Financial assistance in the form of loan by NHAI for languishing BOT projects
- **Rationalised compensation:** Extension of concession period/compensatory annuities for projects languishing due to reasons not attributable to concessionaire
- **Securitisation of BOT projects:** Concessionaires can raise subordinate debt on the strength of future surplus cash flow of operational BOT projects
- **Release of 75% arbitral award:** Release of 75% of arbitral award against bank guarantee

- **Improving arbitration process instils investor confidence**

NHAI has significantly streamlined the arbitration process by introducing the Society for Affordable Redressal of Disputes (SAROD). In addition, as per its latest standard operating procedures, NHAI is completing its arbitration processes in a time-bound manner. In fiscal 2017, NHAI was able to settle claims amounting to Rs 863.631 crore for Rs 165.649 crore.

- **Introduction of new class of investors through TOT**

The TOT model has been successful in attracting sovereign funds, wealth funds and private equity investors who are looking at a long investment horizon and operational road assets with reduced construction risk. Having successfully bid out the first bundle of TOT and having raised Rs 9,681 crore, NHAI will be bidding out more bundles. This model is beneficial for the investors since there is operational history of the asset and NHAI as well, as it gets upfront monetary benefit for its operational assets.

- **Slow performance of InvITs**

Private investment is expected to play a major role in financing ambitious targets set out in Bharatmala Pariyojana. Significant

liquidity in capital markets and demand for investments in real assets have opened new funding avenues - infrastructure investment trusts (InvITs). A few InvITs were launched with much fanfare but currently trade at a discount to their issue price, primarily because of misconceptions about the nature of product and expected returns.

- **Rapid implementation of electronic tolling collection system**

Electronic tolling collection (ETC) system uses electronic tags and tokens to enable automatic identification and classification of vehicles. These are issued to users at point of sale (POS) terminals. FASTag is the radio-frequency identification (RFID) technology adopted by NHAI for making toll payments. This tag can be bought at the branches of the State Bank of India, ICICI Bank, Axis Bank, Federal Bank and Syndicate Bank. They can also be ordered online through NHAI's website. ETC is envisaged to be operational in all 462 toll lanes by the end of this year. It will help reduce waiting time at toll plazas and thus decrease travel time. It will be a game changer for the logistics sector by ensuring smooth fleet movement.

## 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 problems players in the infrastructure sector are grappling with. The problem is especially acute for mid-sized players who have recently won projects from NHAI. Banks have misgivings about the balance sheet strength of such players and their ability to absorb a financial hit in case the projects are delayed. Banks are also uncomfortable because of wide discrepancies in costs estimated by the bidder and NHAI in a number of cases.

### **Slow awarding because of long time taken for approvals and clearance**

The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013, has made the land acquisition process longer and more challenging. In addition, the land acquisition cost has tripled from Rs 80 lakh per hectare to Rs 2.38 crore per hectare. To avoid project delays, NHAI issues tenders for projects that have achieved 80% land acquisition. However, the lengthy process has led to a slowdown in project awarding as limited tenders are getting issued.

### **Lack of road infrastructure maintenance leading to fatalities**

State and national highways together account for 63% of all fatalities related to road accidents. One of the factors for these fatalities is ill-maintained roads and vehicles. Extreme weather also deteriorates the condition of roads. In addition, the absence of emergency medical facilities around the highway network leads to significant treatment delays. Hence, casualty rates in case of any accidents on highways are very high.

## Way forward

### **Need for capital generating financing instruments**

With 90% projects being awarded on EPC and HAM, there has been an increase in requirement for public funding. Given the general reluctance of the banking sector 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 NHAI. A second bundle is in the tendering process, which is expected to fetch Rs 5,362 crore

- **InvITs**

Until now, the response to InvITs has been subdued due to lack of understanding of this financial product and returns expected from it. However, suitable measures that boost management, governance and quality of assets can go a long way in improving investor interest.

- **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 funds and pension funds will have to be tapped.

## 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 LARR. Such progressive steps have been an encouragement to the central authorities.

## Measures for improving road safety and reducing accidents

Redesigning highway network and road geometry can go a long way in reducing accidents and fatalities. Although MoRTH is aware of the issue and has identified over 789 accident-prone 'black spots' all over the country, accident-related deaths have continued to climb on-year. Of these, 189 spots have been repaired and 256 black spots are in process of being repaired. In addition to this, a dedicated highway police patrol force, on the lines of the Government Railway Police is required to be established as local authorities

have proven to be inadequate in enforcing traffic discipline on highways. There is a dire need to formulate remedial measures to improve road safety. For instance, a rating system that measures the quality of infrastructure developed will keep a check on adherence to safety norms by the developer.

## Revival of PPP

### Introduction

The length of India's highways network has increased significantly to 115,435 km in fiscal 2018. It has improved hinterland connectivity across the country and brought unprecedented level of connectivity to various parts of the country. The PPP mode of development has contributed considerably to this development. Demand for private sector funding in the highways sector led to introduction of PPP in the 1990s. However, given the challenges that developers have faced in the past because of various risks associated with the sector, new initiatives are needed to revive PPP in the sector.

### Prevailing key impediments

- **Financing constraints**

The good part is, the sector is relatively stable now and not overwhelmed by bad loans as it was at one point of time. Banks are still wary of lending to PPP projects in the roads sector, especially those that are being developed by mid-sized companies with weaker balance sheets. Therefore, private players are finding it difficult to raise finances for road projects. This problem is especially acute in HAM projects where the developer is responsible for maintenance of the road for 15 years.

- **Lengthy land acquisition and clearance process**

Land acquisition is viewed as one of the biggest challenges in the roads sector. The LARR Bill has made the process longer and more challenging. The associated cost has also increased substantially, almost tripling from Rs 80 lakh per hectare to Rs 2.38 crore per hectare. The clearance and approval process from multiple entities for environment, irrigation, etc, cause a further delay in commencement of projects.

- **Stretched balance sheet of Indian developers**

Existing Indian developers have a stretched balance sheet, as the claims made to the authorities on breach of concession agreement remain pending. For instance, IL&FS, one of the largest companies in the roads sector, has Rs 17,000 crore in claims to the authority. As the owner of 30 projects and 14,000 lane-km of roads in the country, the company has not participated in BOT projects since 2015 due to potential losses. The existing debt burden of Rs 60,000 crore at the project level in infrastructure projects does not provide room for absorbing future risks. Such experience of existing developers has muted the interest of new players wishing to enter the sector.

### Key initiatives to revive PPP in roads sector

- **Careful risk allocation in PPP models**

Risk has been allocated more carefully in HAM and TOT models, which were introduced recently. HAM, which was introduced in 2016, involves pre-determined revenue and risk distribution between the government and private players that has increased the interest of the private sector. Currently, 50% of projects are awarded on HAM. The most recent model that has attracted the attention of private players, including sovereign funds, wealth funds, private equity players, etc, is the TOT model. TOT, as an infrastructure financing mechanism in India, was first recommended by the Kelkar Committee

on PPP. The committee urged the roads sector to move onto the next level in PPP and monetise its operational assets given the challenges in raising budgetary resources as well as the reluctance of financial institutions to fund projects in the infrastructure sector in general. It is an attractive model for private sector players who are looking at a long investment horizon with the option of exiting in two years. In addition, projects under TOT have established revenue streams in operational assets, leading to reduction in traffic risk.

- **InvIT offers an important divestment platform**

The InvIT Fund provides an opportunity to the private sector to divest assets in a suitable manner and deploy the freed-up capital towards other projects. IRB had successfully launched the IRB InvIT Fund in May 2017. Since the launch, IRB has divested seven of its road assets to the fund, which has reduced the leverage of the company considerably. Such a mechanism is favourable to private investors since the fund is dedicated to the development of profitable assets that have operational history and offers flexible exit options.

- **Strong implementation of PPP reforms**

The central bodies are aware of the issues faced by the private players and have proposed multiple reforms to solve these issues. In most sectors, reforms get stuck at the execution phase with little or no impact on the existing system. However, in the roads sector, the reforms were implemented to mitigate the challenges faced by private players. These measures and reforms are as follows:

- **Premium deferment:** Concessionaire allowed to restructure the premiums committed once through the life of concession
- **100% equity disinvestment:** Concessionaire allowed 100% equity divestment two years after completion of construction for all BOT projects irrespective of year of award
- **Harmonious substitution:** Substitution of existing concessionaires allowed in BOT projects
- **One-time fund infusion:** Financial assistance in the form of loan by NHAI for languishing BOT projects
- **Rationalised compensation:** Extension of concession period / compensatory annuities for projects languishing due to reasons not attributable to concessionaire

- **Securitisation of BOT projects:** Concessionaires can raise subordinate debt on the strength of future surplus cashflow of operational BOT projects
- **Release of 75% of arbitral award:** Release of 75% of arbitral award against bank guarantee

- **Institutionalisation of arbitration process**

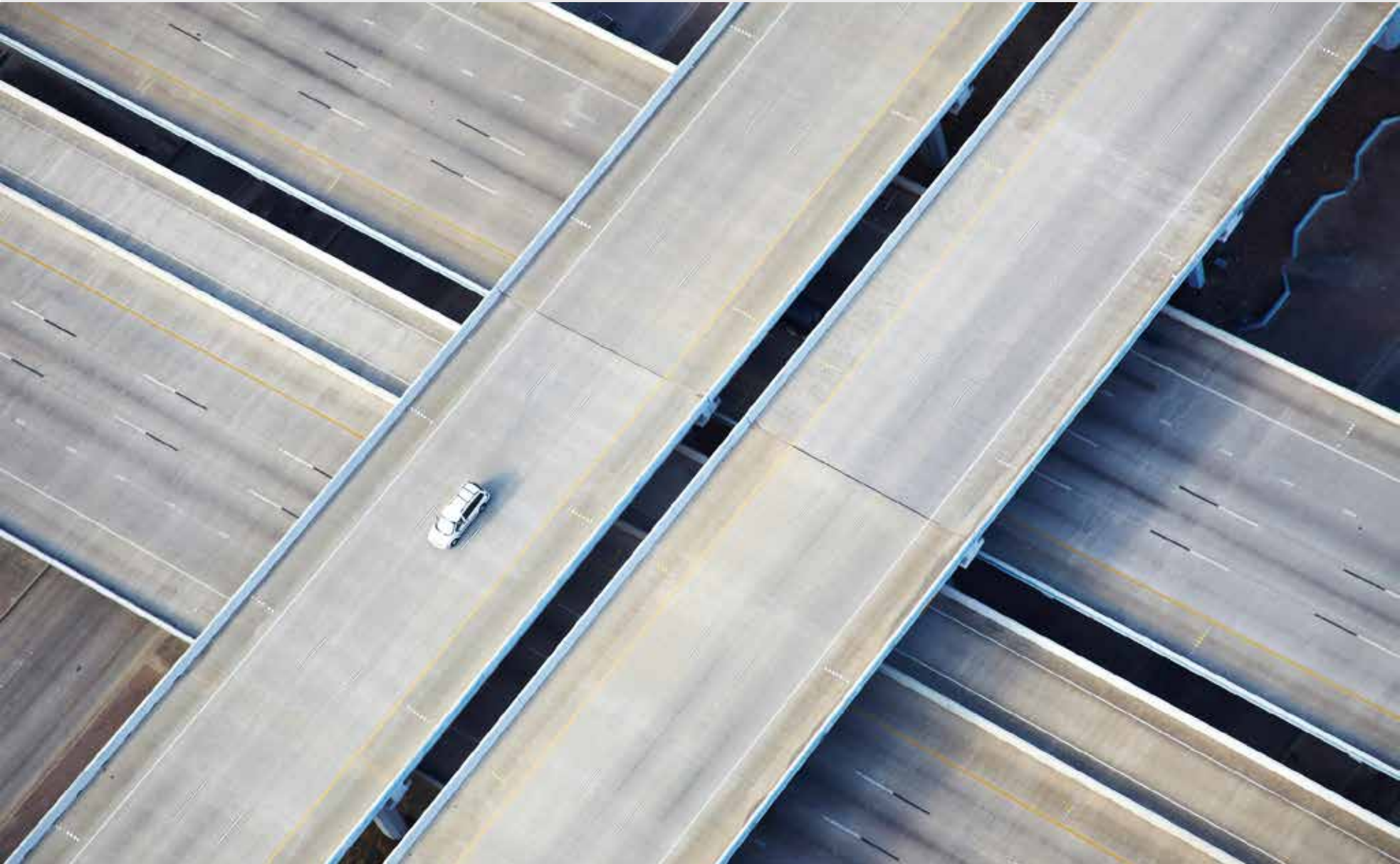
MoRTH had realised the need for fast dispute resolution and introduced SAROD, which was incorporated in 2013 by NHAI. The entity aims to reduce the cost of arbitration, resolve pending disputes and expedite dispute resolution. The setup of this mechanism has led to streamlining of the arbitration process. In addition, as per its latest standard operating procedures, NHAI is completing arbitration processes in a time-bound manner. Institutionalisation provides certainty to the arbitration process, increasing the private sector's confidence in the roads sector.

- **Partial land acquisition to be complete before project award**

The central bodies allow projects to be bid out after 80% of land acquisition is complete to avoid project delays and subsequent revenue loss to the concessionaire. This will provide certainty of complete land acquisition until the project awarding process gets over and ensures timely commencement of the project.

## Concluding notes

The central bodies regulating and implementing road projects realise the need for private sector investment. To remove the roadblocks in attracting private sector investment, the government has undertaken reforms in the past and continues to propose suitable policy changes. Measures to strengthen internal processes such as land acquisition and arbitration make the sector investor-friendly. Interestingly, the introduction of PPP models such as TOT and formation of infrastructure funds such as InvIT have piqued the interest of a new class of investors.



# Railways







Parameter	Drivers	Drags
Policy intent	<ul style="list-style-type: none"> <li>• Thrust on investment; Rs 8.5 lakh crore over 5 years / MoU with LIC</li> <li>• Sharp capex increase between fiscals 2014 and 2017</li> <li>• 100% electrification could potentially lead to savings</li> </ul>	<ul style="list-style-type: none"> <li>• Chronic under-investment and large gaps</li> <li>• Incomplete implementation of reforms proposed</li> <li>• Impact of actions will be felt over longer term</li> </ul>
Institutional capacity and regulatory maturity	<ul style="list-style-type: none"> <li>• Some forward movement on decentralisation</li> <li>• Cabinet approval for rail regulator, but delayed</li> </ul>	<ul style="list-style-type: none"> <li>• Pace of institutional reforms remains slow</li> <li>• Limited private sector participation</li> <li>• Station redevelopment PPPs not picking pace; efficacy of implementation under public entities to be seen</li> </ul>
Financial sustainability	<ul style="list-style-type: none"> <li>• First PPP annuity project awarded to Essel Infraprojects, but a little early to judge its implementation</li> </ul>	<ul style="list-style-type: none"> <li>• Independent tariff regulation not yet in place</li> <li>• Operating ratio turns adverse @111% in Q1 fiscal 2019</li> <li>• Competition from airlines in higher classes</li> </ul>
Implementation track record	<ul style="list-style-type: none"> <li>• First packages of DFCs expected to start work</li> <li>• Elimination of unmanned railway crossings by 2019</li> <li>• Progress on high-speed locomotives, modern coaches</li> <li>• Land acquisition for DFCs finally achieved</li> </ul>	<ul style="list-style-type: none"> <li>• Spate of recent accidents have raised concerns on safety</li> <li>• Need for wholesome land acquisition reform a key requirement especially for station development and network expansion in and around large cities</li> </ul>

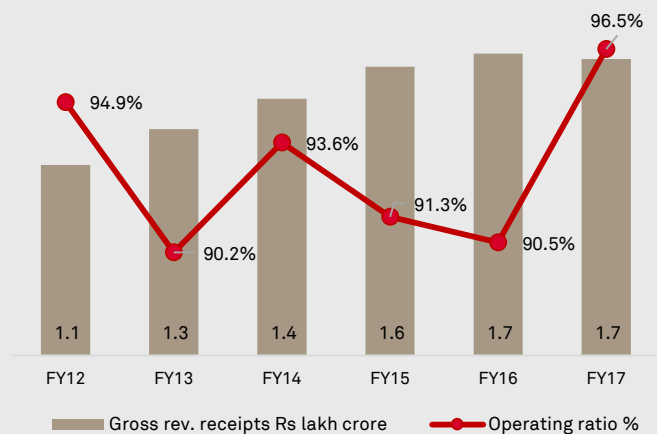
Parameter	Evaluation criteria	Max	InfraInvex score	
			2017	2018
Policy direction	Policy consistency	10	6	5
	Public financing support	10	7	7
Institutional maturity and strength	Entity implementation capacity	10	6	6
	Financing models	10	5	4
	Regulatory robustness	10	5	5
Financial sustainability	Cost recovery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

## Sector performance and growth trends

### Revenue and operating ratio

- The gross revenue receipts of the Indian Railways was Rs 1.653 lakh crore in fiscal 2017<sup>1</sup>. It grew at a compound annual growth rate (CAGR) of ~15% between fiscals 2012 and 2015, but slumped to ~1.5% between fiscals 2015 and 2017
- The operating ratio of the railways, a consistent weakspot, reached alarming levels of 111%<sup>2</sup> for April-July of fiscal 2019, from 96.50% in fiscal 2017. The huge jump in operating ratio will pose difficulties for the railways to carry out its operations and certainly restrict any investments in capacity augmentation or modernisation through internal accrual

#### Brakes on gross revenue receipts, operating ratio off kilter (Rs 000 crore)



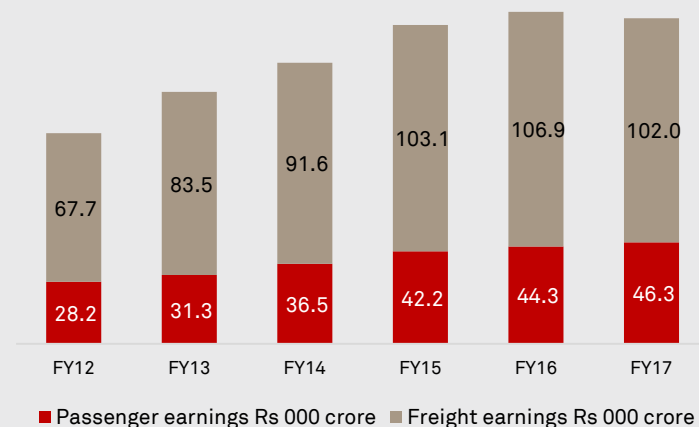
Source: Indian Railways Statistical Summary, 2016-17

<sup>1</sup>Indian Railways Statistical Summary, 2016-17

<sup>2</sup>Media reports

- The freight segment contributed a major share of 64% to the railways' earnings, vis-à-vis 26% share of passenger earnings, in fiscal 2017. The remaining came from non-fare revenue and indirect earnings (wharfage, demurrage)

#### No steam in freight earnings (Rs 000 crore)



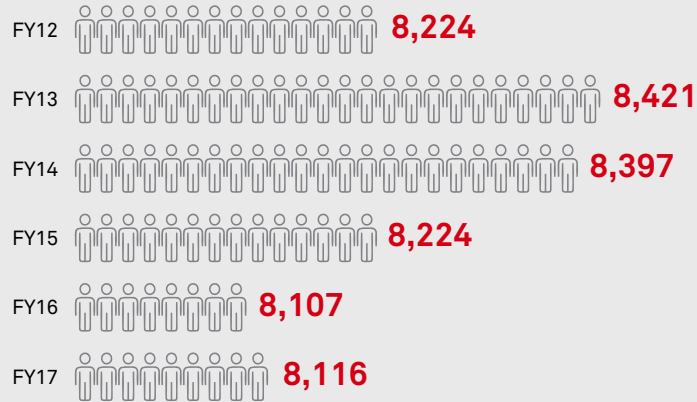
Source: Indian Railways Statistical Summary, 2016-17

- The Indian Railways aims at boosting revenue from passenger traffic by introducing dynamic pricing, new trains, and special trains during busy season
- Initiatives such as rationalising the merry-go-round policy, incentivising by withdrawing port congestion charges, and minimising the distance for mini rakes, will be fundamental in increasing revenue from freight traffic

## Growth in traffic

- As the third-largest rail network in the world, the Indian Railways currently operates 12,617 trains that cater to ~23 million passengers daily<sup>3</sup>
- In fiscal 2017, the Indian Railways served ~8.1 billion passengers and emerged as the world's largest freight carrier by transporting ~1.1 billion tonne
- Passenger traffic remained flat between fiscals 2012 and 2017, attributed to increase in modal competitiveness for short distances

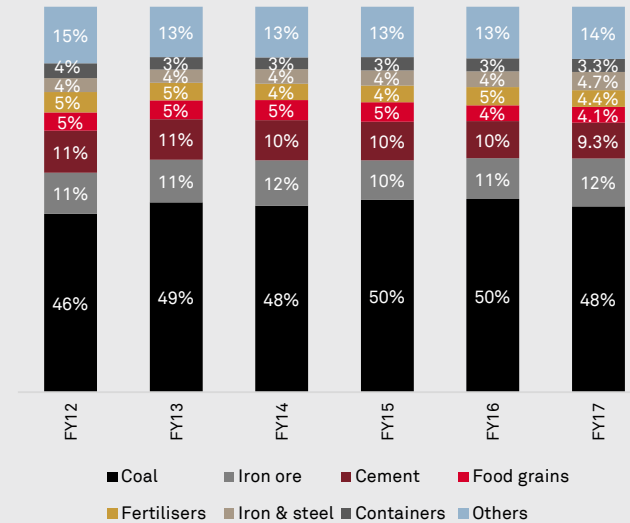
### Number of originating passengers (million)



Source: Indian Railways Statistical Summary, 2016-17

- Coal is the leading commodity in freight business, accounting for ~48% in the total traffic in fiscal 2017<sup>4</sup>. It was followed by iron ore, cement, iron and steel, food grains, fertilisers, and containers

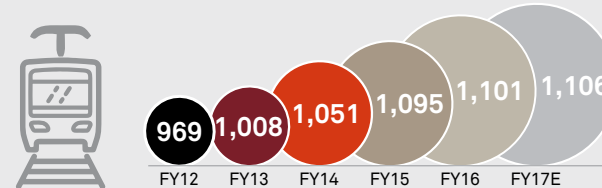
## Share of commodities in the railway freight basket



Source: Indian Railways Statistical Statements

- Tapering growth in freight traffic is a cause for concern, as it has declined from ~4% between fiscals 2012 and 2015, to less than 1% between fiscals 2015 and 2017. This can be attributed to a decline in coal traffic for thermal power plants, slowdown in container traffic, and low volumes of cement traffic, which collectively comprise 60-65% of the railways' freight basket

## Revenue earnings from freight traffic (Rs 00 crore)



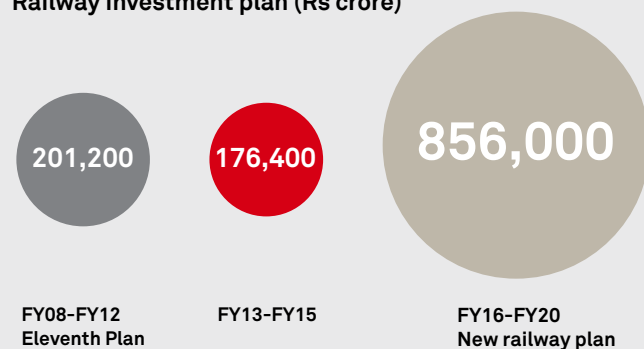
Source: Indian Railways Statistical Summary, 2016-17

<sup>3</sup>Report on Reform, Perform and Transform by Indian Railways, July 2017, <sup>4</sup>Indian Railways Statistical Summary, 2016-17

## Investment plan

- Investment in railway infrastructure is estimated to grow rapidly from Rs 3.8 lakh crore (fiscals 2013 to 2017) to Rs 8 lakh crore (fiscals 2018 to 2022)
- Total capital and development expenditure rose more than doubled from Rs 54,000 crore in fiscal 2015 to Rs 1.31 lakh crore in fiscal 2018<sup>5</sup>
- An outlay of Rs 8.56 lakh crore is envisaged in the current plan (fiscals 2016 to 2020)

### Railway investment plan (Rs crore)



Source: Indian Railways

- Contribution of gross budgetary support from the Centre is 30%, while that from extra budgetary resources is 58%
- The Ministry of Railways has secured Rs 1.5 lakh crore from the Life Insurance Corporation of India (LIC) through extra-budgetary resources - institutional finance route for funding railway projects. These funds are being utilised for financing various capacity augmentation and decongestion projects

- In addition, significant investment is planned for railway modernisation. The Ministry of Railways is planning to spend up to Rs 20 lakh crore, out of which Rs 10 lakh crore will be utilised in converting trunk routes into high speed corridors<sup>6</sup>

## Private sector participation in railways

- Railway infrastructure development has seen limited involvement of private players in the past
- Recent policy reforms are estimated to attract public-private partnership (PPP) investments of Rs 27,000 crore in fiscal 2019
- Approval of policy of 'participative models for rail connectivity and capacity augmented projects' in 2012 was an important milestone for private players willing to own railway lines and repay investments
- In 2012, private investments were invited to strengthen rail connectivity to ports such as Pipavav, Mundra, Mangalore, Kandla, Dahej, Krishnapatnam and Dhamra. Investments have been approved for these ports amounting to Rs 45,500 crore
- Model concession agreements for non-government private line model, joint venture model, and customer funding are in the public domain. Build-operate-transfer (BOT) and annuity models in PPP mode have been approved for capacity augmenting projects
- Railways' first annuity project was recently bagged by Essel Infraprojects Ltd for Rs 1,706 crore, for the Eastern Freight Corridor connecting Howrah and Chennai main line<sup>8</sup>
- 100% foreign direct investment under automatic route is applicable on approved list of projects
- General Purpose Wagon Investment Scheme, 2018, allows investments in such wagons for loading of restricted commodities including coal, iron ore and other minerals

<sup>5</sup>Final Business Plan 2017-18, Indian Railways, <sup>6</sup><https://economictimes.indiatimes.com/industry/transportation/railways/railways-may-invest-rs-20-lakh-crore-in-high-speed-corridors/article-show/62214979.cms>, <sup>7</sup>Railways Report July 2018, IBEF, <sup>8</sup><http://www.esselinfraprojects.com/sites/default/files/news-files/20180704%20Essel%20Infra%20bags%20India%27s%20first%20Railway%20Project%20on%20Annuity%20mode%20-%20Business%20Standard.pdf>

## Potential opportunities for private sector participation

Private investment is invited in projects of greater economic significance, such as the elevated rail corridor in Mumbai, sections of the dedicated freight corridors (DFCs), freight terminals, station redevelopment and other rail modernising projects. Some of these are detailed below:

- **Development of DFCs**  
With an aim to increase rail freight share, create additional freight capacity, and reduce transportation cost, DFCs have been planned as eastern and western corridors. The completed physical progress as of January 2018 was 40.3%. Private investment is expected in corridor development and structuring other logistical amenities. Sections of Western DFC (432 km) and Eastern DFC (343 km) will be operational soon.
- **Developing logistics capacity through multi-modal logistics parks/private freight terminals**  
Private players can invest in developing multimodal logistics parks and integrated logistic parks along the eastern and western corridors passing through various states. The Container Corporation of India (Concor) and the Ministry of Railways are spearheading this initiative together. Access charges at rail terminals constructed will be levied on logistics providers and users of terminal facilities.  
  
To build terminal capacity, Concor and the Ministry of Railways had planned to set up 100 private sidings/freight terminals between fiscals 2016 and 2018, to provide end-to-end logistics services, by developing common user facilities with handling and value-added services at select rail terminals. Currently, 90 projects have been commissioned against the target of 100. Private investors have shown significant interest.
- **Modernising stations through station redevelopment projects**

The Indian Railways has identified 400 stations across 100 cities covering ~2,700 acres of land. Mode of development has been deliberated and the ministry is now redeveloping stations through the Indian Railway Station Development Corporation, under engineering, procurement and construction mode. The Habibganj station, allotted to the Bansal Group, is expected to commission by December 2018. 10 stations have been allotted to NBCC India Ltd.

- **Solutions for first/last-mile connectivity projects**  
Partnerships with logistics service providers and container train operators are envisaged to transform the logistics landscape. The aim is to provide integrated transport solutions for select commodities. For example, Indian Port Rail Corporation Ltd, a joint venture between the Ministry of Railways and Indian Ports Association, will build the Indore-Manmad rail corridor for container movement from Indore to the Jawaharlal Nehru Port Trust.

## Sector outlook

Based on the above outlined plans of the railways, CRISIL Infrastructure Advisory expects the following outcomes in the near term:

- **Network augmentation and decongestion projects to accommodate more freight and passenger trains**  
In high density areas, route congestion is a major issue faced by passengers and freight trains, leading to detention and low average speed. Projects for doubling of existing tracks in high density corridors, development of DFCs and port/coastal connectivity projects are expected to create additional capacities, and reduce delays and associated costs.
- **Higher non-fare based revenue targets**  
This initiative is imperative to reduce dependence on traditional fare-based revenue. Initiatives such as train branding, railway display network, and on-board entertainment are expected to fetch additional revenue. The target for fiscal 2019 from these sources is Rs 1,200 crore.

- **Greater share of high-capacity wagons**  
Augmenting carrying capacity of existing lines and improving railway freight revenue are aims of the “Mission 25 Tonne”. However, the realisation of this initiative will require upgrading of existing rail tracks to bear 25-tonne axle-load wagons.
- **100% rail electrification plan**  
Railways is pushing for complete electrification, which is likely to save at least Rs 11,000 crore annually on fuel expenses. This will help in improving railways’ operating ratio and enable electric locomotives to run in any part of the country. In fiscal 2018, the railways electrified 4,000 km of route and in this fiscal, it targets to electrify 6,000 km.
- **Increase in modal share**  
In addition to all the above initiatives, the following are likely to boost the modal share of railways in coming years:
  - Commissioning of the DFCs
  - Improvement in punctuality of trains
  - End-to-end transport facilities for selected commodities
  - Use of dwarf containers to capture non-bulk commodities
  - Rolling stock innovation that captures new commodity traffic

## The challenges

- **Lack of investment for capacity augmentation**  
Over 100% utilisation of many routes has led to gradual wear and tear of tracks and decline in average speed of trains, necessitating large investments in network expansion and decongestion projects. Demand, too, has increased exponentially, with the supply side struggling to keep pace. This has created a significant investment gap for capacity expansion.
- **Lack of rake availability for cargo movement**  
This is a major issue for freight transportation through rail. It is further aggravated in the case of unregulated sectors

such as steel and cement, where rail transport is a major component of the supply chain for sourcing of raw materials as well as placing of finished products in the market. In the existing scenario, end users switch to other modes of transport, leading to a decline in the modal share of railways.

- **Loss of passenger share to airlines**  
The development of airports and thrust of airlines in Tier 2 and 3 cities, coupled with government support to that sector, has posed a threat to railways to lose out on passengers. Traditionally, railways had an edge over air travel on pricing. However, the emergence of numerous budget airlines with sectors in many cities has led to more and more middle class passengers to shift to air travel.
- **Lack of focus on customer requirement**  
Quality of delivery is an ongoing issue. Factors such as cleanliness, safety, service punctuality, and food quality should be ensured to give passenger comfort, as it will play an important role in increasing modal competitiveness.
- **Challenges in proper utilisation of available resources**  
Internal funding is allocated to passenger-oriented or low-freight projects, because they are not financially viable and cannot be financed through other mechanisms (owing to low internal rate of return). Extensive reliance on budgetary and extra-budgetary resources for implementation of projects will have a direct or indirect impact on the revenue generating capability of the Indian Railways.
- **Passenger traffic crowding out freight traffic**  
Freight trains have to run at half the speed of passenger trains, as the latter get priority in railways scheduling. In addition, freight rates rose 91% in the previous decade as compared with 28% increase in the politically sensitive passenger rates. On this account, railways has been steadily losing freight market share to road transport. This, coupled with an estimated increase in permitted axle load of commercial vehicles by 25%, may further lead to reduction in modal share in freight transport.

- **Lack of safety-related infrastructure**  
Track renewals are imperative to ensure safety. Therefore, backlog in track renewals has to be cleared away. Out of 64,000 km of track, over 7,000 km is more than 30 years old and needs immediate replacement. In addition, over 4,000 unmanned rail crossings need to be eliminated<sup>9</sup>.

## Way forward

- **Augment capacity and redefine pricing**
  - Augment capacity of railway routes with utilisation of more than 80% with immediate effect
  - Introduce AC railway coaches in trains in Tier 1 cities and increase ticket charges to boost passenger revenue
  - Reduce cross-subsidisation of passenger fares to lower logistical cost for freight transportation
- **Modernise and upgrade infrastructure**
  - Create innovation options for new technologies for high speed rail operations
  - Expedite development of high/semi high speed corridors which can allow speed of up to 150-200 kmph
  - Procure rolling stock with potential to operate at 200 kmph, with optimum design capacity
  - Ensure coach availability by following better coach maintenance practices
- **Explore financing sources**
  - Expedite joint ventures with state governments/public sector undertakings to undertake rail infrastructure works
  - Ensure applicability of institutional financing options to ensure assured availability of funds
  - Explore funding from sovereign wealth funds, and insurance and pension funds, and ensure continuity to source from multilateral agencies such as the Asian Development Bank and World Bank, to finance projects capable of servicing debt

- **Focus on customer experience**
  - Introduce applications that provide an all-inclusive railways service to customers, including ticketing, food options, etc
  - Introduce better customer experience while travelling, such as free wi-fi in long distance passenger trains and better quality food with multiple options
  - Explore user-fee model to finance the development of passenger amenities at select stations
- **Increase passenger fare and targeted subsidy**
  - Increase passenger fare to curtail the losses incurred by railways in the passenger segment
  - Develop and implement targeted subsidy mechanism for passengers

## Revival of PPP interest

### Introduction

The Indian Railways has addressed the issue of chronic absence of investments, by announcing a plan to pump in Rs 8.56 lakh crore in the sector between fiscals 2016 and 2020. Of this investment, 15% is envisaged to be funded through the PPP mode. Earlier, private sector participation was limited to wagon manufacturing, civil construction, raw material supplies, and catering. However, the latest reforms and policy changes have cast the net of private sector participation in the railway sector much wider. In addition, there are various projects such as DFC, station redevelopment, and private freight terminals, which have increased the opportunity for private players to enter the sector.

However, certain factors pose challenges to private participation.

<sup>9</sup><http://economictimes.indiatimes.com/industry/transportation/railways/whats-stopping-the-railways-from-being-on-the-safe-track/r1-jpg/slideshow/60204628.cms>

## Key impediments

- **Passenger business priority over freight business**

The passenger business makes perennial losses, as the railways loses its share to other modes of transport. To cross-subsidise these losses, the Indian Railways tends to increase freight tariffs, making the freight business unviable. In addition, cost escalations owing to delayed land acquisition and clearances make the project unattractive to the private sector.
- **Slow implementation of reforms and policies**

There is a gap between intent and speed at which reforms are being implemented. Planning stage of DFC has advanced tardily, concession structure of station redevelopment keeps changing, and viability of private freight terminal is under debate. While the railways has announced reforms, it is unable to expeditiously implement these measures. This has led to a decline in private sector interest.
- **Inefficient internal structure of the Indian Railways**
  - Accounting system: The Indian Railways does not follow a double entry accounting system, which makes it difficult to separate the cost of infrastructure services from operational activities and calculate line-wise profitability. As a private investor, it is an important factor for calculating envisaged investment, which remains uncertain in rail projects due to the accounting system
  - Uncertainty about traffic materialisation: The traffic projections made by the Indian Railways are over optimistic at times, which make realisation of traffic uncertain and affects the viability of the project
- **Absence of independent regulatory mechanism**

The Indian Railways is the regulator as well as the commercial operator. Owing to this, the private sector believes that its concerns are not being entertained, especially with respect to tariff setting. Although there have been talks on setting up of a rail development authority as an independent regulatory authority, implementation remains sluggish.





- **Challenges in schemes for ownership of rolling stock**  
Multiple schemes have been implemented for private ownership of rolling stock, such as Own Your Wagon Scheme, Wagon Investment Scheme, Liberalised Wagon Investment Scheme, Special Freight Train Operator, and Container Train Operator. However, there have been various issues with their implementation such as:
  - Delays in getting design clearance from the Research Design and Standards Organisation
  - Delays in decision making by the Indian Railways
  - High tariffs such as stabling and haulage charges
  - Policy ambiguity

These challenges have led to a decline in private sector interest in railways.

## Key initiatives to revive PPPs

- **Significant investment on network decongestion**  
Network decongestion projects have received greater focus, with an aim to gain freight market share. The ministry has dedicated an outlay of Rs 1.993 lakh crore in the investment plan for fiscals 2018 to 2022.
- **Increasing investment opportunities for private sector**  
Private investment has been invited in projects of greater economic significance, such as elevated rail corridor in Mumbai, sections of DFCs, freight terminals, station redevelopment and other rail modernising projects:
  - DFCs: To increase rail freight share, creating additional freight capacity and reducing transportation cost
  - Multi-modal logistics parks: To build an integrated unit across the DFCs with logistics services and value-added services for ease of freight handling
  - Private freight terminal: To build terminal handling commodities and provide last-mile connectivity to/ from production centres
- **Allowing private investments in general purpose wagons**  
The Indian Railways introduced the General Purpose Wagon Investment Scheme in 2018 and allowed loading of coal, iron ore, and other minerals in privately procured wagons. The scheme is expected to see considerable investments by the private sector, especially non-regulated sectors that face issue of rake availability for transportation of key raw materials such as steel and cement. This step is expected to help railways increase private investments in rolling stock substantially.
- **Encouraging private ownership of rail lines**  
Previously, private investment was only limited to a few areas of railways. However, with the approval of participative models for rail connectivity and capacity augmentation projects, private players are encouraged to own railway lines. Model concession agreements for non-government private line model, joint venture model and customer funding are in the public domain. PPP models in Build-Operate-Transfer and annuity modes have been approved for capacity augmenting projects. This is an important step towards enabling PPP in the railway sector.

## Conclusion

The Indian Railways appears to have realised the challenges in the way of private sector participation and has taken steps to mitigate them by proposing reforms and policy change. However, there is sluggish implementation of these reforms. This has subsequently discouraged private sector funding. The railways has also been slow to respond to market changes. It needs to reduce unnecessary costs to the freight business and focus on increasing its freight market share. To achieve this, the sector will need to revive the PPP track for executing more focussed projects such as DFC.

# Airport





Parameter	Drivers	Drags
Policy intent	<ul style="list-style-type: none"> <li>NABH Nirman initiative targets billion trips in 10 years</li> <li>100+ airports to be developed</li> <li>Next phase of UDAN to connect tourist destinations to major cities</li> </ul>	<ul style="list-style-type: none"> <li>Larger airports operating beyond full capacity</li> <li>Failure to attract private investors in Ahmedabad/Jaipur airports suggests need for a review of model</li> <li>Suspension of divestment plan for AAI, high ATF prices, tax burden other dampeners</li> </ul>
Institutional capacity and regulatory maturity	<ul style="list-style-type: none"> <li>5 large privatised airports handle ~55% traffic</li> <li>Predetermined tariff for greenfield airports being considered</li> <li>AERA amendment bill increased threshold for major airports to 3.5 million passengers per annum</li> <li>New airports developed under pre-determined tariff model outside AERA's purview</li> </ul>	<ul style="list-style-type: none"> <li>Capacity constraints at AERA causing delays</li> <li>Lack of clarity for development model for brownfield airports</li> <li>TDSAT made appellate tribunal for AERA disputes, could delay resolutions if capacity is not commensurately added</li> </ul>
Financial sustainability	<ul style="list-style-type: none"> <li>Traffic growth to sustain aiding in strong financials</li> <li>&gt;10% growth in revenues for PPP airports</li> <li>Pre-determined tariff based model could minimize risk</li> </ul>	<ul style="list-style-type: none"> <li>Airports continue to face regulatory uncertainty</li> <li>Grants/VGF may be required for PPPs in smaller airports</li> <li>Delay in operationalization of routes awarded under UDAN</li> </ul>
Implementation track record	<ul style="list-style-type: none"> <li>19% growth in domestic traffic and 11% growth in international traffic during fiscal 2018; traffic at six major airports up 15%</li> </ul>	<ul style="list-style-type: none"> <li>Capacity additions continue to lag demand as all larger airports operating above 100%</li> <li>Delay in statutory approvals especially land acquisition have significant impact on project cost</li> </ul>

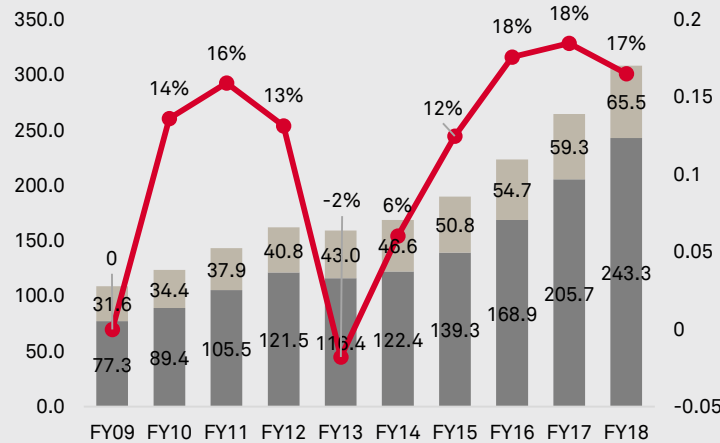
Parameter	Evaluation criteria	Max	InfraInvex score	
			2017	2018
Policy direction	Policy consistency	10	7	7
	Public financing support	10	6	6
Institutional maturity and strength	Entity implementation capacity	10	8	8
	Financing models	10	6	7
	Regulatory robustness	10	5	6
Financial sustainability	Cost recovery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

## Sector performance and growth trend

As per the International Air Transport Association, in calendar 2017, India recorded the third consecutive year of fastest domestic passenger growth, at 17.5%. It was followed by China at 13.3% and Russia at 10.1%

### Growth in passenger traffic

Growth in passenger traffic carried by scheduled carriers in India (million)

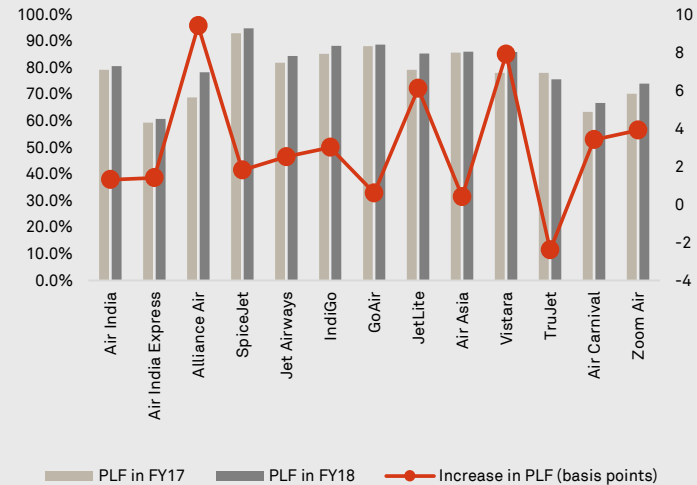


Source: Airports Authority of India

- International passenger traffic in India, took off at 8% compound annual growth rate (CAGR) between fiscals 2009 and 2018 to reach 65.5 million passengers. Domestic passenger traffic at Indian airports grew at 13.6% CAGR in the period, to reach 243.3 million passengers.

- Currently, 15 airline operators<sup>1</sup> operate domestic flights, including passenger and freight. IndiGo has been the market leader from fiscal 2017 with almost 40%<sup>2</sup> market share, followed by Jet Airways and SpiceJet at 15% and 13%, respectively. Loading was more than 80% for all three in fiscal 2018<sup>3</sup>. Among the scheduled airlines, SpiceJet had the highest passenger load factor (PLF) at 94.7%. The strong growth in domestic passenger traffic was also reflected across overall PLFs for a majority of the airlines

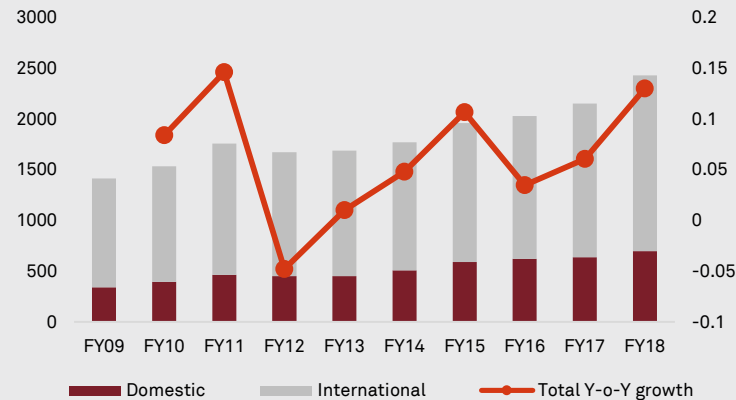
Year-on-year comparison of domestic PLFs across scheduled carriers



<sup>1</sup>Fleet Statistics of Scheduled Indian Operators as on July 31, 2018, DGCA, <sup>2</sup>Domestic Passenger Share in Terms of Passengers Carried (2017-18), DGCA, <sup>3</sup>DGCA

## Growth in air cargo

Growth in freight traffic carried by scheduled carriers (thousand tonne)



Source: DGCA

- International air cargo traffic grew at 5.5% CAGR between fiscals 2009 and 2018 to reach 1.73 million tonne. In the period, domestic air cargo traffic expanded at 8.2% CAGR to reach nearly 0.7 million tonne
- The air freight capacity of the country's airports in fiscal 2017 was ~4.63 million tonne<sup>4</sup>, with overall utilisation roughly 71%
- CRISIL expects air cargo traffic to be driven majorly by the growing e-commerce sector and improving air connectivity to smaller airports
- SpiceJet is slated to become the first scheduled domestic airline to begin dedicated air cargo services in the country. The venture, to be named SpiceXpress, would induct four freight planes in its fleet this fiscal<sup>5</sup>

## Passenger traffic across major airports

Passenger traffic at major airports in India (million)

Major airport	FY16	FY17	FY18	Growth rate (FY16-FY17)	Growth rate (FY17-FY18)
Kolkata	12.4	15.8	19.9	27.4%	25.7%
Hyderabad	12.4	15.1	18.2	21.9%	20.2%
Chennai	15.2	18.4	20.4	20.7%	10.9%
Bengaluru	19.0	22.9	26.9	20.6%	17.6%
Mumbai	41.7	45.2	48.5	8.4%	7.4%
Delhi	48.4	57.7	65.7	19.2%	13.8%
Kochi	7.7	9.0	10.2	17.3%	14.0%

- Across the six metropolitan city airports, passenger traffic grew by 14% on-year in fiscal 2018 to nearly 200 million, with the highest passenger traffic handled at Delhi. Kolkata registered the highest traffic growth at 25.7%

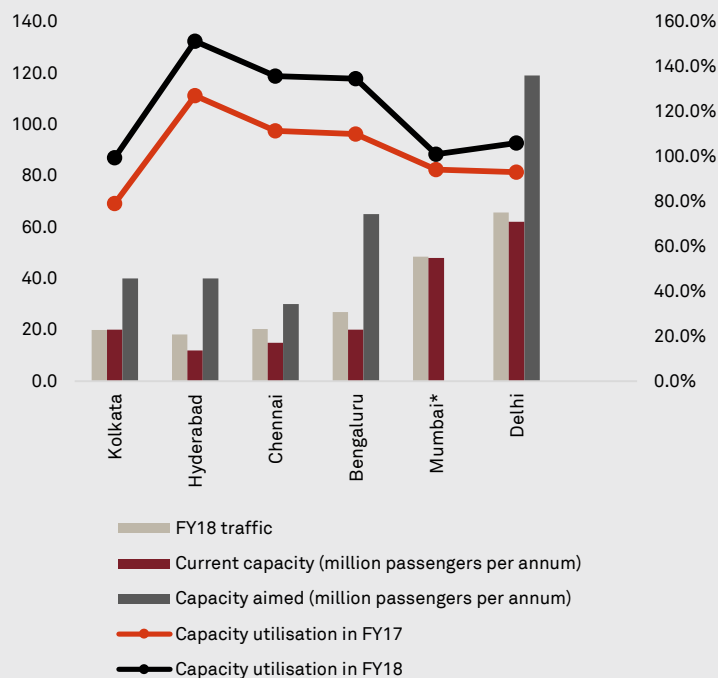
## Capacity utilisation trends

Capacity utilisation across the six key airports increased significantly. Nearly all had above 100% capacity utilisation in fiscal 2018, signalling the dire need to augment capacity at these airports.

<sup>4</sup><https://timesofindia.indiatimes.com/business/india-business/air-cargo-volumes-to-grow-by-60-infra-still-a-concernreport/articleshow/63596183.cms>, April 3, 2018 article, Accessed on September 10, 2018

<sup>5</sup>[https://www.thehindu.com/business/Industry/spicejet-to-start-dedicated-air-cargo-services-from-september-18/article24914578.ece?utm\\_source=industry&utm\\_medium=sticky\\_footer](https://www.thehindu.com/business/Industry/spicejet-to-start-dedicated-air-cargo-services-from-september-18/article24914578.ece?utm_source=industry&utm_medium=sticky_footer), Accessed on September 10, 2018

**Trend in capacity utilisation across key airports (FY17-FY18)**



*\*Navi Mumbai airport with a planned capacity of 10 million in Phase I and reaching 60 million by 2030 will enhance the capacity for Mumbai*

## Private sector participation

### Update on private airports

- The Airports Authority of India (AAI) manages 125 airports, including 18 international airports, seven customs airports, 78 domestic airports, and 26 civil enclaves at defence airfields. However, five airports, namely, Delhi, Mumbai, Hyderabad,

Bengaluru, and Kochi, are privately operated. They cater to more than 50% of the country's passenger traffic

- Revenues of these public-private partnership (PPP) airports have increased more than 10% on-year owing to robust growth in the domestic market as well as improved operational efficiency
- Mumbai and Delhi airports have topped the best airports ranking in 2017 and best passenger service award in 2018 at the Airport Service Quality awards.
- Construction of the Navi Mumbai International Airport, again a PPP airport, commenced in February 2018. Other airports, including Nagpur, Pune, Jewar (Near Noida), and Bhogapuram (near Visakhapatnam), are in various stages of development through the private mode
- The Airports Economic Regulatory Authority of India (Amendment) Bill has been passed wherein the threshold for definition of major airport has been raised to 3.5 million passengers per annum. This move will significantly bring down the number of airports that will fall under the AERA's purview, thereby addressing the capacity constraints at AERA resulting in speedy tariff determination process

## New models of private sector participation

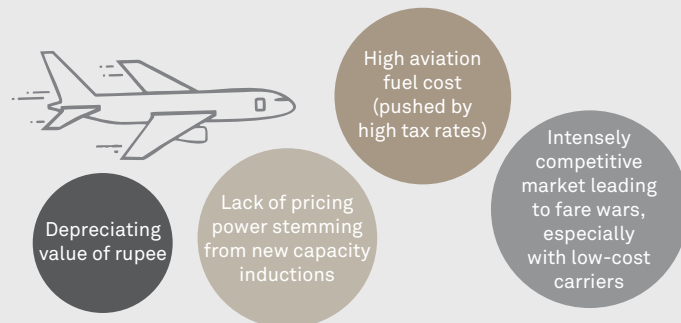
- The government is considering a new transaction structure to develop greenfield airports. It involves a pre-determined tariff regime as against a cost-plus model to minimise the tariff uncertainty risk currently haunting the sector
- The AAI is also considering revising the operations and maintenance (O&M) model to be adopted for the partial privatisation of Ahmedabad and Jaipur airports. This is after multiple rounds of low/no interest from potential bidders
- Once the updated model is successful, the AAI plans to adopt it to award O&M contracts at other profitable airports

## Sector outlook

### Outlook for airlines in India

- Passenger traffic grew in double digits for the 48th straight month in July 2018, at 20.82%<sup>6</sup> as compared with the same period last year. However, the domestic airlines industry will likely face losses to the tune of Rs 11,000-12,000 crore, according to the Centre for Asia Pacific Aviation (CAPA)
- A key cost component for an airline in India is aviation turbine fuel (ATF). Whereas globally fuel accounts for ~24.2% of an airline's average cost structure, in India it comprises ~34%<sup>7</sup>
- For older airlines, ageing fleets also increase maintenance costs. This further impacts their cost structures vis-à-vis those of airlines with newer fleets
- As of August 2018, Indian airlines had a collective order book of 1,055 aircraft, with orders for a further 100 wide-body aircraft expected over 12 months<sup>8</sup>. The airlines need to finance close to Rs 3.5 lakh crore by 2027<sup>9</sup>
- The domestic aviation market is inherently competitive, and carries price-sensitive passengers. This translates into airlines being unable to raise ticket prices despite rising input costs

### Key cost drivers of Indian airlines



### UDAN scheme

- The 2018 budget gave an impetus to the Ude Desh Ka Aam Nagrik (UDAN) scheme, with a fivefold increase in outlay (Rs 1,014.09 crore) as compared with last year
- Till date, two rounds of bidding have been conducted under the scheme, with 128 routes bid out in the first round and 325 in the second round
- Overall, the scheme has had moderate success. As of May 2018, 70 out of 453 routes, or roughly 15% of the routes, were operational<sup>10</sup>
- One of the most prominent successes of the UDAN scheme is Hubballi airport in central Karnataka, where passenger traffic crossed 45,000 in July 2018 from a pre-UDAN level of 3,600 per month<sup>11</sup>
- Recently, the Ministry of Civil Aviation released a draft policy for international air connectivity under UDAN for air connectivity between select international destinations and Indian states<sup>12</sup>. Under the draft scheme, eight routes were identified, six from Guwahati and two from Vijayawada
- The ministry is also planning to undertake a third round of bidding under UDAN with a focus on connecting the tourist destinations to the country's major airports
- Apart from this, the government has identified eight international routes for extending its subsidised UDAN scheme to neighbouring countries and ensuring affordable flying for the masses

<sup>6</sup><https://www.ndtv.com/business/domestic-airlines-seen-posting-losses-of-1-65-1-9-billion-in-2018-19-1910671>, Accessed on September 10, 2018

<sup>7</sup><https://www.thehindu.com/business/Industry/taxes-on-jet-fuel-choking-airlines-iata/article24865885.ece>, September 4 2018 article, Accessed on September 10, 2018

<sup>8</sup>CAPA India

<sup>9</sup>CAPA India

<sup>10</sup><https://www.thehindu.com/business/a-year-on-udan-is-yet-to-soar/article24007808.ece>, Accessed on September 10, 2018

<sup>11</sup><https://swarajyamag.com/insta/from-3600-to-45000-passengers-per-month-hubballis-udan-success-story>, Accessed on September 10, 2018

<sup>12</sup><https://timesofindia.indiatimes.com/business/india-business/government-identifies-eight-international-routes-under-udan-scheme/articleshow/65499834.cms>, Accessed on September 10, 2018

## Outlook for airports in India

- The NextGen Airports for Bharat (NABH) Nirman initiative, announced in the 2018 budget, aims to expand airport capacity by more than five times to handle a billion trips a year in the next 10-15 years
- Recently, the government announced the development of 100 airports at a whopping estimated cost of Rs 4.2 lakh crore in the next 10 years to meet the NABH Nirman initiative's objective
- According to the Economic Survey 2017-18, in-principle approval has been granted to develop 18 greenfield airports. These include Mopa (Goa); Navi Mumbai, Pune, Shirdi, and Sindhudurg (Maharashtra); Bijapur, Gulbarga, Hassan, and Shimoga (Karnataka), Kannur (Kerala); and Bhogapuram airport (Andhra Pradesh)
- Apart from this, the AAI will invest ~Rs 18,000 crore over the next four years to upgrade airports. Rs 15,000 crore of the investment will be made this fiscal to expand existing terminal buildings and construct new ones

## Key challenges

- **High tax structure on ATF**  
Even as airlines are striving to bring down fares for key routes, the ever-increasing tax/duty on ATF acts as spoilsport. Airlines are forced to pass on the tax to passengers, negatively impacting the otherwise growing airline industry. ATF is out of the ambit of the Goods and Services Tax (GST). Once it comes under the GST's purview, it will help curb the rise in fuel prices.
- **Delay in operationalisation of routes awarded under UDAN scheme**  
As mentioned, only 15% of the routes awarded under UDAN

have been operationalised. This is mainly due to lack of slots availability at major airports to serve growing passenger traffic and delay in the development of airport infrastructure at regional airports.

- **Capacity enhancement lagging behind demand**  
Large airports cater to a lion's share of the traffic and operate at more than 100% capacity, strongly indicating the need to expand and/or develop a second airport in metros. Mumbai International Airport recently held the record of handling maximum number of flights in a 24-hour cycle, at around 974 on a single runway. While the record may be commendable, it highlights that capacity utilisation remains an inherent issue plaguing the performance of the airport.
- **Delay in the privatisation of major airports**  
It is evident passengers are drawn towards privatised airports owing to superior infrastructure and terminal facilities. Moreover, since most major airports would be saturated over the next five years due to exponential demand, it is imperative these airports are developed and upgraded. Most airports operated by the AAI are making losses due to low revenue generation, which is inadequate to meet the airport's total expenditure. The AAI earns an insignificant amount from non-aero revenue and that primarily comes from airports in Tier 1 cities. Privatised airports earn a hefty amount, or 30-40% of their revenue, from non-aeronautical services which aids in sustaining the airport expenditure.

## Way forward

- **Steps for reduction in ATF prices**  
Some measures that can rein in fuel costs include bringing jet fuel under the ambit of the GST with full input tax credit, elimination of the fuel throughput fee, provision of common use open access infrastructure for fuel at airports, and reducing excise duty on fuel<sup>13</sup>.

<sup>13</sup><https://www.thehindu.com/business/Industry/taxes-on-jet-fuel-choking-airlines-iata/article24865885.ece>, September 4 2018 article, Accessed on September 10, 2018



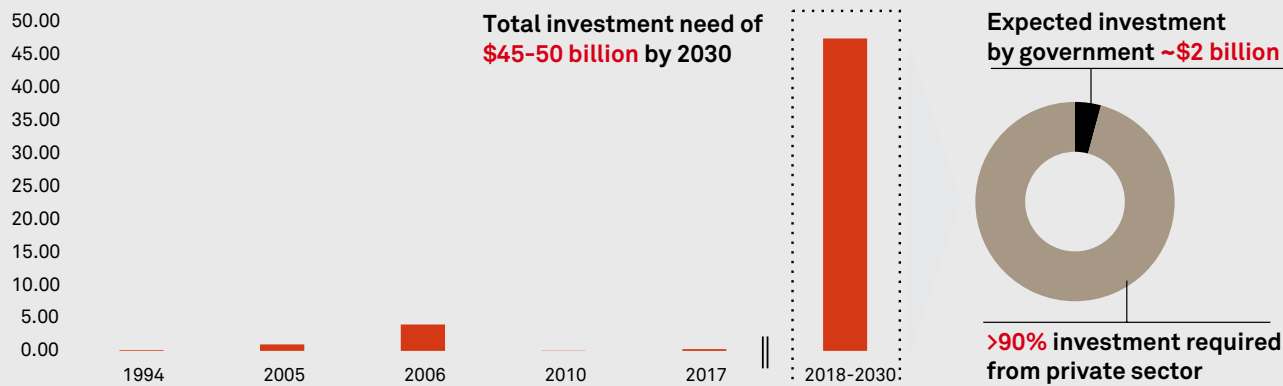
- Prioritisation of projects for development**  
 Identification of the project pipeline based on current capacity utilisation levels and targeted traffic growth to address the demand-supply gap. The government may take on the privatisation of major airports, especially the profitable ones, including Kolkata, Bhubaneswar, Guwahati, Leh, Lucknow, Mangaluru, Patna, and Tiruchirappalli, to maintain the growth momentum in the aviation sector coupled with timely implementation.
- Collaborative effort from the government and private sector**  
 As much as Rs 3-3.5 lakh crore needs to be invested by 2030 to achieve the target set by the government for the sector. However, with its limited resources, the government cannot make such a huge investment. Hence, increased investment from both the government and private players to achieve the sector's holistic development is the need of the hour. Private players can invest in commercially attractive airports and the government can divert funds towards the development of Tier 2 and 3 non-profitable airports.

- Push for maintenance, repair and overhaul sector**  
 Growth in the aviation sector is accentuating demand for maintenance, repair and overhaul (MRO) facilities. Thus, investing in the development of in-house MRO facilities will be the key as the segment contributes to 13-15% of total revenues for airlines. The government introduced reforms such as allowing aircraft in India for 180 days from 15 days previously without permission, aircraft allowed to come in with passengers, etc. However, it is important the government develops MRO facilities with the AAI's support.

## Revival of PPP

With airports, private and public, reaching saturation levels, there is an urgent need to augment capacity at existing airports or develop new airports near existing ones. It is important there exists a strong enabling environment for private investment to flow into the sector. CRISIL estimates that by 2026, ~90% of the investment requirement will need to be met by the private sector.

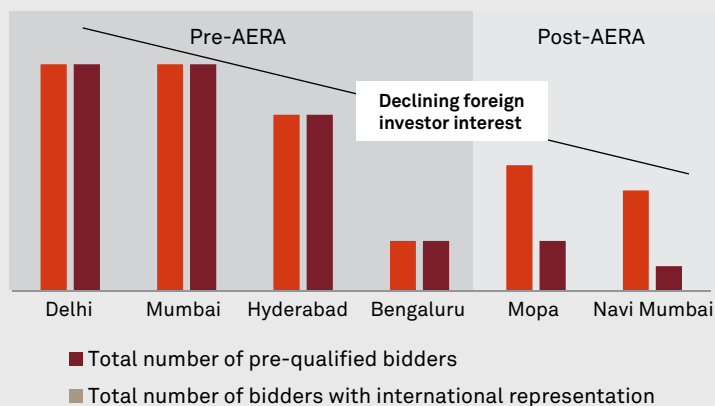
Private sector investment in India's aviation sector (\$ billion)



## Key challenges to PPPs in the airport sector

The nation is expected to cross the United Kingdom as the third largest aviation market by fiscal 2026<sup>14</sup>. The rising demand calls for a steady infrastructure build-out, which can be enabled by strong PPPs. The challenges encountered in earlier PPPs in the sector must be addressed. Inability to do so is reflected in the declining participation by foreign investors in greenfield airport projects.

### Declining bidders for PPP airports



Source: CRIS analysis

Some challenges faced in airport PPPs in the past were:

### Land acquisition and clearance approvals

- Most airports are in congested parts of cities where acquiring land for capacity addition is a challenge
- Therefore, state governments need to provide land for newer airports, which can be a drawn-out process, leading to time and cost overruns
- Delay in land acquisition has been the major reason for the delay in constructing the Navi Mumbai airport which began in 2018 although it was conceived in 1998

### Tariff uncertainty

- The tariff structure and determination guidelines presently followed by the AERA for major airports has unclear components such as definition of regulated asset base, and aeronautical revenues
- Thus, developers must contend with uncertainty in the proper treatment of revenue and consequent cash-flow concerns throughout the concession period. Under the current regime, the revenue leakage risk is higher due to ambiguity in the determination of tariff and delay in decision making

### Regulatory uncertainty

- Regulatory uncertainty is a major factor inhibiting private investment, especially from foreign investors
- Assuming the regulatory risk associated with an airport investment can be discouraging from having to deal with issues such as prolonged tariff setting and delayed dispute resolution

### Long bidding process

- The bid process, right from calling for expressions of interest to signing of concession agreements, can span 3-4 years. The project viability can be affected from escalating costs in such a period

### Prolonged litigation process

- The appellate tribunal under the AERA Act, 2008, is mandated to resolve disputes arising out of tariff fixation by the regulator. However, the Act also allows for appeal in the Supreme Court within 90 days of the order being issued by the tribunal. This leads to a prolonged delay in arriving at a concrete resolution, affecting both the operator and users. Recently, the appellate tribunal under the AERA was merged with the Telecom Dispute Settlement Appellate Tribunal (TDSAT), which will further delay resolution of disputes. This is because the TDSAT is already

<sup>14</sup>International Air Transport Association

mandated to settle disputes for the telecom and cyber security sectors. Also, representation of an independent aviation expert in the panel is necessary for effective dispute resolution

### Issues in the current model concession agreement

- The current model concession agreement has several issues, such as terms of concession period, equity lock-in period and definition of actual project cost. These are some of the reasons cited as hindrances to future investment. Other factors such as treatment of project cost in the event of termination and equity lock-in period also dissuade investor interest

### Way forward for revival of PPP to sustain growth in the sector

Capacity addition and creation are vital to sustain the pace of demand growth in the sector. Attracting private sector investment holds the key to enabling this. Through NABH Nirman, the government has introduced new models of development which will address a few of the issues mentioned in the previous section. Key improvements under consideration in the earlier PPP arrangements which can incentivise foreign and domestic private investment are:

- **Ease of land acquisition and other statutory approvals for speedy development of project**  
Getting the necessary clearances and approvals is a prerequisite for any project. However, it is understood majority of the airports developed through the privatisation route have faced time and cost overruns owing to delays in obtaining statutory approvals from various government departments. Land acquisition is one of the main hurdles in implementing any project. There have been delays in getting the balance 10% of the land. In some cases, the balance 10% consists of pockets that form part of the core airport operational area, hampering the progress of construction of even basic aeronautical infrastructure. Hence, the complete land earmarked for the airport's operations should form part of the initial 90% land transferred on the effective date.

- **Pre-determined tariffs for airport operations as against cost-plus model followed currently**

This model may help eliminate regulatory uncertainty with respect to the potential revenue to be generated from the airport as tariffs will be fixed prior to bidding for the project. The land cost, service standards, and airport design and, most importantly, planned investments will be taken into account for deciding tariffs. The airport tariff will be indexed appropriately to factor in changes in inflation, foreign exchange rates, and interest rates against future uncertainties.

- **Redefining the AERA's role in effective and speedy tariff determination as proposed in the Airports Economic Regulatory Authority Of India (Amendment) Bill, 2018**

The bill seeks to effect two reforms in the earlier version of the Act:

- **Definition of major airports:** Treatment of airports having annual traffic levels greater than 3.5 million passengers as major airports instead of airports having annual traffic levels greater than 1.5 million passengers
- **Tariff determination:** The AERA Act, 2008, empowered the AERA to determine:
  - o Tariff for aeronautical services at different airports every five years
  - o Development fees of major airports
  - o Passenger service fees

In the amended bill, the AERA is no longer required to determine the tariff, tariff structures or development fees for certain cases of airports. Cases wherein tariff amounts for an airport were stated in the bid document on the basis of which the airport's operations was awarded, can be exempted from the AERA's regulation. However, the AERA would need to be consulted prior to the incorporation of such tariffs in the bid document.

## Concluding notes

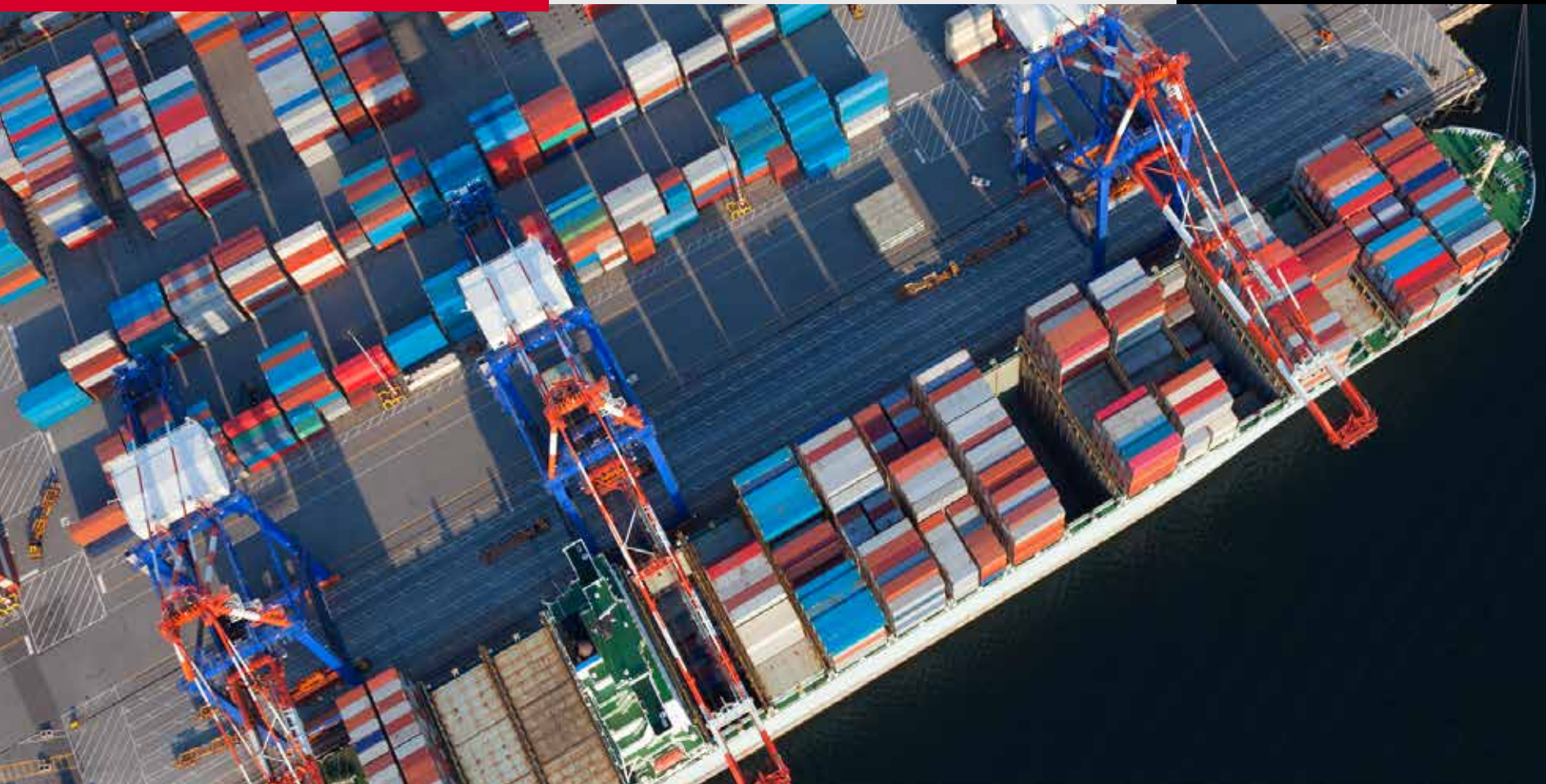
With the Indian government's thrust on PPPs in the infrastructure sector, multiple models have been formulated to channel private sector investments into various projects. These models, with suitable legal and regulatory frameworks, have been used in actual infrastructure projects across sectors with varying degrees of success. Given that infrastructure projects are inherently capital-intensive and susceptible to cost overruns, the positioning of private sector players as stakeholders through PPPs has incentivised robust project management practices.

Learnings from operational PPP models led to the development of newer models, which addressed challenges and evolved with time. While past PPP initiatives in the airports sector have been successful in attracting private investment, both government regulators and private investors faced a number of challenges. Given the pace of traffic growth across several airports in India, capacity augmentation of existing airports and development of newer airports have become increasingly important. Against this backdrop, it is essential a rigorous PPP framework for the airport sector be put in place to enable the development of required infrastructure for both greenfield and brownfield airports.





# Ports & shipping



2017 score

**6.6/10**



2018 score

**6.7/10**



Parameter	Drivers	Drags
Policy intent	<ul style="list-style-type: none"> <li>Migration of older terminal operators into new rate regime</li> <li>Relaxation in cabotage law allowing foreign registered vessels to transport containers between Indian ports</li> <li>100% FDI under automatic route in ports sector</li> <li>Shipping ministry budget outlay up from Rs 2,762 crore in fiscal 2015 to Rs 5,080 crore in fiscal 2019</li> </ul>	<ul style="list-style-type: none"> <li>New Major Port Authorities Bill delayed</li> <li>Delay in rehaul of the TAMP regime</li> </ul>
Institutional capacity and regulatory maturity	<ul style="list-style-type: none"> <li>Major ports transitioning to landlord port model</li> <li>Cabinet approval of revised model concession agreement for PPP projects in major ports including exit clause for developers, and dispute resolution mechanism (SAROD Ports)</li> </ul>	<ul style="list-style-type: none"> <li>Low SFC project approval cut-off at Rs 25 crore</li> </ul>
Financial sustainability	<ul style="list-style-type: none"> <li>PPP projects structured to recover full costs typically with a revenue share to the landlord port</li> </ul>	<ul style="list-style-type: none"> <li>Capacity utilisation down from 71% to 61% between fiscal 2012 and 2017</li> <li>Slow trade growth could dampen investment sentiment.</li> <li>Cargo traffic grew ~4% between fiscals 2012 and 2017</li> </ul>
Implementation track record	<ul style="list-style-type: none"> <li>Turnaround time down from 102 to 64 hours in 5 years, and from 82 hours to 64 hours in a year</li> <li>Improvement in operating margin from 23% to 44% in five years, and from 41% to 44% in a year</li> </ul>	<ul style="list-style-type: none"> <li>Land acquisition and environmental clearances for greenfield projects concern</li> <li>Concept-to-implementation of greenfield ports still takes inordinately long time</li> </ul>

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

## Sector performance & growth trends

### Indian ports - Key characteristics

- Ports handle more than 90% of India's foreign trade in volume terms and play an important role in India's export-import trade
- The country has 12 major ports - six each on the eastern and western coasts. India also has about 200 non-major ports, of which one-third are operational
- Major ports are under the jurisdiction of the Government of India and governed by the Major Port Trusts Act, 1963, with the exception of Ennore port, which is the first corporatised major port and is governed by the Companies Act, 2013. Non-major ports are governed by state maritime boards

### Global perspective of trade & ports

	India	China	Germany
Coastline	7,517 km	14,400 km	2,389 km
Major ports & capacity	12 major ports with capacity of 1,451 MMT	34 major ports with capacity of top 10 ports aggregating to 6,100 MMT	21 port locations
Share in world's merchandise export & import	1.7%, 2.2%	13.1%, 9.8%	8.4%, 6.5%

Source: UNCTADStat; Ministry of Shipping, Government of India

### Growth in cargo traffic

- Cargo traffic at ports increased at a CAGR of 4.6% between fiscals 2013 and 2018
- Cargo traffic at major ports has increased at 4.5% CAGR in the last five years, whereas on-year growth in fiscal 2018 was 4.7%. Factors driving growth included:
  - Traffic in petroleum and other liquids, or POL, which contributes more than 30% of cargo traffic, grew at 7.2% in the last year
  - However, coal traffic, another key contributor, growth has remained subdued due to low import of thermal coal
  - Iron ore, which had seen 177% growth in fiscal 2017 due to mining ban lift, de-grew at 3% on a high base

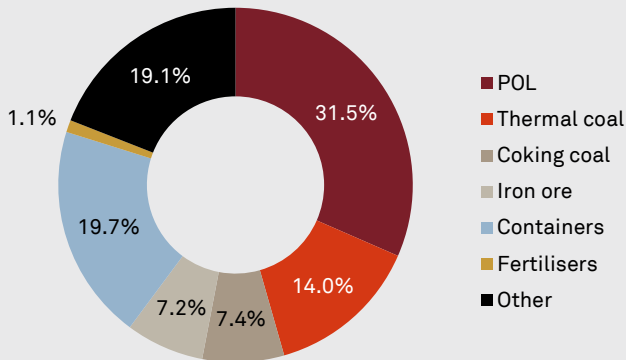
### General cargo traffic at Indian ports (million tonne)

	FY13	FY14	FY15	FY16	FY17	FY18
Major ports	545.8	555.5	581.3	606.5	648.4	679.4
Non-major ports	387.9	417	471	465.9	485.3	492.0
Total traffic	933.8	972.5	1,052.2	1,071.8	1,133.7	1,171.4

Source: Ministry of Shipping, Indian Ports Association



### Composition of cargo traffic at major ports in FY18



Source: Indian Ports Association

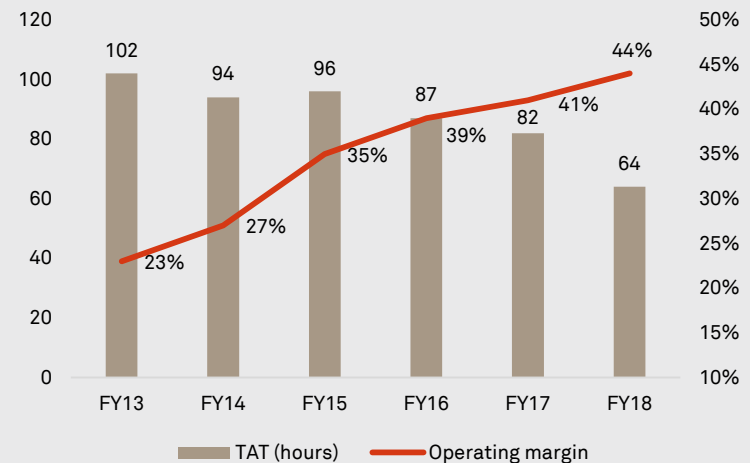
- Growth in container traffic
  - Rise in external trade gives impetus to container traffic. Container handling at Indian ports has clocked 8% CAGR over the last 10 years. In terms of throughput, the top three container ports are Jawaharlal Nehru Port Trust (JNPT), Mundra and Chennai, together controlling almost 75% of Indian's total container traffic
  - Container traffic at major ports has shown a moderate CAGR of 3.4% over fiscals 2013 to 2018
  - Container traffic over the last few years has been affected by slowdown in international trade
  - Container traffic at Indian ports is likely grow at a healthy rate keeping pace with India's economic growth and increase in container penetration level

## Improvement in operational efficiencies of major ports

In the last five years, operating margin of major ports has improved significantly from 23% in fiscal 2013 to 44% in fiscal

2018. This upswing is influenced by the reduction in turnaround time (TAT). TAT, the total time spent by a ship from entry into port until departure, has dropped at a rapid pace from 102 hours in fiscal 2013 to 64 hours in fiscal 2018. Drop in capacity utilisation helped improve TAT to some extent. Average output per ship berth day also increased from 13,156 tonnes in fiscal 2016 to 14,918 tonnes during fiscal 2018<sup>1</sup>.

### Increasing operating margin with decrease in TAT



Source: Ministry of Shipping

Improvement in TAT is influenced by 116 initiatives as identified across 12 major ports, out of which 70 have already been implemented:

- Direct port delivery and direct port entry system has been adopted to facilitate faster clearance
- E-delivery order through the Port Community System has been made mandatory along with e-invoicing and e-payment
- RFID-based gate-automation system has been installed across all major ports

<sup>1</sup><http://pib.nic.in/PressReleaseframePage.aspx?PRID=1513281>; Figure as on 31.10.2017

Still, the TAT for Indian ports continues to trail the benchmarks at major global ports such as Port Klang, Singapore and Rotterdam, where it's between one and two days on average, sometimes even less than a day.

## Private sector participation

### • Status of private sector participation

- Up to 100% foreign direct investment (FDI) under the automatic route is already permitted in the ports sector. This has resulted in several public-private partnership (PPP) projects coming up in major ports
- Currently, about 33 PPP projects are operational, costing ~Rs 17,818 crore<sup>2</sup>
- 20 projects were awarded in fiscal 2017 and are under implementation, with investments estimated at ~Rs 22,363 crore<sup>3</sup>
- The Ministry of Shipping, through its Sagarmala Programme, aims to modernise ports and expand port capacity via private sector participation

### • Shift from service model to landlord port model

- 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
- Large- and medium-sized ports are increasingly transitioning towards the landlord model, wherein a private operator is allotted port real estate for undertaking operations, mainly cargo handling. This allows government-owned ports to leverage private sector efficiencies
- The government has plans to convert 11 out of 12 government-owned ports to the landlord model. Ennore port in Tamil Nadu has already been corporatised

### • Key policy initiatives

- De-licensing: For projects related to construction and maintenance of ports and harbours, the government has allowed 100% FDI
- Tax holidays: 10-year tax holiday to private players engaged in the business of developing, maintaining, and operating ports, inland waterways and inland ports
- Faster security clearance: Existing system has been streamlined and enhanced for faster security clearance
- Direct port delivery: Allows importers or consignees to take containers directly from the port to their factory and skip the container freight station

## Implementation of Sagarmala Programme

The Sagarmala Programme is based on the four key pillars for port-led development and comprises 577 projects across 19 states.

### Sagarmala - Overview

Theme/ pillar	Number of projects	Value of projects (Rs crore)
Port modernisation	243	142,955
Port connectivity	211	249,785
Port-linked industrialisation	57	476,258
Coastal community development	66	7,125

Source: Ministry of Shipping

Out of the 577 projects, more than 70% of the projects are in various stages of implementation.

<sup>2</sup>PIB notification dated March 16, 2017, available on <http://pib.nic.in/newsite/PrintRelease.aspx?relid=167425>

<sup>3</sup>PIB notification dated July 14, 2017, available on <http://pib.nic.in/newsite/PrintRelease.aspx?relid=159373>

- **Port modernisation**

- Projects have been identified to increase the capacity to 3,500+ million metric tonne per annum (MMTPA) to cater to the projected traffic of 2,500 MMTPA by 2025
- 116 initiatives have been identified across 12 major ports to unlock 100 MTPA capacity, out of which 96 initiatives have been implemented unlocking 80 MTPA
- RFID-based gate-automation system has been implemented at all major ports
- Direct port delivery system has been adopted to facilitate 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, which is a joint venture between major ports and Rail Vikas Nigam Ltd
- 112 road projects with length of 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, out of which 10 are under implementation

- **Port-led industrialisation**

- 57 industrialisation projects have been identified, out of which 18 are under implementation
- Port-linked special economic zone is under implementation at JNPT, which is expected to attract investment of ~Rs 12,000 crore. However, progress on other coastal economic zones have been slow

- **Coastal community development**

- 26 fishing harbour projects totalling ~Rs 4,000 crore have been identified, out of which only seven are under implementation

## Sector outlook

- **Container segment - Key growth drivers**

The next phase of growth in cargo capacity handled is expected to be led by the containers segment. Though global container movement has been sluggish in the last few years, we expect it to recover over the next 2-3 years. We also expect a pick-up in containerisation of wider variety of cargo in India and container traffic to record 8-10% CAGR, reaching ~21 million twenty-feet equivalent units (TEUs, or containers) in the next five years from current 13 million TEUs.

- **POL - Another key segment of growth**

India's petroleum refining capacity currently stands at 230-250 MMTPA, and the government intends to double it in order to meet the domestic demand as well as augment exports. Petroleum and its products account for almost ~30% of the import-export volume of India. We expect the POL segment to be the major growth driver of port volume.

## Key challenges

### Overcapacity at ports

- **Slowdown in cargo traffic in recent years**

- Slowdown in international trade has resulted in curtailed container traffic growth
- Falling coal imports following higher domestic production, have lowered coal traffic

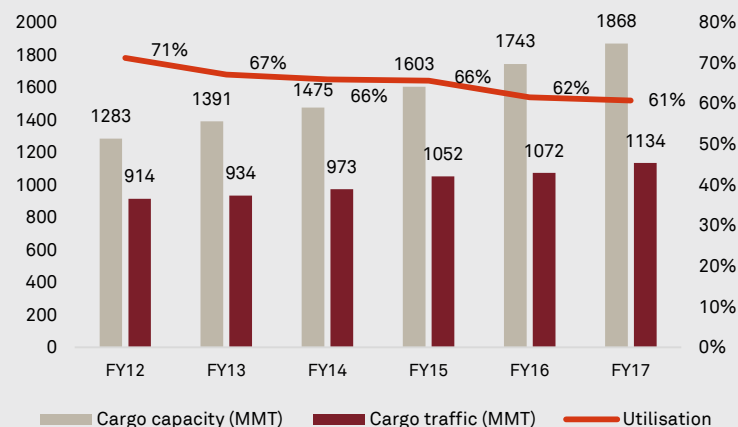
- **Overcapacity has led to decrease in capacity utilisation**

Due to the challenging global trade scenario, in the last five years, India's total port traffic has increased by a meagre ~4%

CAGR, whereas, India's port-cargo capacity clocked 8% CAGR. This has resulted in a significant drop in capacity utilisation, from 71% in fiscal 2012 to 61% in fiscal 2017. In certain pockets, capacity utilisation is below 50%.

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

## Capacity utilisation at Indian ports



Source: Ministry of Shipping, Indian Ports Association

- **Capacities of existing players already idling**

The total container throughput is close to 13 million TEUs, but capacity is approximately 21 million TEUs, resulting in ~65% utilisation.

What is more concerning is further capacity addition, which is under implementation. 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 a capacity of 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.

## Lack of hinterland connectivity

In terms of hinterland connectivity, till now, the government's approach has been unimodal with each ministry promoting its own sector. Indian ports need to implement efficient and modern intermodal systems not just at the policy level but also at the ground level. A co-ordinated and comprehensive master plan must be in place to ensure that the country's road and rail network is able to handle the increased load.

On the railways front, most importantly, both the dedicated freight corridors need to be commissioned on a timely basis. India needs massive beef-up in last-mile rail connectivity. The railway network also needs to be ramped up considerably. Currently, rake availability is a problem even when connectivity exists

On the roads front, the National Highways Authority of India has given an impetus to port connectivity, but many crucial projects suffer from implementation delays.

As for other means of intermodal transport, coastal shipping and inland waterways transport need to be fixed up as cargo evacuation by water is cheaper and cleaner, reduces cost and port congestion and brings in efficiency.

## Way forward

### Cabinet approval of revised model concession agreement

The Cabinet has approved the revised model concession agreement for PPP projects in major ports. Model- approved amendments in the model concession agreement have made port projects more investment friendly:

- Amendments in the model concession agreement envisage constitution of the Society for Affordable Redressal of Disputes Ports (SAROD Ports) as a dispute resolution mechanism similar to provision available in the highways sector
- Providing an exit route to developers by divesting their equity up to 100% after completion of two years from the commercial operation date. This is now similar to the model concession agreement provisions for the highways sector
- Concessionaire would pay royalty on 'per MT of cargo/ TEU handled' basis, which would be indexed to variations in the Wholesale Price Index (WPI) annually

### Migrating older cargo terminals to new rate regime

The government has set terms for older cargo terminals, operating under the restrictive rate regime of 2005, to migrate to a market-driven pricing structure finalised in 2013. For that, existing operators need to participate in open re-bidding to discover a new revenue share to be paid to the port trust concerned. The existing PPP operator will be allowed to exercise the right of first refusal and wrest the contract only if its bid is within 10% of the highest bid.

The 2013 rate regime guarantees a raise of as much as 15% on the base reference or ceiling rate (set upfront at the beginning of the contract by Tariff Authority for Major Ports or TAMP)

during each year of the 30-year contract if the terminal operator complies with certain performance standards. The PPP operators would also be entitled to a further hike every year to account for rising prices because the base rates are indexed to the WPI to the extent of 60%.

In comparison, the 2005 rate guideline penalise operators for efficiency. If the terminal load is more than the projected volume in a tariff cycle, its rate will be cut in the next tariff cycle. Adopting this rule, TAMP has ordered rate cuts at many facilities, resulting in legal challenges that are languishing in courts. Migrating older cargo terminal operators to the new rate regime will provide a level-playing field for all operators. This also gives operators a chance to settle disputes against the port trust/ tariff authority ahead of re-bid, if they decide to participate in the re-bid.

### Relaxation in cabotage law

In May 2018, the shipping ministry lifted restrictions on foreign registered vessels for transportation of loaded and empty containers between Indian ports. In addition, the ministry has relaxed the coastal movement of agriculture, horticulture, fisheries and animal husbandry commodities.

This is expected to impact the shipping industry:

- Some container ports in India may get transformed into aggregation and trans-shipment hubs. So far, shippers needed to relay their cargo via distant foreign ports in the Middle East and Sri Lanka. Almost a third of India's container cargo is trans-shipped through foreign hub ports, which has meant longer transit times and additional costs for shippers
- The repositioning of containers would be easier now, meaning the empties or loaded containers can be moved between Indian ports by foreign or Indian vessels. Earlier only Indian ships could do that job
- Much-needed fillip to coastal shipping in India is expected, which could also lower transportation costs

## Introduction of Indian Ports Bill, 2018, to replace Indian Ports Act, 1908

The Ministry of Shipping has proposed to revise the Indian Ports Act, 1908. Accordingly, a draft Indian Ports Bill, 2018, has been prepared. This step is being taken keeping in view the need to repeal the obsolete clauses and propose new clauses, which are beneficial for the maritime sector. The salient feature of the new bill is introduction of new clauses, which may grant powers to the Government of India to define port limit, outline rules, grouping of ports, etc. However, the new bill is in a nascent stage - currently under consultative process with stakeholders.

### Other initiatives

- Green energy projects at major ports: Promote usage of renewable energy through installation of solar and wind-based power systems at all major ports across the country. The aim is to set up 90.64 MW solar energy capacity at 12 major ports and 70 MW of wind energy capacity at four major ports
- Draft Inland Vessels Bill: The proposed bill involves clarifying aspects of inland vessels and setting standards for usage in inland waters

## Revival of PPP

### Introduction

Attracting private investments in the ports sector has become paramount for the government considering its focus on port-led development, and implementation of ambitious projects like Sagarmala. However, reported cases of PPP terminal operators at major ports going into litigation with port authorities have increased over the years. Apart from this, failure of the current PPP model to remain flexible with respect to changes in the regulatory environment and international market dynamics has reduced the number of investors in the sector. Thus, there is a need for reconsideration of the PPP scenario in the ports sector in India.

## Prevailing key impediments

### • Challenges in existing TAMP regime

TAMP was constituted in April 1997 to provide an independent authority to regulate all tariffs, both vessel and cargo-related, and rates for lease of properties with respect to major port trusts and private operators located within.

While TAMP structure was initially put in place to prevent monopolistic behaviour by terminal operators, restrictive rates of TAMP have been hindering growth of major ports, which now face huge competition from minor ports that have the liberty to fix their own tariff, especially in today's scenario when there is overcapacity in the system, and minor ports are reducing tariff to capture the cargo share. Hence, the TAMP regime needs to be reviewed to ensure level-playing field for major and minor ports.

Also, restrictive rate guidelines of 2005 penalise operators for efficiency. If the terminal load is more than the projected volume in a tariff cycle, its rate will be cut in the next tariff cycle. Adopting this rule, TAMP has ordered rate cuts at many facilities, resulting in legal challenges that are languishing in courts.

### • Lack of accountability of the concession authority

Under the current model concession agreement for major ports, the concessioning authority (port trust) has contractual obligations such as obtaining environmental clearances during the pre-construction period, and subsequently, dredging and providing road and rail facility at the time of construction as well as during the operational phase of PPP. Failure to meet such obligations should entail penalties on the part of the concessioning authority.

However, not a single case has been reported till date wherein the concessioning authority has been penalised due to such failures, whereas the concessionaire risks even termination of contract in case of non-fulfilment of conditions. Such a framework adds to the financial burden of private players, as a 3-5 year delay - which may be due to glitches in the aforementioned areas under the purview of the concessioning authority - may even double the cost and change

the entire economics of the project. Therefore, there is a need for increased monitoring of obligations of the concessioning authority to obtain desired operational results.

- **Absence of well-developed dispute resolution mechanism**  
The current model concession agreement does not have provisions of a well-developed dispute resolution mechanism. As a result, many times, parties to the agreement go for litigation in order to look for plausible solutions to their disputes, often derailing project timelines and freezing funds.

Various alternative dispute resolution mechanisms like amicable settlement, arbitration, conciliation, and mediation are generally provided for in the concession contracts. However, these methods are proving to be inadequate for timely resolution of conflicts and issues in PPP projects.

- **Delay in obtaining approvals and clearances**

Obtaining land acquisition and environmental clearances for greenfield projects is a concern. Time taken from concept to implementation of greenfield projects is still inordinately long.

## Key initiatives to revive PPP in ports sector

Over the last few years, the government has taken a number of initiatives to attract private investments into the ports sector - permitting 100% FDI under the automatic route; allowing income tax incentives under the Income Tax Act, 1961; formation of joint ventures between major ports and foreign ports, non-major ports and private companies; and standardisation of bidding documents such as request for qualification, request for proposal and concession agreement.

Apart from that, some of the recent developments include proposed revisions by the government in terms of the model concession agreement and the replacement of the Major Port Trusts Act, 1963, with the Major Port Authorities Bill, 2016.

- **Cabinet approval of revised model concession agreement**  
The Cabinet has approved revised model concession agreement for PPP projects in major ports. Approved amendments in the model concession agreement have made port projects more investment friendly.
  - Amendments in the model concession agreement envisage constitution of the SAROD Ports as a dispute resolution mechanism similar to the provision available in the highways sector
  - Providing exit route to developers by way of divesting their equity up to 100% after completion of two years from the commercial operations date. This is now similar to the model concession agreement provisions of the highways sector
  - The concessionaire would pay royalty on 'per MT of cargo/ TEU handled' basis, which would be indexed to the variations in the WPI annually. Once affected, the port operator will pay royalty on the actual income, and not on notional income
  - Provision regarding refinancing is aimed at facilitating availability of low-cost, long-term funds to concessionaires so as to improve the financial viability of projects
  - New definition of 'change in law'
  - Imposition of standards and conditions arising out of TAMP guidelines/ orders, environment law and labour laws
  - Increase and imposition of new taxes, duties, etc
- **Major Port Authorities Bill, 2016**  
In order to increase autonomy of major port boards, the Union Cabinet has approved the Major Port Authorities Bill, 2016, which allows ports to fix tariff based on the market conditions, winding down TAMP. The bill is more compact compared with the Major Ports Trusts Act, 1963, as the number of sections has been reduced from 134 to 65.
  - PPP operators will be free to fix tariff based on the market conditions. The board of the port authority has been delegated the power to fix the scale of rates for other port services and assets
  - An independent review board is proposed to be created to carry

# Infrastructure Advisory

out the residual functions of the erstwhile TAMP for major ports and to look into disputes between ports and PPP concessionaires

- The board of each major port shall be entitled to create specific master plan of any infrastructure proposed to be established within the port limits and such master plan shall be independent of any local or state government regulations of any authority whatsoever. This will expedite the approval process which is a big positive for PPP
- **Migrating older cargo terminals into new rate regime**

The government has set terms for older cargo terminals, operating under the restrictive rate regime of 2005, to migrate to a market driven pricing structure finalised in 2013. The PPP operators be entitled to a hike every year to account for rising prices because the base rates are indexed to the WPI to the extent of 60%.

Migrating older cargo terminal operators to the new rate regime will provide a level-playing field for all operators. This also gives operators a chance to settle disputes against the port trust/ tariff authority ahead of re-bid, if they decide to participate in the re-bid for migration.

## Concluding notes

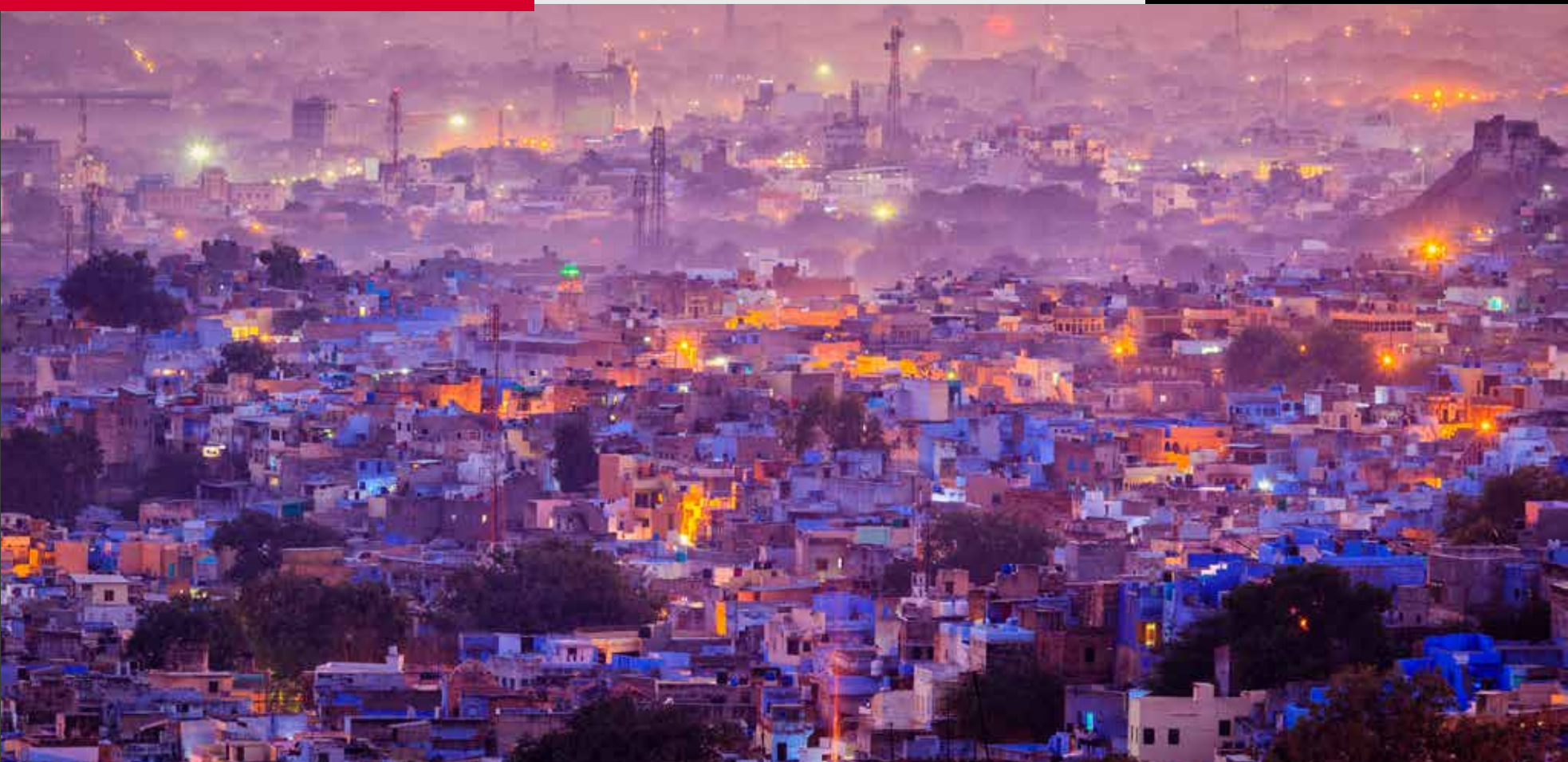
Reform measures taken by the government for PPP projects in the ports sector have significant impact in the context of making Indian ports more attractive to private investors. Without further delay, the government needs to implement the Major Port Authorities Bill, 2016, replacing the existing Major Port Trusts Act, 1963, and abolish the TAMP regime. Also, the government would have to ensure that existing PPP projects in operation get absorbed in the reform process and derive maximum benefits in the renewed ecosystem.







# Urban infrastructure





Parameter	Drivers	Drags
Policy direction	Increase in central transfers and Rs 250,000 crore of allocation under Smart Cities and AMRUT projects	Utilisation and absorption capacity at the city level
Institutional capacity and maturity	Revival of interest in municipal bonds	Weak institutional capacities
Financial stability	Revenue enhancement through VCF and property tax	Lack of operations and maintenance cost recovery, barring in a few pockets
Implementation ease	Rs 20,000 crore projects awarded	Slow pace of execution on Smart Cities and other programmes

Parameter	Evaluation criteria	Max	InfraInvex score	
			2017	2018
Policy direction	Policy consistency	10	6	6
	Public financing support	10	6	6
Institutional maturity and strength	Entity implementation capacity	10	4	4
	Financing models	10	4	4
	Regulatory robustness	10	4	4
Financial sustainability	Cost recovery	20	9	9
	Demand risk	10	4	4
Implementation ease	Track record	10	4	5
	Externalities	10	4	4
		<b>100</b>	<b>45</b>	<b>46</b>

## India's urbanisation context

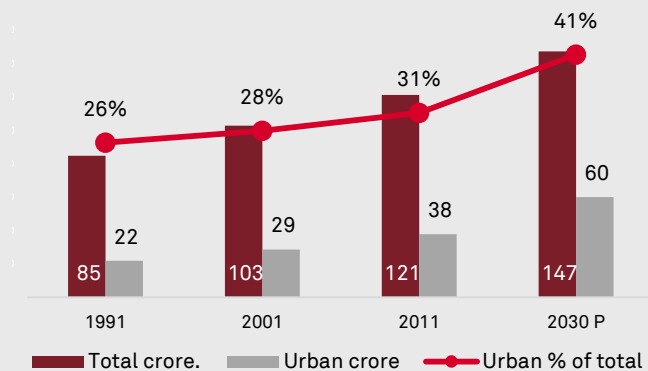
### India's urban population has grown rapidly in recent decades

India's urban population accounts for ~11% of world's urban population, and has grown rapidly in recent decades. Incremental growth in urban population was higher than rural for the first time in 2001-2011. A further 210 million could get added to urban population by 2030, compared with 159 million added during 1991-2011.

India's urban population is concentrated in a few large states with the top 10 states accounting for over 80% of India's urban population. Many of these states could cross 50% urbanisation by 2030. Similarly, India's top 12 cities (population > 2.5 million) accounted for over 26% of India's urban population.

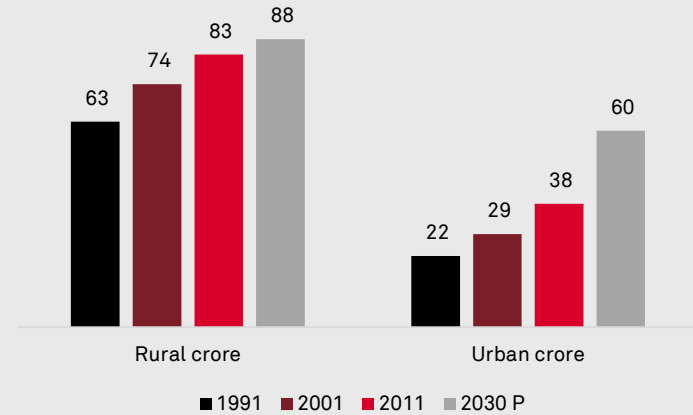
In all, the number of cities with a million plus population increased from 42 in 1991 to 53 in 2011 (and expected to rise to 68 by 2030), with smaller cities growing at a faster pace. India's mid-size cities, (population 2.5-5.0 million), including, Surat, Kanpur, Lucknow and Jaipur, collectively grew at 3.7% annually during this period, while 450-odd relatively smaller cities (population range 0.1 million to 2.5 million) exhibiting rapid growth at 3.5% as well.

### Urban population up from 26% to 31%, could climb to 42% by 2030

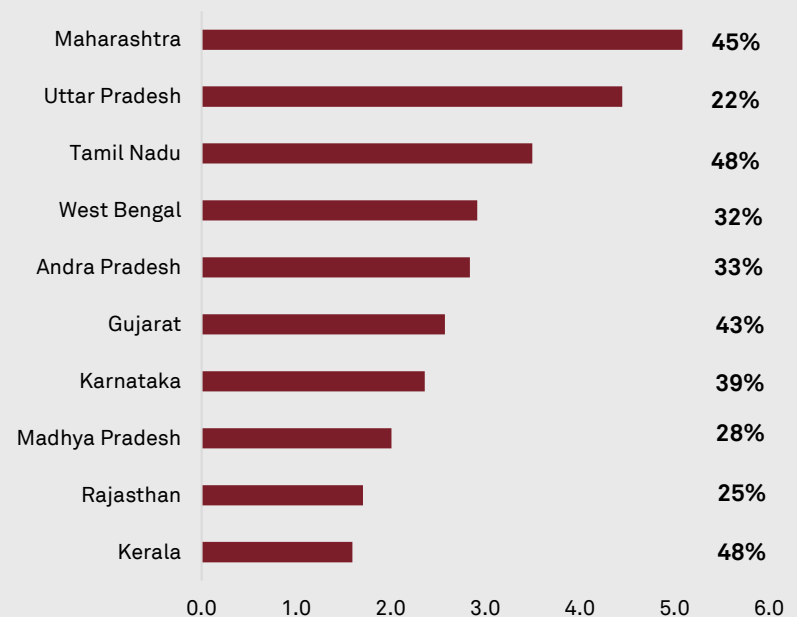


P - Projected

### Urban growth set to accelerate even further



### State-wise urban population (crore, as per 2011 census)



**All categories of cities exhibiting rapid growth; relatively smaller cities (0.1–2.5 million) exhibiting rapid growth too**

Population size (million)	Urban areas	% of India's urban population	1991–2011 CAGR
>10	Mumbai, Delhi, Kolkata	13%	2.1%
5–10	Chennai, Bengaluru, Hyderabad, Ahmedabad, Pune	10%	2.9%
2.5–5	Surat, Jaipur, Kanpur, Lucknow	4%	3.7%
0.1–2.5	Nagpur, Ghaziabad, Indore, Coimbatore + 452 cities/towns	44%	3.5%
<0.1	5,703 urban agglomerations	30%	2.2%
	Total	100%	2.8%

## This rapid growth has exacerbated service delivery gaps

Demand for urban services grow with cities, and in the absence of adequate institutional and financial capacity to cope up with growth, glaring service gaps become visible.

In water supply, while ‘access’ figures look reasonably healthy at 75%, the ‘quality of access’ and duration of supply are way below par. Losses in distribution, high non-revenue water (NRW), low pressure, and inadequate cost recovery continue to plague urban water supply systems across the country.

Less than 30% of urban domestic wastewater is treated, which has disastrous consequences for health and environment. Also share of public transport is low and declining. Slum population in urban areas was estimated at 26% of population in 2010. Notwithstanding the

progress under the Swachh Bharat Mission, most Indian cities still do not have sanitary landfills and resort to indiscriminate dumping.

## Trends in flagship schemes of the Government of India

The need for investments to address these deficits have begun to be recognised as an important aspect of development and means to support economic growth and poverty reduction. From paltry allocations by the Government of India, estimated at Rs 3,700 crore between 1980 and 2005, the launch of the Jawaharlal Nehru National Urban Renewal Mission (JNNURN) saw a huge step up in central outlays with over Rs 65,000 crore allocated under this scheme.

In 2015, the Government of India, in an effort to provide a further boost to urban development, launched the Atal Mission for Rejuvenation and Urban Transformation or AMRUT (2014–2019) covering 500 cities and the Smart Cities Mission (2014–2019) covering 100 cities with an allocation of Rs 50,000 crore each.

These schemes accelerate the trend of the past 10–15 years, when public outlays from both central and state governments increased sharply. Similarly, several states have increased budgetary support to urban development sharply. A few of them have successfully tapped lines of credit from multilateral and bilateral agencies for stepping up reforms and investments in their urban sector.

Unfortunately, the increase in allocations have not been accompanied by commensurate enhancement of capacities at the level of city governments and urban local bodies (ULBs), which are vested with the accountability for universal and effective delivery of urban services. Many ULBs are institutionally and financially incapacitated, leading to limitations in investment spending and delays in implementation, as is reflected in the summary of progress on important flagship schemes, which shows low utilisation levels at 22%.

The ambitious Smart Cities Mission (focused on novel projects in urban planning and IT-driven pan-city solutions) is showing even lower utilisation levels, reflecting the structural weaknesses in implementation capacity.

## Urban flagship schemes: Capacity limitations constrain implementation

	Allocation (Rs crore)	Releases (Rs crore)	Releases/ allocation	Utilisation (Rs crore)	Utilisation
SCM	10,084	9,943	98.6%	183	1.8%
PMAY	15,026	10,012	66.6%	2,081	20.8%
AMRUT	12,447	8,629	69.3%	2,480	28.7%
SBM	7,691	5,848	76.0%	2,223	38.0%
NULM	2,601	1,515	58.2%	850	56.1%
HRIDAY	700	247	35.3%	34	13.6%
Total	48,549	36,194	74.55%	7,851	21.7%

SCM: Smart Cities Mission, PMAY: Pradhan Mantri Awas Yojana, AMRUT: Atal Mission for Rejuvenation and Urban Transformation, SBM: Swachh Bharat Mission, NULM: National Urban Livelihoods Mission, HRIDAY: Heritage City Development and Augmentation Yojana  
Source: 22<sup>nd</sup> Report of Standing Committee on Urban Development (2017-2018), Lok Sabha Secretariat, March 2018

## Smart Cities Mission

The Smart Cities Mission, launched in 2015, selected 100 cities (accounting for about a quarter of India's urban population), through a competitive selection process lasting four rounds, with a view to support implementation of proposals prepared by cities to implement area-based development and technology-driven pan-city solutions. Cities were also required to set up well-staffed special purpose vehicles (SPVs) with ring-fenced financing to steer implementation.

The overall outlay of all the projects under the Smart City proposals submitted by cities is ~Rs 203,000 crore, with area-based development projects involving an outlay of Rs 164,000 crore, and projects for pan-city solutions costing ~Rs 39,000 crore. Of this, about Rs 67,430 crore is envisaged coming from external financing (including debt and public-private partnerships).

Although cities have constituted SPVs, and may have also appointed project development and management consultants (PDMCs), progress in investment spending has been slow, owing to combination of capacity

limitations at the ULB and SPV levels and delays in commissioning and completing the extensive preparatory studies needed to get the conceptual ideas identified in the Smart City proposals into shovel-ready and bankable projects.

## Smart Cities Mission - Progress on milestones and investment completion

Particulars	Target	Achievement	% Progress
Selection of cities under Smart Cities Mission	100	99	99.0%
Constitution of SPVs (number of cities)	99	91	91.9%
Appointment of PDMC (number of cities)	99	62	62.6%
Projects completed (Rs crore)	203,979	4,583	2.3%

Source: MoHUA Annual Report (2017-18); 4 Years of Urban Transformation, 2014-18, MoHUA, May 2018

## Smart Cities Mission - Status of projects

Stage	Number of projects	Cost (Rs crore)
Work completed	243	4,583
Projects under implementation	948	30,675
Projects under tendering	399	19,190
Projects under DPR approval / preparation	2,130	1,05,813

Source: 4 Years of Urban Transformation, 2014-18, MoHUA, May 2018

## PMAY

The Pradhan Mantri Awas Yojana (PMAY)-Urban component, a part of the vision of 'Housing for All' by 2022, aims to provide financial assistance to all states and union territories to address housing requirements of the urban poor. Coverage of the mission has been extended from 4,041 statutory towns to all areas falling within notified planning / development areas. The mission intended to meet housing demand of 120 lakh units by 2022. Although 47.5 lakh housing units have been sanctioned, progress on implementation has been slow with less than 7% units reported completed, while another 57% units are reported to be grounded for construction.

The implementation of reforms including the Real Estate (Regulation and Development) Act, 2016, and other ease-of-doing-business initiatives are expected to remove irregularities and improve investability in housing.

### PMAY progress (number of houses)

Verticals	Sanctioned	Completed	Grounded for construction
ISSR	74,934	1,588	32,501
AHP	14,76,331	17,922	6,36,916
BLC	21,46,562	1,56,461	8,92,386
CLSS	86,344	86,344	86,344
RAY	1,41,848	68,964	1,14,904
Total	39,26,019	3,31,279*	17,63,051

\*499,884 houses completed includes those under JNNURM since June 2015  
 ISSR: In-situ Slum Redevelopment, CLSS: Credit-Linked Subsidy Scheme, AHP: Affordable Housing in Partnership, BLC: Beneficiary-led individual house construction or enhancement, RAY: Rajiv Awas Yojana  
 Source: 22nd Report of Standing Committee on Urban Development (2017-2018), Lok Sabha Secretariat, March 2018

## AMRUT

Being implemented in 500 cities with a population of more than 100,000, the AMRUT mission seeks to provide basic civic amenities like water supply, sewerage, drainage, urban transport, and parks so as to improve the quality of life for all, especially the poor and the disadvantaged.

### AMRUT progress

Particular	Target (Rs. crores)	Achievement (Rs crores)	Progress
Water sector projects completed	39,011	9	0.0%
Sewerage projects completed	32,456	5	0.0%
Drainage projects completed	2,969	4	0.1%
Urban transport projects completed	1,436	9	0.6%
Green space & park projects completed	1,768	149	8.4%
Total	77,640	176	0.2%

Source: MoHUA Annual Report (2017-18)

## Swachh Bharat Mission

The Swachh Bharat Mission reflects better performance relative to other flagship schemes, and aims to achieve 'open defecation free' (ODF) status and 100% scientific processing of municipal solid waste across all cities and towns. Till date, urban areas in 17 states have attained ODF status.

### Swachh Bharat Mission progress

Particular	Target	Achievement	% Progress
ODF status (number of ULBs)	4,041	2,729	67.5%
Individual household latrines (number of units)	66.42 lakh	57 lakh*	73.2%
Public and community toilets (number of units)	5.08 lakh	3.8 lakh**	65.0%
100% door-to-door waste collection (wards)	84,260	63,355	75.2%
Waste to energy - Constructed/WIP (MW)	511	503	98.43%
Waste to compost - Constructed/WIP (lakh TPA)	54	51	94.44%

\*48.6 lakh constructed, 8.3 lakh under construction. \*\*3.3 lakh completed, 0.37 lakh under construction  
 Source: 4 Years of Urban Transformation, 2014-18, MoHUA, May 2018

## Deendayal Antyodaya Yojana – National Urban Livelihoods Mission

The mission aims to reduce poverty and vulnerability among the urban poor, and covers all 4,041 statutory cities and towns. It seeks to enable access to self-employment and skilled wage employment opportunities. The focus of the mission is to organise urban poor in grassroots level institutions, create opportunities for skill development leading to market-based employment and help set up self-employment ventures by ensuring easy access to credit. The mission also aims at providing shelters equipped with essential services to the urban homeless and address livelihood concerns of the urban street vendors.

### Deendayal Antyodaya Yojana achievements

Particular	Achievements
Employment generated (number of persons)	652,817
Self-help groups (SHGs) assisted with revolving fund (numbers)	200,193
Loans disbursed to SHGs (numbers)	400,494
Shelters sanctioned (numbers)	1565
SHGs formed (numbers)	288,502
Street vendors identified (number of persons)	1,676,403
Skill training imparted (numbers)	1,116,818
Shelters operational	961

## HRIDAY

The National Heritage City Development and Augmentation Yojana (HRIDAY) aims to bring together urban planning, economic growth and heritage conservation in an inclusive manner with the objective of preserving the character of each heritage city.

HRIDAY involves an outlay of Rs 500 crore. The scheme is implemented in 12 identified cities. 63 DPRs amounting to Rs 421 crore have been approved of which 58 projects are under implementation and 5 projects are under contractor selection. 6 projects have been completed. As of April 2018, around Rs 262 crore have been released under the programme.

## Urban transport

The Ministry of Housing and Urban Affairs (MoHUA) is the nodal agency for planning and coordination of urban transport.

Several metro projects are under implementation through 50:50 joint ventures set up by the GoI with respective state governments.

Two of these projects, the Delhi Metro Phase 1 and 2, and Bengaluru Metro Phase 1, are fully operational, and several other projects are under implementation. Models to increase ridership, augment feeder service and last mile connectivity, enhance revenue, increase non-fare box revenue, and reduce operational losses are being implemented. A review and revamp of the PPP mode, building on lessons from Mumbai Metro Line 1 and Hyderabad Metro, is also being considered as an avenue particularly in operations and management of these systems. The Metro Rail Policy, 2017 aims at ascertaining and enhancing the economic, social and environmental feasibility of metro rail projects. It creates an ecosystem for the rapid development of metro rails in the larger cities under different models including public-private partnerships (PPP) and paves way for Make in India products in the sector.

### Urban transport, progress in metro rail systems (JV route)

Particular	Target	% Completion
Delhi Metro Phase 3	140	88.3%
Bangalore Metro Rail (Phase 1)	42	100.0%
Bangalore Metro Rail (Phase 2)	72	17.0%
Chennai Metro Rail Project Phase 1	45	92.0%
Chennai Metro Rail Project Phase 1 (extension)	9	17.8%
Nagpur Metro Rail Project	38	52.2%
Kochi Metro Rail Project	26	81.7%
Mumbai Metro Line 3	33	15.0%
Ahmedabad Metro Rail Project Phase 1	36	22.0%
Lucknow Metro Rail Project Phase 1A	23	55.8%
Pune Metro Rail Project Phase 1	31	9.2%
Total	495	58.7%

Source: MoHUA Annual Report (2017-18)



## Other initiatives

### Liveability Index

In June 2017, liveability standards was launched to bring about a systematic improvement in quality of life in cities and to generate a Liveability Index and rating cities against these standards. In a recent launch, the next phase of the Liveability programme was launched, where cities will now be encouraged, to invest in improvement of their liveability scores through a competitive process,

### Pilot on formulation of local area plan and town planning scheme

While most missions are structured as project-based reforms, there is a strong need for reforms in urban planning. The recent announcement to prepare local area plans for brownfield redevelopment and Town planning schemes for greenfield city expansion, are a step in this direction.

These initiatives are aimed to supplement the retrofitting/ redevelopment and greenfield strategies of the Smart Cities Mission. Such coordinated and incentivised planning is intended to bring about an integrated and balanced renewal / growth in existing cities.

## Financial reforms

### Credit ratings

Credit ratings were been completed in 412 cities. Although 155 cities received ratings of BBB- and above, only 34 cities are rated A- and above, reflecting the weak financial capacity of city governments. The credit rating exercise conducted under AMRUT, seeks to provide impetus for financial reforms at the level of ULBs and to boost issuances of municipal bonds.

## Municipal bonds sees a start, after a long lull

Under AMRUT, MoHUA also announced an incentive of Rs 13 crore for every Rs 100 crore issued by the first 10 ULBs in fiscals 2018 and 2019. The incentive is capped to a maximum of Rs 26 crore per ULB.

Although, India's municipal financing has been dominated by budgetary outlays, cities have tapped into the capital markets through one-off bond issuances from as early as 1997, when the Bangalore Municipal Corporation issued a municipal bond of Rs 125 crore with a state guarantee. The first non-guaranteed municipal bond was issued by Ahmedabad Municipal Corporation in 1998. Since then there were around 30 municipal bond issuances in India, raising around Rs 2,300 crore cumulatively over the last 22 years.

However, issuances dropping sharply after 2005. And 82% of the value of issuances were through issuances by ULBs and the rest through the pooled-finance mechanism in Tamil Nadu and Karnataka.

The recent revival with issuances by three ULBs is reflective of a push to expand non-grant financing options and specifically municipal bond financing. A separate regulatory framework for municipal bond financing was put in place when Securities and Exchange Board of India released its regulations for municipal securities in 2015.

The higher share of financing to be secured by ULBs for projects under Smart Cities Mission and AMRUT is also expected to provide impetus at least among the small pool of better rated ULBs. Following the issuance of Rs 200 crore bond issue by the Pune Municipal Corporation last year, civic bodies of Indore and Hyderabad have raised issued bonds. The bond issues were supported by escrow of own funds and assigned revenue including octroi grants/ property tax/ water and sanitation charges.

However, sustaining this would require continued reforms and instilling implementation capacity and debt repayment discipline in ULBs.

## Municipal bond issuances picking up

Issuer (Year)	Pune Municipal Corporation (2016)	Indore Municipal Corporation (2018)	Greater Hyderabad Municipal Corporation (2018, in 2 tranches)
Loan size (Rs crore)	200	140	395 (Rs 200 crore in February and Rs 195 crore in August 2018)
Coupon	7.59%	9.25%	8.90% and 9.38%
Tenor	10 years	10 years (call/ put option in 7 years)	10 years
Credit rating	AA+(SO) by India Ratings and CARE	AA (SO) by Brickwork and SMERA	AA by CARE Ratings and India Ratings
Guarantee	No	No	No
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
Issue of proceeds	24/7 water supply scheme	AMRUT	Strategic road development plan

Source: CRIS Analysis

## VCF frameworks

Value capture refers to the recovery of a share of the increment in land valuation due to the positive externalities from actions (infrastructure development) other than the land owner's investments. Land-based fiscal tools have been recognised as a promising avenue for augmenting financial resources for urban infrastructure financing. It is observed that the revenue of ULB, in most cases, can be doubled by introduction of value capture financing (VCF) reforms.

Development of framework for value capture financing for generating

revenue is defined as one of the reforms under the Smart Cities Mission and is also extended to the AMRUT cities. Key VCF tools operational in India are property tax, vacant land tax, development charge, stamp duty surcharge, betterment levy, saleable floor area ratio, compounding fee, and project based impact fee. However, the implementation of these reforms need changes in the act and rules which need to be done at the state level. While several cities have conducted the assessment of VCF tools and revenue potential through them, progress on measures to be adopted including amendments to municipal legislation remains slow.

## Property tax reform

The main objective of property tax reforms proposed under Smart Cities Mission is to improve tax revenues by identifying the unassessed and under assessed properties to improve coverage. The reform also aims at improving administrative systems, digitalisation of the property tax system to have a computerised property tax base, improvements in the collection efficiency and a review of the taxation system - the current tax base, tax zoning, tax rates, exemptions and incentives. Similar to value capture financing, while the review and recommendations of the current framework has been carried out in several cities, operationalisation of the changes has been slow.

## The path to accessing non-grant financing and nurturing urban PPPs

### Challenges

The sharp increases in budgetary outlays from state and central government schemes have not been backed with commensurate improvements in institutional and financial capacity at the level of cities, to equip them to deliver services effectively. Challenges to scale urban investments from present levels arise on account of four factors:

- Even though a multi-fold increase in investment is needed to bridge infrastructure and service delivery gaps requires, capacity weaknesses constrain implementation and absorption of even available grants in many of our cities. The low absorption levels on several of the flagship schemes reflect this constraint

- Revenue base is narrow and non-buoyant in most cities, to scale up non-grant financing beyond the large metros. Only 34 cities out of 412 rated cities have A- rating. Further, even cities that may have requisite intrinsic financial strength in terms of revenue surplus and economic potential, are either reluctant or not equipped institutional capacity-wise to pursue
- Notwithstanding initiatives over the years to introduce accrual accounting, financial accounting and information disclosure practices are weak. Delays in finalisation and audits of accounts, and poor harmonisation of accounting practices constrain temporal and cross-city analysis

## Possible measures

Getting ULBs access to non-grant financing has been tough because of the challenges mentioned above. It begins with actions to make ULBs credible, creditworthy and capable counterparties.

### 1. A focused government programme for a financial and institutional reform programme in select cities

Even as broad-based efforts to engender urban reforms are being supported as for instance, under AMRUT, central government should support an institutional and financial transformation programme in coordination with state governments in 10 relatively credit-worthy cities in a time-bound manner. Selected cities should have scale and financial capacity and could be selected from a pool of cities that have population greater than 2 million and credit rating of A- and above.

The support could cover the following transformations at the ULB level:

- Making civic revenues stable and buoyant via tax reforms, rationalisation of user charges and a stable devolution regime
- Strengthening institutional capacity and setting up dedicated teams/cells for project development and debt management
- Preparing rolling multi-year investment plans and financing avenues
- Ensure robust financial management and disclosure standards

Such a programme could help create the necessary scale, momentum and supporting ecosystem to nurture wholesome reforms for accelerated results, and potentially create a template for expeditious and wider roll-out subsequently.

### 2. States ought to play a proactive role in building good credit discipline in ULBs

In addition, states should seek to build credit discipline among ULBs through urban development funds and pooled financing, by accessing concessional lines of credit. To start with, states should even consider channelling a portion of budgetary outlays through a loan window, given that capital markets and debt access are typically beyond the reach of most cities.

Finally, property tax reforms hold transformative potential in the Indian context and should be pursued with zeal by central and state governments. We emphasised this in our 2017 yearbook and the repetition is intentional.

At less than 0.2% of GDP, property tax revenue has remained relatively low, despite multi-fold increase in underlying property prices across urban India over the last decade or so. A transparent distortion-free property tax fixation regime, a sound framework to enable timely revision indexed to inflation in rental/capital values and improved efficiency in administration and tax collection could potentially help achieve a multi-fold increase in ULB revenue and contribute significantly to strengthening their financial capacity.

### 3. Lessons from the past on reviving ULBs

PPPs in urban infrastructure have been negligible relative to the scale of investment. Private sector investments have been low mainly because of lack of bankable projects and lack of management and institutional capacities of ULBs to undertake projects under the PPP mode. Key lessons from past projects are summarised below.

- Programmatic push: Urban PPP projects in the past have largely been one-off projects and have tended to be driven by a champion-led push rather than as a strategic transformation initiative for

efficiency gains. There is a need for a state- or sector-level PPP strategy along with a programmatic thrust at a sub-segment level (water supply and wastewater)

- Scale of project and size of ULB: Paradoxically, many early urban PPP projects especially in water supply were conceptualised in smaller cities with questionable financial and institutional capacity. Also, without scale and programmatic push, many of these projects could not attract and nurture a large reputed bidder ecosystem in a manner that the highways sector could accomplished
- Risk sharing and need to evaluate investment-light models: On hindsight, many projects were poorly structured with an over-reliance on build-operate-transfer models and user charges in financially weak ULBs. A greater thrust on annuity-based and investment light models, including management contracts ought to be mainstreamed.
- Service delivery over revenue maximisation: Early waste management PPP, for instance, particularly in waste processing, focused excessively on revenue maximisation rather than efficient service. Even when it was clear that solid waste management (if we take the entire chain from household to landfill) was a net cost activity, many projects were conceptualised with excessive revenue potential in mind instead. The key consideration to PPP in urban services ought to be on getting service delivery gains and universal access, given the large viability gaps at present

In line with the thematic push of the yearbook, the concluding section focuses on pathways to revive PPP in urban water supply.

## Getting the flow right in urban water supply

### The story so far

India witnessed a rise in urban water supply PPP projects reaching contract award stage during 1999 to 2009<sup>1</sup>. This trend was characterised by a shift in private sector involvement from bulk supply to operation and maintenance.

PPPs in the Indian urban sector, more so in water supply, have been for the most part quite low, especially when compared with the power and telecom sectors<sup>2</sup>. The Department of Economic Affairs' PPP database (last updated in 2016) reveals that out of a total of 1,539 PPP projects, only 1.81% (28 projects) are water supply PPPs. Further, out of these 28 projects, only 15 are now operational.

Poor project structuring due to lack of prior experience and/or technical capacity, unreliable data systems and inadequate knowledge of risk-sharing have also contributed to the failure of urban water supply PPPs<sup>3</sup>. In addition, the sectoral challenges are several and that makes it difficult for the sector to be PPP amenable. For PPPs to be successful in the urban water supply sector, the public agency will need to be active and develop a true partnership with the private operator in both asset creation and improving service delivery.

### Murky waters

In the urban water supply sector, there is a greater emphasis of public investments on infrastructure creation rather than improving service levels. The sector goes through several investment cycles but seldom has the public service providers been made accountable for past investments and service levels delivered.

Most service providers do not recover 100% of operation and maintenance (O&M) costs leave alone capital costs. There is a need to monetise efficiency gains through reduction in non-revenue water levels, increasing revenue collection and reducing cost of service delivery.

The sector has considerable emotive appeal amongst different stakeholders. Because water is so important in people's lives it, is often exploited for political reasons. But not all non-performance issues can be explained by this factor. Lack of service orientation, poor accounting or asset management practices are some such issues.

Some of the foremost challenges for PPPs in urban water supply include weak institutional capacity, poor reforms implementation, and lack of service level data, leading to incompatible and unequal risk allocation,

<sup>1</sup>Water and Sanitation Program (2011) 'Trends in Private Sector Participation in the Indian Water Sector: A Critical Review'. India: World Bank

<sup>2</sup>Ministry of Urban Development (2011b) 'Twelfth Five Year Plan: Report of the Working Group on Financing Urban Infrastructure'. New Delhi: Government of India

<sup>3</sup>Water and Sanitation Program (2011) 'Trends in Private Sector Participation in the Indian Water Sector: A Critical Review'. India: World Bank

and inaccurate performance target-setting<sup>4</sup>. Failure on the part of the private operator for big infrastructure projects usually entails a bail-out by the government. Hence, PPPs inherently engender “contingent liabilities” for the government<sup>5</sup>.

On one hand, delays seen in projects under flagship schemes such as JNNURM earlier, and now AMRUT and Smart Cities, point to the lack of absorptive capacity to utilise grants provided to create infrastructure. Institutional capacity comes in the way of implementing projects and the same is even more true in case of PPPs which are more complex by design. At the same time, tariff levels being abysmally low in most cities, viability gaps are large and hence for projects on PPP to be sustainable, grants in excess of 70% are often needed to make projects viable at an acceptable tariffs

## What are the options?

Given the risks that the sector is fraught with, public funding will continue to dominate investments in the sector. A possible starting point could be to consider investment-light models that blend private expertise and public funding to improve efficiency and achieve universal access.

Private-sector participation should not be limited to investment support - management expertise is equally crucial. That’s because cities in India have grown, but public service providers have not kept pace in terms of skillsets and managerial capacity to provide desired level of services.

Engaging the private sector to provide services – backed by investment support from a public agency or government, and a performance contract – could be a way to address the ability gap among service providers. But structuring a performance-based contract in the absence of reliable baseline performance data has its own set of challenges.

Depending on the maturity level of the ULB / utility, various contracting models can be explored. Some of the most workable options in the foreseeable future have been discussed below.

### 1. Outsourcing contracts

Outsourcing contracts constitute a rudimentary form of private sector participation and are suited to ULBs / utilities that grapple with inadequate staff. The objective of these contracts is to simply address staff deficiency. Such contracts are simply a tool of outsourcing manpower requirements, and thus bring in neither private investment nor expertise. However, they do hold the potential of bringing in greater efficiencies, if administered well.

### 2. Performance-based management contracts (without prior condition assessment)

Performance-based management contracts are now a fairly established contracting model, used to rope in private sector expertise and efficiency. This model has demonstrated successful results when carried out in small pilots, and has the potential to be scaled up in a phased manner. The concessionaire is largely insulated from investment and revenue risks, as both capital and O&M expenses are borne by the authority, with payments usually made in an annuity format. For instance, water distribution management contracts for the towns of Hubballi-Dharwad, Gulbarga and Belagavi in north Karnataka have resulted in desirable outcomes such as reduced water losses and per capita consumption. This was possible only because the capital investment for these projects came from the government, while the private operator was paid a fixed fee for O&M of the system.

### 3. Bidders take responsibility for service levels at RFP stage

While the previous model addresses the investment and revenue risk for the concessionaire, this model addresses the baseline risk for the private sector. This contracting model involves a tendering process whereby shortlisted bidders at the request-for-qualification stage can jointly appoint and fund an agency to carry out a study to determine the condition of infrastructure assets as well as existing water supply service levels. This study serves to establish a baseline prior to bidders submitting their proposals. The baseline that emerges from this study is approved by the concessioning authority and forms a part of the request for proposal, based on which bidders quote. This ensures that all the bidders will have the same information to prepare and submit the bids, thus reducing the risks imposed by information asymmetry. As

<sup>4</sup>Ministry of Urban Development (2011a) ‘Report on Indian Urban Infrastructure and Services’, New Delhi: Government of India

<sup>5</sup>Chong, S. and E. Poole (2013) ‘Financing Infrastructure: A Spectrum of Country Approaches’, Reserve Bank of Australia Bulletin (September Quarter): 65-76

an additional safeguard, the contract also provides for variation orders in the eventuality that huge deviations are observed in actual baseline service levels during project execution.

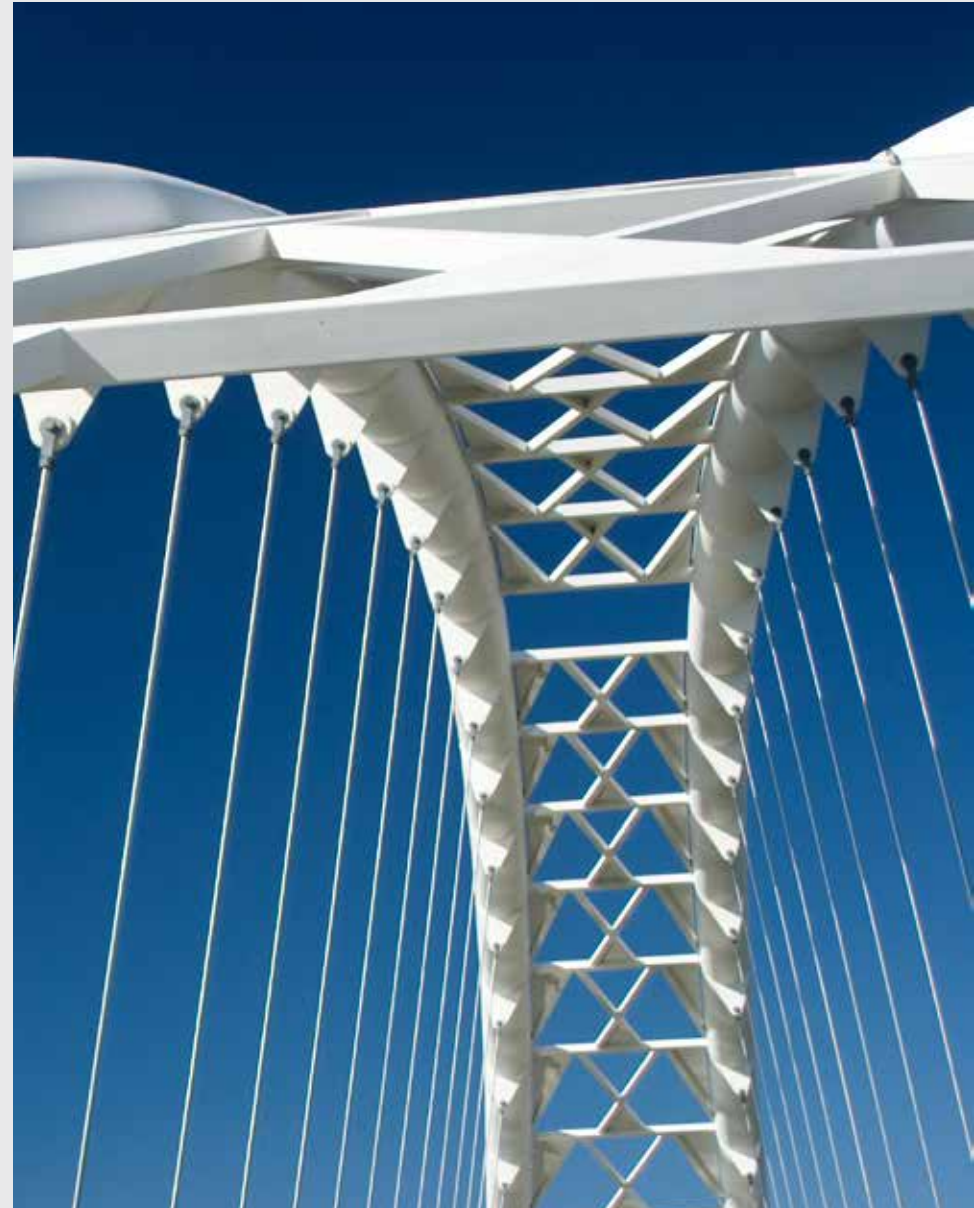
#### 4. Public service providers carries out condition assessment prior to procurement

This option is more suited to service providers that have mature finances and institutional capacity to execute and evaluate performance of PPP contracts. In this model, the ULB first carries out studies to assess the condition of infrastructure and existing service levels in a scientific manner. Based on these assessments, the ULB develops a service level improvement plan through which it sets reliable performance targets and identifies specific instrumentation or system requirements to achieve these targets. These requirements translate into projects for which the private sector can be roped in. The performance targets are then used as a basis for procuring the services of the private sector for specific interventions.

### Transition enabling steps

In order to better equip public service providers to administer and execute performance based management contracts, and eventually transition to more mature models of PPPs in the sector, certain steps need to be carried out. These have been discussed below.

Situation	Timeline	PPP contract model
Public agency with inadequate staff and weak capacity	Immediate	Labour contracts
Baseline service levels not established	Immediate / medium term	Bidders jointly take responsibility for determining service levels at RFP stage
Small pilots	Immediate / medium term	Performance-based management contract (PBMC)
Credit-worthy public agency and institutional capacity	Long term	Public agency carries out condition assessment prior to PBMC procurement



**1. Channel public funds without risking innovation:** Public funding may need to be the driver of service improvement in urban water supply. In fact, increased public funding through nationally sponsored missions has been used as a tool to rope in greater private sector participation. Yet, public funding sometimes tends to crowd out efficiency improvements, and shifts focus from rehabilitation to replacement. Thus, PPPs need to be structured in such a way so as to incentivise innovation and bring in greater internal efficiency improvements.

**2. Reform to sustain:** While public funding is critical to avoid high tariffs, there is a strong need to couple this with reforms, in order to ensure long term sustainability. Ideally, reforms should precede the introduction of PPPs in order to avoid misguided notions of PPPs and high tariffs. National missions such as JNNURM and AMRUT, have tried to push through mandatory reforms that local governments have committed to fulfil. Many of these reforms are key to alleviating certain revenue related PPP risks. Examples of these reforms include introduction of user charges for water supply, creation of separate accounts, cost recovery and collection efficiency targets, and shifting to rationalised property taxes and double entry accounting. These reforms should not be side-stepped.

**3. Data is critical, but there are workarounds:** Establishing baselines on existing service levels is critical and doing this at tendering stage has challenges. A target-based contract where, for example, NRW has to be reduced by a certain predetermined volume and penalties/bonuses apply for not achieving/surpassing the target, may not always work. These targets can be considered arbitrary in the absence of a reliable baseline and accurate conditional assessment of the infrastructure. If the targets are too high, the private sector will not be interested to bid or the risk premium will be substantial. If they are too low, the contract might be disadvantageous for the utility. Hence, attempts need to be made to design project agreements which, instead of having fixed targets, have performance fees that are directly proportional to levels of achievement.

**4. Balanced risk allocation:** Most PPPs in urban water supply have failed primarily because of inequitable risk allocation<sup>6</sup>. As a rule of

thumb, operators must be insulated from demand and tariff risks. There have been cases of well-structured mitigation measures against operational and revenue risks. PPP contracts need to have built-in contingency plans to cope with eventualities such as change in scope, delay in grant funding, etc. For instance, caps may be set for the amount of capital investment to be contributed by the contractor. In case of contingencies such as expansion in scope of work, mechanisms for application and sanction of additional funds from the government must be clearly spelt out.

## Summing up

The lacklustre impact of PPPs in urban water supply serves to underscore the need for stringent reforms and the need to have a credible counterparty as we have emphasised through this document. At the project level, there is a dire need to allocate risks to the party that is best suited to handle it, and clearly spell out responsibilities and risk mitigation measures in the contract, leaving no room for ambiguity. At the sectoral level, internalisation of reforms regarding user charges, rational billing mechanisms, plugging municipal revenue leaks and devolving financial powers to local governments will be critical to providing impetus to PPP investments in the sector.

Water supply is an essential service, mired in politics, with a whole range of stakeholders, whose roles and interests are often divergent and conflicting. Notwithstanding challenges, context driven project structuring driven and supported by the public agency, balanced contracting structures, defined and predictable financial devolution, and improving internal capacities and revenue base, could help in realising the promise of 'getting the flow right'.

<sup>6</sup>Government of India (2009) Position Paper on the Water and Sanitation Sector in India. New Delhi: Department of Economic Affairs, Ministry of Finance, Government of India

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