WORLD ECONOMIC FORUM

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Industry Agenda

# Reforms to Accelerate the Development of India's Smart Cities

## Shaping the Future of Urban Development & Services

April 2016

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In collaboration with PwC


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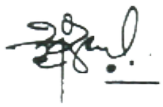
# Foreword

**Devendra Gangadharrao Fadnavis**
Chief Minister of Maharashtra, India



## Chief Minister of Maharashtra

It is said that economic growth and urbanisation are correlated. Economic growth highly influences urbanisation. While in turn urbanisation affects the rate at which economy grows. Growing urbanisation brings with it challenges of providing adequate land, water, food, better infrastructure, employment opportunities and of course, better living standards. The inadequacies of any of these resources result in insufficient and faulty management of cities. Therefore, cities are said to be engines of economic development of the nation.

Today, 31 % of India's population resides in urban areas contributing 63 % of national GDP. It is expected that by the year 2030, 40 % of India's population will be living in urban areas and will contribute 75% of national GDP. Considering these facts comprehensive development of physical, institutional, social and economic infrastructure become necessary. All these are important to improve the standard of living and attract people and investments to cities. Development of smart cities is the first step in that direction.

The object of the Smart City Mission is to provide core infrastructure and quality life to its citizen with clean and sustainable environment and application of smart solutions.

The Government of India's urban rejuvenation programme, 100 smart cities and 500 AMRUT cities will only serve to stimulate the existing urban development efforts.

Maharashtra is the most urbanised State of the country. Approximately 50 % of its population resides in cities creating huge demands on the existing infrastructure. Therefore, we have to develop better scientific tools to improve city planning with sensitivity to local ecology and heritage and reduce demand for transportation, improve mobility and reduce congestion. For this, we need sound policies to achieve these goals.

We welcome the private sector's participation in urban development and consider their contribution pivotal in the State's achievements. We welcome the recommendations suggested by the World Economic Forum and will consider those that relate to strengthening urban local bodies and the development of better business environment.

Considering the past experiences the State has already initiated a War Room to accelerate strategic urban infrastructure projects. Further, the State is focused on reforming the power sector, which will be critical to urban development and building world class cities. I believe that this new found approach to delivering projects, coupled with business reforms will accelerate the initiation of Smart Cities in Maharashtra.

**Nara Chandra Babu Naidu**
Chief Minister of Andhra Pradesh, India

## Chief Minister of Andhra Pradesh

India is at crossroads in its journey towards becoming a developed nation, and cities will play a pivotal role in improving the socio-economic standing on India. The Government's recently announced schemes such as 100 Smart Cities, 500 AMRUT cities, Digital India, Make in India and Skill India - when converged together - provide a framework which sets the development agenda for the country.

Our focus on building smart cities is prudent and timely. The State of Andhra Pradesh has taken the lead towards the implementation of these programs - as showcased by the selection of two cities (Visakhapatnam and Kakinada) among the top twenty smart cities in India. In order for the state to develop its urban core, strong public-private collaboration will be required - and we have taken steps towards this.

Additionally, we also plan to develop Amaravati - a new greenfield city - which wil serve as the state capital of Andhra Pradesh. The Greenfield riverfront capital city, coming up on the banks of river Krishna, is set to have a number of firsts in the country.

I believe every city needs basic civic infrastructure in place for proper mobility, economic development, growth and safety. As we develop our state's urban core, we need to strive together to create stronger and independent institutions at a local level and also create a congenial business environment for the private sector.

The World Economic Forum has pointed out reforms required to accelerate the development of smart cities. In this regard, we have already begun our journey towards the implementation of some of these reforms.

We are committed to meet and exceed the aspiration of all stakeholders - citizens, business and members of civil society by adopting the right governance structure and empowering institutions. We are working to develop the entire ecosystem and develop each city into a growth centre, eventually transforming Andhra Pradesh into a bustling state.

I would like to thank the World Economic Forum for recommending the reforms for our urban local bodies and state government and we will give our due considerations to their suggestions in developing world class cities in Andhra Pradesh.

# Executive Summary

The global urban population has risen to 54% of total population and is set to rise to over 66% by 2050, and India is a significant contributor. While the country's urban population currently totals around 410 million people (32% of the total population), it is expected to reach 814 million (50%) by 2050.[1] Cities in India have become a centre of focus for business and are a means to enhance livelihoods. India must rejuvenate its cities promptly to address the increasing aspirations of urban dwellers and attract the investment that will further drive growth and development.

The growth of India's urban population has not been accompanied with commensurate increases in urban infrastructure and service delivery capabilities. Cities in India face a range of challenges to meet demand and supply gaps in urban regions, in such areas as water, waste management, energy, mobility, the built environment, education, healthcare and safety. The challenges may exacerbate further if timely and adequate action is not taken; if neglected, they could even derail India's growth.

With the growing focus on enacting positive reforms in governance and improving investor confidence in India today, the time is right to put the spotlight on cities as they are hotspots of business and economic activity. The plans announced by the Government of India for 100 smart cities and 500 Atal Mission for Rejuvenation and Urban Transformation (AMRUT) cities should usher in a structured approach towards urban management.

These programmes have opened up avenues for local industry and global players to participate in the development of cities across such sectors as utilities, housing, mobility, telecommunications, information technology, healthcare, education and recreational facilities. Private-sector support will enable the rejuvenation of crippling and inadequate infrastructure and help address capacity issues across state governments and urban local bodies (ULBs). The Government has shown commitment by allocating funds to these programmes, and the current imperative is to build a framework of policies and reforms that will help to develop urban agglomerations.

While the Government has sent out a positive message to the private sector in announcing the programme, the following challenges must be addressed to create an environment enabling contributions to urban development.

– **Institutional challenges:** ULBs will play a crucial role in implementing the urban rejuvenation programmes, but they lack the resources to execute the programmes. A World Economic Forum survey on smart cities[2] highlighted the fact that city governments are the least prepared to execute the programmes from among all the stakeholders, which include the national government, state governments, the private sector, non-governmental organizations (NGOs) and academic institutions. Their lack of preparedness emanates from the lack of empowered leadership, inadequate institutional capacity, inadequate revenues, a lack of collaboration between multiple planning and administration bodies, and archaic processes.

– **Business environment challenges:** The results of the same World Economic Forum survey indicate that reforms are required in the procurement process, land acquisition, permitting process, dispute resolution and to address risks in public private partnerships, such as changes in scope, market distortion, community risks and breach of contracts risks. These reforms must be made a priority to attract private-sector participation.

– **Sector-specific challenges:** Based on the survey results, the sectors with major demand and supply gaps (water, waste and sanitation) have been identified as those that are least attractive for private-sector participation. The challenges across these key sectors include the lack of user charges (to fund infrastructure capacity expansion) and of the propensity to pay such charges, distribution losses and behavioural issues, to name a few. Specific reforms are required to make the key sectors appealing to the private sector so that demand and supply gaps can be bridged.

This report provides a framework (Figure 1) to address the challenges through reforms that will help ULBs to create a thriving business environment and that will address sector-specific issues. Included are recommended actions for the private sector to initiate a constructive dialogue on urban development.

– **Institutional reforms:** Strong leadership at the city level with a unified command structure across multiple planning and administrative entities is difficult to achieve but needed in order for state governments to ensure that cities are equipped to make decisions and implement programmes. The devolution of power to determine and collect user charges and local taxes, along with capacity development, are necessary for ULBs to function independently. ULBs also need to streamline their internal processes by

adopting e-governance and by making data-driven decisions.

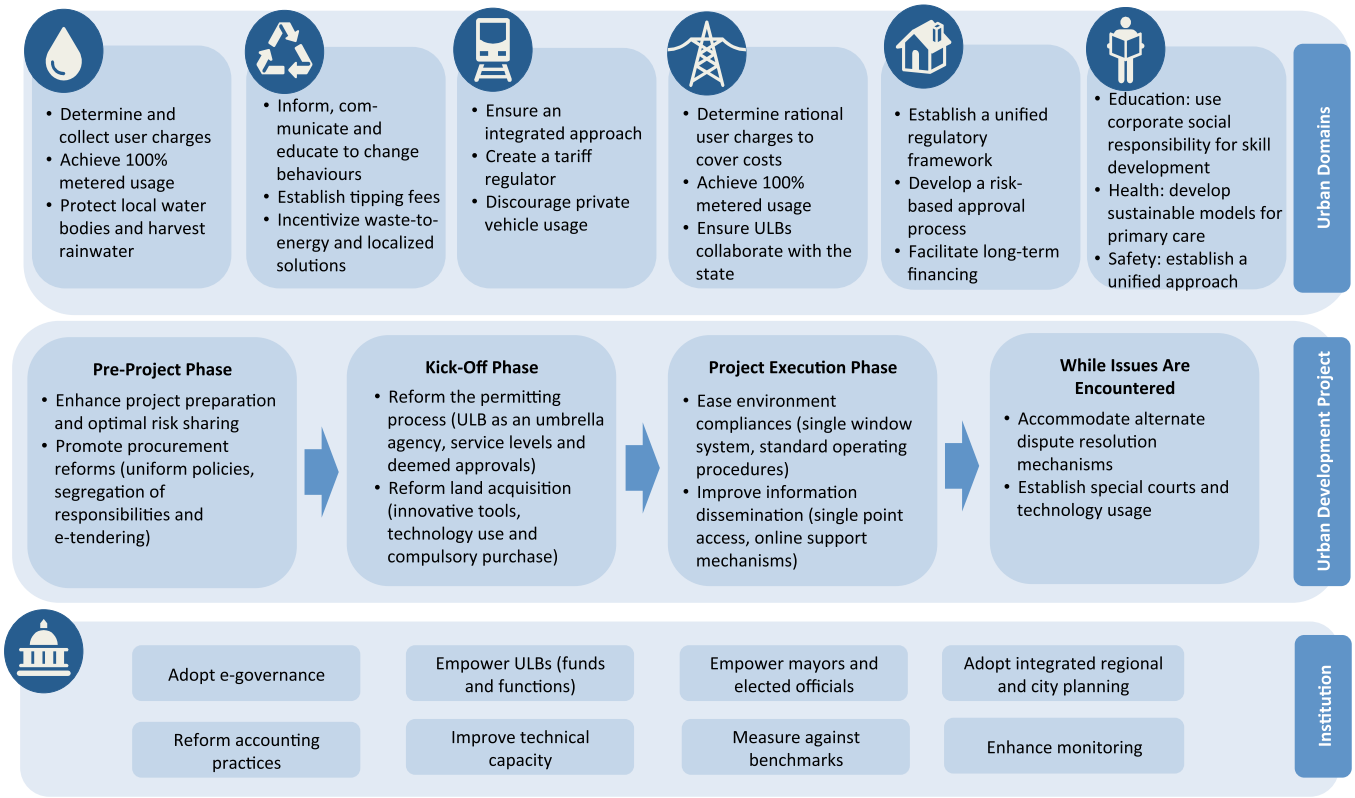
– **Business environment reforms:** At the outset, a structured approach to public-private partnerships with emphasis on project preparation and optimal risk sharing is required to enhance investor confidence. Single window systems that ease the permitting process during the start of the project and during execution will accelerate project execution, reduce cost and time overrun, and improve intra- and inter-department collaboration. Further, process reforms during land acquisition in terms of using technology and innovative methods of land acquisition will enhance infrastructure development for greenfield and redevelopment initiatives.

– **Sector-specific reforms:** Across sectors that deal with physical infrastructure, reforms will be required to establish independent regulators, ensure metering, develop skilled resources, enforce collections (of user charges and taxes) from large defaulters and adopt integrated planning. Similarly, for social infrastructure, financially sustainable models will have to be created for the private sector to participate in education, healthcare and safety.

– **Private-sector actions:** A structured approach towards community engagement, public-sector engagement and ethical conduct will be key to building trust and ensuring the private sector becomes an equal stakeholder in India's urban rejuvenation.

Dedicated effort will be required by all stakeholders to create an environment where a balance is achieved between the private sector's goal to achieve maximum returns and the public sector's goal to achieve social welfare at minimum cost. Such an environment cannot be created over a short period of time and will require a sustained long term effort. The effort will be worth it as it will reduce the gaps in service delivery and will benefit society in general, and its vulnerable sections in particular.

**Figure 1:** Reforms to Accelerate Urban Development

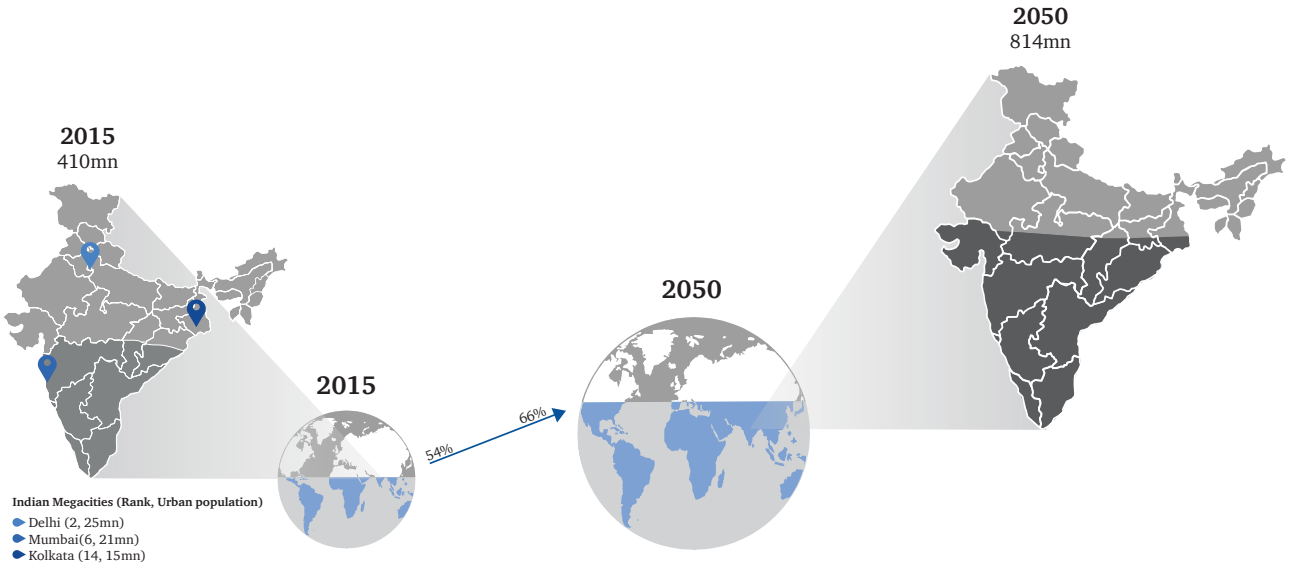



Sources: World Economic Forum, Shaping the Future of Urban Development & Services; PricewaterhouseCoopers research

# 1. Urbanization in India

Urbanization is one of the biggest challenges that both developed and developing countries across the world must face. The challenges differ based on stages of development and regional factors. Some developed countries face the challenges of ageing infrastructure and shrinking cities, while for others the challenges stem from an ageing society. In developing countries, cities must bridge the demand and supply gap for core physical and social infrastructure, provide a safe environment for urban dwellers and develop a thriving urban economy.[3]

**Figure 2:** Global and Indian Urban Population Trends




Sources: Data from United Nations, Department of Economic and Social Affairs, Population Division. *World Urbanization Prospects, the 2014 Revision*, Highlights,2014

By the year 2050, globally approximately 2 billion more people are expected to have shifted to urban areas; that speaks volumes about the impending challenge for cities. The urban population in India currently totals around 410 million people (32% of the total population) and is expected to reach 814 million (50%) by 2050 (Figure 2). Three of India's metropolitan areas are among the most populous in the world: Delhi (25 million), Mumbai (21 million) and Kolkata (15 million) rank 2nd, 6th and 14th, respectively. Even though India stands just behind China (758 million, 54%) in urban population size, its urbanization ratio (Figure 3) is low compared to Brazil (173 million, 85%), Mexico (98 million, 79%), Indonesia (134 million, 53%) and Russia (105 million, 74%).[4]

**Figure 3:** Urbanization across Emerging Economies


Sources: Data from United Nations, Department of Economic and Social Affairs, Population Division. *World Urbanization Prospects, the 2014 Revision*, Highlights,2014

Urban administrators are seeking answers to the following questions: How can a city sustain growth? How can a city provide optimum quality of life when its resources are being consumed without checks and balances? How can they promote sustainable living practices to ensure long-term development?

Within the Indian context, the situation is all the more alarming as both the access to basic urban services and their quality are constrained. Similar to their global counterparts, cities in India have become a centre of focus for business, livelihoods, comfort and a higher quality of life. This has resulted in rises in the urban population and a degradation in service delivery and infrastructure in urban areas. Indian cities have often functioned in a laissez-faire manner; a concrete, long-term plan that focuses on growth and sustainability seldom exists at the city level and, even when it does, it is seldom followed and often outdated. Meeting ever-growing demands is a constant struggle and the learnings from this struggle have not been uniformly applied across the country in order to plan city development in a structured manner.

## 1.1. Emerging urban landscape in India

India's urban landscape has undergone dramatic change in a very short period of time. Between 2004 and 2014, India's population rose by approximately 14%, of which the urban population grew by almost 27% whereas the rural population grew by only about 8%.[5] Urbanization is occurring in two ways: the rural population migrates to cities in search of opportunities, or existing semi-urban areas develop and evolve into urban areas with improved services and offerings for its inhabitants.

Mumbai and Bangalore are examples of the former; as Mumbai is the financial capital of the country, it promises to offer something to everyone and has witnessed a massive inflow of migrants over the last five decades. Similarly, Bangalore has transformed into the information communication technology (ICT) hub of india, which has resulted over the last 20 years in the migration of middle-income and high-income individuals into the city to seek better jobs. The second type of urbanization is best exemplified through cities such as Pune, Ahmedabad and Gurgaon, which have developed over time and turned into large urban centres.

While cities are viewed as offering opportunity, they are illusorily viewed as a source of infinite resources, such as land and utilities. As a result, the rise of cities in India has most often been characterized by the rampant consumption of these resources with very little checks on the manner of consumption or the availability of such resources. This presents the risk that such cities could implode in the future owing to a lack of planning and direction.

Although a city development strategy exists in most cities, it is often difficult to implement due to such factors as informal dwellings, a lack of resources close to the city, the regulatory framework, etc. The net effect is a complex combination of external, uncontrolled factors that are now prohibiting planned and favourable growth in cities. Every city, depending on its background, faces a unique challenge related to land use, water availability, power, infrastructure and climate. Cities must innovate to find solutions to their problems that can help them grow in a sustainable manner.

## 1.2. India's earlier responses to urbanization

Municipal institutions in India have a history of over 300 years. The first municipal corporation in the country was set up in Madras (now known as Chennai) in 1687, followed by the Calcutta Municipal Corporation and the Bombay Municipal Corporation in 1726.[6] Although the institutions existed, the constitution did not recognize the urban local government as decentralized autonomous entities, for a long period after India's independence.

Urban planning in India has seen a few reforms and specific programmes implemented over a period of time. The second Five-Year-Plan provided for the creation of town and country planning laws and initiated planning institutions, after which master plans for a number of cities were developed. The two state capitals and industrial towns were developed in the third Five-Year-Plan. Urban planning took a different trajectory when the fourth Five-Year-Plan emphasized the need to limit urban population growth and the fifth Five-Year-Plan promoted smaller towns. The acts to limit the concentration of landholding (Rent Control Act and Urban Land Ceiling and Regulation Act) in urban areas resulted in distortions in ownership rights and land redevelopment. The sixth Five-Year-Plan continued to focus on towns, developing roads, pavements, bus stands, markets, etc.

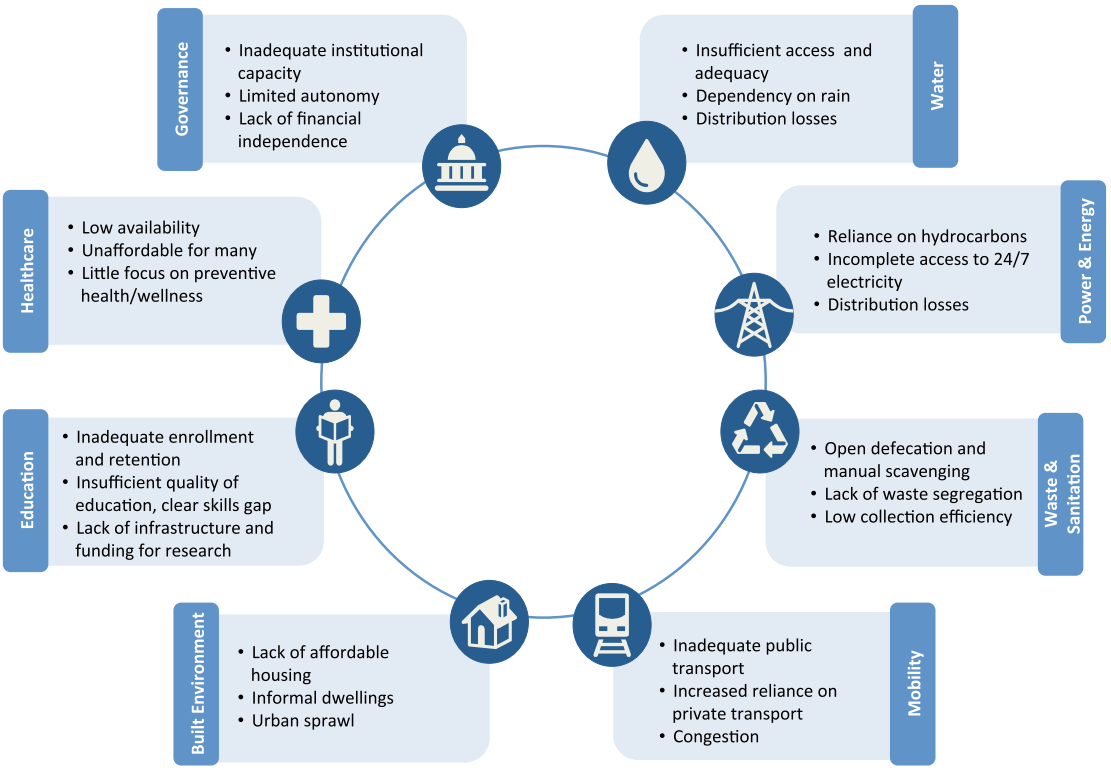
In the 1990s, reforms were instituted in the form of the 74th Constitutional Amendment, which enabled the devolution of funds, function and functionaries to the ULBs. Interest in the development of cities was renewed with the launch of an urban rejuvenation programme (JnNURM) in 2005 across 65 cities. While these attempts created some flexibility for cities to manage their affairs independently, the erstwhile method to provide urban solutions was based on a one-size-fits-all approach and was not adequate to serve the needs of a rising population across the cities of India. As a result of the focus on rural India that occurred for a significant extent of time after India's independence, the country's cities face challenges across physical, social, economic and governance dimensions.

## 1.3. Challenges in urban India

The concept of a planned urban administration is yet to be addressed in India's cities and severe supply and demand gaps are driving cities towards a planned approach to tackle urbanization. Piecemeal efforts have been made but they lack the thrust to address mega issues. Urban India faces challenges across sectors, with some requiring immediate attention and others requiring long-term action. The challenges range from fundamental supply and demand gaps across such sectors as water, waste and sanitation,

and mobility, to quality and affordability issues across sectors such as health and education, as depicted in Figure 4.

**Figure 4:** Challenges in Urban India




Source: World Economic Forum, Shaping the Future of Urban Development & Services

### *Challenges in the water sector*

- **Insufficient access to water:** India faces acute water shortages and a lack of safe drinking water; 97 million citizens do not have access to safe water to drink.[7] The situation in urban India is no different, with almost 8% of India's urban households requiring travel beyond 100 metres to access drinking water.
- **Inadequacy of water:** India's water reserve has dwindled from 4,000 cubic metres per person per year in 1951 to 1,000 cubic metres per person per year in 2011, such that the country is now considered water stressed.[8] Rapid urbanization has led to a drastic reduction in the amount of water available per person over the past few years, stretching the existing sources of water to their maximum capacity.
- **Leakages in distribution:** Non-revenue water in urban India accounts for 50% of water production, compared to just 5% in Singapore,[9] which primarily arises due to leaking pipes, the pilferage of water, a lack of meters and tampered meters.
- **Dependency on rain:** India receives average annual rainfall in the range of 300 mm to 3,400 mm across various states but lacks a robust and replicable mechanism for harnessing rainwater.[10]

### *Challenges in the power & energy sector*

- **Incomplete access to electricity:** Urban India is still short of 100% access to electricity (93.9%[11]). Among areas with access to electricity, very few urban areas have access to electricity 24/7. This has led to increased reliance on non-commercial sources of energy and hydrocarbon-based generators.
- **Leakages in distribution:** The aggregated technical and commercial (AT&C) losses for electricity distribution in India are over 25% for most cities (with AT&C losses in states raging between 15% and 75%[12]), which impacts the capacity of the network and the cost of electricity paid by consumers.
- **Excessive reliance on hydrocarbons:** India is the fourth largest consumer of electricity but lacks abundant hydrocarbon resources to meet its energy demands. An estimated 61% of power is generated from coal and 9%[13] from petroleum products (gas and diesel), leading to excessive imports and detrimental environmental impact.

### *Challenges in the waste & sanitation sector*

- **Low waste collection efficiency:** Waste collection efficiency ranges from 70-90% and less than 50% in smaller cities.[14] Less than 30% of waste is segregated.[15]

- **Poor recovery of costs:** Even at current levels of waste collection, 25-50%[16] of ULBs' budgets are spent on waste collection. The recovery of operations and maintenance expenses are less than 50%.
- **Open defecation and manual scavenging:** The situation in the sanitation sector is also alarming with over 50 million[17] people defecating in the open. Moreover, the practice of manual scavenging is still prevalent in parts of urban India.
- **Low treatment of sewerage:** Even in large cities, 50% of households are not connected to sewerage, and only 20% of waste water generated is treated.[18]
- **Inadequate citizen participation:** Communities do not participate in waste management. Citizens are indifferent to waste management in general and to the segregation of waste in particular.

*Challenges in the mobility sector*

- **Inadequacy of public transport:** Public transport accounts for only 22% of transport in India, and only 20 cities (out of 85 with a population of 0.5 million or more) have a city bus service.[19] The absence of public transport infrastructure leads to overcrowding and poor quality of service.
- **Increased reliance on private transport:** Between 1951 and 2004, India witnessed a 100-fold increase in private vehicles, with the share of buses decreasing from 11% in 1951 to 1.1% in 2001.[20]
- **Congestion:** The increase in the number of private vehicles, however, has not been accompanied with commensurate increases in road infrastructure (an eight-fold increase), resulting in congestion at critical nodes within the city.

*Challenges in the built environment sector*

- **Urban sprawl:** Few cities in India have a development plan that is updated on a timely basis. In some cases these plans are not implemented, resulting in urban sprawl. Cities' land use plans are not integrated with mobility plans or socio-economic development plans.
- **Lack of affordable housing:** Real estate prices in India have increased manyfold in the last two decades, leading to a lack of housing for the economically weaker segments of society.
- **Informal dwellings:** The scarcity of affordable housing leads migrants and the urban poor to use informal dwellings. Most Indian cities are plagued with large swaths of land with informal settlements. These dwellings are not equipped with such basic urban infrastructure as water, sanitation, waste management or electricity, leading to poor quality of life and health concerns.
- **Deprecated inner cities and central business districts:** The inner cores of cities have seen little investment over the last five decades, such that the infrastructure in these areas has not grown in tandem with population growth. This leaves these areas vulnerable to natural and man-made disasters.

*Challenges in the education sector*

- **Lagging literacy rate:** According to the 2011 census, literacy rates in India increased by 8% over the previous statistics, with 74% overall literacy. However, India still lags far behind when compared to its Asian peers. Moreover, India's mean in years of schooling is 5.12, which is less than in the other national economies forming the BRICS; China's mean is 8.17 years of education and Brazil's is 7.54 years.[21]
- **Insufficient quality of education:** Enrolment in schools has improved in urban India over the last two decades, but student learning across scholastic and non-scholastic dimensions remains poor.
- **Skills gap:** A gap exists between the skill level of undergraduates and the level required by the private sector, which actively recruits these graduates. This reduces employability and increases the cost of training, which the private sector must provide and pay for to bridge the skills gap.
- **Lack of infrastructure and funding for research:** One of the reasons for the talent exodus from India is the lack of infrastructure and funding for research and development (R&D), although R&D is crucial for the competitiveness of cities. India attracts insufficient high-quality R&D and most institutes lack research infrastructure. R&D is a critical aspect of smart cities as innovation will continue to be a key driver.

*Challenges in the healthcare sector*

- **Low availability of healthcare:** The overall capacity, which includes both public and private healthcare professionals, is low. Against an expected level of 85 doctors per 100,000 people, India has only 45 doctors per 100,000 people,[22] and the situation is the same with nurses and midwives. The problems are likely to worsen due to an increasing population and life expectancy in urban India.
- **Unaffordable healthcare:** The percentage of the population with insurance cover is fairly small, which leads to significant out-of-pocket expenses (61% of total healthcare expenditure as of 2010[23]), putting added pressure on incomes.
- **Lack of preventive health and wellness programmes:** The government focus in India has been on curative medicine rather than on preventive health. Outbreaks of malaria and dengue are common in India and preventive programmes are often ineffective. The rise in diabetes and cardiovascular diseases in urban India calls for increased focus on preventive health and wellness.

Some challenges emerge out of ineffective governance structures, lack of autonomy of urban local bodies, and lack of financial independence (further elaborated in section 2.1). In view of these issues, the Government of India initiated urban rejuvenation programmes in 2015 to address the challenges that the country's cities are facing.

## 1.4. Urban development initiatives

### 1.4.1. Smart cities programme

*Programme overview*
The Ministry of Urban Development of Indian has launched a holistic city rejuvenation programme for 100 cities (Figure 5) in India, which aims to improve physical, social, economic and governance infrastructure.[24] The Government plans to develop lighthouse projects within each city's compact areas for further replication across the city.

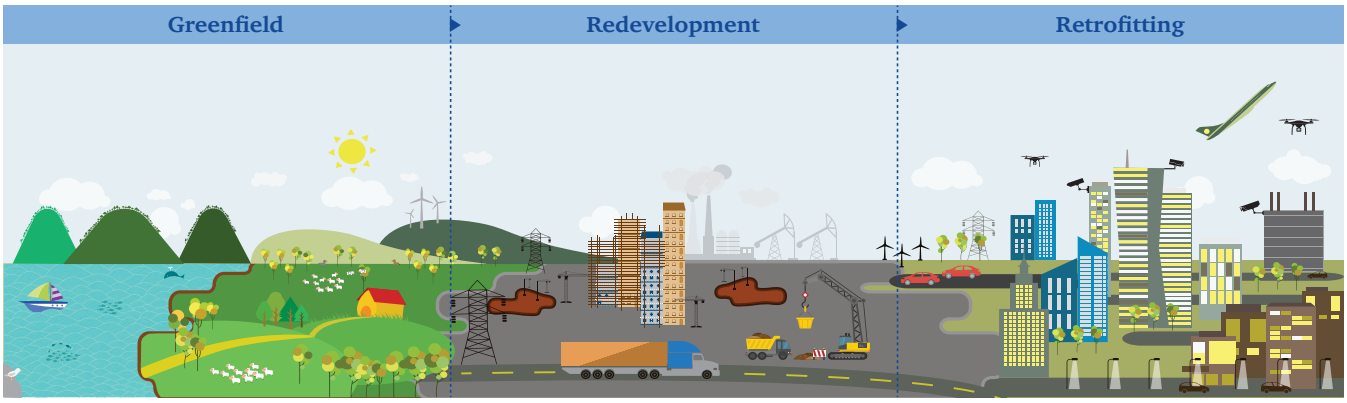
The development of the cities identified under the programme will take place through the adoption of a pan-city initiative that is envisaged to improve the quality of life of all citizens and through one of three "area-based development" strategies: retrofitting, redevelopment and greenfield.

- **Retrofitting:** A city's existing area will be developed by adopting smart solutions without making major modifications to the built environment.
- **Redevelopment:** A city's existing derelict area will be redeveloped from a built environment perspective to improve its infrastructure and service delivery.
- **Greenfield:** A city's vacant area will be developed using innovative planning, plan financing and plan implementation.

**Figure 5:** 100 Smart City Distribution across States


Source: Ministry of Urban Development, Government of India, *Smart Cities: Mission Statement & Guidelines*, June 2015

**Figure 6:** Area-Based Development Strategies




Sources: World Economic Forum, Shaping the Future of Urban Development & Services and PwC research

The Government envisages the following elements as integral parts of every Smart City:

- Assured electricity supply with at least 10% of the energy requirements met through renewable energy
- Adequate water supply with the recycling of waste water, harvesting and the reuse of storm water
- Adequate urban transport with an emphasis on non-motorized transport, pedestrian-friendly pathways, intelligent traffic management and smart parking facilities
- Enhanced citizen experiences with engaging usage of open spaces and a safe environment for women, children and the elderly
- Robust IT connectivity and the smart metering of services

*Programme execution*
The Government intends to select 20 cities in the first year of the programme's implementation, followed by 40 cities each over the next two years. The cities will participate in a nationwide challenge by submitting a Smart City proposal. Once a city has been selected for the programme, a Special Purpose Vehicle (SPV) formulated through equity contributions from the state and central government will be responsible for the execution. The SPV, which will be headed by a full-time chief executive officer, will be in charge of planning, appraising, managing the implementation, monitoring and evaluating the Smart

City development project. The SPV will choose whether to execute the project through a joint venture, a public-private partnership or subsidiaries. The private sector or financial institutions can become equity stakeholders in the cities' SPVs provided their stake remains below 50%.

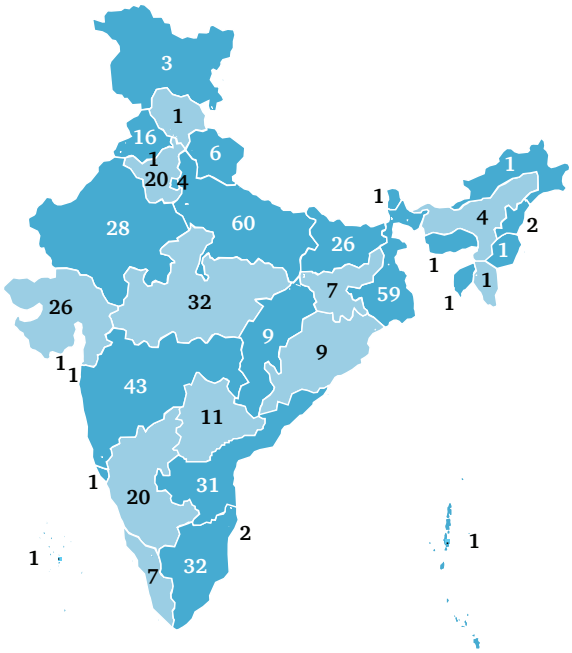
*Project funding*
Funding for the 100 smart cities over the four-year programme will amount to $15 billion, with equal contributions from the states and central government. It is anticipated that the funds required for the overall implementation will go beyond the provisions made by the Government so it recommends that the grant it provides be used to attract funding from external sources.

### 1.4.2. AMRUT programme

*Programme overview*
Indian cities have been lagging behind in the provisioning of basic services including water, sewerage and urban transport. The Government of India has identified the provision of basic services in 500 cities as a national priority by launching the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) programme.[25] The objective of the programme is to:

- Ensure every household has access to water and a sewerage connection
- Increase the amenity value of cities by developing well maintained open spaces (e.g. parks)
- Reduce pollution by promoting public transport or constructing facilities for non-motorized transport (e.g. walking and cycling)

**Figure 7:** AMRUT City Distribution across States




Source: Ministry of Urban Development, Government of India, *Atal Mission for Rejuvenation and Urban Transformation: Mission Statement & Guidelines*, June 2015

*Programme execution*
Each ULB in the selected city will identify the existing service level for water, sewerage, mobility and open spaces and will create a service-level improvement plan at the city level. The states will then aggregate the city-level improvement plan in order to create a state-level action plan. The states will approve the projects at the city-level after the Ministry of Urban Development approves the state action plan. Responsibility for project execution will lie with the ULB.

*Project funding*
Total central funding for the programme is $7.5 billion over a period of four years (from financial year 2015-16 to financial year 2019-20). Central assistance is to be provided in three instalments on completion of project milestones, with additional funding to implement the reforms identified in the AMRUT programme. State contributions in the programmes will be a minimum of 20% of the project cost; with the upper ceiling not defined, states will have the flexibility to contribute more to the projects to make them viable.

### 1.4.3. Other urban development programmes

*Clean India (Swachh Bharat Mission – Urban)*
India's census in 2011 showed that over 7.9 million households do not have access to toilet and defecate in the open, raising health risks for the already marginalized urban poor in India. Additionally, untreated urban sewerage contributes to pollution, weakening the biodiversity in urban water bodies.

The Swachh Bharat Mission (Clean India Programme) – Urban was conceived to address issues pertaining to solid waste management, sanitation and sewerage management.[26] The programme's objectives are to:

- Eliminate open defecation and manual scavenging
- Modernize municipal waste management
- Increase awareness of healthy sanitation practices to bring about behavioural change

To achieve these objectives, the Government of India intends to build more household, community and public toilets. Civic bodies will be encouraged to prepare detailed project reports for solid waste management wherein waste management projects become financially viable; smaller civic bodies will have the flexibility to come together to form clusters and become viable entities for private investment. Further, the central government will encourage waste-to-energy conversion projects by providing viability gap funding and required handholding support.

*Housing for All – Urban*
The Housing for All – Urban programme will be implemented over a seven-year period, starting in 2015. It aims to benefit resident families that do not own formal settlements and will cover over 4,000 towns during its execution phase. The programme supports the development of affordable housing (of up to 30 square metres) with basic civic infrastructure such as water, sanitation, sewerage, roads and electricity. Moreover, the programme also intends to empower women by mandating the title ownership of the house to the female head of household. The programme allows for *in situ* slum redevelopment and the provision of credit linked subsidies.

*HRIDAY*

The Heritage City Development and Augmentation Yojana (HRIDAY) development programme focuses on conserving urban heritage by linking the service delivery of basic infrastructure, urban planning and heritage conservation.[27] The programme encourages public-private partnerships for urban rehabilitation and private-sector funding for the development of components. The programme aims to:

- Support programmes that link heritage sites with the trunk infrastructure of the city in order to cater to variable demand patterns arising from high transitory traffic
- Revitalize heritage cities so tourists have an enhanced experience while visiting heritage cities

**Figure 8:** HRIDAY Cities

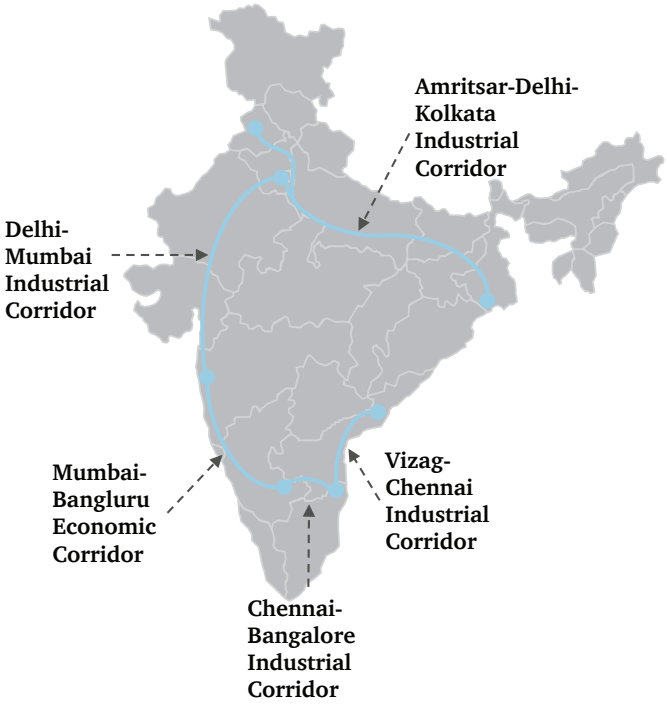
Source: Ministry of Urban Development, *Guidelines for HRIDAY: Heritage City Development & Augmentation Yojana,* January 2015

*Industrial corridors*

The Government of India plans to establish five industrial corridors to increase exports, industrial output and employment in the regions impacted by the corridors. Each corridor will have several key nodes that will be developed using Smart City principles.

- **Delhi Mumbai Industrial Corridor:** This corridor aims to develop an industrial zone that will span six states in India, to spur economic growth. The project aims to establish industrial clusters, with rail, road, port and air connectivity along the corridor, and to develop six logistics parks and seven greenfield cities. The states covered under this corridor are Delhi, Uttar Pradesh, Rajasthan, Maharashtra, Gujarat and Haryana.
- Other corridors in the planning phase are the Amritsar Delhi Kolkata Industrial Corridor (impacting the states of Punjab, Haryana, Uttar Pradesh, Uttarakhand, Bihar, Jharkhand and West Bengal), the Bengaluru Mumbai Economic Corridor (impacting the states of Maharashtra and Karnataka), the Visakhapatnam Chennai Industrial Corridor (impacting the states of Tamil Nadu and Andhra Pradesh), and the Chennai Bengaluru Industrial Corridor (impacting the states of Andhra Pradesh, Karnataka and Tamil Nadu).[28]

**Figure 9:** Industrial Corridors




Source: Federation of Indian Chambers of Commerce and Industry, PwC, *India: Surging to a smarter future*, April 2015

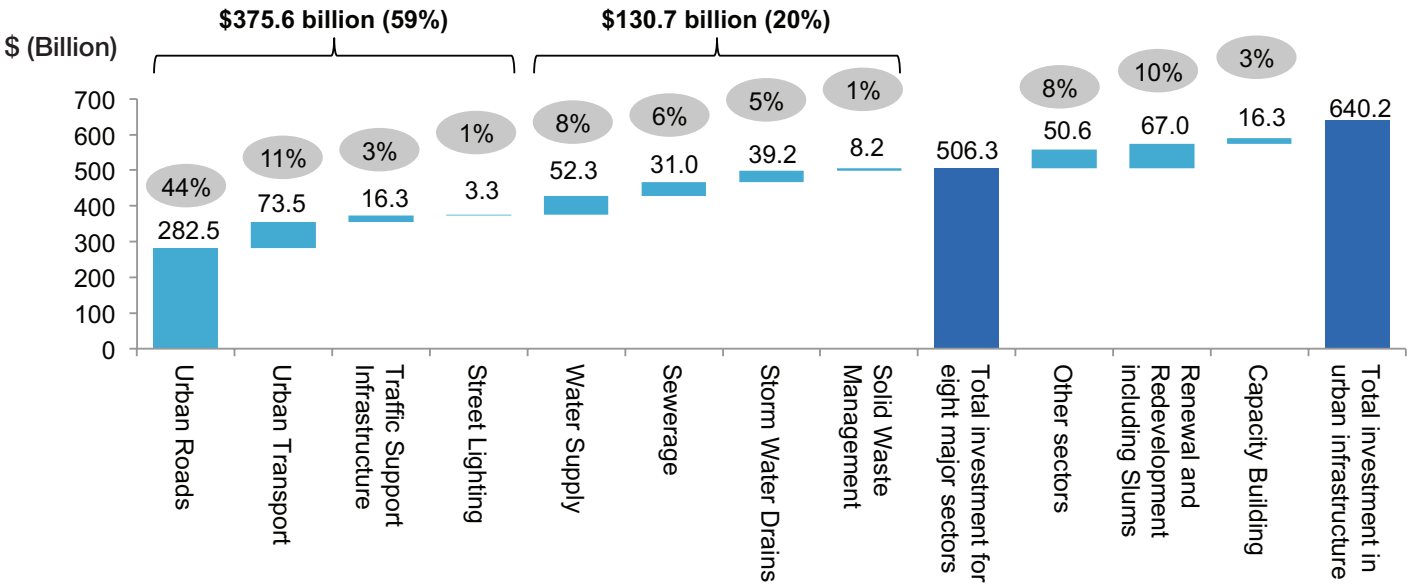
## 1.5. Opportunities for private-sector participation

The High Power Expert Committee for Estimating the Investment Requirements for Urban Infrastructure Services report views urban infrastructure opportunity in India to amount to $640 billion (Figure 10) and the funding gap for infrastructure in India to amount to $100 billion up to 2030.[29] The programmes will enable the private sector to help support the Government in infrastructure development – which is a priority considering the inadequate and crippling infrastructure that is rampant across Indian cities.

Many ULBs in India do not have the financial resources and skills to provide infrastructure and service delivery. They are increasingly seeking support from the private sector to close the gap. Meanwhile, institutional investors hold substantial assets under management, for which they are seeking attractive investment opportunities. In such an environment, public-private partnerships (PPPs) can accelerate infrastructure development by using the private sector's skills in delivering infrastructure and services and leveraging financial resources.

The World Economic Forum's Global Survey on Urban Services revealed that private- and public-sector collaboration is required in all areas of the urban value chain, including in policy-making, planning, design, implementation, operation and maintenance, and monitoring, as well as in the financing of urban development projects. The survey identified the private sector as being better prepared than government agencies to drive the transformation, and respondents suggested greater private-sector participation in design, implementation, operation and maintenance, and financing. The recently announced urban rejuvenation programs present an opportunity for private sector to contribute across various urban domains (Table 1), more so in the physical infrastructure sector in cities.

**Figure 10:** Sector Infrastructure Investment Needs




Source: World Economic Forum, *Future of Urban Development & Services: Urban Development Recommendations for the Government of India*, April 2015

**Table 1:** Sector-Specific Opportunities from Various Urban Development Programmes

| Sector | Smart Cities | AMRUT | Other Programmes |
|---|---|---|---|
| **Water** | Yes | Yes | Yes (Housing for All, HRIDAY) |
| **Waste & Sanitation** | Yes | Yes | Yes (Clean India, Housing for All, HRIDAY) |
| **Mobility** | Yes | Yes | Yes (Housing for All, HRIDAY) |
| **Energy** | Yes | No | Yes (Clean India, Housing for All) |
| **Built Environment** | Yes | No | Yes (Housing for All, HRIDAY) |
| **Social Infrastructure** | Yes (education, healthcare and safety) | No | Yes (HRIDAY – Safety) |

Source: Ministry of Urban Development, Government of India. Smart Cities: Mission Statement & Guidelines. 2015; Ministry of Urban Development, Government of India. Atal Mission for Rejuvenation and Urban Transformation, Mission Statement & Guidelines. 2015; Ministry of Urban Development, Government of India. Guidelines for Swachh Bharat Mission.2014; Ministry of Housing & Urban Poverty Alleviation, Government of India. Housing for All: Scheme Guidelines

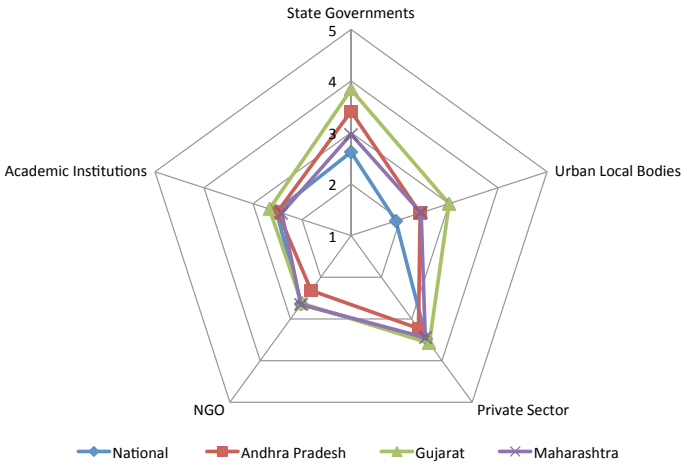
# 2. Challenges in Urban Transformation

The success of the programmes will depend on addressing the key challenges that inhibit investment in urban development. These include institutional challenges, business environment challenges and sector-specific challenges. A focused effort will be required on the part of city and state governments to create an environment in which the private sector can participate in India's urban transformation.

## 2.1. Institutional challenges

Urban development programmes have been initiated by the Government of India, but state governments to some extent and city governments to a large extent will be responsible for executing the programmes. Participants in the Forum's India Survey on Smart Cities indicated that state and city governments are the least prepared to handle the type of urban transformation outlined in the programmes announced by the Government of India (Figure 11).

**Figure 11:** Stakeholder Readiness for Urban Transformation




Source: World Economic Forum, Shaping the Future of Urban Development & Services, India Survey on Smart Cities (Oct.-Dec. 2015)

The lack of preparedness is due to leadership with limited powers, an inadequate revenue base, poor collaboration among planning and administrative bodies within cities, archaic processes and insufficient capacity.

### *Leadership with limited powers*

The current governance structures in India do not provide sufficient autonomy to cities. The mayor is a ceremonial city head. Among ULBs, there is no consistent tenure, power or method to elect the mayor. The executive head of the city is the municipal commissioner, who is not appointed by the mayor or the city government. Since the city government has no role in the appointment of the municipal commissioner, the latter is primarily accountable to the state government and not the city government.[30] When city governments are not empowered, it becomes difficult to execute large transformational changes.

### *Inadequate revenue base*

The revenue collected by ULBs in India is less than 0.9% of the gross domestic product,[31] significantly less than that of Brazil (7.4%) and South Africa (6%). India's 74th constitutional amendment left financial devolution to the state government. The ULBs are thus constrained in the

absence of funding sources for urban development projects. The major source of revenue for urban local governments are property taxes and user charges but low charge out rates and poor compliance in the payment of charges and taxes have led to financial dependence on the state government.

With declining sources of revenue,[32] local governments must seek funds from the state governments even to fund operational expenses such as the salaries of employees.

### *Poor collaboration among planning and administrative bodies*

The urban governance structure is fragmented in India. At one end of the spectrum lie such cities as Ahmedabad, in which the ULB provides all services, and at the other end are cities such as Bangalore, in which over 10 agencies are involved in providing urban services. Agencies involved in the planning and administration include ULBs, parastatals, state government agencies and development authorities, among others. With each agency under a different leader, the goals of the agencies are often unaligned, which leads the city to operate in siloes.

### *Archaic processes*

Interdepartmental and intradepartmental processes have not evolved with the advent of technology. Many ULBs in India follow paper-based processes across entire procedures, including citizen service delivery processes. Bureaucratic processes, where little value is added with each step, are delayed. Processes that are not optimized not only hinder urban development projects but also slow down urban service delivery, impacting the lives and livelihood of urban dwellers.

### *Insufficient capacity*

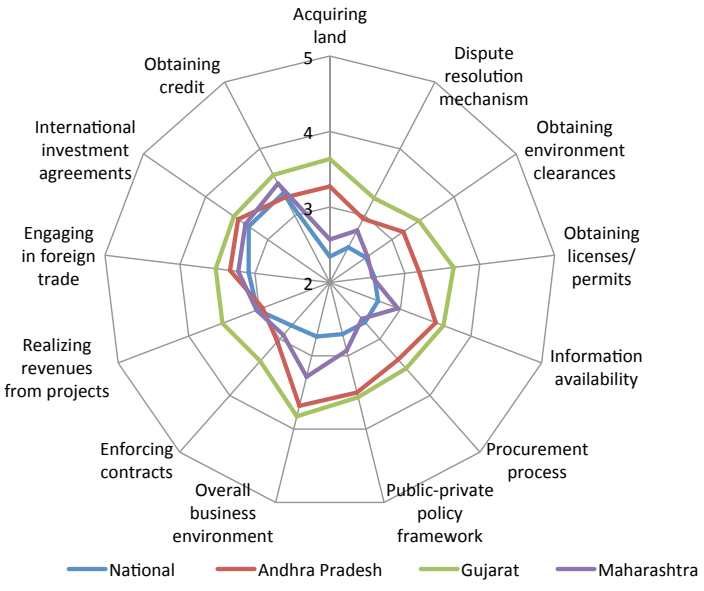
Cities in India are governed by generalists. A framework for urban specialists does not exist, resulting in a lack of technical expertise in ULBs. Employees are often moved across departments and functions, which leads to "management by authority" rather than "management through knowledge". Cities deficient in capacity often source external support from the private sector. Some cities even lack the capacity to manage and monitor external providers. Civic employees are neither equipped nor empowered.

These institutional challenges create a vicious cycle. The inadequate resources coupled with a poor governance structure and archaic processes result in inadequate and low-quality service delivery. Such service delivery attracts lower user charges and compliance that further degrades urban governance and finance.

## 2.2. Challenges in the business environment

Needing technical and managerial resources, and facing difficulties in financing and funding projects, ULBs in India must increasingly rely on the private sector to bridge the gaps. The private sector needs a stable business environment. The urban rejuvenation initiatives will result in significant infrastructure development activities; the ULBs and state governments will play a crucial role in creating a business environment that is conducive to infrastructure development. The Forum's survey identified the key issues across the country's business environment, and specifically in the states of Andhra Pradesh, Gujarat and Maharashtra.

**Figure 12:** Business Environment Issues




Source: World Economic Forum, Shaping the Future of Urban Development & Services, India Survey on Smart Cities (Oct.-Dec. 2015)

As shown in Figure 12, major reforms are required (implied by the 2 rating) across such aspects of the business environment as obtaining environmental clearances and licences, acquiring land, managing the procurement process, promoting public private partnerships through public-private policy frameworks, resolving disputes and accessing information. Other areas also require reforms (implied by the 3 rating) but priority must be given to those areas that need major reforms so urban development can be accelerated.

### *Obtaining environmental clearances and licences*

The process of obtaining permits for infrastructure development is lengthy. Construction of a simple two-storey warehouse takes 147 days and involves coordinating with over 20 departments and sub-departments.[33] Delays in obtaining permits could significantly delay project development and may have financial implications on the project. The challenges stem from:

- Paper-based processes and the lack of an umbrella agency responsible for providing permits, resulting in multiple interactions with officials and time delays
- Inadequate institutional capacity in conducting evaluations and site visits, resulting in delays due to people-dependent approvals as opposed to process-backed approvals
- Lack of clarity on the applicability of regulations for environmental permits, resulting in multiple engagement channels and delays
- High turnaround time and lower validity period, resulting in multiple operational permits (from an environmental perspective) over a relatively shorter time frame

### *Acquiring land*

Smart Cities will be developed in a path dependent form and may require contiguous land for infrastructure development. Because landowners are often wary of selling in view of the potential for future price appreciation, land acquisition is further complicated. Aside from the social issues that rehabilitated landowners face, land acquisition is marred by multiple issues, such as:

- Land record processes are not uniform across the country and information about landholdings is not consistent. Often, records of rights are difficult to validate due to the inadequate use of technology.
- The benchmark for compensation is set by recent sales, which are often at depressed prices and lead to inadequate compensation.
- The consent criteria (70% of affected owners agreeing, with the project passing the social-impact test) and compensation lead to holdouts on the land. Scenarios in which sellers increase their compensation demands could impact the financial viability of a project.
- Any dispute during land acquisition tends to derail the project due to long dispute resolution periods.

### *Managing the procurement process*

The smart cities programme focuses on the delivery of services and outcomes. Hence procurement may take the form of service and performance-based contracts rather than taking form of goods based procurement. Conventional least-cost-based procurement may not be suitable for smart cities, such that governments will have to address the following issues:

- A lack of uniform procurement practices (in terms of documents, legal clauses and grievance redressal mechanisms) could arise as each special purpose vehicle may follow the local norms (either defined by urban local bodies or defined by state or specifically formulated by each special purpose vehicle).
- Negotiation with the lowest bidders is a common practice that leads to the cushioning of bids. Arriving at a threshold value for awarding contract during the negotiation processes becomes an issue in wake of cushioning of bids.
- The procurement cycles, from the time a tender is floated, can range from one month to several months, leading to cost escalation and currency risks on the part of the bidder.
- Transparency issues remain because physical document submission during procurement is still widely practiced. Studies show that corruption is widespread, and corrupt payments can attain 15% of the contract value.[34]

### *Promoting public-private policy frameworks*

PPPs for urban development have had mixed results in India. Urban rejuvenation programmes have encouraged private-sector participation but the following issues must be resolved to attract the best firms:

- Project funding is a challenge with low user charges and insufficient other value capture mechanisms. Although ULBs are not financially independent, they must make projects financially viable through adequate funding mechanisms.
- The sharing of risks in public-private partnership projects has often been suboptimal with revenue risk often passed on to the private sector.
- Government agencies have limited capacity to perform the preparatory work required to develop projects appropriately. The lack of time to ensure good-quality project development could result in reduced private-sector interest, mispricing, cost escalation or delays in execution.
- Outstanding and delayed payments to the private sector have resulted in a loss of confidence, aggravated by long-standing disputes.

### *Resolving disputes*

In most cases, when an urban development project becomes involved in a dispute, activities are stalled, as are vendor payments. With poor cost recovery and high legal costs, companies engaged in disputes find it difficult

to sustain their activities. Government entities will have to address the following issues to improve the dispute resolution process:

- Inadequate project preparation and poor legal expertise within ULBs lead to ambiguity in project scope and contract terms, resulting in disputes.
- The volume of litigation cases in India's judicial system is large. This issue is exacerbated by the fact that little operational support in terms of technology is currently employed in Indian courts, leading to excessive paperwork and slow judgements and hence to the slow resolution of disputes.
- Commercial cases involving claims last for several years, which stalls project implementation and hinders developmental activities. India takes 30% more time than the average in South Asia to resolve disputes.

*Accessing information*

Investors looking to invest in India and those expanding to new regions within India expect transparency and consistency in the availability of information. The information must be relevant, readily available, conveniently located and frequently updated. Common issues pertaining to the availability of information include:

- A single source of reliable information is rarely available. Multiple sources provide inconsistent information, leading to ambiguity regarding the process that must be followed. Out-of-date information available online also leads to lack of clarity.
- Few mechanisms exist for businesses (seeking permits or to ensure compliance) to receive support from government entities through digital channels. This often leads to delays.
- A city's project pipeline is often not available to the private sector, leading to reduced interest when projects are put out to tender.

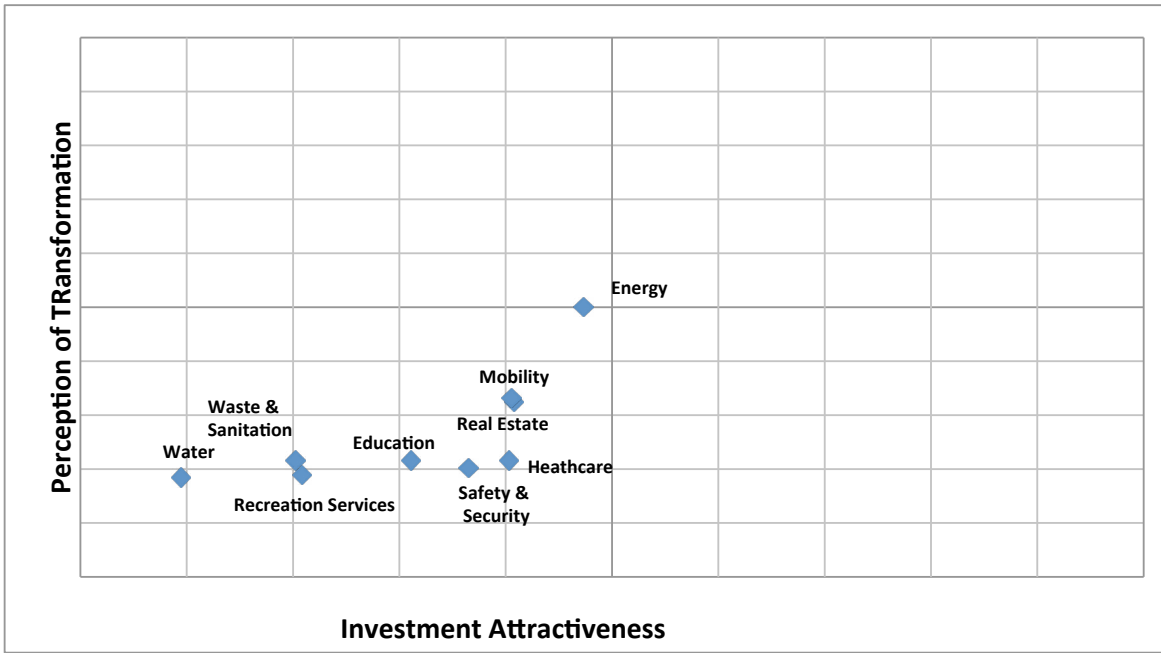
## 2.3. Sector-specific business challenges

While the overall business environment in India requires reform to attract private-sector participation in urban transformation, some urban areas require specific reforms to make them attractive to the private sector. The World Economic Forum's survey gauged respondents' perception across two dimensions – investment attractiveness and extent of transformation. As depicted in Figure 13, areas such as water and waste & sanitation rank low on both investment attractiveness and extent of transformation, whereas energy ranks high on both measures.

*Water*

Most rainwater in India gets washed off or seeps underground, making it non-consumable. Water has become a scarce resource due to little rainwater harvesting in urban areas and the absence of recycling. The water utility authorities in urban India recover only 30-35%[35] of operation and maintenance costs. This poor recovery arises from high non-revenue water (50% of water production[36]), which is lost during the distribution process, the lack of metering and low user charges. The lack of collection of user charges and delays in recovering outstanding user charges further increase the gap between revenues and expenses. Due to losses and user charges, water projects are seldom financially sustainable.

**Figure 13:** Urban Domains – Investment Attractiveness and Extent of Transformation




Source: World Economic Forum, Shaping the Future of Urban Development & Services, India Survey on Smart Cities (Oct.-Dec. 2015)

***Waste & sanitation***

Waste management accounts for 25-50% of ULBs' expenses, with cost recovery of less than 50%. Waste management projects are rarely successful due to their poor financial viability, resulting from the absence of tipping fees and the non-segregation of waste. Urban India is also plagued with open defecation (over 50 million[37] people defecate in open), which to a large extent impacts both waste management and sanitation. Many Indian cities do not have extensive sewerage networks to treat the collected water. The majority of cities have not yet unlocked the revenue stream from treated waste water, thereby attracting limited interest from the private sector.

***Mobility***

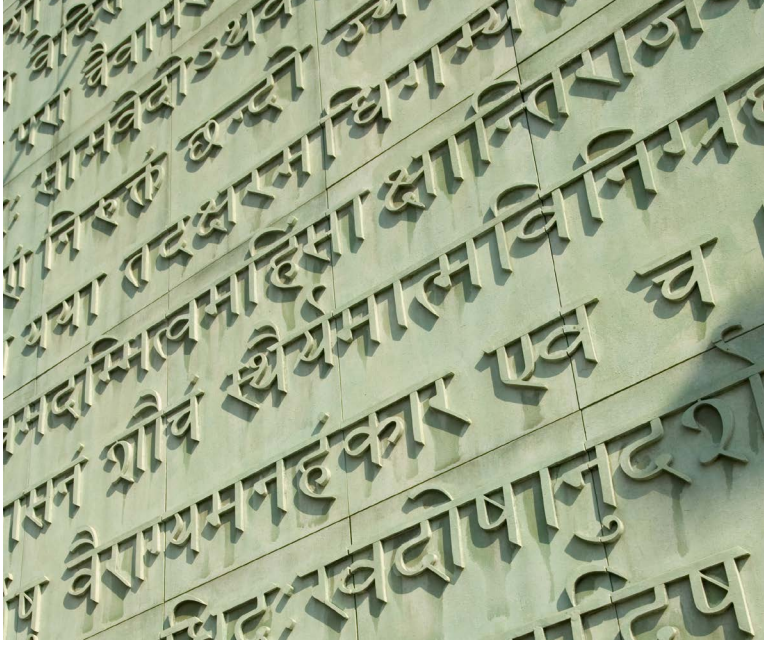
Most cities in India engage multiple organizations, including development authorities, road transport authorities, state transport corporations, public works departments, ULBs and police services, in different aspects of transport regulation, but there is little coordination among them. No integrated approach towards urban mobility exists, with various modes of transport competing and cannibalizing each other. User charges are often inadequate to fund infrastructure development, and cannibalization makes the revenue stream unpredictable, which negatively impacts on the financial performance of each mode.

***Energy***

Uninterrupted power with adequate quality is imperative to sustain and fuel growth in urban India. While generation capacity in India has increased, urban India has not yet achieved 100% access to electricity (93.9%[38]). Distribution remains a weak link in the energy sector with high AT&C losses. Inefficiencies in metering, billing and collection have increased the gap between supply side costs and tariffs. This has adversely impacted the financial sustainability of power generation and the distribution ecosystem. India's push for renewable energy must be accelerated to reduce the country's dependence on hydrocarbons.

***Built environment***

Although the National Building Code and Common General Conditions of Contract have evolved, they have not been applied by the central government or the states. Presently, no common construction law exists; construction activities are administered through 32 different laws, rules and statutes.[39] Construction permits are provided by multiple agencies with little coordination between them. A unified regulatory framework for the construction industry does not exist, and there is no efficient dispute resolution mechanism, leading to cost escalations and time delays in project execution. The high cost of finance translates into high costs for the industry and end consumer. The current trend in the real estate sector is for projects to be retail financed, through payments based on milestones from owners. The lack of skilled resources and insufficient financing in this highly leveraged sector are major challenges that arise in addition to those in the business environment.



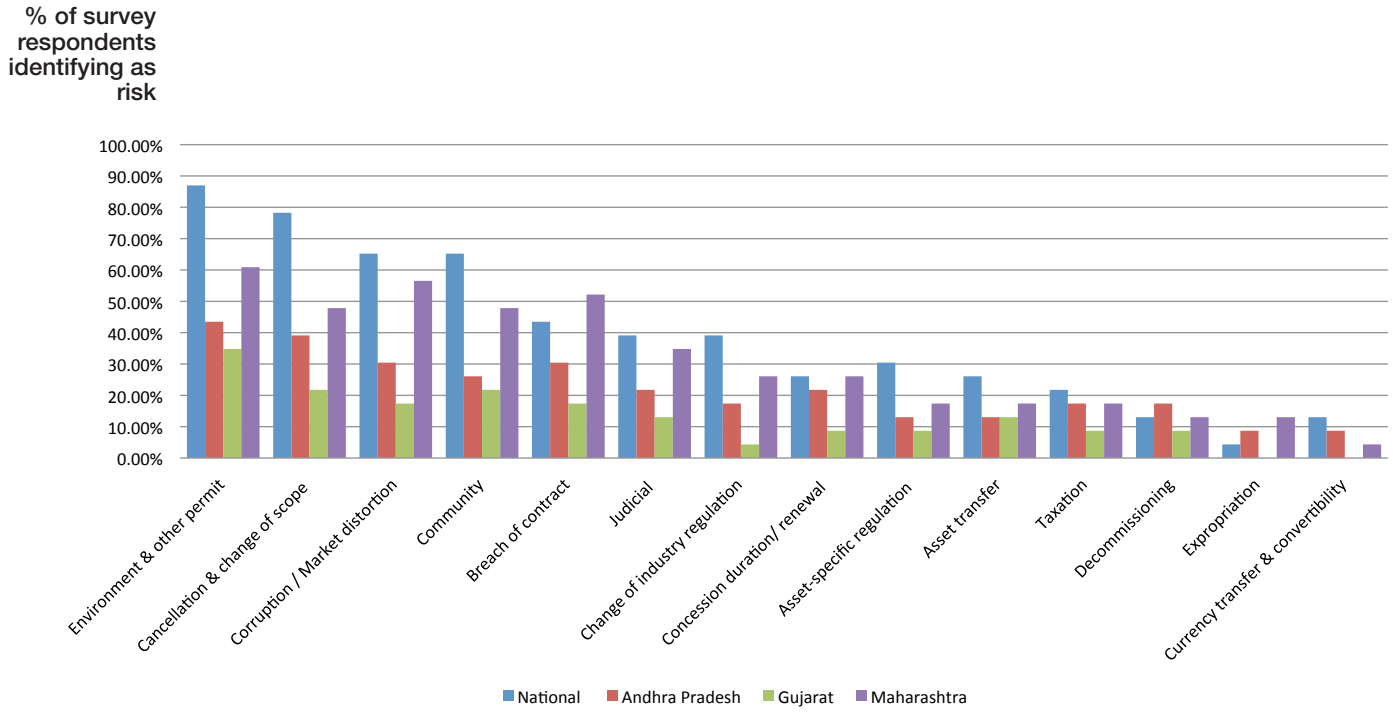
***Social infrastructure (healthcare, education, and safety & security)***

*Healthcare:* The healthcare sector in urban India has benefitted from significant private-sector participation. The Government, however, still needs to clarify whether its role is to provide healthcare or to pay for universal healthcare. A clear decision would allow private-sector players, such as healthcare and insurance providers and pharmaceutical companies, to define their role and plans in India. The paucity of skilled resources is another challenge that both the Government and the private sector must address.
*Education:* This sector is controlled by multiple regulatory bodies but the enforcement of compliance is poor. For-profit entities are not allowed in higher education, and not-for-profit entities find scaling up difficult. Multiple licences are required to establish primary and secondary schools, which increases the entry barriers in the sector.
*Safety & security:* This area has witnessed private-sector participation recently with the adoption of the concept of safe cities. But multiple agencies responsible for safety and security, including police and fire departments (within and outside ULBs), ULBs and emergency care givers, have adopted a siloed approach towards safety and security, resulting in the duplication of work and operational challenges in the execution of projects.

## 2.4. Risks in public-private partnerships

Each stage in the urban development project life cycle raises a specific risk. Risks in the planning and construction phase include changes in scope, the environment and permits, or community opposition. Risks during the project's operating phase arise from nationalization (transfer of ownership from private sector to government entities), breaches of contract and asset-specific regulations. In the termination phase, risks can occur during the duration/renewal of concessions, asset transfers and the decommissioning of assets. Some risks impact a project across its life cycle, such as the risk of a change in industry regulations, changes in taxation, currency transfers and convertibility, and judicial, corruption and market distortion risks.[40] The Forum's India Survey on Smart Cities identified the likelihood of risks (Figure 14) for PPPs in India's urban development projects.

**Figure 14:** Risks in Public-Private Partnerships (%)




Source: World Economic Forum, Shaping the Future of Urban Development & Services, India Survey on Smart Cities (Oct.-Dec. 2015)

Among a myriad of risks affecting public private partnerships in India, significant risks as per survey results are:

- *Environment and other permits:* Delays in obtaining construction permits or environmental clearances can also significantly delay project execution and lead to interest expenses for the private sector. Moreover, caveats in the permits can lead to escalating project costs.
- *Cancellation or change of scope:* A project is at risk when approvals are sought from politically elected bodies or during a change of regime. The private sector's investment in the project's preparatory activities would be rendered futile, and such changes could have a detrimental effect on project costs and timelines.
- *Corruption/market distortion:* These are underlying causes of inefficient political and regulatory decisions; they tarnish the entire pre-project and project execution phase and could lead to severe legal consequences for both the private and public sectors.
- *Community opposition:* Local communities can impact the permitting process if the project involves land acquisition and rehabilitation. In extreme circumstances, it may result in the withdrawal of the project or outright rejection to pay the user charges, impacting the infrastructure provider.
- *Breach of contract:* The city or regional government might breach its contractual obligations on the grounds of safety, health or other public concerns, adversely affecting asset values.
- *Judicial risk:* The lengthy processes and unenforceable decisions could significantly delay the project and inhibit the private sector's capacity to generate adequate and timely revenue streams from the project.
- *Change of industry regulations:* The infrastructure assets' performance is closely linked to the regulations governing them. The regulations in question might be sector-specific or general laws, and they often put the incumbent infrastructure providers at a disadvantage.

# 3. Recommendations for Accelerating Urban Rejuvenation

The Government of India has initiated programmes to rejuvenate urban areas, making it all the more important to ensure that a thriving environment is created for the investors and private-sector organizations that wish to participate in the projects to develop urban infrastructure and services. A business-friendly environment will encourage entrepreneurs, existing businesses and foreign investors to participate in the public procurement process. The reforms needed to equip ULBs as the drivers of most of the programmes are classified in three broad categories:

- Institutional reforms – to equip government organization
- Business environment reforms – to address the issues that impact all the sectors
- Sector-specific reforms – to tackle the sector-specific challenges

## 3.1. Institutional reforms

Government entities will need to enhance the capacity of ULBs across the entire value chain of service delivery, which includes service planning, design, implementation, delivery and service billing and collection. Specific interventions will be required from the state governments and the ULBs to improve the institutional capacity.

***Ensure stronger leadership at the city level***

The leaders of cities needs to be empowered to make decisions at the local level. Currently the mayor is only a ceremonial head, while the municipal commissioner (or equivalent in smaller ULBs) is the executive head. City mayors should be entrusted with higher administrative and executive powers; as elected representatives, they should have a say in the overall planning and administration process. Whether the city structure comprises a “Council Mayor” or an “Executive Mayor” can be determined by the state, but the mayor must have appropriate power and autonomy for the tenure. The special purpose vehicles constituted for the smart cities, ULBs or other parastatal bodies at the city level must also operate under the uniform command of the mayor. The state governments should take the lead in transferring financial and functional autonomy to the city leadership. In addition, locally elected leaders should be empowered to make decisions for the city as they are closer to the urban challenges than are the state or central governments. The state governments should ensure that the lessons learned from the devolution of power (according to the 74th Constitutional Amendment) are taken into consideration in the empowerment of mayors.

***Example:*** The Government of India's 74th Constitutional Amendment constituted a progressive step towards delegating funds, functions and functionaries from the state government to the ULBs within the state. The aim is to empower ULBs so they can functional independently, based on the needs of the citizens through elected representatives.

The 74th Amendment mandated the following provisions to recognize the rights and responsibilities of local governments:

- Constitution of municipalities
- Composition of municipalities
- Regular elections under the supervision of state election commissions
- Protection against the arbitrary dissolution of locally elected bodies by representatives of higher levels of government
- Constitution and composition of ward committees to ensure greater proximity to citizens
- Reservation of seats for women and other marginalized groups

The 74th Amendment laid out a list of functions that the state legislature may delegate to local governments to achieve independent and quick decisions. The manner of delegation was left to the states. The Amendment also laid down provisions for the establishment of a state finance commission that would help balance the finances between the state and local governments. Finally, it required that a district and metropolitan planning authority be set up to integrate development plans across different jurisdictions.

The Appraisal of Jawaharlal Nehru National Urban Renewal Mission (JnNURM)[41] identifies the following broad reasons why the 74th Constitutional Amendment was not as effective as envisaged.

- Very few state governments were able to delegate all 18 functions recommended to local governments and some did not even start to do so due to reasons such as the absence of administrative will or poor technical capacity to perform several of the functions.
- In some instances where powers were delegated, the result was not as expected due to deficiencies in institutional capacity as the ULBs lacked the technical capacity to implement complex functions, such as preparing city development plans.
- In cases where all the functions were passed on to the local governing bodies, they were not given the freedom to decide taxes, user charges, etc., as these aspects remained with the state's political representatives. As a result, the link between the state and local governments was maintained such that the ULBs had to continuously rely on state governments to make decisions.
- In some situations, several parastatal bodies were engaged in urban utilities or urban planning within the same city, resulting into overlapping functions and a lack of clarity in institutional boundaries.

The lesson learned from this experience is that, as the nature of the functions to be transferred and the manner of transfer were not made clear, the states adopted their own model of transfer. Greater clarity and specific guidelines regarding delegating funds and functions and how they should be transferred from the state government to the ULBs were needed. Yet critical to the partial success of this reform is that ULBs were allowed to perform certain functions independently, based on the visions of the elected representatives, even if financial independence was not attained.

### *Enhance revenue streams*

ULBs typically have their own resources (tax and non-tax revenues), shared revenues, state grants and loans from state governments and market loans. Following the abolition of the entry tax in most states, property taxes are the most important source of revenue for local governments. User charges are the main source of non-tax revenues for ULBs, although the tendency has been to charge low user charges for various urban services. This has led to inadequate cost recovery, maintenance and investment in infrastructure. Efficient local tax collection and appropriate user charges are needed to reduce the reliance on state and central governments. An independent price determination mechanism must be developed so the operation and maintenance of urban utilities is supported by user charges, without the need for financial assistance.

An independent regulator must be encouraged to mitigate political and regulatory risks. The key to independence is separating regulatory body's funding from public budgets, selecting officials without taking into account political considerations and creating a proper term for administrators governing the regulatory body, independent of the political cycle.

***Example:*** The Office of Gas and Electricity Markets, the UK electricity and gas regulator, is funded by licence fees from regulated companies. The appointment of board members is staggered over time and based on competence.[42]

### *Engage stakeholders throughout the urban development life cycle*

The government entities responsible for planning need to leverage participatory governance to address the diverse stakeholders' concerns. The smart cities programme focuses on citizen consultation. In addition, the state and city governments must engage the private sector and academic institutions in the planning, design, implementation, operation and maintenance, and financing of urban development initiatives. This participatory approach produces projects that have the greatest chance of success (financial viability, technical feasibility, and social acceptance). Moreover, it creates an opportunity for consensus among such divergent and competing urban agencies as municipal corporations, development authorities, and sewer and water authorities.

The consultative engagement with the private sector and academic institutions will have to be initiated early on in the

Smart City planning phase but ownership will remain with the city governments. As the urban development phases move beyond planning, the involvement of the private sector will increase; it could be made responsible for the design, implementation and operations and maintenance. One engagement matrix for stakeholders is shown in Table 2.

Each city may modify it based on the project and the urban area involved but the key is ensuring that all stakeholders are involved during the entire urban development value chain.

**Table 2:** Illustrative Responsibility Matrix for Stakeholders

| Stakeholder Phase | Government | Private Sector | NGOs | Academic Institutions | Citizens |
|---|---|---|---|---|---|
| **Policy-Making** | Accountable, responsible | Consulted | Consulted | Consulted | Consulted |
| **Planning** | Accountable, responsible | Responsible | Consulted | Consulted | Informed |
| **Design** | Accountable | Responsible | Informed | Consulted | Informed |
| **Implementation** | Accountable | Responsible | Informed | Informed | Informed |
| **Operations & Maintenance** | Accountable | Responsible | Informed | Informed | Informed |
| **Monitoring** | Accountable, responsible | Informed | Responsible | Responsible | Responsible |

Sources: World Economic Forum, Shaping the Future of Urban Development & Services and PwC research

***Example:*** The JnNURM programme was launched in India to encourage reforms, promote the development of infrastructure in cities, improve service delivery mechanisms and make ULBs independent in city management. The programme achieved mixed results and the lessons learned could be useful in the implementation of the planned urban development programmes.

Focus on project conceptualization: Part of the JnNURM strategy involved project implementation through the technical expertise of the private sector, using PPP models or privatization. While the projects were expected to be executed by the private sector, the latter was not consulted adequately during the project conceptualization phase. Due to inadequate project structuring, many projects ended up with unsustainable business models.

Suboptimal risk sharing: In many cases, risk sharing between the Government and private bodies was not balanced. The private sector was expected to take on risks that it was not capable of handling, such as revenue risks. Since opportunities were just unfolding, in the race to win credentials for even bigger projects, the private sector continued to participate in projects in which the sharing of risks was not balanced. This resulted in delays during implementation, escalated costs and in some cases even project closure.

### *Improve internal processes*

A ULB's function involves such responsibilities as ensuring water, sewerage and solid waste management, providing healthcare and education, preparing city development plans, and issuing permits, certificates and licences. In many ULBs, these functions have remained unchanged or have not been re-engineered in years. Adopting e-governance systems would:

- Streamline operations and offer citizen services over digital channels
- Enable ULBs to track and monitor daily tasks
- Support the planning process
- Increase transparency by reducing the need for citizen/business stakeholder to meet with officials for specific requests

Some ULBs have adopted e-governance systems but the systems have yet to be institutionalized in day-to-day operations across processes. As long as paper-based communication and approval channels are not eliminated completely, internal process will remain laborious.

The standardization of financial statements and accounting practices will lower the costs of evaluating ULBs and will facilitate a comparison of cities' finances. Regular, timely and standardized financial disclosures will help create a municipal information ecosystem for independent review and analysis by all stakeholders. Once local government accounting is modernized, the system will provide critical

information that will facilitate a wide range of financial and operational reforms. This will increase the efficiency and transparency of the local government's financial operations, particularly when combined with administrative reforms.

***Example:*** The Seoul Metropolitan Government established several information systems covering all of the city government's public services. It built its own telecom network connecting its 16 affiliated organizations, and set up an extensive e-government promotion group headed by a chief information officer. To make its city administration highly efficient using information technologies, the Seoul Metropolitan Government set up over 400 information systems covering the entire range of its public services, including urban planning, culture, tourism, transportation and housing for its 127 divisions. The city has started using big data and mobile-based service delivery to enhance the citizen experience.[43]

### *Augment capacity*

Today's urban challenges are complex. The solutions require skills beyond the capacity of most local governments in India. Local governments can improve certain areas but they cannot reform the sectors requiring technical expertise without professional expertise. Transformative change of the nature outlined in India's urban reform agenda will be difficult to accomplish without administrative changes that liberalize human resource policy and produce better urban management.

An assistance programme must become a permanent feature of the reform process to support the slow and long-term nature of decentralization and help strengthen local capacity. A technical team placed within a local government should work with diverse agencies to implement reforms. The central government needs to organize a rigorous training network, channel resources into priority areas and evaluate progress to reinforce the reform programmes.

***Example:*** Singapore's Public Service Leadership Programme grooms individuals for leadership in the public sector by providing training on five key dimensions – economy building, infrastructure and environment, social, security and central administration. The economy building dimension enables participants to understand and develop an economy that drives growth and ensures macroeconomic stability. The infrastructure and environment dimension enables participants to understand and develop a sustainable environment with robust infrastructure and good connectivity. Similarly, the social, security and central administration dimensions focus on making Singapore a cohesive, resilient, caring and inclusive society; keeping Singapore safe and secure; and developing core governance functions, such as human resources, finance, public communications, procurement and international relations.[44]

### *Improve the monitoring mechanism*

A uniform monitoring and oversight mechanism will have to be developed at all three government levels to ensure sufficient synergies exist in the programme (the current monitoring mechanism for individual urban development programmes needs stakeholders in common across monitoring committees). This would include establishing a monitoring team comprising representation from all stakeholders. Such a governance mechanism operating above the programme implementation level would be in a position to point out synergies and potential conflicts.

Technical support and benchmarking are crucial to measure and evaluate the extent to which institutionalization has occurred, and what still needs to be accomplished. India needs to develop uniform service performance indicators that permit a comparative evaluation of ULBs and project outcomes. Open data initiatives can also be used by government entities to enhance monitoring and citizen feedback. Such open data platforms serve to enhance transparency and to evaluate private-sector performance in the implementation process using the citizen audit mechanism.

***Example:*** The Office of Operations of the Mayor of New York City created the NYCStat Stimulus Tracker, an online tool to help the city track federal stimulus funds. The tool enables residents to follow the progress of stimulus funding on a project, contract and payment level, and ties public outcomes to the money spent. The tool provides detailed, almost immediate information on stimulus projects in eight areas: infrastructure, energy efficiency, economic and workforce development, health and social support, education, public safety, neighbourhood stabilization and budget relief.[45]

## 3.2. Business environment reforms

State governments and ULBs will need to undertake reforms across the various project phases of the urban development life cycle in order to improve the business environment. In the pre-project or project development phases, reforms will be required in the public-private policy framework and procurement process. During the project kick-off phase, reforms in the permitting and land acquisition processes will be needed. While the project implementation phase in under way, reforms will be necessary in the area of information dissemination and the permitting process and, finally, in the event of disputes, reforms will be required in the contract enforcement and dispute resolution process.

### *Public-private partnerships*

While synergies exist between the demands for urban infrastructure and the capabilities of the private sector, few PPPs have achieved the desired outcomes. One of the reasons for the limited success is insufficient project preparation, which results in the development of projects that are not bankable in terms of commercial and technical feasibility, risk allocation and governmental commitment towards the regulatory framework. As the city vision has been developed and the identification of projects at the city level has been completed, the focus of government agencies must now be on creating bankable public-private partnership projects. The World Economic Forum's

Strategic Infrastructure initiative[46] highlights the best practices that governments can adopt to accelerate public-private partnerships (Figure 15).

**Figure 15:** PPP Preparation Best Practices


Sources: World Economic Forum, *Strategic Infrastructure: Steps to Prepare and Accelerate Public-Private Partnerships*, 2013

### *Team and leadership*

A PPP project requires a cross-functional team augmented by external expertise as all responsibilities for a project are encapsulated in a long-term contract. The team should be structured with the right skill sets across the entire life cycle of the PPP project, which includes the origination, feasibility study, structuring, procurement and contract management. Experts such as economists, urban planners, engineers, environment specialists, financial analysts, legal specialists, transaction specialists and contract management specialists must be deployed based on the life cycle of the project. Assured leadership support from high-level politicians and bureaucrats is required to champion the project and convey the goal and benefits to the stakeholders.

### *Governance and project management*

A clear governance structure with the requisite segregation of responsibilities is required as multiple stakeholders will be involved in the project. In the case of smart cities, the special purpose vehicle must be established as the central point of contact to coordinate with other agencies and facilitate timely decisions. A Project Management Office that can plan, coordinate and monitor the preparation phase and provide further support during implementation and contracting is needed to navigate through the project life cycle.

### *Funding and project preparation*

Investment in project preparation typically costs between 1% and 4% of the total project amount,[47] and inadequate preparation could result in delays, lack of interest from the private sector and increased cost as compared to the feasibility studies. When evaluating a PPP as an option for project execution, due consideration should be given to funding the project preparation exercise.

### *Technical scope*

Estimating usage levels or demand is a major determinant in evaluating PPP feasibility. A structured approach and the availability of quality data are key to forecasting demand. In addition, an independent review by major stakeholders and experts is needed to guard against an optimistic bias. Models similar to the traffic risk index (that take into consideration the tolling culture, traffic escalation, the time horizon, the existing road network, traffic growth, the macroeconomic environment, etc.) can be used to determine the level of uncertainty in the final forecast. Once the demand is evaluated, the local governments must define the outputs and performance levels rather than using traditional inputs and specification-based procurement methods. This will ensure innovation in the final solution.

### *Commercial attractiveness*

As ULBs in India must use current funds to sustain existing operations, user charges, value capture and ancillary revenues must imperatively be used to fund new projects. When applying user charges, it is necessary to enforce payments after giving due consideration to the social impact of user charges. A bankability test can ensure all revenue and cost drivers are factored in and the resulting returns are aligned with the opportunity cost of the equity. ULBs should conduct a market sounding exercise involving potential contractors, subsystem suppliers, multilateral development banks and financiers to understand their specific concerns and solicit ideas on how to shape the project.

### *Stakeholder engagement*

When the infrastructure is being developed and services are enhanced to the benefit of urban dwellers, some sections of society might be negatively impacted. Early stakeholder engagement is required to reduce the risk of community opposition and gain the buy-in of concerned citizens. ULBs can partner with NGOs to obtain agreement and showcase the benefits of the new infrastructure for the hard-to-reach groups or vulnerable sections of society.

### *Contracting models and incentives*

Adopting the right contracting model is crucial to balance the goals of making a project attractive to the private sector and safeguarding public interest. The following models in ascending order are available to private-sector based on extent of ownership and the risks are assumed by the private sector:

- A service contract is suitable for specific operational aspects
- A management contract is suitable to bundle several operational and maintenance aspects
- A lease contract is useful when the private sector takes temporary ownership of the asset and full responsibility for operating it
- A concession contract is useful when the private sector raises finance to build the asset and maintains it with operating rights for a certain period
- Divestiture can be used to sell an asset to the private sector and it takes ownership of the asset

The models must be chosen based on the readiness of the private sector (to finance and operate the project) and the public sector (to regulate and govern the project). Often, large capital investment requirements translate into entry barriers for the private sector and projects may become monopolist. A regulatory mechanism (that guards against the abuse of power while promoting efficiency and investment) is crucial to balance the profit and welfare goals in PPPs.

### *Risk mitigation and allocation*

The allocation of risks between the public and private sectors is often generic (building and operations to the private sector; permitting, site risk and macro risks to the public sector) but the project's characteristics will drive the specific distribution of the risks. In general, risk is allocated to the party that is best able to:

- Control the likelihood of its occurrence
- Limit its impact
- Absorb it at the lowest cost

Some infrastructure project risks, such as a severe shortfall in demand, input-price volatility, unfavourable refinancing conditions, national economic shocks and so on, are difficult to predict. The problem is aggravated by the long contract durations of PPPs. An automatic adaptation mechanism to manage cost risks could be put into place where costs could be passed on to consumers or indexed to inflation. Among the various risks, revenue risk requires particular attention during the project preparation phase. Various options are available to mitigate and share the risk; planners must pick the best one according to the requirements of the project.

- No mitigation and sharing: the private sector bears the entire revenue risk
- Risk sharing: earnings sharing to set a predetermined profit range for the private sector with any upside or downside risks shared between both public sector and private sector
- Risk guarantees: minimum guarantees to the private sector so that base revenue is assured
- No risk allocation to the private sector: fixed payments go to the concessionaire, irrespective of revenues, with the government assuming the revenue risk

### *Safeguards for a changing environment*

PPPs are long-term contracts that can become unsuited during their long duration to satisfying society's infrastructure needs. It is crucial, therefore, to incorporate some adaptability into the contract, whereby the public-sector authority can retain some control over the project. However, an inherent conflict is apparent: while the public sector's interest lies in flexibility, the concessionaire's interest lies in predictability. Adequate safeguards need to be put in place by the public sector on concession termination and duration to incentivize high-quality service delivery.

The measures to create an enabling environment from the public-sector perspective are provided by institutional and business environment reforms. Key actions that can be initiated to attract private-sector participation are listed below.

***Independent institutional structure to handle PPPs***

As all urban rejuvenation programmes require private-sector participation, be they sector-specific programmes such as Clean India, Housing for All or HRIDAY, or programmes spanning across several sectors such as Smart City and AMRUT, it is important that an institutional arrangement be drawn up at the state government level so synergies can be brought about in projects targeting a specific city or area. Such synergies will highlight the overall direction and enable the private sector to view the overall vision of the cities within a state. Moreover, specific PPP-focused institutional arrangements can also help the state to customize the toolkits (guidelines, model contracts, best practices checklists, etc.) created for specific urban domains.

***PPP information dissemination***

The states should provide information on all the projects in the pipeline that will be executed through PPPs as part of the urban rejuvenation programmes. Such a robust database will enable the private sector to monitor existing project progress within the pipeline and modify its approach based on the available data.

***Standardization of documents***

In addition to an enabling environment, the standardization of bidding documents is key to encourage private-sector participation in PPP projects. Standardization leads to greater certainty, broad public acceptability, a reduction in transaction costs and time, in addition to addressing the issue of capacity constraints. In the Smart City programme, model documents for PPP projects must be developed in such areas as water supply, urban waste management, including solid waste and sewerage, urban transport, and the social sectors, such as healthcare, education and affordable housing.

## *Permitting process*

The urban rejuvenation programmes are likely to result in enhanced infrastructure development activity in cities. ULBs and state governments will need to play a crucial role in quickly issuing permits for infrastructure development. It is difficult for the Engineering & Construction industry to absorb the costs of slow permit procedures, complicated policies and deficient process standards. The damage caused by inept policies ultimately reflects on the end user or the buyer in the form of higher costs.

***ULB as an umbrella agency***

The best approach for reforming the permitting process would be to institute a single approval authority for all permits, including environment clearances. A single authority granting permits would be ideal but if department-specific laws and statutes do not allow ULBs to take ownership, they could at least take responsibility for the coordination and follow-up with other departments. ULBs should serve as a single point of contact to obtain any permit for urban development projects. The infrastructure developers would approach just the ULB, which would interface with other government departments, such as environment, civil aviation, development authorities, etc., to seek permits.

The ULB should have a geographic information system (GIS)-enabled common online application where all information required by approving departments are aggregated, including a unified payment gateway to process fees and development charges in an aggregated manner. The system should use validation mechanisms such as building codes and master plans to automatically check infrastructure development plans for compliance. The same application would also be used by the departments when approving individual permits so that an aggregated real time view can be made available to the business entity seeking permission.

***Outsourcing if capacity is unavailable***

ULBs and respective departments need to keep pace with technological improvements when performing compliance evaluations and inspections. Outsourcing to certify compliance can be considered when capacity is limited or the government department adds little value. Outsourcing can also be considered for non-critical activities and site checks for the permit providing body. For such outsourced activities, the government body can assume the role of a monitoring agency, which performs regular policing to ensure compliance and adherence to norms.

***Comprehensive policy and standard operating procedures***

Considering Smart City's implementation time frame (four years), the existing process must be simplified. A new, comprehensive permitting policy that encompasses all the government bodies involved (even though certain policy areas may be executed by multiple departments) is essential to guide applicants and remove the element of uncertainty in permit procedures. It is critical to ensure that both business stakeholders and government departments are involved in drafting this policy to make it easier to comply with.

The periodic review of regulations in consultation with such stakeholders as industry, academic institutions and environmental activists is required to tailor them to technological advances.

***Service levels and deemed approvals***

Obtaining permits for large-scale buildings, commercial establishments and residential complexes is much more complicated than for a warehouse, which already takes 147 days.[48] This slow permitting process poses a risk to the Smart City projects that envisage the redevelopment of derelict areas within the city and new greenfield development. A risk-based approval process in which service levels for approvals are determined by the complexity of the infrastructure to be developed can be institutionalized. In scenarios where service levels are breached, deemed approval (auto-approvals on breaching service levels) can be provided, but strong escalation and

penalty mechanisms must be in place prior to service levels being breached.

***Example:*** Singapore has a single-window clearance system for building permits. Building applications with layout and survey plans are submitted through the Electronic Development Application System, which spans across the entire life cycle of the building permit and which in Singapore is spread across 10 steps. The application system plays a vital role in each step and helps obtain permits in only 54 days.[49] Hong Kong SAR has a similar system in which a single-window system caters to building permits for warehouses and the software spans across six government departments and two private utility vendors.

***Example:*** Since 2008, the United Kingdom has been developing and using a risk-based system for permit approvals, which has allowed it to eliminate eight procedures and cut 49 days from the permit process.[50] In Seoul, Republic of Korea, the introduction of a risk-based approval system helped officials between 2004 and 2009 focus on the complicated projects rather than on the simple ones at a time when the number of applications for building permits increased from 1,521 to 3,895.[51] Ukraine also uses a risk-based system to provide permits; low-risk buildings receive permits faster and are subjected to relaxed policies while high-risk buildings are subjected to stringent scrutiny. Ukraine classifies buildings into five categories, with simpler buildings ranked 1-3.[52]

***Example:*** Canada's "one project, one review" process ensures a single point of contact and a strict time frame for reviews. The average approval time for large energy projects was reduced from four years to 22 months between 2007 and 2011.[53]

## *Land acquisition*

When developing critical infrastructure projects, the timely acquisition of contiguous land is imperative to contain project cost escalation and adhere to project timelines. However, landowners are often wary of selling, in view of the potential for future price appreciation. As a consequence, land for development is not easily available. Central and state governments in India acquire private land for urbanization, industrialization and the development of large infrastructural facilities. The Government in return provides compensation to the affected landowners and rehabilitates them. The entire cycle forms the land acquisition process. Land acquisition is marred by multiple issues, such that the following reforms are required to accelerate the process.

### *Land tools*

Several tools are available to facilitate land acquisition depending on its intended use. Community Land Trusts (CLTs), which are entities designed to ensure community stewardship of land, can be used when private non-profit corporations hold the land for the benefit of the community and provide secure affordable access to land for individual households. As the households only purchase the building and not the land, CLT homes are more affordable. Guided Land Development (GLD) allows the conversion of privately owned land on the fringe of a city from rural to urban use so that development can formally occur. The landowners contribute to the development on the fringe by providing the right of way for the development of critical infrastructure and pay a betterment levy against which they enjoy appreciation when the rural land becomes serviced land. A Transfer of Development Rights (TDR) separates the right for development from the land itself by creating a mechanism where rights are purchased from an area where development is discouraged and transferred to another location where more density is desired.

Land readjustment or pooling is also emerging as an alternative to the land acquisition process. The municipal authorities provide infrastructure, which is funded by developing a part of the land. The remaining land is reallocated back to the participating private landowners, who now benefit from the increased value of the land. The implementation of land readjustment requires well defined property rights, an independent and transparent evaluation process, and a strong judiciary to address public concerns. Land sharing (LS) is also an option that provides a pragmatic solution to the illegal occupation of land by residents of informal dwellings. LS is an agreement between the illegal occupants of the land and their landlords, in which the land is divided into two parts: the more valuable part is used by the landlord for commercial development and the less valuable part is used by the illegal occupant for low-cost, affordable housing.

### *Compulsory purchases*

Several developed economies allow compulsory purchases for the development of critical infrastructure approved by their governments. India could adopt the compulsory purchase procedure as an approach for the different treatment of strategic infrastructure projects.

### *Procedural reforms*

Administrative procedures can be simplified by facilitating single-window clearances, standardized documentation, GIS-based records and timely approvals. E-procedures can help improve land acquisitions while curbing unethical practices and helping to complete work within agreed timelines.

***Example:*** In Burlington, Vermont, a CLT was used to provide affordable housing to 2,000 households with average incomes of only 57% of the area median. The owners are entitled to full rights of the land but the ground lease stipulates that upon resale, they receive only 25% of the property value's appreciation.[54]

***Example:*** Mumbai, India has used a TDR since the 1990s which can originate from anywhere within Greater Mumbai but can be used only in the northern areas that are less congested and where additional infrastructure can be developed. Development charges and a property tax are payable on TDR consumption and duty is levied on the transfer and use of the TDR, thus accruing addition revenue for the government.[55]

***Example:*** Bangkok used LS as a means to reduce evictions and allow affordable housing to low-income residents. The National Housing Authority played a mediating role and provided technical assistance to residents and the landlord during the land sharing process.[56]

***Example:*** Gujarat has a sound land acquisition system which can be taken up by other states in India.[57] The Gujarat Industrial Development Corporation allows flexibility in negotiations during acquisitions, and offers developed land as part of the compensation. The land acquisition price is determined based on market prices, which are derived from a scientific method developed by renowned institutes. The guaranteed returns eliminate the chances of future disputes. The identification and allotment of land has been made easy as information related to the availability of utilities, the distance from ports, etc., is readily available online, enabling investors to make decisions without visiting offices. The land details are updated on a GIS system.

***Example:*** The Government of Maharashtra decided to make the details related to landholding (record of rights) available online so every citizen can have landholding information at their fingertips. The accurate and updated information helps citizens to make proper decisions regarding landholding. Apart from digitally available landholding details, the government also decided to integrate the registration and mutation (changes in the record of rights) process. As a result of this initiative, any registration made without the knowledge of the relevant land officials could be stopped. Cases related to fraudulent land selling and to deceiving citizens have reduced drastically.

## *Procurement Process*

The urban rejuvenation programmes offer an opportunity to reform the entire procurement process at the level of the state and ULBs, and could introduce spillover effects that would benefit public procurement as a whole. A new approach to outcome and project life cycle cost-based procurement will be required for the urban rejuvenation programmes, replacing the least-cost, goods-based procurement approach. However, the programmes' efficiency and success in achieving the intended outcomes will fundamentally depend on how well and quickly the existing contracting processes on public procurement are reformed and adopted. The following explains the reforms recommended to ease the procurement concerns:

### *Procurements policies*

Smart City procurement will be initiated by special purpose vehicles. With a special purpose vehicle created for each city, differing procurement policies (created based on the state procurement policy or the ULB's procurement policy) may result in different tender and contract conditions. A standard procurement pack preferably created at the national or state level will create a uniform environment for bidders to participate. A nodal agency or department needs to be created at the state level, which would be responsible for the procurement policy and framework. The nodal department would be responsible for formulating the procedures for procurement, creating standardized documents, and publishing the prices at which the goods are procured in the public domain. This department could be given the responsibility to be the central agency for bid protest across ULBs and special purpose vehicles.

### *Review processes and segregation of duties*

The tender document must be evaluated by individuals who have not prepared the tender, to reduce preferential treatment of bidders. All procurements must go through an independent evaluation process to ensure no private gains are made during the tendering process. Lawmakers should design and implement rules, institutions and practices that prevent and penalize corrupt behaviour, and thereby enhance transparency in decision-making and in enforcing compliance. International rules, such as the United Nations Convention against Corruption, should be adopted by local administrations.

### *Electronic tendering systems*

Web-based electronic tendering systems must be institutionalized in order to reduce corruption and person dependent processes. Moreover, the evaluation must be objective to make the process more transparent.

***Example:*** The cities of Oulu and Vantaa in Finland adopted a Pre-Commercial Procurement process in which the public sector defines the need for which a solution is sought but not the service to be bought. The buyer defines the need but the supplier creates the solution. This makes the creation of market-oriented innovations possible. The process shifts through the most apt solutions. The supplier remains committed to the product development process as remuneration is paid for its work on the solution during the design phase.[58]

***Example:*** A joint effort to combat corruption between governments, business representatives and NGOs could serve to mobilize the media, educate the public on its effects and expose the culprits. A voluntary multistakeholder anti-corruption initiative, such as the World Economic Forum's Partnership Against Corruption Initiative (PACI), can improve the way stakeholders work together, influence public policy and monitor the compliance of partner organizations.

***Example:*** The UK Bribery Act, enacted in 2010, specifies that a company's failure to prevent bribery by employees and associates is a corporate offence, and allows for prosecution of an individual or a company with links to the United Kingdom. Penalties include up to 10 years in prison and unlimited fines.[59]

## *Contract enforcement and dispute resolution*

With multiple cities developing infrastructure, implementing technology and setting up large-scale public-private partnerships, the likelihood that contractual issues will

arise if project preparation is not performed diligently is strong. Such issues can hamper the progress of Smart City development. The effective and speedy resolution of disputes is a win-win situation for all stakeholders involved. In addition to effective resolution, it promises a certain level of predictability in commercial transactions and can bolster trade, economic growth and development. Below are some solutions that can be explored to accelerate dispute resolution and to create a legal framework encouraging agencies to participate in the Smart City programme.

### *Alternate dispute resolution mechanisms*

Currently, reliance on alternative dispute settlement mechanisms is low, despite providing effective, fast and cost-effective ways to resolve disputes. The cost involved in such resolutions is typically much lower than the traditional approach of relying on the judicial system and the time needed for resolution is also shorter. Disputes require prompt and efficient resolution, and an array of options can be applied to resolve them, from mediation and non-binding expert panels to national regulators and arbitration. The courtroom should be the last resort, used only when all other mechanisms fail.

### *Special courts*

Since the number of high value contracts is expected to increase as a result of the ambitious urban development initiatives, setting up special courts to fast-track contract-related cases may be a feasible option. Such courts should be trained especially in contract enforcement and provisioned with adequate technology to manage cases effectively. Reforms could be implemented, such as the use of e-Courts, case management systems and litigation management systems, which allow courts to process cases more quickly. These reforms can play a crucial role in improving the productivity of courts, lead to the increased resolution of cases and refine operations.

***Example:*** Chile uses permanent expert panels to resolve disputes in the electricity sector. Initially, panels have a conciliatory function, but cases can be escalated to the arbitration level where the panels' decisions are binding.[60]

***Example:*** Singapore and Korea are ranked among the top countries globally in terms of their ranking that take the least time to enforce contracts or settle commercial disputes. The number of days for resolving commercial disputes stands at 150 for Singapore and 230 days for Korea. The cost of dispute is also the lowest at 25.8% and 10.3% of the value of the claim for Singapore and Korea, respectively.[61] The two countries are also known for the quality of court automation, which helps streamline judicial processes. Korea started automating its courts in 1970 by gradually building a database of cases and went on to establish a case management system in 1986. This enabled judges to make ready references to past cases and judgements, which helped when presiding over similar new cases. Gradually, the case management system was made accessible to external users who could access national court data online in real time. An e-filing system was also introduced in 2010.[62] Singapore also has a similar court automation system. In view of the vast volume of backlogs in Indian courts, automation would provide steady support to adjudicate and resolve cases. While e-Courts are a national project under way, implementation must be accelerated to support dispute resolution.

***Example:*** The Environment Court of New Zealand is a specialist court that deals with environmental issues and, as such, sits outside the judicial pyramid of general jurisdiction courts. Most of its work involves issues arising under the Resource Management Act. Such issues largely deal with appeals related to the contents of regional and district statements and plans, as well as appeals stemming from applications for resource consents.

## *Information access*

Investors wishing to invest in India or expand to new regions within the country expect transparency and consistency in information availability. Information must be relevant, conveniently located and frequently updated. The cities should accelerate adoption of information frameworks such as Basic Statistics for Local Level Development (BSLLD) and National Urban Information System (NUIS) to capture and periodically update city data.

### *Single point of information access*

At the state level, consolidated information pertaining to all the departments/ministries must be available centrally. Access to high-quality information also implies the availability of a defined but comprehensive set of sources, ideally integrating the different departments together. The information centralized at the state level must then be inherited through open Application Program Interfaces (APIs) by all ULBs in the state. The ULBs should maintain their information in a standard format so that the data from the national and state governments can be plugged in easily without modification. The availability of standard information at the city level will enable the private sector to easily make comparisons between cities and evaluate their attractiveness for investment.

### *Online support mechanisms*

Online support mechanisms include online forums, help desks to address public queries and concerns, and an e-portal to conduct moderated, "open" forums for the public to post queries and receive answers from officials. Sample filled-in documents could be uploaded to guide investors.

### *Information dissemination*

Apart from online information availability, it's increasingly important to disseminate and even market the initiatives and programmes by proactively reaching out to private sector to provide updates on changes and reforms. In most states, large volumes of information are provided online, across a multitude of websites.

***Example:*** Singapore's TradeNet single-window system integrates 35 government departments.[63] TradeNet is a trade facilitation single-window system that enables round-the-clock availability for the electronic submission of documents. It connects 35 government agencies to improve the processing and approvals of trade permits. The processing time per application is under three minutes.

***Example:*** Malaysia established a system to facilitate cross-border trade formalities. The system[64] was set up by Malaysia's National Chamber of Commerce and Industry to streamline trade processes. It is now extended to more than 500 customs locations and provides a single gateway for documents and information, customs brokers, freight forwarders and banking and insurance agents.

**Table 3:** Sector-Specific Recommendations

| Sector | Recommendations |
|---|---|
| **Water** | 1. Ensure 100% functioning meters to enhance billing and determine leakage points<br>2. Establish and empower independent regulators to determine user charges; adopt telescopic user charges to protect the needs of the urban poor and incentivize lower consumption<br>3. Empower the provider (private sector or concerned line department) to terminate connections of users who are large defaulters on payments of user charges<br>4. Incentivize cities to protect local water bodies, improve the upkeep of local bodies (lakes,ponds, rivers, and rivulets), and use the local water bodies<br>5. Incentivize infrastructure developers to harvest rainwater and to adopt localized solutions for recycling |
| **Waste & Sanitation** | 1. Conduct information, communication and educational programmes in cities in general and schools in particular to increase awareness, drive behaviour change about open defecation and the segregation of waste, and sensitize on linkages between waste management and health impacts<br>2. Include the informal sector of "waste collectors" and NGOs in the value collection-disposal chain to increase the extent of recycling<br>3. Determine tipping fees and impose them based on volume of waste generated<br>4. Incentivize waste-to-energy through preferential tariffs<br>5. Incentivize decentralized and localized solutions (for energy generation, compost generation and biogas generation) to reduce the dependency and load on centralized solutions and landfills used by ULBs |
| **Mobility** | 1. Adopt an integrated approach towards urban mobility where modal mix is decided on based on the life cycle cost of modes of transport<br>2. Establish and empower independent regulators to determine tariffs and ensure minimal cannibalization across modes of transport<br>3. Discourage the use of private vehicles through congestion charges, promote the sharing of capacities within vehicles (carpooling), and provide alternate modes of public transport<br>4. Enhance non motorized transport and walk-able neighborhoods to reduce dependency on public and private transport. |
| **Energy** | 1. Determine rational unit-based energy prices to cover the cost of distribution and generation and enhance the financial sustainability of distribution companies; increase private-sector participation in the distribution process to reduce aggregated commercial and technical losses<br>2. Ensure 100% functioning meters to enhance billing and determine leakage points; ensure the timely payment of subsides to distribution entities in cases where unit rates are subsidized<br>3. Provide a collaboration platform for state-controlled entities to interact with ULBs (which are responsible for urban rejuvenation programmes) to promote the use of renewables and low-energy consumption devices, and initiate waste-to-energy programmes |
| **Built Environment** | 1. Create a unified regulatory framework to consolidate all statutes from multiple laws and establish a robust dispute resolution mechanism<br>2. Review the non-performing asset norms for the sector and facilitate long-term financing for infrastructure development<br>3. Develop a risk- and impact-based approval process, through which approvals can be accelerated for certain class of projects. Promote access based models (rental housing) to address the needs of migratory population. |
| **Social Infrastructure** | 1. Healthcare: Test and develop sustainable business models for private-sector participation in primary healthcare to improve geographical, financial and technological access to vulnerable sections<br>2. Education: Simplify the licensing process with a single-window licensing system; encourage private-sector participation to manage the operations of schools and higher education<br>3. Skill development: Create a framework to channel corporate social responsibility investments into skill development to bridge the skills gap across sectors<br>4. Safety & Security: Adopt a unified approach to safety and security by enhancing collaboration among police, emergency services (fire and disaster management) and healthcare |

Sources: World Economic Forum, Shaping the Future of Urban Development & Services and PwC research

## 3.3. Sector-specific recommendations

The results of the survey conducted by the World Economic Forum indicate only an incremental change in the way urban infrastructure and services are being provisioned, with maximum transformation taking place in the mobility and energy domains, and few changes taking place in the areas of recreational facilities, water, waste management and sanitation. Sector-specific reforms will be required over and above other reforms to attract private-sector participation in urban development initiatives.

## 3.4. Private-sector action items

### *Engagement with the public sector*

Private companies should facilitate constructive conversation with the public sector to prevent mistrust and present their point of view on the impact of regulations. Communication between the private and public sectors must go beyond the project level and extend to industry-wide regulations to make their views count when formulating policy. External industry experts from industry bodies can engage proactively with government bodies in developing a target regulation. The private sector should refuse to give any misleading information during the bidding process, and should be open about any problems it may have regarding bidding conditions and project risks. Conscientious communication required for the delivery process is important to reinforce trust.

### *Engagement with local communities*

Although most infrastructure projects benefit the community at the city level, they may adversely impact a local community. Consultation with the community early on during the planning phase will ease local anxieties and improve the project design by taking the community's concerns into account. The consultation process may also help reduce disruptions affecting the local community during the construction phase by creating a balanced schedule and addressing its needs. Such communication should continue during the entire project phase to reduce the concerns and address the justified fears that local communities may have. The private sector must also facilitate transparent communication on the infrastructure projects' social and environmental impacts. The key considerations when engaging with communities are to keep communication succinct and to identify champions within the community who create deeper engagement.

### *Ethical conduct*

Unethical behaviour is not only unacceptable, it also presents a big risk to the private sector. Companies must establish internal procedures to guard against unethical practices, and have a framework to take legal action against any violations. When engaging with a third party, rules pertaining to performing due diligence should be in place. The private sector should take steps collectively, as a community, to ensure a corruption-free environment is created.

# Case Studies

## Public-Private Partnership for Water Supply in Nagpur, India

The city of Nagpur is known to endure severe drought and harsh weather. Water scarcity has emerged as a pressing issue there, requiring serious measures to ensure an optimum quality of life within the city. Nagpur Municipal Corporation (NMC) has piped water to over 80% of the population, with the duration of supply ranging from 2 to 12 hours in different areas. A water audit revealed 62% non-revenue water. Within this context, NMC decided to ensure better availability and lower losses and to improve the management of water services.

NMC had previous experience with public-private partnerships (PPPs) in several areas of its water supply system, and realized that the efficiency required to reduce non-revenue losses and improve the quality of service could be brought about through private-sector involvement. The partnership's implementation was planned through a special purpose vehicle (SPV) comprised of a private vendor, NMC and Nagpur Environmental Services Ltd, a subsidiary of NMC.

The operator was given a five-year transition period to understand the network and identify focus areas in which to improve efficiency. It was compensated at an operator rate for a fixed volume of 250 million litres per day (MLD) or actual metered volume billed, whichever was higher, thus assuring revenues. After the transition period, the operator was compensated on the basis of actual billing. It was also freed from certain performance standards during the transition and deductions were only applied from the sixth year onwards.

The initial improvement programme for the first five years was funded through Government of India grants for up to 70% of the approved project cost; the remaining 30% was provided by the SPV. Any cost escalations over the 30% was funded through an increase in operator rates, thus capping the risk to the SPV. The contract provided for rate adjustments based on inflation, five-yearly rate revisions to ensure a fixed internal rate of return for the vendor and rate adjustments for unforeseen circumstances due to increased

responsibilities, changes in business plans, delays/ failures not accountable to the vendor or additional capital expenditure.

The project model was initially verified through a pilot project, which provided evidence of its feasibility. Substantial benefits were observed, including an increase in billed volume from 22 MLD to 33 MLD, a reduction in non-revenue water of 12% and an incremental 5,000 connections. The project was enabled by sound financing, pragmatic risk sharing and good analysis as a result of the pilot scheme that indicated success in spite of challenges.

The overall implementation process encountered certain issues. A lack of awareness among the public led to dissent over increases in water billing. While an annual tariff hike of 5% is allowed by law, its periodic implementation was difficult and required strong political will.

The key lessons learned from this initiative are that ensuring financial sustainability and proper risk segregation are critical and are an essential feature of all capital-intensive projects. The dissemination of information to reduce dissent from the public is also essential.

Source: PwC

## Public-Private Partnership for Fare Collection in Kochi, India

Kochi is one of India's 53 urban agglomerations with more than 1 million people (according to the 2011 census) and the most populated urban area in Kerala. It is widely referred to as the commercial capital of Kerala and it has attracted heavy investments, especially in IT, real estate and retail, making it one of the fastest-growing second-tier metro cities in the country. Kochi witnessed 37.9% average growth in urban population per decade between 1981 and 2011. This rapid growth and increased economic activity resulted in the tremendous proliferation of motor vehicles, putting the transport infrastructure under stress due to its inadequacy to meet travel demands.

Kochi needed a solution to accommodate the growing population's transportation needs and to expand its transport infrastructure. It especially needed public transport options. Hence, the Government of India sanctioned a Metro Rail project for Kochi under a Special Purpose Vehicle (SPV) called Kochi Metro Rail Ltd (KMRL) for its implementation, operation and maintenance. Even though metro projects are capital-intensive, in India passenger tariffs are regulated to ensure social welfare. Thus farebox revenues, which are the major source of revenue for metro projects, are typically insufficient to cover total operating costs, mandating a strong case for KMRL to optimize costs and maximize alternate revenues.

KMRL introduced Open Loop Smart-Card-based ticketing and Automatic Fare Collection (AFC) systems through an innovative PPP model, which offered KMRL significant benefits by saving on upfront capital investments and operating expenses pertaining to AFC systems. It also provided an opportunity to garner additional revenues from annual royalty and revenue-sharing mechanisms with the private partner. In addition, the open and interoperable standards of the smart card will be leveraged to implement a common mobility solution for all of Kochi, aligned to the vision of KMRL.

A financial-institution-led consortium was appointed by KMRL to install the complex hardware and software required for fare collection and to undertake AFC system operation and maintenance. To ensure financial sustainability, the contract period was fixed at 10 years as the consortium would incur significant cash outflows due to upfront capital expenditure, and as revenues earned were expected to gradually improve over time with an envisaged seven-year breakeven period. To make sure the social welfare objective was achieved, KMRL put in place limitations on the revenue that could be collected from passengers.

The consortium will pay KMRL $33 million as royalty for co-branding rights along with a pre-specified revenue share of every non-ticketing transaction enabled by the smart card. The public sector has mitigated the contract's delivery risk and payment settlement risk by designating the financial institution as lead member of the consortium liable for all payments and services. KMRL's initiative is enabled by innovative contract structuring based on a financial-institution investment model, whereas the normal practice in metros worldwide is for the metro company to invest its own funds into the capital expenditure.

The use of the Open Loop Smart Card will significantly reduce passengers' transit time and ease congestion in the transit network. By providing a single payment mechanism for all transactions, KMRL has taken steps towards achieving financial inclusion in Kochi and creating an ecosystem for cashless transactions.

With its first-in-kind PPP model for the procurement of AFC systems, KMRL has set a good example for reducing upfront investments and increasing alternate revenues in capital-intensive metro projects. Recently, metro Nagpur has also taken steps to implement a similar PPP model for AFC systems. The model is worth emulating across other upcoming metro transit systems in India.

Source: PwC

## Public-Private Partnership for Electricity Distribution in Delhi, India

Delhi, the capital of India, has evolved over the years as one of the largest commercial centres in the country. The city has witnessed tremendous growth; its population increased from 6 million in 1981 to 16.8 million in 2011. The city has attracted Indian and multinational firms as well as talent from all across the country as part of its growth.

Starting in 1957, Delhi Electricity Supply Undertaking (DESU), working under the Municipal Corporation of Delhi, was responsible for supplying power to the city. Due to its weak operating performance, over the years the utility company suffered huge financial losses, deteriorating its net worth. In 1997, DESU was replaced by Delhi Vidyut Board (DVB) to reduce losses by improving operations. However, the power sector in the national capital continued to experience high aggregated technical and commercial (AT&C) losses (of over 50%), overwhelming financial losses ($100 million in 1996-1997 to $164 million in 1998-1999), poor maintenance of existing infrastructure, power outages and high power theft. The heavy annual allocation of funds to the state power sector (~17% of the budget) left the Government little flexibility to put priority on other key sectors. These factors led the Government of the National Capital Territory of Delhi (GNCTD) to consider private-sector participation in distribution.

In February 1999, the GNCTD published a strategy paper outlining power-sector reforms, and steps followed to restructure the DVB. In July 2011, seven companies were formed after the DVB was unbundled: the Delhi Power Company Limited (holding company), Indraprastha Power Generation Company Limited and Pragati Power Company Limited (two generation companies), Delhi Transco Limited (transmission company), as well as Yamuna Power Limited (BYPL), BSES Rajdhani Power Limited (BRPL) and North Delhi Power Limited (NDPL) (three distribution companies).

All of DVB's assets were acquired by GNCTD and its liabilities were transferred to a holding company specifically created for the purpose; the entire equity of the holding company was issued to GNCTD. The assets were then transferred from GNCTD to successor entities. Of the total liabilities, only the serviceable liabilities were transferred to successor entities.

The distribution companies were subsequently privatized, with private partners holding 51% of the equity. The successful bidders were selected on the basis of AT&C loss-reduction scenarios for the next five years.The distribution companies were assured a post-tax return on equity of 16%.

The main challenges during privatization were transitioning manpower from DVB to the successor companies, dealing with the outstanding state liabilities and valuating the assets. To address them, employee support was ensured through a tripartite agreement guaranteeing the non-retrenchment of employees and continued service in the successor companies on the same terms and conditions as prior to their transfer. The retirement benefits of existing DVB employees and retirees were also ensured. It was decided that DVB's past unserviceable liabilities and losses would not be passed on to the successor companies so they could start with clean opening balance sheets. Since no fixed asset details were available for valuation, a business valuation method was adopted to value them.

The execution of the partnership was made possible by the collective efforts of the Government's leadership, corporate support and consumer cooperation. The privatization model's features ensured mutual risk sharing as well as risk-hedging mechanisms that enabled the private parties to provide significant investment upfront. Incentives linked to the over-achievement of targets (to retain 50% of the additional revenue resulting from the better performance) encouraged the distribution companies to continuously perform better. As a result, all three companies reduced their AT&C losses drastically over the years (BYPL reduced AT&C losses from 57% in 2002 to 22% in 2011; BRPL from 48% in 2002 to 19% in 2011; and NDPL from 48% in 2002 to 13% in 2011).

This case's key lesson is that the potential for reducing losses proved to be considerably higher through a PPP than through the DESU to DVB transition. Moreover, upfront investment by the distribution companies along with transitional support from GNCTD helped them to build momentum in the initial phase and sustain it over the long term.

The identical tariff for the distribution companies during the transition period enabled the companies to focus on reducing AT&C losses, which complemented the Government's financial support. The success of this model had made it worthy of replication by other power utilities.

Source: PwC

## Public-Private Partnership in Waste Management in Pune, India

Pune is the second largest metropolis in the state of Maharashtra. The city with its over 3 million occupants (in 2011) spread over 244 square kilometres is changing from a pensioner's city into an education and information technology hub. This has allowed it to develop a cosmopolitan culture with a modern flavour.

Pune generates around 1,500-1,600 tons per day of municipal solid waste within its limits. This waste was mostly dumped without processing at the Urali-Devachi landfill site (located 22 km from the city) until 2010 when the site exceeded its waste disposal capacity, leading to critical environmental and health-related problems, such as groundwater pollution and hazards to nearby villagers due to frequent fires at the landfill.

Pune Municipal Corporation (PMC) was thus forced to look for alternative methods of waste management (its treatment and disposal in particular) that were less land-intensive and more technologically advanced and inclusive in nature, while involving local livelihood opportunities. It needed to find a solution that would integrate the informal sector for solid waste management, convert refuse to biogas, convert waste to energy and provide an easy way to collect and manage waste-related data.

A PPP became the preferred option, owing to the need for investment in a waste treatment plant and for advanced technology to achieve the project's objectives. PMC decided on a management contract with private operators in which the infrastructure was funded by the urban local body, and responsibility for the technology and successful operations for five years was transferred to the contractor. Risk segregation was ensured by the clear division of responsibility between the corporation and the private operator. While PMC took responsibility for the provision of the infrastructure, clearances, waste collection and segregation, the private operator was responsible for the design, construction and operations, as well as municipal staff capacity building.

Financial sustainability was ensured through revenue streams from the operator's sale of electricity, manure and carbon credits. The payback period was six years. PMC was able to integrate the informal sector and employ the services of 5,500 waste pickers for waste management activities across 400,000 households. The cost to transport 7-8 tons a day of waste to landfills was avoided through this project and the plants were able to generate 400 kilowatt hours of energy per day.

The PMC case offers a classic example of the proper planning and implementation of a waste management system. It averted heavy investment, avoided livelihood losses and promoted social inclusion by involving female waste collectors who are presently the breadwinners of their families. The project also exhibited an effective selection of technology suitable to Indian conditions and easy to implement and maintain.

Source: PwC

## Public-Private Partnership in Advanced Radiology in Andhra Pradesh, India

The state of Andhra Pradesh has a population of 84 million. Its public healthcare system suffers from various challenges that lead to inefficient service delivery. The Advanced Radiology Services project was launched by the state government to provide advanced radiological services in four medical colleges in Vishakhapatnam, Warangal, Kurnool and Kakinada. It had a distinct set of outcomes: to be patient centric (affordable, providing quality services and better health outcomes); to be population centric (providing job opportunities for skilled labour and professionals, thereby improving economic growth); to be facility centric (improving capabilities, service availability and the waiting time for treatment commencement at medical colleges); to be system centric (enhancing the government's capacity to commission other PPP projects and mobilizing private-sector efficiency for quality-service delivery). Prior to this project, the provision of advanced radiological services in public health facilities was limited, which was a major concern in second- and third-tier cities and towns in the state as the services were primarily being provided by private medical centres. This meant patients had to pay for services at market rates, thereby increasing their out-of-pocket expenses and the overall cost of healthcare services.

The project was funded by $444,000 of "viability gap funding" for the construction of facilities and by a maximum

annual service fee of $290,000 from the government. It provided basic infrastructure along with $26 for every referral case to the provider for services. In return, the provider supplied radiological services to all “referrals cases” within 12 hours, and to all “emergency referrals cases” within two hours of referral.

The project was monitored according to specific technical requirements and performance standards. A liaison committee (with representatives from the government and the provider) was also formed to jointly manage and resolve administrative issues related to operations. Association with the International Finance Corporation (IFC), which served as a transaction adviser, increased the private operator’s comfort level to participate in the project, due to the IFC’s credibility, technical expertise and understanding of PPP health transactions. The liaison committee was also useful in obtaining approvals/authorizations for the project. The biggest challenge for the government proved to be bringing all teaching hospitals on board to cooperate and work in partnership.

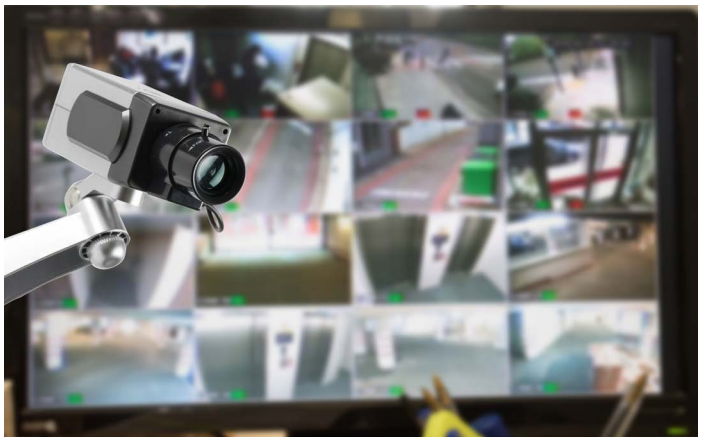
The key outcomes of the project were:

– Patient centricity in terms of the accessibility, availability, affordability and quality of services, enhancing the public’s awareness of these services
– Facility centricity in terms of uninterrupted availability and improvement in the quality of services; increased clinical effectiveness, better diagnoses and prescription of targeted treatment and care; increased patient footfall; reduction in cycle time for the provision of medical assistance/treatment; improved training facilities for students
– System centricity in terms of the reduction in government expenditure; increased numbers of PPP initiatives within the state

The provision of services through a PPP results in larger social impact, making treatment affordable, available and accessible to the poor, as demonstrated by this project. Financial support from the government enhanced the project’s attractiveness; full subsidization for government referred patients improved the utilization of services; and tertiary-care hospitals provided better volumes of cases for radiology PPP projects. Robust monitoring and reporting mechanisms were key to achieving the envisaged outcomes, along with the political willingness and clarity of vision of the government.

Source: PwC

## Public Procurement for a Surveillance System across Multiple Cities in Maharashtra, India



With a population of over 110 million, Maharashtra is the world’s second-most populous subnational entity. It is the largest contributor to India’s GDP. Its high crime rates prompted the home department to improve overall state security measures through a closed-circuit television (CCTV) surveillance system to assist the police in maintaining law and order. To pursue these obligations, the Government of Maharashtra implemented a comprehensive security management system for Mumbai, Pune and Nasik. The beneficiaries of the project included the municipal corporations and these cities’ over 20 million citizens.

The project’s vision included implementing a holistic and integrated video surveillance system for cities in Maharashtra in order to enhance safety and security there. The system aids investigations, improves traffic management and helps deter, detect and thus deal with criminal activity. The video surveillance data from various cameras are monitored at command and control and viewing centres. The system also encompasses various analytic features, such as facial recognition, gunshot detection, video analyses and number plate recognition, to improve the efficiency of the police and enhance their decision support system. The project also includes the installation of signboards at various junctions denoting the area is under surveillance, acting as a deterrent to crimes. The system is designed for connection to other government databases, those pertaining to vehicles, prisons, courts, crimes and criminals, etc., aiming at comprehensive and productive security coverage in the state. The Government of Maharashtra has also released a voluntary code of practice that provides guidelines to various public and private institutions for the installation of the CCTVs.

The main challenge encountered during project implementation was the fact that more than 10 different permissions from various government departments were needed to carry out the work. To solve this issue, a high-powered committee, headed by the chief secretary of the Government of Maharashtra and comprised of representatives from all the stakeholders groups, was formed to ensure smooth and timely project completion.

CCTV footage in Pune and Nasik has helped more than 250 crimes/accidents be detected or prevented. The initial success of this project has paved the way for numerous CCTV surveillance projects in India. So far, more than 10 across the country have been modelled along the lines of this project. Support from government organizations and coordination among all the stakeholders are essential drivers for the success of any initiative that leverages the services of a private player.

Source: PwC

## Improving Sanitation and Hygiene in Schools in Kenya

The water and sanitation as well as hygienic conditions in Kenyan schools are below standard. Only 29% of schools in the country have access to water and sanitation facilities. The Ministry of Education, Science and Technology rates accessibility to water and sanitation facilities in the country's schools as dangerous, implying that over 100 pupils share a single latrine.

The absence of facilities and poor hygiene affect both girls and boys, although inadequate sanitary conditions in schools have a stronger negative impact on girls. More than half of the schoolgirls who drop out of school during upper primary education do so because they miss school particularly during their menstrual periods, due to the lack of sanitary napkins, no separate toilet facilities and inaccessibility to water sources within the schools.

Schools are key in initiating change by helping to develop useful life skills on health and hygiene. The East African countries have incorporated hygiene and sanitation in schools in their environmental health interventions, and policies have been developed to support this initiative. Although the main focus is providing water and sanitary facilities, other elements of school health, as advocated by the World Health Organization, are being considered.

Kenya is currently implementing a national programme on Personal Hygiene and Sanitation Education (PHASE). This model was developed by the African Medical and Research Foundation in collaboration with the Government through the Ministries of Education and Health, with funding from a private-sector company. The PHASE model is designed to help primary-school children take responsibility for their own health and to convey messages to their communities on sustainable hygiene behaviour change.

Through PHASE, teachers and pupils are trained on appropriate hygiene practices. The teachers act as trainers of facilitators, while the pupils are trained using health clubs and peer learning approaches. In this way the trained teachers and pupils both train others, including in neighbouring communities. Simultaneously, school management committees are supported to develop water and sanitation facilities, including latrines, hand-washing facilities and waste disposal systems.

Improved school sanitation and hygiene education lead to health, and social and economic benefits, including increased learning opportunities for children and reduced child deaths related to preventable causes. Increasing the number and standard of school latrine facilities would decrease dropout rates, especially for adolescent girls.

Water and sanitation facilities are increasingly recognized as fundamental to promote appropriate hygienic behaviour and children's well-being. However, many schools have unsanitary conditions that vary from inappropriate and inadequate sanitary facilities to the outright lack of latrines and safe drinking water. Therefore, providing adequate water and sanitation facilities coupled with ensuring proper hygiene in schools are essential to enhance effective learning, attract enrolment in schools, particularly of girls, and reduce the burden of disease and worm infestation among pupils.

(This case study is an abstract of the "WELL FACTSHEET – Regional Annex East Africa School Sanitation and Hygiene Education (SSHE)", written by Gerald Rukunga and David Mutethia, African Medical and Research Foundation, January 2006, which is available at http://www.washinschools.info/page/160.)

## Improving Sanitation and Hygiene in Bangladesh

According to the World Health Organization and UNICEF's Progress on Sanitation and Drinking Water: 2015 Update and MDG Assessment, 39% of the population of Bangladesh, amounting to more than 60 million people, do not have access to safe, hygienic sanitation. The diarrhoeal diseases that are spread as a result have a significant negative impact on public health and the nation's economy. The majority of latrines constructed in rural Bangladesh have low-quality plastic pans that provide no means of isolating waste and the pathogens it contains from future direct or indirect human contact. These latrines act as breeding grounds for flying insects and disease transmission.

To help people in Bangladesh improve access to safe and hygienic latrines, an inexpensive product using a new technology was designed by a steering committee member of the Toilet Board Coalition, which is a global alliance of leading companies and sanitation experts that aims to develop sustainable and scalable solutions to the sanitation crisis, with a 2012 grant from the Bill & Melinda

Gates Foundation. The resulting innovation – a new and improved toilet – is designed and developed so that it automatically seals pit latrines against foul odours and disease transmitting insects. The toilet pan is sold at an affordable retail price of under $2. To further accelerate the adoption of this simple yet affordable technology, the "Flush for Good" campaign, which was held during 2013 and 2014, was launched to increase awareness of the global sanitation crisis and to improve quality of life in developing countries. As a result, the toilet is now used by more than 4 million people in Bangladesh and worldwide.

Through this programme, one of these new toilets was donated for every one of a particular model of toilet sold in North America. Through the programme, more than 800,000 toilets have been distributed in Bangladesh, Uganda, Haiti, Nepal, Nigeria and the Philippines.

In the spirit of leveraging the powerful influence of public-private partnerships, the distribution of the hygienic toilet pans to underprivileged communities in need of safe plumbing solutions to the sanitation crisis has been facilitated in collaboration with non-governmental organizations, BRAC (an international development organization based in Bangladesh), WaterAid, UNICEF, Save the Children, Water for People, Food for the Poor and Plumbers Without Borders.

Based on the initial success of the new hygienic toilet pan, an improved latrine product for Sub-Saharan Africa is being designed and developed with a second grant from the Bill & Melinda Gates Foundation. The models under development are designed to operate effectively with minimal quantities of water and can be installed without the use of concrete, to further bring down the installation costs.

The sanitation needs of those at the base of the economic pyramid are often overlooked. Focused product development using best-in-class tools, methodologies and know-how can be very effective in bringing affordable innovations to developing country markets. At the same time, there is often minimal awareness, thus dampening the demand for proper sanitation in many developing communities. The public and private sectors worldwide can do more together to promote the critical importance of clean and safe sanitation to improve people's quality of life and prevent the spread of disease.

(This case study was provided by LIXIL Group Corporation (Japan).)

## 3.5 State Specific Action Items

World Economic Forum's Survey on Smart City identified risks in public private partnership across three states of India – Maharashtra, Gujarat and Andhra Pradesh. The table below list the top risks in the state and the reforms required to address the challenges.

| State | Risks in Public Private Partnerships | Recommendations |
|---|---|---|
| Andhra Pradesh | 1. Risk in obtaining environment & other permit risk (e.g. delay in permits)<br>2. Market distortion risk & Corruption risk (e.g. opaque procurement processes)<br>3. Cancellation & change of scope risk (e.g. rejection of contract by approving body)<br>4. Community risk (e.g. non-approval from local population)<br>5. Breach of contract risk (e.g. denial of payment) | 1.1 Develop and institutionalize single-window systems by integrating various departments under a common IT platform<br>1.2 Develop standard operating procedures for granting permits and conducting inspections<br>1.3 Create a single approval authority for granting permits<br>1.4 Develop frameworks for risk-based approvals<br>2.1 Mandate e-tendering to increase transparency<br>2.2 Strict implementation of anti-corruption and transparency standards<br>3.1 Establish non-partisan alignment on infrastructure vision and strategic decisions<br>4.1 Involve all stakeholders (citizens, NGOs, Academic Institutions, Private Sector) during the lifecycle of urban development projects<br>5.1 Develop legal architecture conducive to preserving established principles |

| State | Risks in Public Private Partnerships | Recommendations |
|---|---|---|
| Gujarat | 1. Risk in obtaining environment & other permit risk (e.g. delay in permits)<br>2. Market distortion risk & Corruption risk (e.g. opaque procurement processes)<br>3. Community risk (e.g. non-approval from local population)<br>4. Cancellation & change of scope risk (e.g. rejection of contract by approving body)<br>5. Judicial risk (e.g. lack of predictability of timelines of court decisions) | 1.1 Develop and institutionalize single-window systems by integrating various departments under a common IT platform<br>1.2 Develop standard operating procedures for granting permits and conducting inspections<br>1.3 Create a single approval authority for granting permits<br>1.4 Develop frameworks for risk-based approvals<br>2.1 Mandate e-tendering to increase transparency<br>2.2 Strict implementation of anti-corruption and transparency standards<br>3.1 Involve all stakeholders (citizens, NGOs, Academic Institutions, Private Sector) during the lifecycle of urban development projects<br>4.1 Establish non-partisan alignment on infrastructure vision and strategic decisions<br>5.1 Accommodate alternate dispute resolution mechanisms in contracts<br>5.2 Establish special courts for infrastructure projects<br>5.3 Develop technology-based solutions to accelerate the resolution of disputes |
| Maharashtra | 1. Market distortion risk & Corruption risk (e.g. opaque procurement processes)<br>2. Risk in obtaining environment & other permit risk (e.g. delay in permits)<br>3. Cancellation & change of scope risk (e.g. rejection of contract by approving body)<br>4. Community risk (e.g. non-approval from local population)<br>5. Breach of contract risk (e.g. denial of payment) | 1.1 Mandate e-tendering to increase transparency<br>1.2 Strict implementation of anti-corruption and transparency standards<br>2.1 Develop and institutionalize single-window systems by integrating various departments under a common IT platform<br>2.2 Develop standard operating procedures for granting permits and conducting inspections<br>2.3 Create a single approval authority for granting permits<br>2.4 Develop frameworks for risk-based approvals<br>3.1 Establish non-partisan alignment on infrastructure vision and strategic decisions<br>4.1 Involve all stakeholders (citizens, NGOs, Academic Institutions, Private Sector) during the lifecycle of urban development projects<br>5.1 Develop legal architecture conducive to preserving established principles |

Source: World Economic Forum, Shaping the Future of Urban Development & Services, World Economic Forum, Strategic Infrastructure Mitigation of Political & Regulatory Risk in Infrastructure Projects, 2015, World Economic Forum, Shaping the Future of Urban Development & Services, India Survey on Smart Cities (Oct.-Dec. 2015)

# 4. Way Forward

Urban infrastructure is the foundation for sustained economic development. Quality urban infrastructure and services ensure economic growth, social equity and environmental sustainability. Technology can be an important enabler for cities in India to leapfrog stages of urban development, but India must continue to improve its regulatory environment and urban governance in order to create a platform where technology can provide benefits. A clear long-term vision and focused pragmatic leadership are essential to guide cities through the reforms needed. Cities in India will have to gradually develop institutional strength and usher in decisive transformations to create an environment where the private sector can contribute to urban rejuvenation.

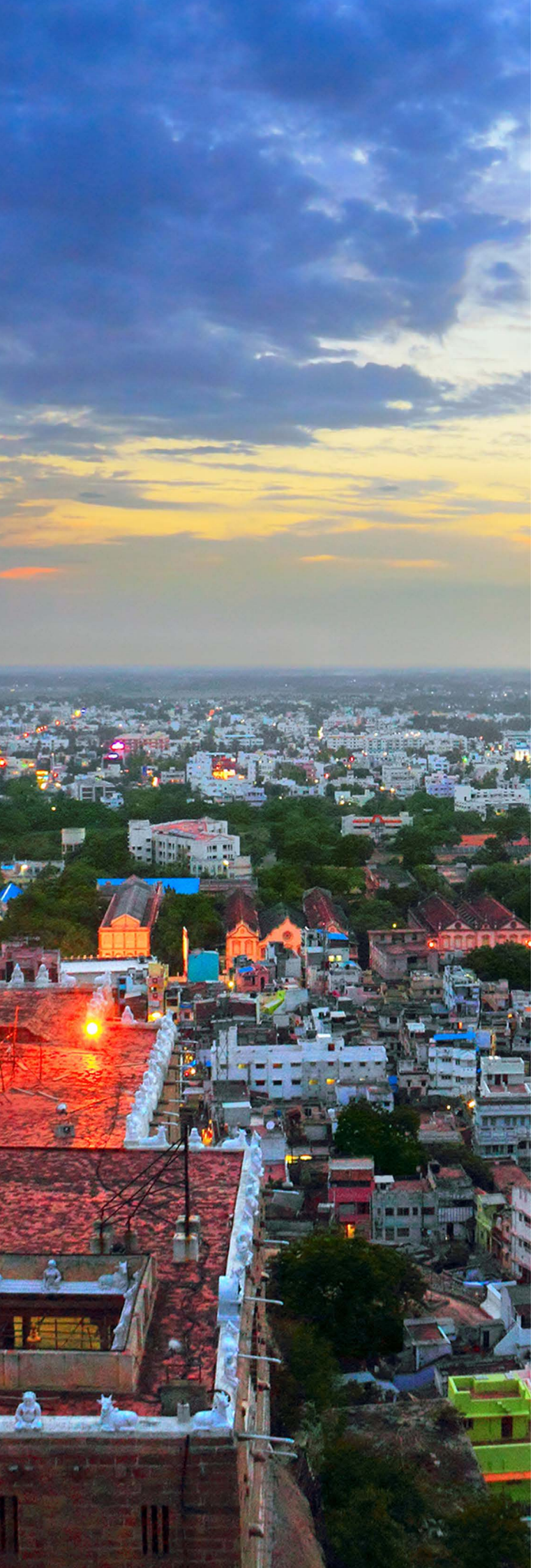
Reforms are required at the various tiers of government to accelerate the implementation of urban development programmes. When implementing a string of reforms, it is important to prioritize the reforms to provide signals to industry about the direction of the changes, to showcase quick wins and to ensure progress on the long-term reform agenda. An indicative approach to the reform process is provided in Table 4.

Dedicated effort will be required by all stakeholders to create an environment where a balance is achieved between the private sector's goal to achieve maximum returns and the public sector's goal to achieve social welfare at minimum cost. Such an environment cannot be created over a short span of time and will require sustained effort over a long period. The effort will be worth it as it will reduce the gaps in service delivery and will benefit society in general, and its vulnerable sections in particular. It is hoped that cities in India will accelerate the reform process to accelerate the development of infrastructure and services.

**Table 4:** Reforms Prioritization Matrix

| Reform Category | Short Term (within one year) | Long Term (over one to three years) |
|---|---|---|
| **Institutional Reforms** | 1. Improve internal processes through the adoption of e-governance systems and the standardization of financial statements<br>2. Augment technical and managerial capacity with external handholding support<br>3. Engage the private sector, academic institutions, NGOs and citizens across all phases of urban development<br>4. Improve monitoring mechanisms and measure services against benchmarks; adopt open data platforms for citizen audits | 1. Establish strong leadership at the city level by empowering mayors and bring all urban planning and administrative bodies in a city under unified command<br>2. Enhance revenue streams through adequate user charges and improved collection efficiency<br>3. Augment capacity with internal competency development to "manage by knowledge" vs the current practice to "manage by authority" |
| **Business Environment Reforms** | 1. Develop and institutionalize single-window systems by integrating various departments under a common IT platform<br>2. Outsource the certification of non-critical compliances where capacity does not exist<br>3. Develop standard operating procedures for granting permits and conducting inspections<br>4. Introduce service levels for granting permission and develop a framework for deemed approvals<br>5. Develop single points of information access, with data consolidation through open APIs<br>6. Publicize single points of information access to enhance awareness among the business community<br>7. Institutionalize procedural reforms through standardized documentation, GIS systems and single-window clearance<br>8. Adopt land tools, such as the Community Land Trust, Guided Land Development, Land Pooling and Land Sharing, to accelerate land acquisition in urban development projects<br>9. Institutionalize independent evaluations to ensure fairness to participating companies<br>10. Mandate e-tendering to increase transparency<br>11. Accommodate alternate dispute resolution mechanisms in contracts | 1. Create a single approval authority for granting permits<br>2. Develop a comprehensive policy that unifies all compliance and statutes for easier construction and operational permits<br>3. Augment capacity (with internal competency development)<br>4. Develop frameworks for risk-based approvals<br>5. Develop online support mechanisms to address the concerns of stakeholders in urban development<br>6. Develop a compulsory purchase framework for strategic infrastructure development that addresses the needs of all stakeholders<br>7. Create a nodal agency to standardize procurement procedures and documents across all ULBs and parastatals making procurements for urban rejuvenation programmes<br>8. Establish special courts for infrastructure projects<br>9. Develop technology-based solutions to accelerate the resolution of disputes |
| **Sector-Specific Recommendations** | 1. Empower the provider (private sector or concerned line department) to terminate connections for users who default on payments of user charges (water and power)<br>2. Incentivize infrastructure developers to harvest rainwater and to adopt localized solutions for recycling<br>3. Conduct information, communication and educational programmes in cities in general and schools in particular to increase awareness and drive behaviour change about open defecation and the segregation of waste<br>4. Incentivize localized solutions to reduce the load on the ULB (waste and water recycling)<br>5. Provide a collaboration platform for state-controlled entities to interact with ULBs (which are responsible for urban rejuvenation programmes) to promote the use of renewables and low-energy consumption devices, and initiate waste-to-energy programmes<br>6. Review the non-performing asset norms for the sector and facilitate long-term financing for infrastructure development<br>7. Create a framework to channel corporate social responsibility investments into skill development to bridge the skills gap across sectors | 1. Ensure 100% functioning meters to enhance billing and determine leakage points (water and power)<br>2. Establish and empower independent regulators to determine user charges (water, waste and sanitation, power and mobility)<br>3. Adopt an integrated approach towards urban planning with special emphasis on integrated urban mobility<br>4. Discourage the use of private vehicles through congestion charges, promote the sharing of capacities within vehicles (carpooling), and provide alternate modes of public transport<br>5. Test and develop sustainable business models for private-sector participation in primary healthcare to improve geographical, financial and technological access to vulnerable sections |

Sources: World Economic Forum, Shaping the Future of Urban Development & Services and PwC research



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