McKinsey Global Institute




April 2010

India's urban awakening: Building inclusive cities, sustaining economic growth

The McKinsey Global Institute

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India's urban awakening: Building inclusive cities, sustaining economic growth

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Preface

The choices that India makes to manage the process of its urbanization will have profound consequences for its people and its economic future. But the approaches India's policy makers take will have much broader resonance beyond their own borders. Worldwide, the search for new sources of growth and new market opportunities is on—and how India performs over the next 20 years is of acute interest globally.

India's urban awakening: Building inclusive cities, sustaining economic growth describes the findings of the research that the McKinsey Global Institute (MGI) launched 21 months ago in collaboration with the India office of McKinsey & Company. The purpose of this research project was to understand how India's urbanization might evolve, explore the many problems facing India's fast-growing cities and what policy makers can do to mitigate the strains of urban life in India and maximize the opportunities offered by cities.

MGI developed an econometric model to study the implications of urbanization at the local, state, and national levels, and the economic and demographic impact on the 70 largest cities in India. We supplemented all modeling with in-depth analyses of 15 Indian cities and engaged in discussions with more than 100 Indian and international urban experts and economists, and with officials in state and local governments. We also held workshops with the political and administrative leaders of five international cities—Johannesburg, London, New York, Shanghai, and Singapore.

Ajit Mohan, a consultant based in Delhi, led this project, with overall guidance from Shirish Sankhe, Ireena Vittal, and Richard Dobbs. The core team comprised Ankur Gulati, Sudipto Paul, Gurpreet Sethy, and Aditya Sanghvi. Venu Aggarwal, Pranab Banerjee, Prachee Banthia, Somnath Chatterjee, Karam Malhotra, Suharsh Sinha, Mukund Sridhar, Vibhor Srivastava, Kshitij Vijayvargiya, and Niveditha Viswanathan contributed to this effort. The team also benefited from the contributions of Alex Kim, an MGI fellow based in Seoul, and Susan Lund, MGI Director of Research.

The econometric modeling team comprised Jonathan Ablett, Shishir Gupta, Ujjyaini Mitra, and Prasenjit Ghosh, and was ably guided by our external modeling expert, Geoffrey Greene.

We would also like to thank Janet Bush, MGI senior editor, who provided editorial support; Rebeca Robboy and Sunali Rohra, external communications managers for MGI and McKinsey in India, respectively; as well as Marisa Carder, Nipun Gosain, Therese Khoury, and J. Sathya Kumar, visual graphics specialists. We are grateful for the outstanding support of our administrative staff over the last two years, including Pallavi Agarwal, Surbhi Duggal, Audrey Mendes, Noora Michael, and Teenaa Mistry.

We appreciate the vital input and support of numerous McKinsey colleagues around the world. In particular, we would like to thank Rajat Kumar Gupta for his support through the last two years. We also valued the inputs of Janamitra Devan, Noshir Kaka, Laxman Narasimhan, Stefano Negri, Nitin Seth, and Jonathan Woetzel.

Distinguished experts outside of McKinsey provided invaluable insights and advice. In particular we would like to thank the members of our academic advisory committee: Dr. Isher Judge Ahluwalia, chair of the Indian Council for Research on International Economic Relations (ICRIER) and chair of the High Powered Expert Committee on Urban Infrastructure; Dr. Suman Bery, director general of the National Council of Applied Economic Research in India (NCAER); Om Prakash Mathur, professor of urban economics and finance at the National Institute of Public Finance and Policy in India (NIPFP); and Ramesh Ramanathan, cofounder, Janaagraha, a not-for-profit institution focused on urban reforms.

We gained from the inputs provided by Alain Bertaud, former principal urban planner for the World Bank; Vernon Henderson, professor of economics and urban studies at Brown University; and Rakesh Mohan, senior advisor to MGI.

Our business advisory committee, including Adi Godrej, chairman of the Godrej group; K. V. Kamath, non-executive chairman of ICICI Bank; Anand Mahindra, vice chairman and managing director, Mahindra and Mahindra Ltd.; Nandan Nilekani, cofounder and former CEO of Infosys Technologies Ltd.; and Deepak Parekh, chairman of Housing Development Finance Corporation, provided helpful thoughts during the course of our work.

We would like to offer special thanks to the Ministry of Statistics and Programme Implementation and the National Council of Applied Economic Research in India (NCAER) for their valuable collaboration. Much of our underlying data sets were derived from government departments and NCAER. Further we are grateful for the counsel provided by Dr. Pronab Sen, chief statistician, Ministry of Statistics and Programme Implementation, and Dr. Rajesh Shukla at NCAER.

We sincerely appreciate the valuable discussions conducted with several central and state government officials: Arun Maira, member of the Planning Commission of India; M. Ramachandran, secretary of the Ministry of Urban Development (MoUD); Kiran Dhingra, secretary, Ministry of Housing and Urban Poverty Alleviation (MoHUPA); P. K. Srivastava and A. K. Mehta, joint secretaries of MoUD; S. K. Singh and Dr. P. K. Mohanty, joint secretaries, MoHUPA; Manu Srivastava, secretary, Urban Development, Government of Maharashtra; and Urvinder Madan, project manager of Mumbai Transformation Support Unit.

We would also like to thank Narinder Nayar, chairman of Bombay First, Shubhagato Dasgupta, consultant to the High Powered Expert Committee on Urban Infrastructure, and Swati Ramanathan, chairperson, India Urban Space Foundation, for providing us with their valuable perspectives.

This report contributes to MGI's mission to help global leaders understand the forces transforming the global economy, improve company performance, and work for better national and international policies. As with all MGI research, we would like to emphasize that this work is independent and has not been commissioned or sponsored in any way by any business, government, or other institution.

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Opportunity of India's urbanization to 2030

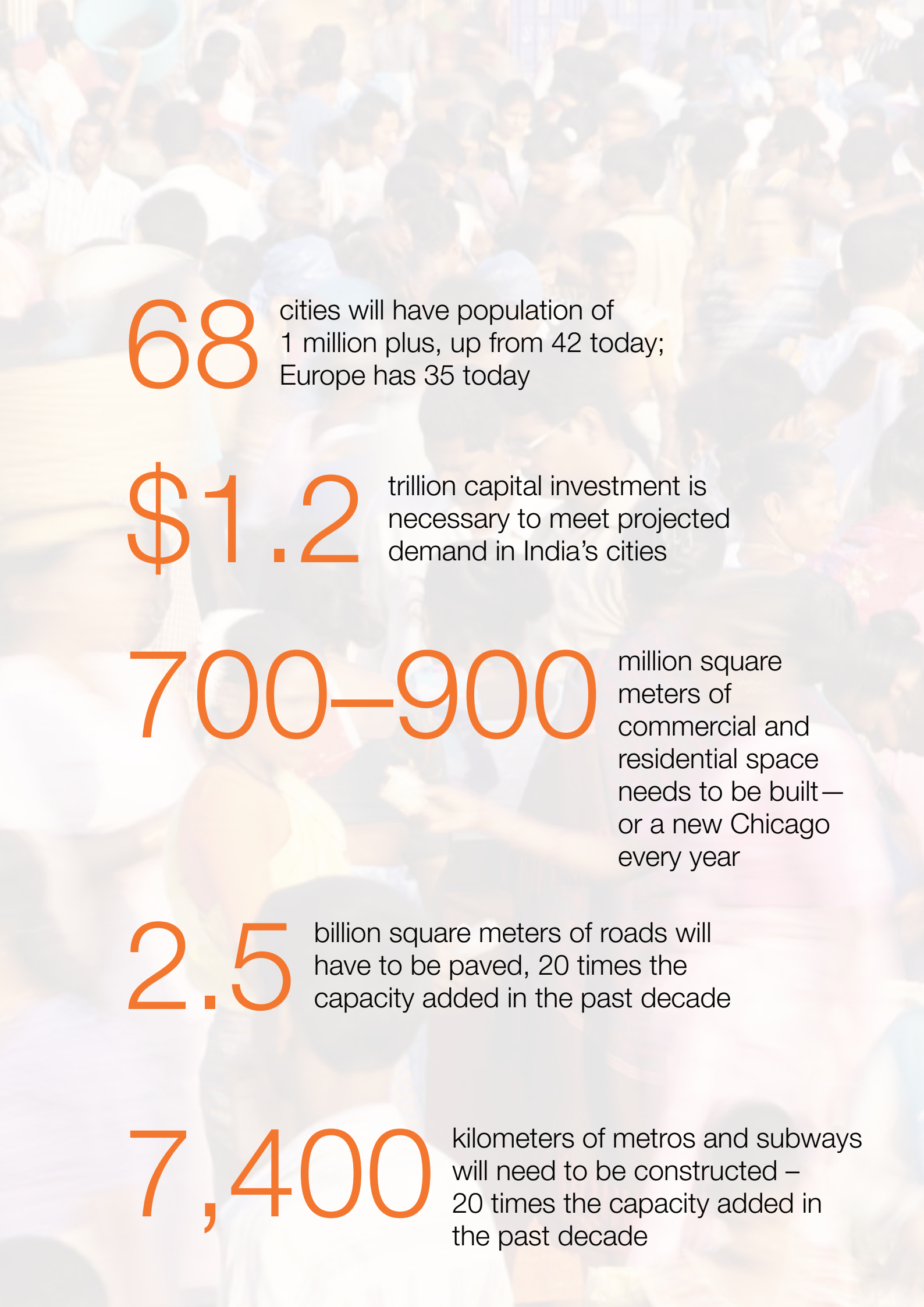
5 times – the number by which GDP will have multiplied by 2030

590 million people will live in cities, nearly twice the population of the United States today

270 million people net increase in working-age population

70 percent of net new employment will be generated in cities

91 million urban households will be middle class, up from 22 million today



68 cities will have population of 1 million plus, up from 42 today; Europe has 35 today

$1.2 trillion capital investment is necessary to meet projected demand in India's cities

700–900 million square meters of commercial and residential space needs to be built—or a new Chicago every year

2.5 billion square meters of roads will have to be paved, 20 times the capacity added in the past decade

7,400 kilometers of metros and subways will need to be constructed – 20 times the capacity added in the past decade

Contents

Executive summary

India is on the move. Economic reform has already unleashed investment and growth, offering its citizens rich opportunities. Although the Indian economy has been resilient so far, the key issue now is how to sustain this momentum. Turning around its cities and releasing their dynamism will be critical to India's future economic growth.

Unlike many countries that are grappling with aging populations and rising dependency ratios, India has a young and rapidly growing population—a potential demographic dividend. But India needs thriving cities if that dividend is to pay out. New research by the McKinsey Global Institute (MGI), the economics and business research arm of McKinsey & Company, estimates that cities could generate 70 percent of net new jobs created to 2030, produce more than 70 percent of Indian GDP, and drive a near fourfold increase in per capita incomes across the nation.

Surging growth and employment in cities will prove a powerful magnet. India's urban population grew from the 290 million reported in the 2001 Census to an estimated 340 million in 2008, and MGI projects that it could soar further to 590 million by 2030. This urban expansion will happen at a speed quite unlike anything India has seen before. It took nearly 40 years (between 1971 and 2008) for India's urban population to rise by 230 million. It could take only half that time to add the next 250 million.

The speed of urbanization poses an unprecedented managerial and policy challenge—yet India has barely engaged in a national discussion about how to handle this seismic shift in the makeup of the nation. Indeed, India is still debating whether urbanization is positive or negative and whether the future lies in its villages or cities. This is a false dichotomy—villages and cities are interdependent and symbiotic.

In fact, the urban economy will provide 85 percent of total tax revenue, which will finance development nationwide. And some 200 million rural Indians who live in proximity of India's largest 70 cities will directly benefit. But cities themselves are not just home to the prosperous. Far from it. Some 75 percent of urban citizens live in the bottom income segments, earning an average of 80 rupees (around $1.80) a day. Addressing life in India's cities is clearly not an elitist endeavor but rather a central pillar of inclusive growth.

The cost of not paying attention to India's cities is enormous. Today's policy vacuum risks worsening urban decay and gridlock, a declining quality of life for citizens, and reluctance among investors to commit resources to India's urban centers. We believe that the lack of serious policies to manage urbanization could jeopardize even the 7.4 percent growth rate we assume in our base case, risking high unemployment (see box 1, "Growth assumptions").

MGI conducted a 21-month-long study to understand India's urbanization, to identify what was holding back India's cities and what policy changes could transform the situation on the ground. To create a fact base around which to analyze India's urbanization, MGI developed an econometric model and nine sector models that use baseline forecasts of economic growth to understand the implications of urbanization

at the national, state, and city levels. We supplemented our modeling with in-depth analyses of 15 Indian cities and 6 global cities, and engaged in discussions with more than 100 Indian and international experts, urban economists, and state and local governments.

This process has produced a set of recommendations, the vast majority of which India could implement within five to ten years as long as it musters the required political will.

If India were to implement these recommendations, it could not only transform the prospects of its cities but also boost nationwide economic growth. Estimating the impact is not straightforward, but we believe that carrying out the reforms described in this report has the potential to add as much as 1 to 1.5 percent to national annual GDP growth. This additional growth would bring the nation close to meeting the aspiration voiced recently by the Prime Minister of achieving double-digit growth.

Box 1. Growth assumptions

MGI assumes an 8.0 percent annual GDP growth rate between 2009 and 2018, stabilizing to 7.0 percent between 2018 and 2030. From 2008 to 2030, therefore, annual GDP growth is an average of 7.4 percent. We take this projection from Oxford Economics. Oxford Economics' projections are in the middle range of analysts' estimates, and we regard them as conservative.

India, of course, needs to grow at rates faster than these conservative assumptions. In fact, MGI noted in its 2001 report *India: The growth imperative* that India needs to grow its GDP at close to 10 percent a year to create enough employment for the nation's young and growing population. The report argued that double-digit growth would be possible if India were to push aggressively to remove barriers in product, land, and labor markets. While India has made considerable progress, it needs to do more; the case for further reforms remains as compelling today as it was in 2001. [1]

CITIES WILL BE CENTRAL TO INDIA'S ECONOMIC FUTURE

Cities already matter to India. By 2008, an estimated 340 million people already lived in urban India, representing nearly 30 percent of the total population. Over the next 20 years, urban India will create 70 percent of all new jobs in India and these urban jobs will be twice as productive as equivalent jobs in the rural sector.

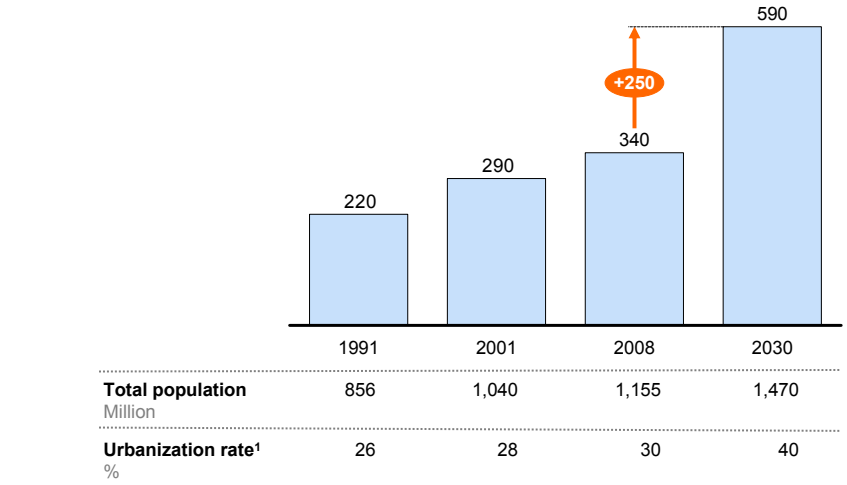
As a consequence, MGI projects that the population of India's cities will increase from 340 million in 2008 to 590 million by 2030—40 percent of India's total population (Exhibit 1). In short, we will witness over the next 20 years an urban transformation the scale and speed of which has not happened anywhere in the world except in China.

Urbanization will spread out across India, impacting almost every state. For the first time in India's history, the nation will have five large states (Tamil Nadu, Gujarat, Maharashtra, Karnataka, and Punjab) that will have more of their population living in cities than in villages (Exhibit 2).

1 For a discussion of economic reform in India, see *India: The growth imperative*, McKinsey Global Institute, September 2001, and *Accelerating India's growth through financial sector reform*, McKinsey Global Institute, May 2006. Both reports are available at www.mckinsey.com.

Exhibit 1

In MGI's base-case scenario, cities are likely to house 40 percent of India's population by 2030



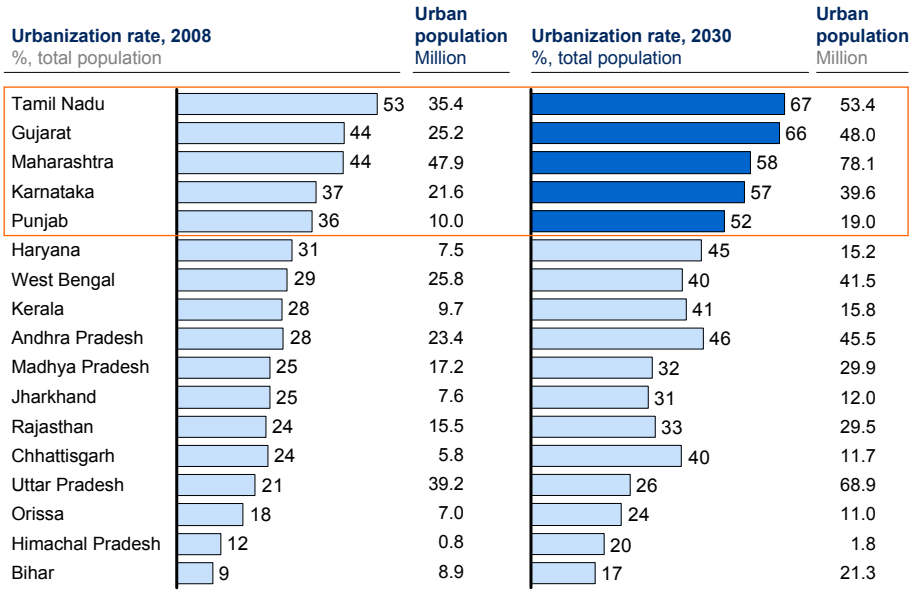
	1991	2001	2008	2030
Total population Million	856	1,040	1,155	1,470
Urbanization rate[1] %	26	28	30	40

1 Defined as the ratio of urban to total population based on the census definition of urban areas; population >5,000; density >400 persons per square kilometer; 75 percent of male workers in nonagricultural sectors; and other statutory urban areas.

SOURCE: India Urbanization Econometric Model; McKinsey Global Institute analysis

Exhibit 2

Five states are likely to be more than 50 percent urbanized

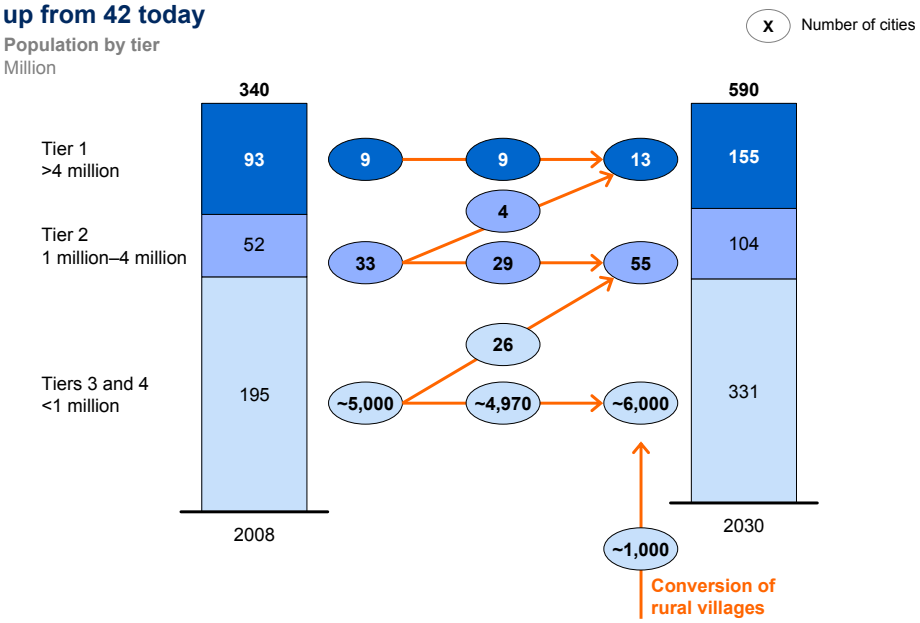


SOURCE: India Urbanization Econometric Model; McKinsey Global Institute analysis

In a global context, the scale of India's urbanization will be immense. India will have 68 cities with populations of more than 1 million, 13 cities with more than 4 million people, and 6 megacities with populations of 10 million or more, at least two of which (Mumbai and Delhi) will be among the five largest cities in the world by 2030 (Exhibit 3).

Exhibit 3

India will have 68 cities with population of more than 1 million by 2030, up from 42 today



SOURCE: India Urbanization Econometric Model; Census 2001; McKinsey Global Institute analysis

In terms of both population and GDP, many Indian cities will become larger than many countries today. For instance, Mumbai Metropolitan Region's GDP is projected to reach $265 billion by 2030, larger than the GDP of many countries today, including Portugal, Colombia, and Malaysia (Exhibit 4).

As India's cities expand, India's economic makeup will also change. In 1995, India's GDP split almost evenly between its urban and rural economies. In 2008, urban GDP accounted for 58 percent of overall GDP. By 2030, under our base-case economic projections, MGI estimates that urban India will generate nearly 70 percent of India's GDP (Exhibit 5).

Exhibit 4

Thirteen cities will have a population of more than 4 million

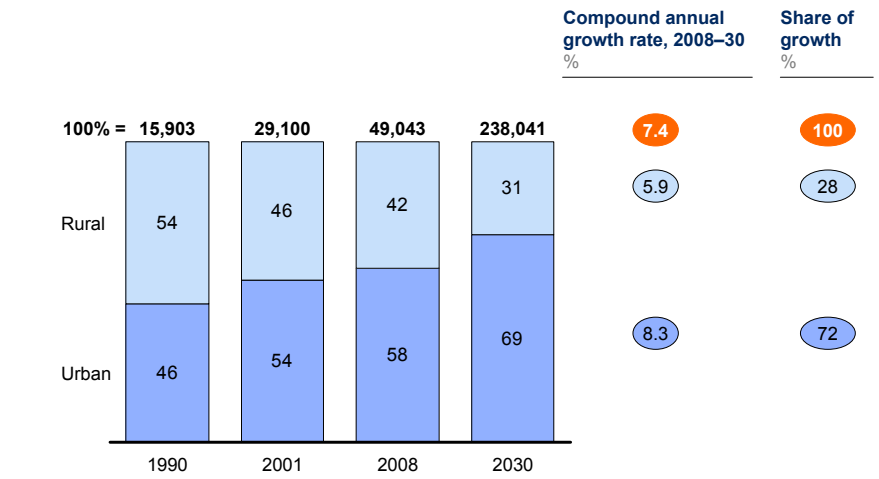
	Population in 2030 Million	GDP, 2030[1] $ billion	Per capita GDP, 2030[1] $ thousand
Mumbai (MMR)	33.0	265	8.0
Delhi (NCT)[2]	25.9	296	11.4
Kolkata	22.9	169	7.4
Chennai	11.0	73	6.6
Bangalore	10.1	127	12.6
Pune	10.0	76	7.6
Hyderabad	9.8	67	6.8
Ahmedabad	8.4	68	8.1
Surat	7.4	53	7.2
Jaipur	5.4	24	4.5
Nagpur	5.2	37	7.1
Kanpur	4.2	15	3.6
Vadodara	4.2	35	8.5

1 2008 prices.
2 National Capital Territory; excludes Noida, Gurgaon, Greater Noida, Faridabad, and Ghaziabad.
SOURCE: India Urbanization Econometric Model; McKinsey Global Institute analysis

India's fast-growing and relatively productive cities will drive a near fourfold increase in India's per capita income between 2008 and 2030 (Exhibit 6). The number of households nationwide earning less than 90,000 rupees per year is projected to fall below 20 percent for the first time in India's history, while the number of middle-class households (earning between 200,000 rupees and 1 million rupees a year) will increase more than fourfold from 32 million to 147 million.

Exhibit 5

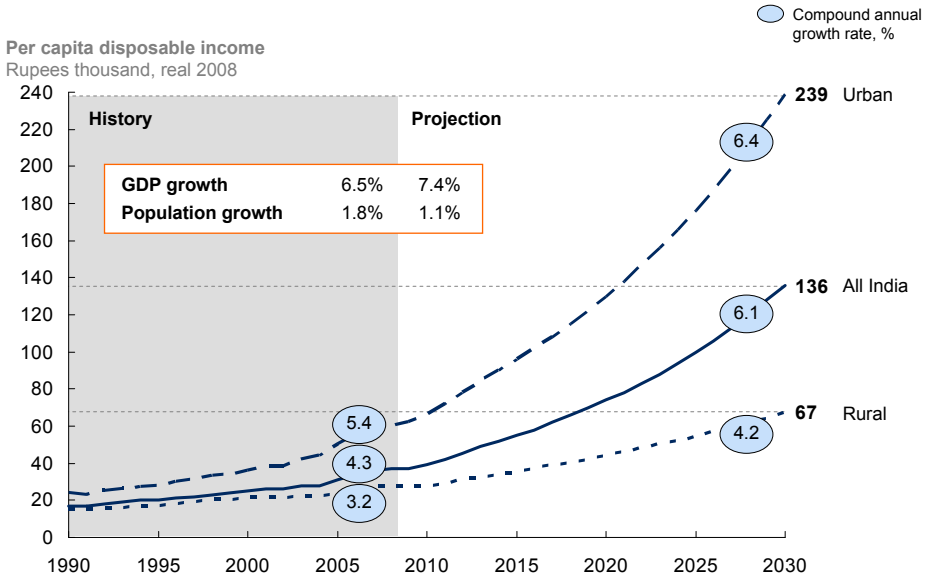
Cities will account for nearly 70 percent of India's GDP by 2030



SOURCE: India Urbanization Econometric Model; McKinsey Global Institute analysis

Exhibit 6

Urban India will drive a near fourfold increase in average national income



SOURCE: India Urbanization Econometric Model; McKinsey Global Institute analysis

These economic trends will unlock many new growth markets, many of them not traditionally associated with India, including infrastructure, transportation, health care, education, and recreation. There will be eye-popping numbers in the infrastructure sector. For instance, we project that the economy will have to build between 700 million

and 900 million square meters of residential and commercial space a year—equivalent to adding more than two Mumbais or one Chicago every year. In transportation, our projections suggest that, to meet urban demand, India needs to build 350 to 400 kilometers of metros and subways every year, more than 20 times the capacity built of this type by India in the past decade. In addition, between 19,000 and 25,000 kilometers of road lanes would need to be built every year (including lanes for bus-based rapid transit systems), nearly equivalent to the amount of road lanes that have been constructed over the past decade.

CITIES WILL ALSO BE CRITICAL FOR INCLUSIVE GROWTH

Cities are about more than just higher incomes—they also offer the promise of a higher quality of life for a larger number of Indians. This is because the scale benefits provided by cities—in India and around the world—offer the opportunity to significantly lower the cost of delivering services such as water and sanitation. Research indicates that the cost of delivering basic services is 30 to 50 percent cheaper in concentrated population centers than in sparsely populated areas. Given finite public resources, any potential savings could be vital if the government is to meet its aspiration for inclusive growth at affordable prices.

Cities are also vital for the funding of development because they generate the lion's share of India's tax revenue—between 80 and 85 percent.

Moreover, cities have benefits beyond their own boundaries. Our research finds that some 200 million people who live close to cities will benefit because they will enjoy improved access to jobs, markets, and the urban infrastructure. Rural populations adjoining large urban centers today have an estimated 10 to 20 percent higher monthly incomes than the rural average.

HOWEVER, INDIA'S CURRENT APPROACH TO CITIES COULD LEAD TO URBAN GRIDLOCK AND DECLINE

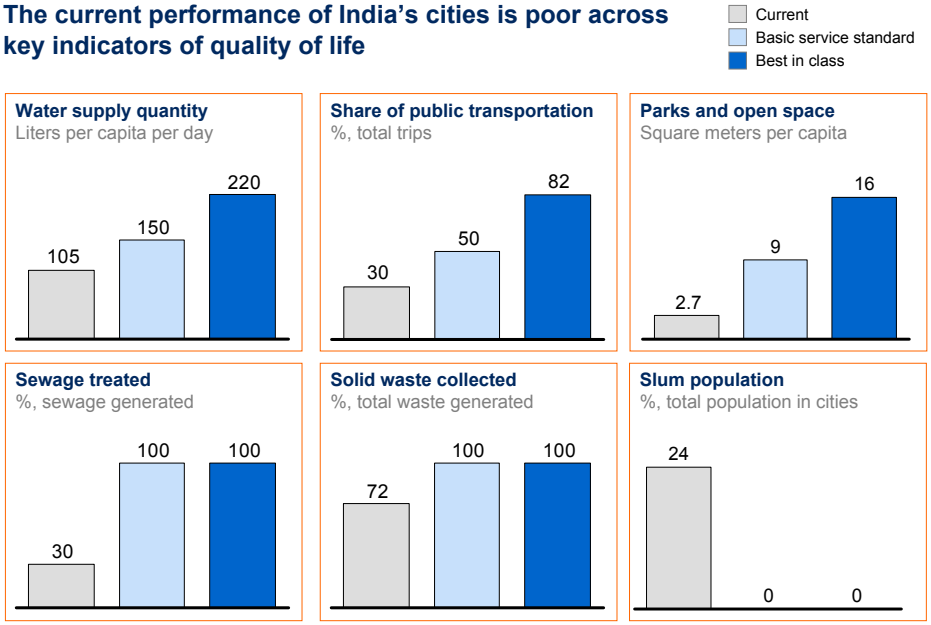
Good cities offer a certain quality of life for their citizens and an attractive proposition for companies. Urban India has attracted investment on the back of strong growth, but is failing many of its citizens. Across all major quality-of-life indicators, India's cities fall well short of delivering even a basic standard of living for their residents (Exhibit 7).

Combine this fact with India's large-scale urbanization and the task is going to become far more onerous. As the urban population and its incomes increase, demand for every key service will increase five- to sevenfold in cities of every size and type. And if India continues to invest in urban infrastructure at its current rate—very low by international comparison—in 20 years' time the urban infrastructure will fall woefully short of what is necessary to sustain prosperous cities.

Life for the average city dweller in India would become a lot tougher. Water supply for the average citizen could drop from an average of 105 liters to only 65 liters a day with a large section of the population having no access to potable water at all. India's cities could leave between 70 to 80 percent of sewage untreated. While private car ownership would increase, shortcomings in the transportation infrastructure have the potential to create urban gridlock—similar to the acute congestion that cripple some Latin American cities (Exhibit 8).

Exhibit 7

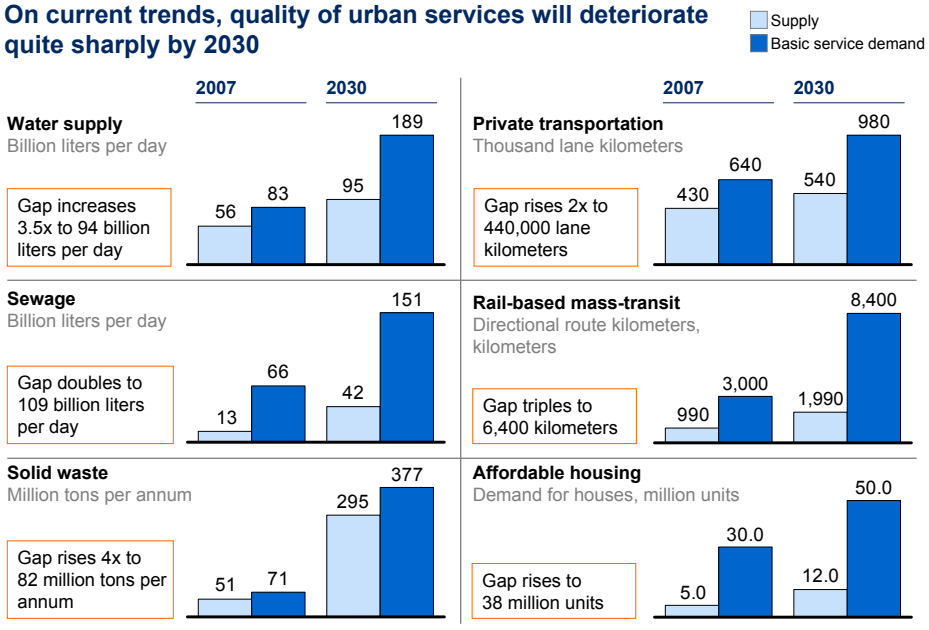
The current performance of India's cities is poor across key indicators of quality of life



SOURCE: United Nations; press search; City Development Plans; The Energy and Resources Institute; Planning Commission; Census 2001; Central Pollution Control Board; McKinsey Global Institute analysis

Exhibit 8

On current trends, quality of urban services will deteriorate quite sharply by 2030



SOURCE: United Nations; Handbook of benchmarks, Ministry of Urban Development; W. Smith, *Transportation Policies and Strategies in Urban India*; National Council for Applied Economic Research; McKinsey Global Institute analysis

INDIAN CITIES NEED $1.2 TRILLION OF ADDITIONAL CAPITAL INVESTMENT BY 2030

Unless it dramatically steps up its construction of the urban infrastructure needed, India will not be able to bridge the gap between demand for services and their provision. In per capita terms, India's annual capital spending of $17 is only 14 percent of China's $116 and 4 percent of United Kingdom's $391. We estimate that India needs to invest $1.2 trillion (53.1 trillion rupees) just in capital expenditure in its cities over the next 20 years, equivalent to $134 per capita per year. That's almost eight times the level of spending today in per capita terms and represents an increase in urban infrastructure

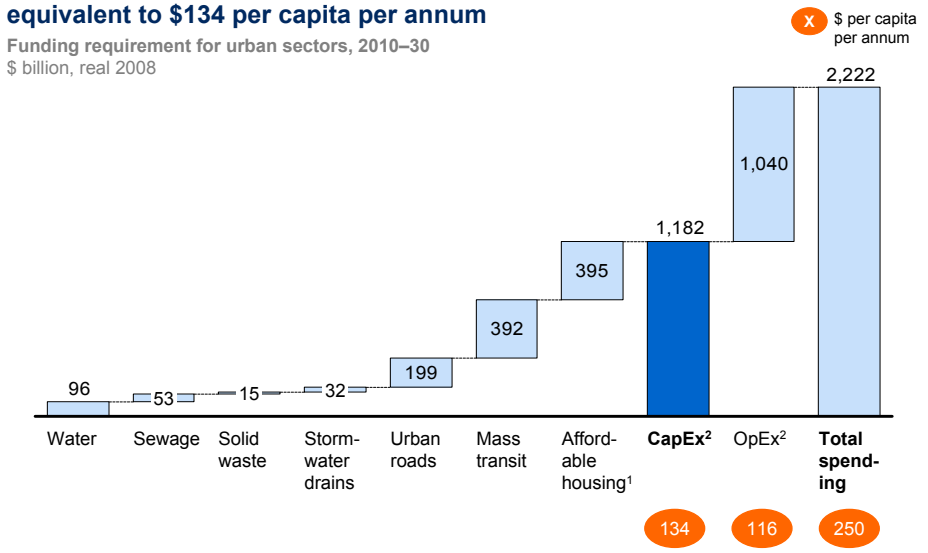
spending from an average of 0.5 percent of GDP today to 2 percent annually. We estimate that more than half of the capital investment is necessary to erase India's infrastructure backlog and the rest to fund cities' future needs. Transportation and affordable housing stand out as the two most capital-intensive sectors (Exhibit 9). The challenge for India will be to ramp up investment in line with economic growth. One trajectory would involve annual spending of around $30 billion through 2015, ratcheting up to $60 billion a year by 2020, and $90 billion annually by 2030.

Capital requirements, of course, vary according to the size of city. Tier 1 and Tier 2 cities would need capital spending of more than $200 per capita per annum (Exhibit 10).

Exhibit 9

Indian cities need capital expenditure of $1.2 trillion over the next 20 years, equivalent to $134 per capita per annum

Funding requirement for urban sectors, 2010–30
$ billion, real 2008



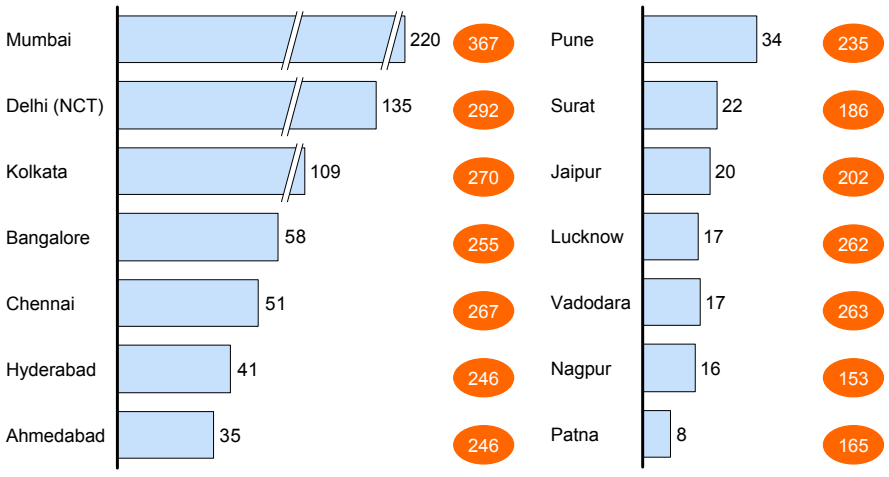
1 Net of beneficiary contribution.
2 CapEx = capital expenditure; OpEx = operational expenditure.

SOURCE: India Urbanization Funding Model; Detailed Project Reports from the Jawaharlal Nehru National Urban Renewal Mission; McKinsey Global Institute analysis

Exhibit 10

Large Tier 1 and 2 cities require per capita investment exceeding $200

Total CapEx requirement, 2010–30
$ billion, 2008 prices



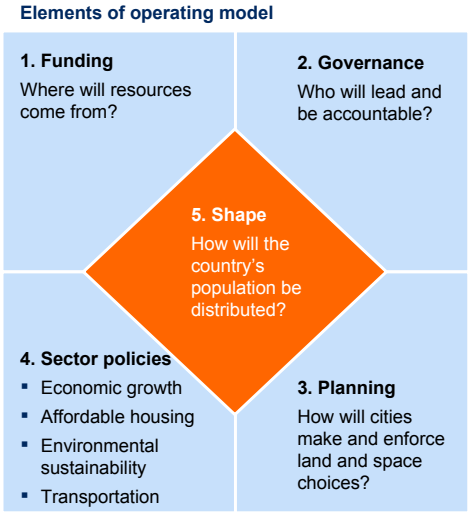
SOURCE: India Urbanization Funding Model; McKinsey Global Institute analysis

INTERNATIONAL EXPERIENCE SUGGESTS IT IS POSSIBLE TO TURN CITIES AROUND IN ONE DECADE

India of course has to chart its own journey. But there are nuts-and-bolts lessons that it can learn from other countries and cities around the world that have faced similar challenges. Many countries, including the United Kingdom, South Africa, and China, have turned around their cities in as little as ten years. Our study of how different countries and cities have approached their urban development shows that five dimensions are important. These are funding, governance, planning, sectoral policies, and shape (Exhibit 11).

Exhibit 11

India's urban operating model should focus on five elements



SOURCE: McKinsey Global Institute analysis

- **Funding.** Sufficient resources for investment to build services for citizens, preferably anticipating demand rather than playing constant catch-up as we see in India, are the bedrock of successful cities. In countries around the world, governments have devised mechanisms to ensure cities have reliable access to funds, internally generated and externally supported. In developed countries, governments have created transparent, formula-based mechanisms (rather than ad-hoc mechanisms as in India) to fund their cities. In the United Kingdom, 70 to 80 percent of city revenues come from central government grants based on a formula (equivalent to $15 billion per year for London excluding spending on social services), but these funds are contingent on achieving certain service outcomes for citizens. In South Africa, central government funds 40 to 50 percent of urban infrastructure investments in large cities and 60 to 70 percent in smaller cities through grants and loans. Developing countries have used land monetization and debt quite extensively to fund its urban infrastructure. China, for example, has given its cities the freedom to raise substantial investment resources by monetizing land assets and also retaining a 25 percent share of value-added taxes (equivalent to $4.5 billion per year for Shanghai). China has also converted many of its big projects into special-purpose vehicles (SPV) to access the debt market. With some exceptions, India has barely utilized these sources of funding.

- **Governance.** Choices that cities make on leadership and management are a second vital component. The most successful governance is a devolved model that empowers local leaders but holds them accountable. Within a

parliamentary democracy, the United Kingdom created an empowered, directly elected mayor of London who sets policies and executes operations through corporatized agencies such as Transport for London. South Africa consolidated previously independent municipalities of Johannesburg into a single metropolitan government under a mayor supported by a professional city manager. China's major cities have powerful political appointees as mayors and use focused SPVs, as in the case of Shanghai's water supply, to build and run the urban infrastructure.

- **Planning.** Effective and systematic urban planning has been part of the fabric of successful cities for decades. Planning is important to allow cities to make informed trade-offs on their use of scarce resources such as land. London micro-plans every aspect of the city's urban space through a cascaded system. A metropolitan master plan sets out the overall strategy for the economy, mass transit, and affordable housing, for instance, which is then applied in detail at the borough level. For example, London plans 20 years in advance how to deal with peak morning traffic. China, too, has a mature urban planning regime that emphasizes the systematic redevelopment of run-down areas in a way that is consistent with long-range plans for land use and transportation. In all these cities, the head of urban planning is a coveted, high-level position generally directly reporting to the mayor.

- **Sectoral policies in job creation, public transportation, affordable housing, and climate-change mitigation.** Great cities invest effort in designing policies for the most important sectors that influence the city's economy and quality of life. For example, affordable housing for low-income groups is an important consideration in most cities. Planning mandates in the United Kingdom have generated 20 to 25 percent of all affordable units built over the last decade. South Africa provides free land for houses for its poorest income groups. Singapore provides public housing for more than 80 percent of its population through a dedicated Housing Development Board, using land monetization and interest-rate subsidies to make affordability work. Great cities also invest a great deal of attention in facilitating community networks that foster innovation and drive the soul and ethos of the city.

- **Shape.** Most countries in the world have had the luxury of urbanizing organically through history and have ended up with different portfolios and distributions of cities. In Germany, for instance, a large number of small and medium-sized cities have grown up in parallel, reflecting Germany's federal structure. We have seen the same in India. China is exceptional in that it consciously fostered a concentrated pattern of urban expansion initially with the development of its dynamic coastal cities. India can proactively shape the overall portfolio of cities in a way that optimizes their economic contributions, investment and land requirements, and the objective of regional equity.

INDIA NEEDS TO CREATE ITS OWN CITY TRANSFORMATION MODEL ACROSS THESE FIVE AREAS

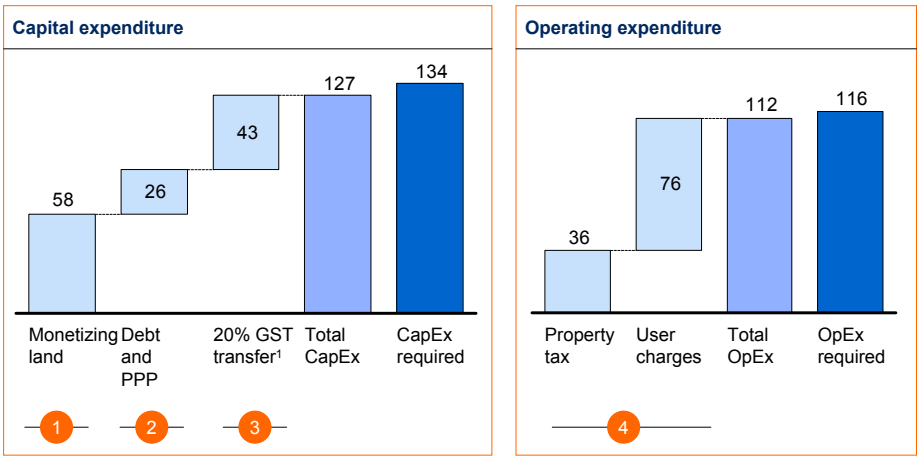
On all five dimensions of urban management, India's record thus far is weak. At root, India's policy makers simply have not acknowledged the importance of an engaged and activist approach to its cities—and the neglect shows. This report makes concrete suggestions in all five areas, most of which we would argue that India can implement within the next five to ten years and thereby transform the prospects of its cities:

1. **Funding: Unlock $2.2 trillion in new urban infrastructure investments, including $1.2 trillion in capital expenditure.** India needs to invest around 53 trillion rupees ($1.2 trillion) in urban infrastructure capital over the next 20 years, an increase from 765 rupees per capita ($17) to 6,030 rupees per capita ($134) per year. India's annual spending would therefore need to increase nearly eightfold on a per capita basis. The challenge of bridging this gap is tough but doable (Exhibit 12). Consistent with the international examples we have mentioned, we see four sources of funding that India should tap into, to a far greater extent than today: Monetizing land assets; collecting higher property taxes, and user charges that reflect costs; debt and public-private partnerships (PPPs); and formula-based government funding. Contrary to popular thinking, the largest Indian cities can generate 80 to 85 percent of the funding they require from internal sources (Exhibit 13). One example of what can be done in a large city is the metropolitan development authority in Mumbai, which plans to spend 1 trillion rupees ($22 billion) over the next five years on infrastructure essentially by leveraging land sales in the Bandra Kurla area and through PPPs. However, internal funding alone will not be enough, even in large cities. The rest has to come from the central and state governments based on a systematic formula rather than ad-hoc grants. For large cities with deep economies, this might mean allowing them to retain 18 to 20 percent of goods and services tax (GST) revenues. This is consistent with the 13th Central Finance Commission's (CFC) assessment that GST, a consumption-based tax that creates local incentives for growth, is well suited for direct allocation to the third tier of government. In fact, the CFC has already given legitimacy to direct allocation by approving 4,700 crore rupees (around $1 billion) in annual grants to cities. For smaller cities (Tiers 3 and 4), however, a better options would be to give guaranteed annual grants totaling an estimated $20 per capita until their economies reach scale.

Exhibit 12

India needs to access four key extra funding streams to pay for urbanization

$ per capita per annum, real 2008



1 Goods and services tax.

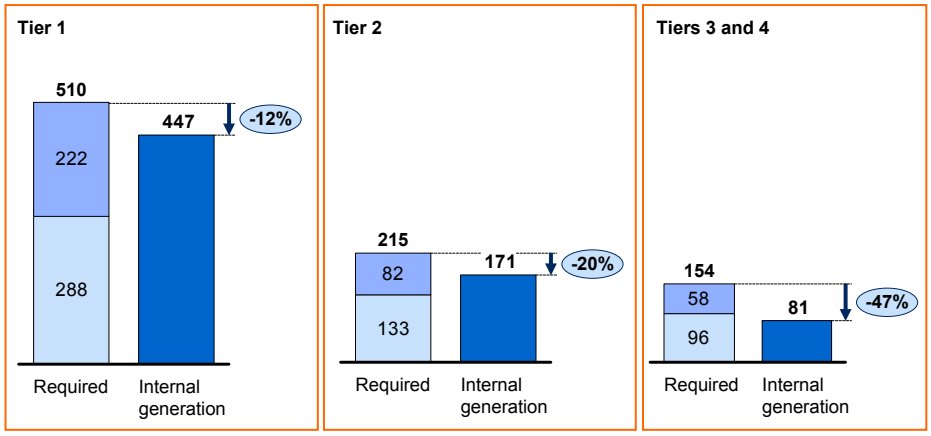
SOURCE: India Urbanization Funding Model; McKinsey Global Institute analysis

Exhibit 13

Tier 1 and Tier 2 cities can generate 80 to 85 percent of their funding needs internally

Funding requirement and internal potential

$ per capita, real 2008



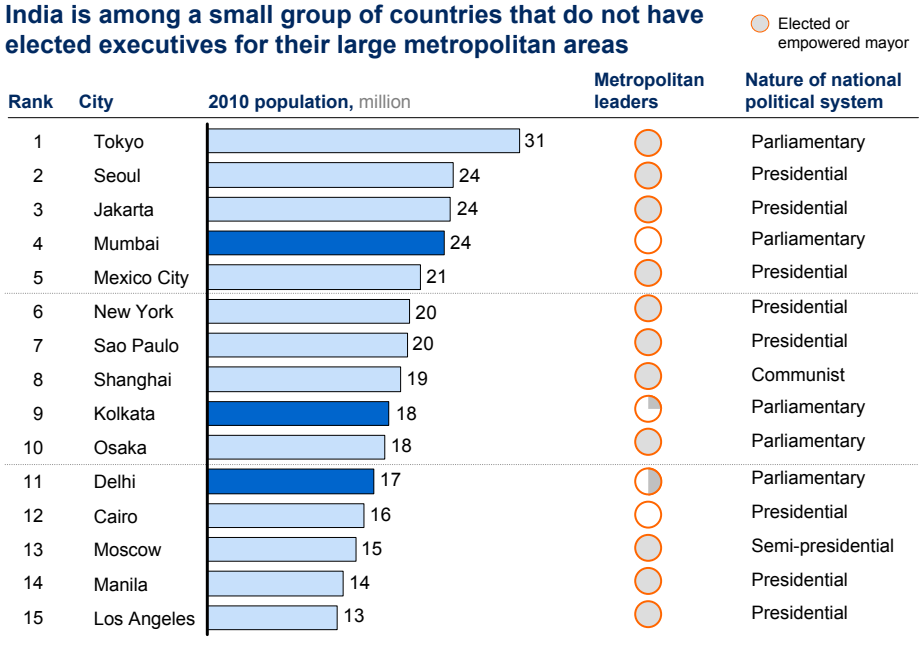
SOURCE: India Urbanization Funding Model; City Development Plans; McKinsey Global Institute analysis

2. **Governance: Empower city administrations (municipal and metropolitan) and modernize service delivery structures.** In 2030, India's largest cities will be bigger than many major countries today. But India's governance of cities is muddled and ineffective and nowhere near ready to face this challenge. As an example, India's large cities are still governed by bureaucrats who can be transferred out of office at short notice. This is clearly untenable. This arrangement is in sharp contrast to large cities elsewhere that have empowered mayors with long tenures and clear accountability for the city's performance (Exhibit 14). There are good examples within India, too. Delhi has quasi-statehood status. Kolkata's modified mayor-commissioner model provides a good starting point for reforming municipal structures in India with its combination of an empowered political executive and administrative support from

a technocrat. In the medium to long term, metropolitan authorities should be led by directly elected mayors. In addition to accountable and empowered mayors for its cities, India needs to clearly define the relative roles of its metropolitan and municipal structures for an estimated 20 metropolitan areas. Very few cities in the country have functioning metropolitan authorities. With cities growing beyond municipal boundaries, we contend that having fully formed metropolitan authorities with clearly defined roles is absolutely essential for the successful management of large cities in India (Exhibit 15). And Indian cities need to rethink how they deliver services to their citizens. Currently, cities deliver services through archaic and bureaucratic departments. India must move to corporatized agencies (BEST, Mumbai's bus and electricity agency is one such example) that have specialized internal skills and the ability to make quick decisions. The ability of these agencies to tap selectively into private-sector expertise through public-private partnerships will represent an equally compelling opportunity to improve services and introduce more transparency in delivery. Candidates for such partnerships include waste collection, water distribution, and operations of selected public transportation routes where public-private partnerships can account for as much as 30 to 40 percent of operations and maintenance budgets in large cities. Last, India needs to build technical and managerial depth in its city administrations. In the Indian Civil Services, India has a benchmark for how to build a dedicated cadre for governance. India now needs to create an equivalent cadre for cities, as well as allow for lateral entry of private-sector executives.

Exhibit 14

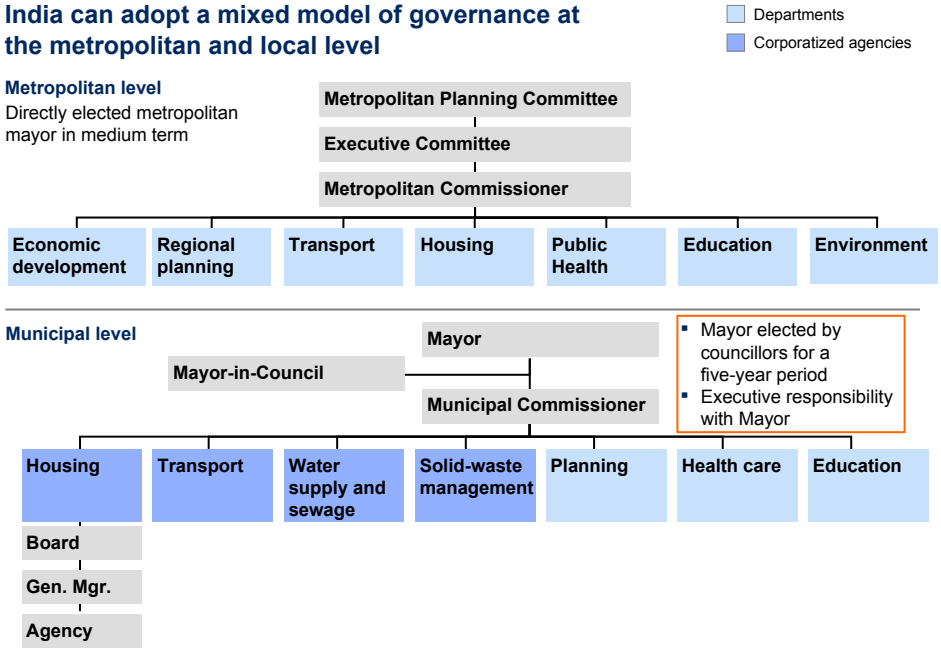
India is among a small group of countries that do not have elected executives for their large metropolitan areas



SOURCE: www.citymayors.com; McKinsey Global Institute analysis

Exhibit 15

India can adopt a mixed model of governance at the metropolitan and local level



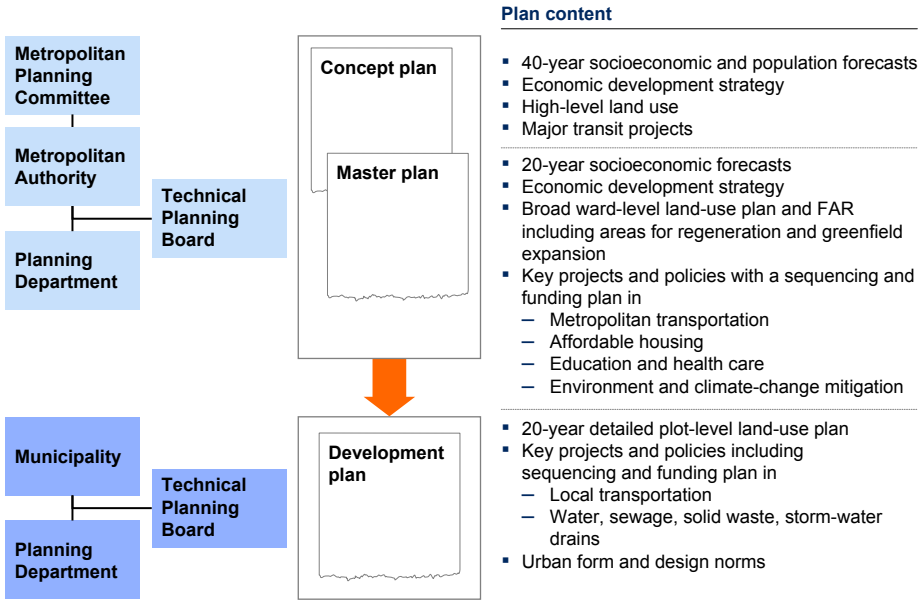
SOURCE: McKinsey Global Institute analysis

3. **Planning: Overhaul metropolitan and municipal plans, planning systems and planning capabilities.** India's planning is in a very poor state. On paper, India does have urban plans—but they are esoteric rather than practical, rarely followed, and riddled with exemptions. For example, no city in India has a proper 2030 transportation master plan, nor has any of them allocated enough space and appropriate zoning for affordable houses. India needs to make urban planning a core, respected function, investing in skilled people, rigorous fact base, and innovative urban form. Putting this right should not be difficult. This can be done through a "cascaded" planning structure in which large cities have 40-year and 20-year plans at the metropolitan level that are binding on municipal development plans (Exhibit 16). Central to planning in any city is the optimal allocation of space, especially land use and Floor Area Ratio (FAR)[2] planning. Both should focus on linking public transportation with zoning for affordable houses for low-income groups. These plans need to be detailed, comprehensive, and enforceable, and exemptions should be rare rather than the norm. By revamping its planning system in this way, India could save more than 6 million hectares of potentially arable land over the next 20 years (Exhibit 17).

2 Floor Area Ratio (FAR) is the ratio of building floor space to the land area the building occupies.

Exhibit 16

India should consider a cascaded planning system

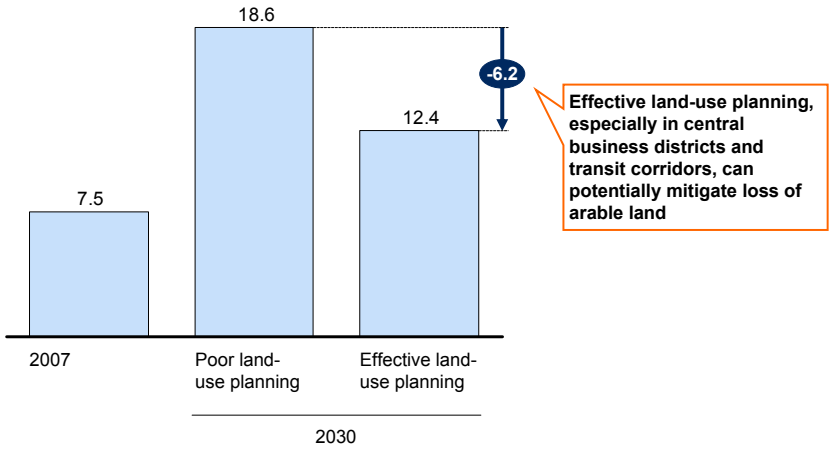


SOURCE: McKinsey Global Institute analysis

Exhibit 17

India could potentially save 6.2 million hectares of potentially arable land through effective planning for land use

Demand for urban land
Million hectares



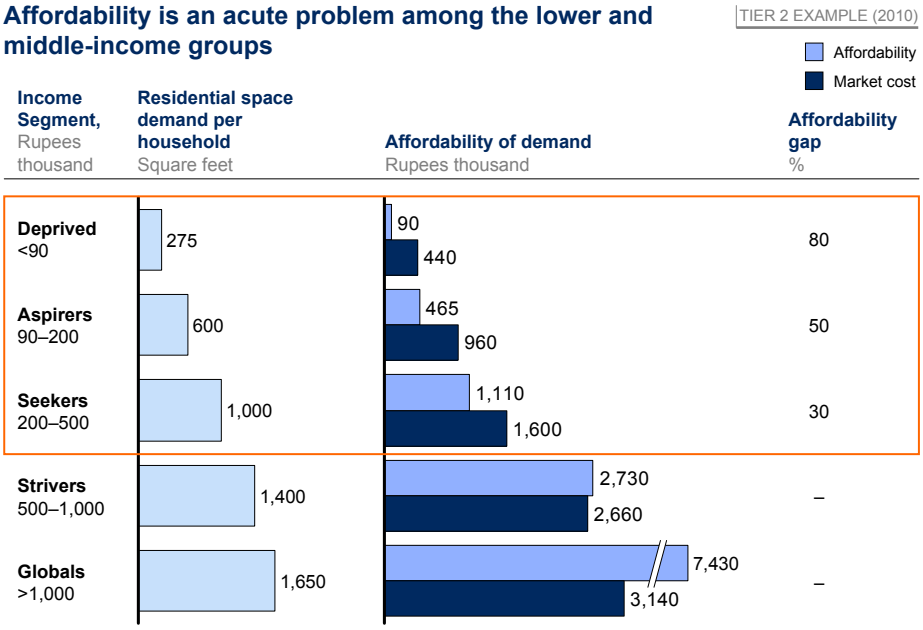
SOURCE: McKinsey Global Institute analysis

4. **Sector policies: Craft policies for key urban sectors, especially affordable housing for low-income groups and environmental sustainability.** All good cities craft policies in four critical areas: job creation, affordable housing for low-income groups, public transportation, and, of late, climate-change mitigation. India has largely failed to embrace the need for this dedicated policy attention within cities. We highlight two such sectors in this report: Affordable housing and climate-change mitigation. Affordable housing is a particularly critical concern for low-income groups; in the absence of a viable model that caters to their needs, India will see the continued proliferation of slums across the country. India faces

the mammoth task of providing affordable homes to an estimated 38 million households by 2030 who will not be able to afford a market-priced house. No other country has provided affordable housing on this scale. And, given India's current stage of household income, affordability itself is a major issue (Exhibit 18). Nevertheless, MGI's analysis suggests that India can meet the challenge through a set of policies and incentives that can bridge the gap between price and affordability (Exhibit 19). This will enable a sustainable and economically viable affordable housing model for both government housing agencies and private developers. MGI's detailed analyses show that a combination of higher FAR of up to 1 on land, an infrastructure grant to the municipal body, and interest subsidies can together create a surge in affordable housing stock. India also needs to encourage rental housing as an option particularly for the poorest of the poor, who may not be able to afford a home even with these incentives. MGI recommends that 30 percent of all affordable housing should be available to rent. Other potentially useful measures could include a favorable tax regime and a national mortgage guarantee fund. If India adopts a broad swath of such measures, it could significantly step up the building of affordable housing as much as ten times, to 2 million units a year (Exhibit 20). Similar policies need to be crafted for jobs and public transportation.

Exhibit 18

Affordability is an acute problem among the lower and middle-income groups



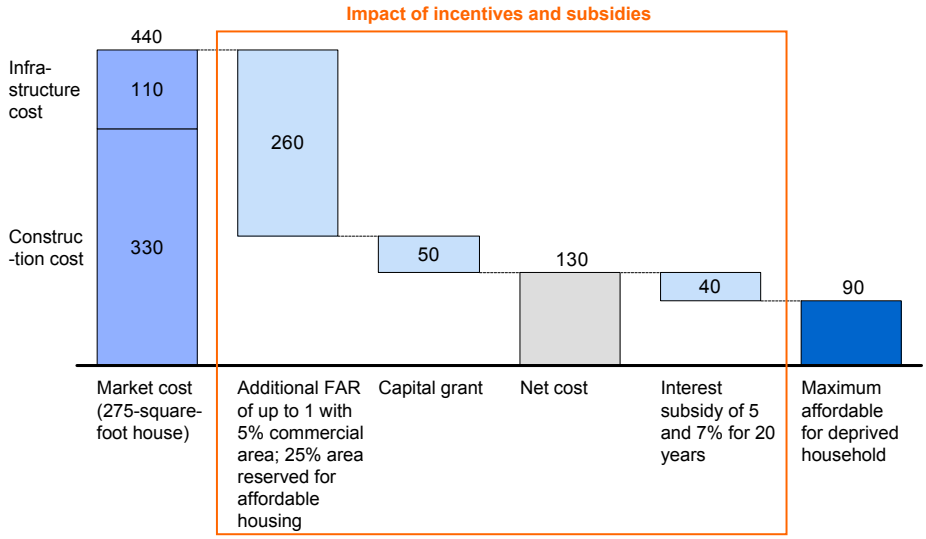
SOURCE: India Urbanization Affordable Housing Model; McKinsey Global Institute analysis

Exhibit 19

A combination of incentives and subsidies can bridge the affordability gap

TIER 2 EXAMPLE

Rupees thousand

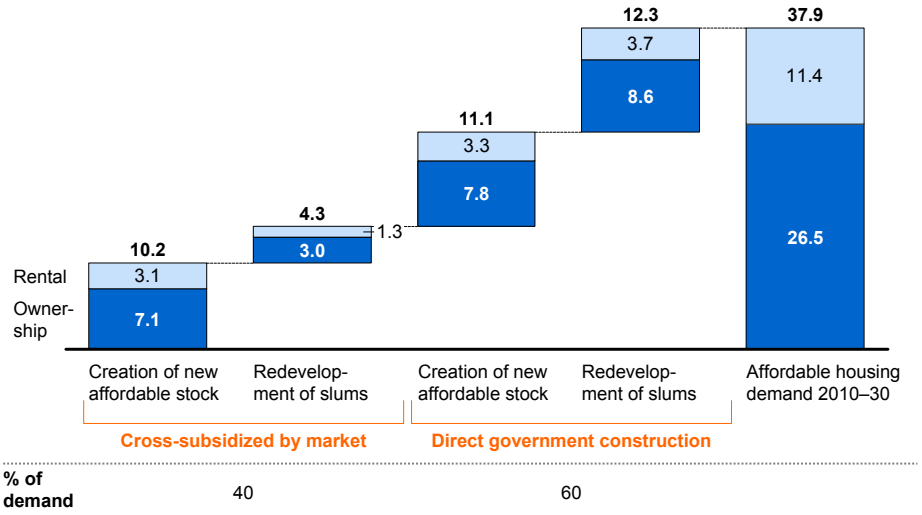


SOURCE: India Urbanization Affordable Housing Model; McKinsey Global Institute analysis

Exhibit 20

With these measures, private sector and direct government construction can trigger a surge in affordable housing stock

Million households



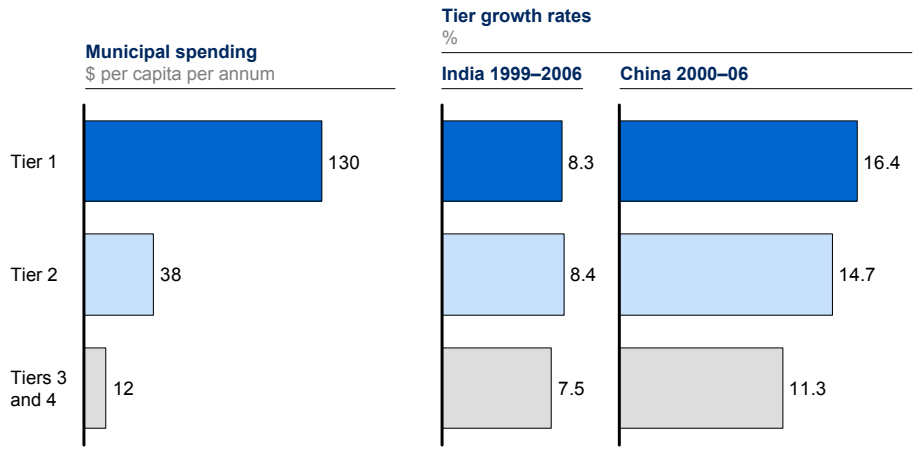
SOURCE: India Urbanization Affordable Housing Model; McKinsey Global Institute analysis

5. **Shape: Shape the distributed urbanization portfolio through focused approaches to different tiers of cities and fostering inter city connectivity.** Urban India today is "distributed" in shape—with a diverse range of large and small cities spread widely around the nation. India should continue to aim for a distributed model of urbanization because this suits its federal structure and helps to ensure that migration flows are not unbalanced toward any particular city or cities. However, India should proactively shape its portfolio by taking four actions. First, India should invest in its Tier 1 cities (e.g., Mumbai, Delhi, and

Chennai) and large Tier 2 cities (e.g., Patna, Coimbatore, and Cuttack) so that they can outperform the national growth average as China's largest cities have done. Pre-investing in emerging Tier 2 cities also makes sense so that, as these cities expand, they do not emulate the trajectory of urban decay of today's Tier 1 cities. Second, India should single out, and build on, its existing specialist cities excelling in sectors such as tourism and manufacturing (e.g., Agra and Durgapur), as they contribute disproportionately to job creation and taxes. Third, India should ensure that services in Tier 3 and 4 cities, that have posted growth of more than 7 percent despite receiving only $12 per capita in investments in recent years, are brought up to a basic standard (Exhibit 21). Fourth, India should think selectively about new cities. MGI research concludes that India could build at least 25 new satellite cities near today's largest Tier 1 and 2 cities to accommodate populations in each of up to 1 million people. Although building new cities is generally more expensive (on a per capita basis) than renewing existing cities, such an effort will act as a benchmark and a model for well-planned, environmentally sustainable world-class cities while helping ease some of the strains of rapid urbanization.

Exhibit 21

Smaller cities have historically posted robust growth despite receiving little funding support while larger cities need to deliver more



SOURCE: India Urbanization Econometric Model; City Development Plans; McKinsey Global Institute analysis

URBAN REFORM NEEDS POLITICAL WILL, VOCAL CITIZENS, AND THE ACTIVE PARTICIPATION OF THE PRIVATE SECTOR

India is in a state of deep inertia about the urgency and scale of urban reform. Despite the perilous state of many Indian cities, there seems to be comfort with the status quo, resistance to change, and a lack of recognition of the urgent need for change.

With the 74th Amendment to India's constitution and the Jawaharlal Nehru National Urban Renewal Mission (JNNURM), India took the first steps toward urban reforms. However, this is not enough. Our recommendations (see box 2, "Summary of recommendations") attempt to translate the intent and spirit of the amendment into the next generation of reforms that can help local governments to improve how they function.

To make this happen, MGI contends that the central government has to play a catalytic role. This is despite the fact, according to India's constitution, urban affairs

are in the realm of the state governments—and they have historically been reluctant to give up powers to cities. Without a political push from the central government accompanied by a supporting package of incentives, change is unlikely to happen.

One way to make a start is to substantially strengthen and modify the JNNURM by considering three changes. First, the central government should triple its annual funding for the JNNURM to 30,000 crore rupees ($6.7 billion) to give more funding to its current list of cities and also create a special allocation for Tier 3 and 4 cities. Second, using this increased funding, the JNNURM should create an incentive fund of around 8,000 crore rupees ($1.7 billion) for states that are willing to undertake the next generation of urban reforms. Our discussions indicated that several cities and states are ready for this. Third, while the JNNURM has had some success in building physical capacity, it needs to invest more in financial and human capacity. Many states and cities have been unable to leverage available funds or implement reforms because of a lack of local capacity and technical expertise. The central government can help by creating specialist teams to assist state and city governments, creating regional centers of excellence, and championing three to four large-scale urban management institutes. These initiatives could be funded through an allocation of 2,000 crore rupees ($0.4 billion) within JNNURM.

Additionally, the central government should allocate 15,000 crore rupees annually ($3.3 billion) to the Rajiv Awas Yojana (RAY), aimed at making India slum-free and currently being considered by the central government, for low-income affordable housing and the eradication of slums.

States and cities should not wait for such change. Progressive chief ministers and city leaders should recognize that starting early on the urban transformation will give them competitive advantage, attract investment, and create jobs—getting them ahead of the curve. For such states, one approach to urban reform would be to immediately create an enabling framework for funding, planning, and governance elements of the operating model we have described, and then to apply the reforms in stages starting with a few cities at a time.

Citizens will also have a critical role to play. Residents of India's cities need to understand the complexity of the urban transformation and gain a perspective on the actions available to them to create real results on the ground. The focus of citizens needs to shift from small, reactive, noninstitutional demands to a call for fundamental institutional change. They need to stop asking their political leaders just to "fix the roads" and instead also ask them to "fix the institutions that fix the roads."

Finally, for any private institution whose interests are linked with India's economic future, this is a topic of vital importance. The ability of cities to create thriving living conditions, facilitate networks that foster innovation, and create the basis for attracting talent will be crucial to the ability of private companies to house themselves in productive settings that trigger growth. As investors, companies therefore have an obligation to demand urban transformation as a prerequisite for investment—and

lobby a great deal more vigorously than they have in the past to drive change. At the same time, they can help transform India's urban landscape by bringing their expertise and capacity to execute the opportunities unlocked by reforms.

□ □ □

It is easy to be skeptical about India's ability to transform its cities. But we are optimistic that it can be done. The recent past shows that once India engages in a national discussion, as it did on economic reforms, action soon follows. The same now urgently needs to happen in the case of urban reform. Nothing less than the sustainability and inclusiveness of India's economic growth are at stake.

Box 2. Summary of recommendations

1. Funding

— Spend $2.2 trillion in cities over the next 20 years, including $1.2 trillion in capital investment (eightfold increase in spending from $17 per capita per year today to $134)

— Make Tier 1 and Tier 2 cities near self-sufficient (around 80 to 85 percent) through monetizing land assets, maximizing property tax collections, recovering O&M costs through user charges, and pushing for greater leveraging of debt and private participation

— Create a sufficiently funded grant system from state and central governments by tripling annual JNNURM allocation in the short term and sharing 18 to 20 percent of GST with cities in the medium term

— Give an additional support to weaker Tier 3 and 4 cities from the central and state governments of at least $20 per capita per year

— Distribute government grant and land revenues equally between municipal and metropolitan authorities

— Create the enabling mechanisms such as a "ring-fenced" city development fund, an effective accounting system and a vibrant municipal bond market

2. Governance

— Devolve real power to cities by implementing the 74th constitutional Amendment in full

— Institutionalize metropolitan structures for at least 20 urban agglomerations with multiple municipalities

— Implement the modified mayor-commissioner system in at least 35 to 40 cities

— Allow for directly elected mayor for metropolitan areas in the medium term; rely on metropolitan authorities in the short term under the Metropolitan Planning Committee (MPC)

— Modernize service delivery structures, including corporatization of select municipal functions and leveraging targeted private-sector participation

— Improve local government capacity through creating a new city cadre and allowing lateral hires from the private sector

— Drive transparency and accountability in city government through city charters, MOUs between mayors and agencies, and through a state-level urban regulator

3. Planning

— Devolve the planning function to local governments by empowering MPCs to create statutory metropolitan plans and transferring local urban planning powers to municipalities

— Execute an integrated, cascaded planning system consisting of 20-year master plans at metropolitan and municipal levels containing calculations of predicted population, GDP, required transportation, affordable housing and other urban infrastructure as well as land use and FAR norms

— Create well-resourced planning organizations at metropolitan and municipal levels and innovate with latest planning technologies and models

— Create tight execution and enforcement mechanisms for city plans with a transparent system for exemptions and sufficient public participation

— Build sufficient urban planning capacity by building six to eight world-class urban-planning institutes to train 3,000 to 4,000 planners annually

4. Sectoral policies: Affordable housing and climate-change mitigation

Affordable housing

— Encourage metropolitan governments and municipalities to plan for affordable housing and allocate land dedicated for this purpose

— Mandate 25 percent area for affordable houses in new developments above an acre, with associated incentives

— Offer a basket of incentives (additional FAR of up to 1, capital grant, utilization of 5 percent incentive area for commercial use, interest rate subsidies and favorable tax regime) to developers and state housing boards to trigger new affordable units and slum redevelopment

— Create flexible affordable housing solutions with 30 percent rentals and 5 to 10 percent dormitories

— Create a national mortgage guarantee fund to spur lending to low-income groups with an initial corpus of 15 billion rupees and capital adequacy ratio of 12 to 15 percent

— Consider creating a corporatized agency for affordable housing within metropolitan authorities and rental management companies to operate and maintain rental stock

Climate-change mitigation

— Reduce vehicle emissions by nearly 100 million tonnes of CO_2 equivalent through greater use of public transportation, improving vehicle efficiency, and use of electric vehicles

— Reduce emissions by nearly 310 million tonnes CO_2e by reducing energy consumption in buildings, appliances, lamps and street lights

— Improve city design to develop energy-efficient clusters to abate nearly 30 million tonnes CO_2e

5. Shape

— Facilitate distributed urbanization

— Renew Tier 1 cities through a substantial new capital investment program of $288 per capita annually

— Preemptively shape the trajectory of the largest Tier 2 cities, through $133 per capita investments a year

— Nurture top 100 specialist cities focused on sectors such as tourism and manufacturing through a capital investment program of $96 per capita a year

— Raise the quality of life to at least a basic standard in smaller Tier 3 and 4 cities through minimum government support of $20 per capita per year

— Facilitate 20 to 25 new cities near the largest 20 metropolitan areas by providing adequate infrastructure such as water, electricity, and transportation links

— Seed future urbanization by building 19 transportation corridors linking Tier 1 and Tier 2 cities

1. Urbanization is critical to India's development

Indian cities matter today—they are home to an estimated 340 million people, or 30 percent of the population. And cities will become even more important by 2030, when an estimated 590 million people, or 40 percent of the population, are likely to be living in them. Already today urban India is a microcosm of the nation, home to a rich variety of communities, professions, and income classes.

Every major industrialized country in the world has experienced a shift over time from a largely rural, agrarian-dwelling population to one that lives in urban, nonagricultural centers. India will be no different. However, India's urbanization will be on a scale that, outside of China, is unprecedented. By 2030, MGI expects 250 million more people to live in India's cities, the fastest addition to an urban population of any country in history outside of China (see box 3, "India's definition of 'urban'").

Unlike many countries that are grappling with aging populations and rising dependency ratios, India has a young and rapidly growing population. We estimate that 180 million new job seekers will enter India's workforce over the next two decades—a potential demographic dividend. But India needs thriving cities if that dividend is to pay out. In our base case, with an estimate of annual GDP growth of 7.4 percent, between 2008 and 2030, cities will account for 70 percent of the 170 million net new jobs created to 2030, account for more than 70 percent of GDP, and drive a fourfold increase in per capita incomes across the nation.

Despite the fact that India's urbanization is already under way and will continue unabated, and that it offers undoubted economic benefits, India has not really engaged with the reality of its urban future. Worse, some even debate whether India's future prosperity and community rest with its villages or its towns and many people are suspicious that urbanization is anti-rural. But that is a false dichotomy. In this chapter, we will show that cities and villages are interdependent and symbiotic. The urban economy will provide the more productive nonagricultural jobs that are important for an eventual increase in agricultural productivity and income. The urban economy will also provide 85 percent of total tax revenue, benefit 200 million rural Indians who live in proximity of the 70 largest cities in the country, and be perhaps the most cost-effective vehicle to expand access to basic services. The fate of India's villages and its cities are closely intertwined.

Box 3. India's definition of "urban"

There is no international consensus about what constitutes "urban," and definitions vary widely among countries. MGI finds that every jurisdictional authority around the world uses one of four definitions: (1) a definition that is strictly administrative and classifies urbanization by geographic zones or administrative centers (e.g., Brazil); (2) a definition based on both administrative and density criteria (e.g., China); (3) a definition based on the size of city population (e.g., the United States); and (4) a definition combining size and economics—i.e., a percentage of a city's population needs to be involved in defined economic activities (e.g., Japan).

India uses a combination of population, density, and employment thresholds. India classifies as urban an area with a population of more than 5,000, a density exceeding 400 persons per square kilometer, and 75 percent of its male workers in a nonagricultural profession. Of course, state governments have the flexibility to declare an area as an urban territory for administrative purposes.

There are many experts in India and internationally who believe that India's urban population today is understated, that the actual population in cities is higher than 340 million, and that India still categorizes many urban areas as rural. Irrespective of these views, the estimates in this report are based on India's definition of urban areas, and the starting point is the official tally on urban population.

CITIES ALREADY MATTER IN INDIA

Economic growth and urbanization have moved in parallel. India already has one of the largest urban populations in the world with the residents of India's cities reflecting the country's diversity.

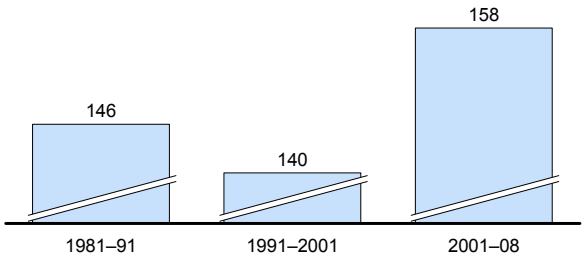
Economic growth and urbanization have gone hand in hand to date

Since 1931, the proportion of India that lives in cities has grown gradually. However, in the past decade the story has really started to change, with urbanization ticking upward in line with economic growth (Exhibit 1.1). This is consistent with the pattern seen around the world (see box 4, "Urbanization has gone hand in hand with economic growth around the world"). It is no surprise that states that have had the fastest economic growth have also had the highest rates of urbanization (Exhibit 1.2).

Exhibit 1.1

India's urbanization has trended upward in recent times

Relative urban population growth[1]
%

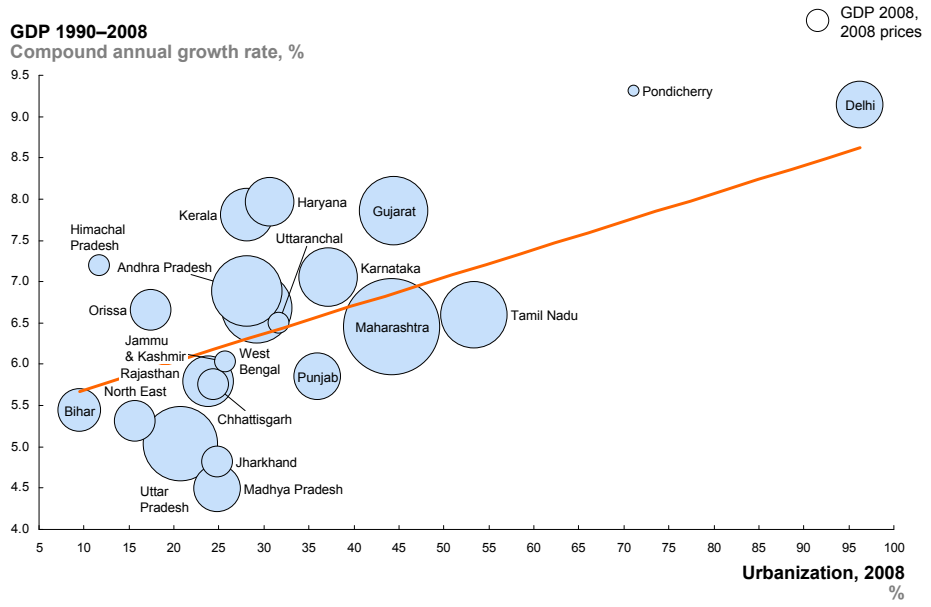


	1981–91	1991–2001	2001–08
GDP growth Compound annual growth rate,%	**5.2**	**6.1**	**7.7**

1 Calculated as rate of urban population growth divided by rate of overall population growth.
SOURCE: India Urbanization Econometric Model; McKinsey Global Institute analysis

Exhibit 1.2

Fastest-growing states also had the highest urbanization rates



SOURCE: India Urbanization Econometric Model

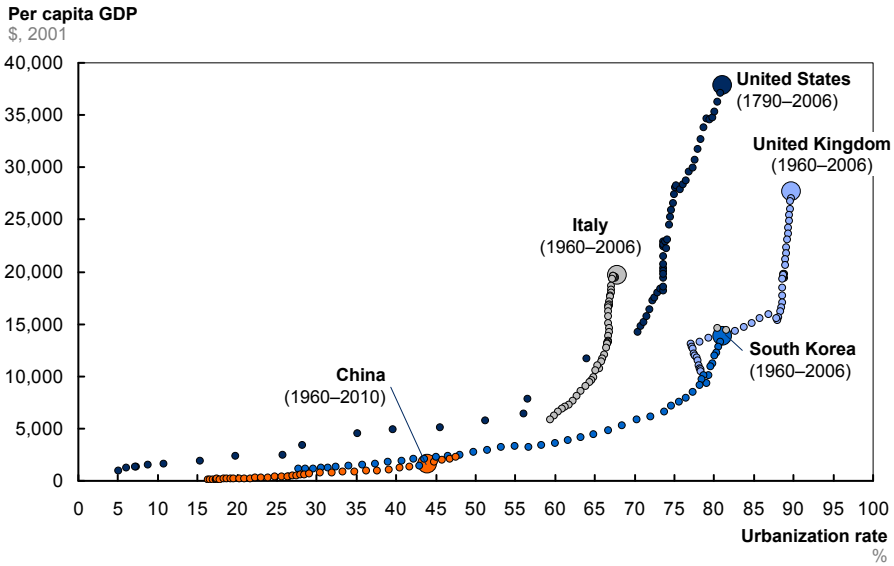
Box 4. Urbanization has gone hand in hand with economic growth around the world

Every major country in the world has, over time, experienced a shift in its population from largely rural, agrarian dwelling to life in urban, nonagricultural centers. The pace of this transition has varied from country to country—but the process has been inexorable and irreversible (Exhibit 1.3).

The key reason for this relationship between GDP growth and urbanization is that the increased density of urban populations produces scale benefits that boost productivity, which in turn enhances growth—a virtuous cycle.

Exhibit 1.3

Urbanization is an inevitable part of a country's economic evolution



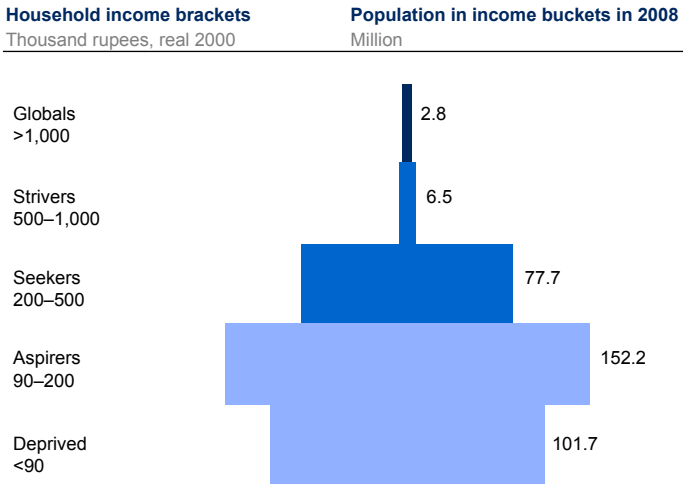
Note: Definitions of urbanization states differ across countries.
SOURCE: World Development Indicators; EU KLEMS database; McKinsey Global Institute analysis

India's cities are home to 340 million people, representing every section of India's society

More Indians now live in cities than ever before—an urban population that is the second largest in the world. India's urban population grew from the 290 million reported in the 2001 Census to an estimated 340 million in 2008, representing nearly 30 percent of India's total population. The population of today's Indian cities is a microcosm of the nation as a whole—a rich mix of communities, cultures, professions, and income classes from the most deprived sections of society to a middle-class majority that is at the heart of India's social and economic transformation. In fact, some 75 percent of urban citizens are in the bottom income segments, earning an average of 80 rupees (around $1.80) a day (Exhibit 1.4). And contrary to popular belief, migration accounts for only a small percentage of the increase in urban population (see box 5, "Historically, organic growth rather than migration has driven India's urban population growth").

Exhibit 1.4

Cities are representative of India, with 75 percent of the urban population concentrated in the bottom two income brackets



SOURCE: India Urbanization Econometric Model

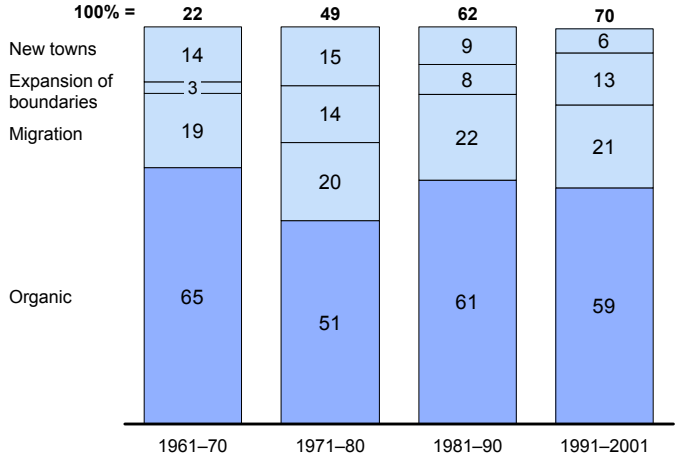
Box 5. Historically, organic growth rather than migration has driven India's urban population growth

Migration data in India has historically been hard to compile, but the data that are available show a pattern in which most of the growth in urban India has come from organic growth in city populations, together with the reclassification of rural areas and the expansion of city boundaries. Only around 20 percent of the increase in urban population is driven by direct migration (Exhibit 1.5). Surveys indicate that this migration is predominantly within districts and within states and that only 20 to 25 percent of migration is across state boundaries.

Exhibit 1.5

Natural growth is the biggest driver of urban population growth

Breakdown of incremental urban population
Million



SOURCE: NSSO and census migration data; Mitra and Murayama, *Rural to Urban Migration: A District-Level Analysis for India*; McKinsey Global Institute analysis

CITIES WILL BE CENTRAL TO INDIA'S ECONOMIC FUTURE

Growing urban jobs will be core to India's future, productivity, and economic growth and will be the driver behind accelerating urbanization.

New job growth will drive India's urbanization

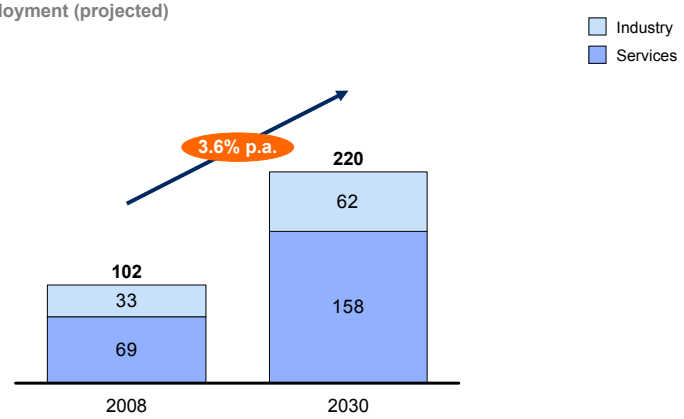
Unlike many countries that are grappling with aging populations and rising dependency ratios, India has a young and rapidly growing population—a potential demographic dividend. India will have the largest growing workforce for the next 20 years, as 270 million Indians will join the net working-age population between now and 2030. Finding jobs for all these new workers is the country's great challenge—and a major part of the answer probably lies in urban India.

Sectoral policies and new investment will be necessary to create jobs for these additional workers. Under a base-case estimate of annual GDP growth of 7.4 percent (see box 6, "Growth assumptions"), cities will continue to attract the majority of new investment. Between 2008 and 2030, MGI's analysis suggests that rural employment can grow at less than 0.6 percent annually at best—moving from 330 million to around 380 million, a net addition of less than 50 million jobs. Job growth in cities, meanwhile, will be far more robust, growing at around 3.6 percent annually, increasing from around 100 million today to 220 million in 2030. In other words, cities will account for 70 percent of all new jobs created in India between now and 2030. Consistent with the underlying fundamentals of India's economy, and its structural transformation, around 90 million of these 120 million new urban jobs will be in the service sector (Exhibit 1.6).

Exhibit 1.6

India's economy is likely to produce about 120 million jobs in cities

Urban nonagricultural employment (projected)
Million jobs



SOURCE: India Urbanization Econometric Model

Box 6. Growth assumptions

MGI assumes an 8.0 percent annual GDP growth rate between 2009 and 2018, stabilizing to 7.0 percent between 2018 and 2030. From 2008 to 2030, therefore, is average annual GDP growth of 7.4 percent. We take this projection from Oxford Economics. Oxford Economics' projections are in the middle range of analysts' estimates and we regard them as conservative.

MGI noted in its 2001 report *India: The growth imperative* that India's needs to grow its GDP at close to 10 percent a year to create enough employment for the nation's young and growing population.[3] The report argued that double-digit growth would be possible if India were to push aggressively to remove barriers in product, land, and labor markets. While India has made considerable progress, it needs to do more; the case for further reforms remains as compelling today as it was in 2001.

In both manufacturing and services, jobs in cities are likely to be nearly twice as productive as those in villages. The GDP per worker in urban service sector is 1.7 to 1.8 times that in rural India; in the manufacturing sector, the productivity advantage is likely to widen from 1.9 times to 2.2 times through to 2030 (Exhibit 1.7).

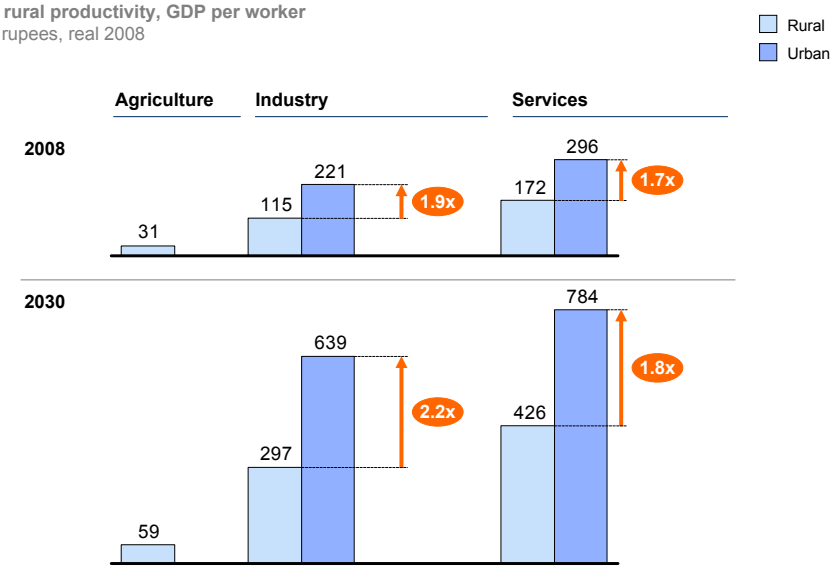
Although these trendline forecasts indicate that, at a base-case GDP growth rate of 7.4 percent, India might not create enough jobs for all these new entrants, it is clear that the vast majority of them will find their livelihoods in the higher productivity urban jobs. India's fastest-growing states, therefore, will continue to urbanize faster (Exhibit 1.8). This is at the heart of the urbanization phenomenon and is central to India's economic growth.

3 *India: The growth imperative*, McKinsey Global Institute, September 2001 (www.mckinsey.com/mgi).

Exhibit 1.7

Urban jobs will enjoy a sustained productivity advantage

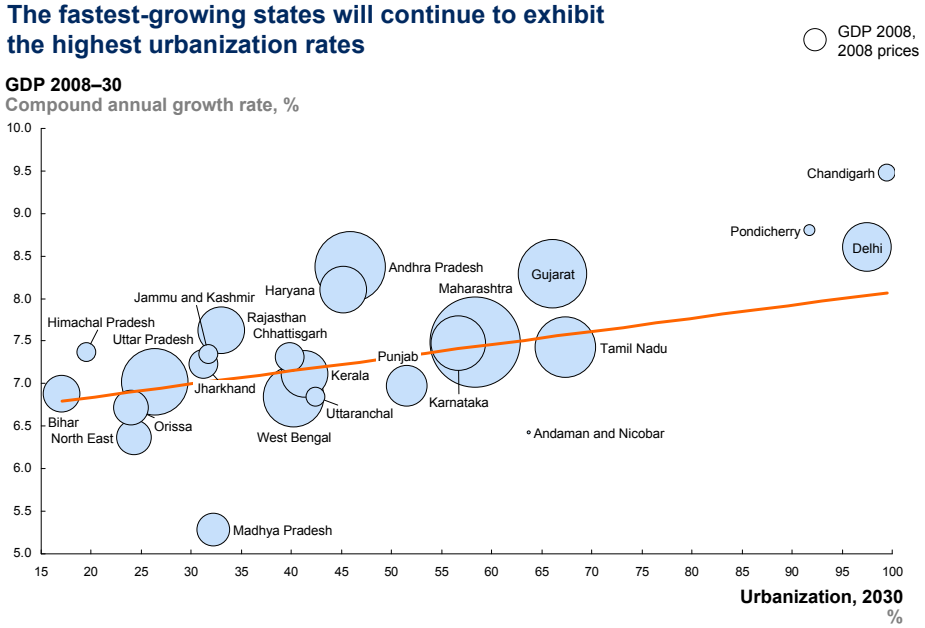
Urban vs. rural productivity, GDP per worker
Thousand rupees, real 2008



SOURCE: India Urbanization Econometric Model

Exhibit 1.8

The fastest-growing states will continue to exhibit the highest urbanization rates

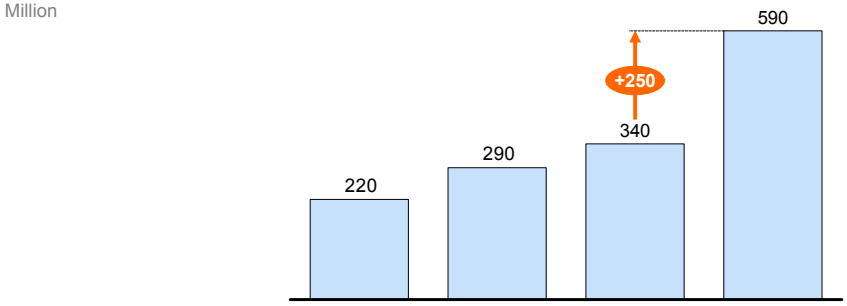


SOURCE: India Urbanization Econometric Model

As a consequence of continued economic growth and the job creation it will entail, MGI projects therefore that the population of India's cities will increase from 340 million in 2008 to 590 million by 2030—40 percent of India's total population (Exhibit 1.9). In short, we will witness over the next 20 years an urban transformation the scale and speed of which has not happened anywhere in the world except in China.

Exhibit 1.9

In MGI's base-case scenario, cities are likely to house 40 percent of India's population by 2030



	1991	2001	2008	2030
Total population Million	856	1,040	1,155	1,470
Urbanization rate[1] %	26	28	30	40

1 Defined as the ratio of urban to total population based on the census definition of urban areas; population >5,000; density >400 persons per square kilometer; 75 percent of male workers in nonagricultural sectors; and statutory urban areas.

SOURCE: India Urbanization Econometric Model; McKinsey Global Institute analysis

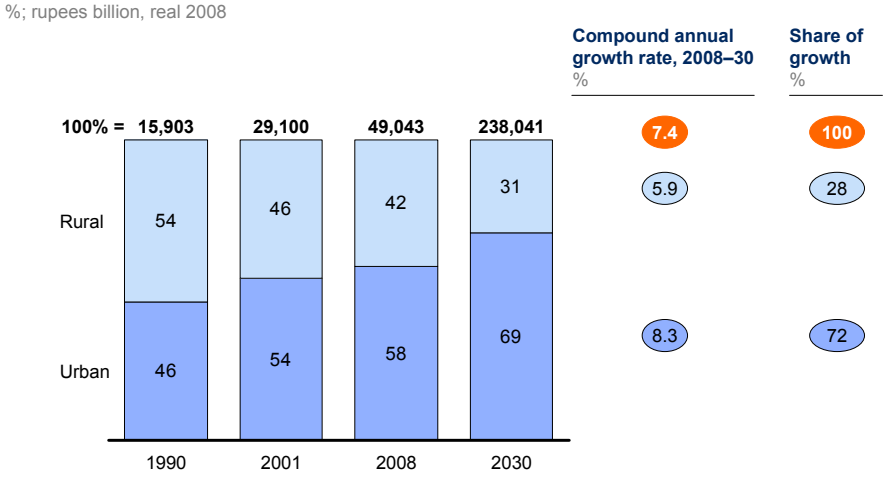
Cities will account for a major share of GDP and income growth

As India's cities expand, India's economic makeup will also change. In 1995, India's GDP split almost evenly between its urban and rural economies. In 2008, urban GDP accounted for 58 percent of overall GDP. By 2030, under our base-case economic projections, MGI anticipates urban India will generate nearly 70 percent of India's GDP (Exhibit 1.10).

India's fast-growing and relatively productive cities will drive a near fourfold increase in India's per capita income between 2008 and 2030 (Exhibit 1.11). The number of households earning less than 90,000 rupees per year will fall below 20 percent for the first time in India's history, while the number of middle-class households (earning between 200,000 rupees and 1 million rupees a year) will increase more than fourfold nationwide from 32 million to 147 million (Exhibit 1.12).

Exhibit 1.10

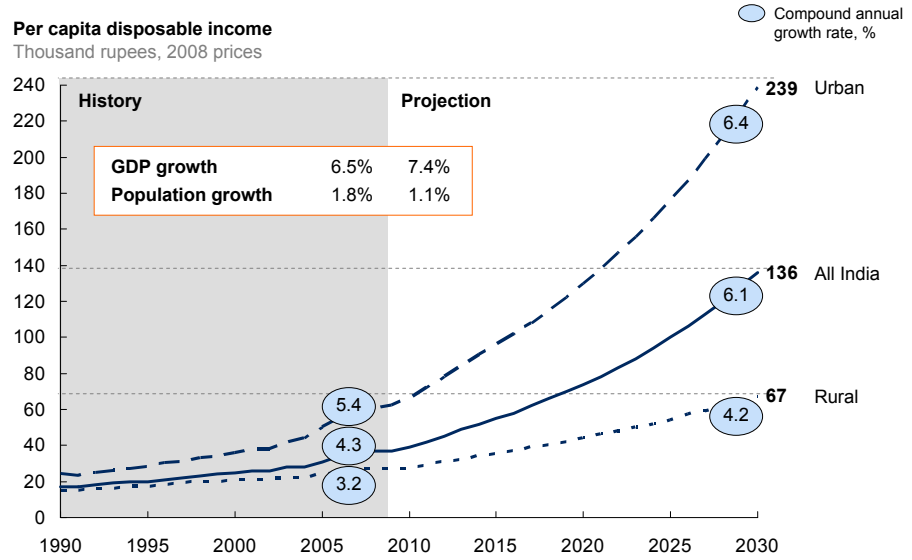
Cities will account for nearly 70 percent of India's GDP by 2030



SOURCE: India Urbanization Econometric Model; McKinsey Global Institute analysis

Exhibit 1.11

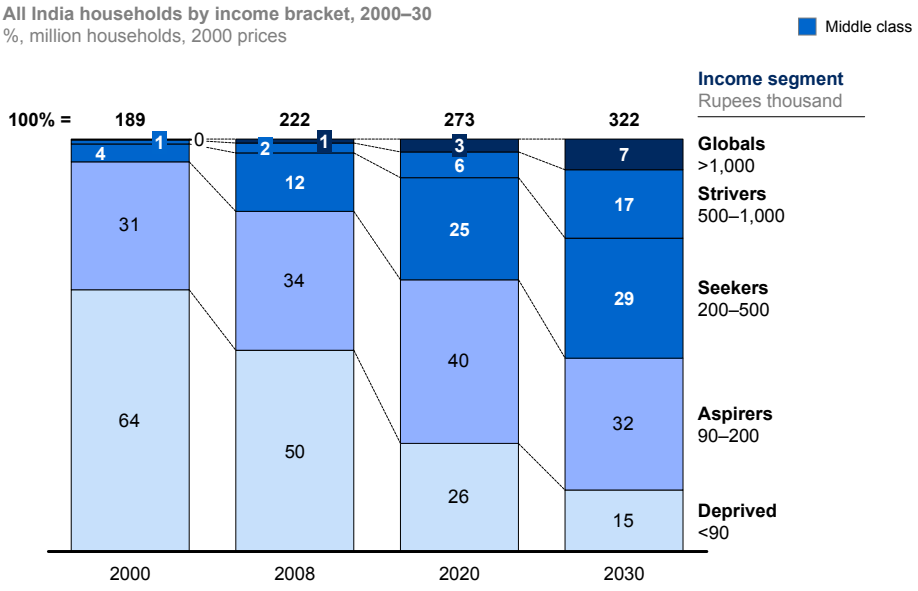
Urban India will drive a near fourfold increase in average national income



SOURCE: India Urbanization Econometric Model; McKinsey Global Institute analysis

Exhibit 1.12

More than 100 million households will join the Indian middle class



SOURCE: India Urbanization Econometric Model

CITIES WILL ALSO BE CRITICAL FOR INCLUSIVE GROWTH

Cities are about more than just economic growth and higher incomes—they perhaps offer the best promise of a higher quality of life for the largest number of Indians. By providing an efficient vehicle for delivery of basic services, generating the majority of taxes, and by benefiting rural areas in their proximity, cities play a vital role in expanding the fruits of India's economic growth to a wider section of its population.

Cities can be a cost-effective vehicle to expand access to basic services

Research over the last few decades has pointed to consistent evidence of the agglomeration benefits of cities. Such benefits play out in at least two ways. First, cities

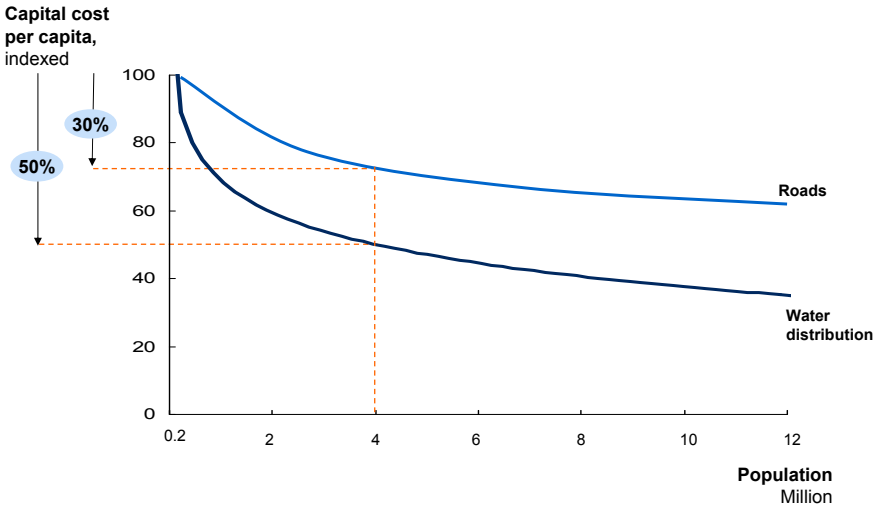
allow for interactions that promote productivity, one of the underlying drivers of economic growth. Second, scale benefits offered by cities—in India and around the world—offer the opportunity to significantly lower the cost of service delivery. This is particularly relevant for a country like India, which faces a significant challenge of rapidly ramping up basic services to a very large section of its population when funds are constrained. Research indicates that the cost of delivering basic services is 30 to 50 percent cheaper in concentrated population centers than in sparsely populated areas (Exhibit 1.13). Given finite public resources, such potential savings could be vital if the government is to meet its aspiration for improving quality of life at affordable prices.

We estimate, for instance, that the cost of delivering a liter of piped water is around 50 percent cheaper because cities are able to leverage common supply depots and cut distribution costs.

The same advantage holds true for higher-end infrastructure as well. Some elements of the infrastructure that are critical to high-end services—international airports, for example—are economically feasible only in population centers of a certain minimum size. Our analysis shows, for instance, that it takes $4.8 million in capital expenditure per daily flight in a city whose population exceeds 4 million—but nearly $13 million in a city of less than 1 million.

Exhibit 1.13

There is clear evidence of agglomeration benefits in basic sectors including water distribution and roads



SOURCE: Global Water Intelligence database; International Association of Public Transport; McKinsey Global Institute analysis

Cities will continue to account for the bulk of tax revenue vital for development spending

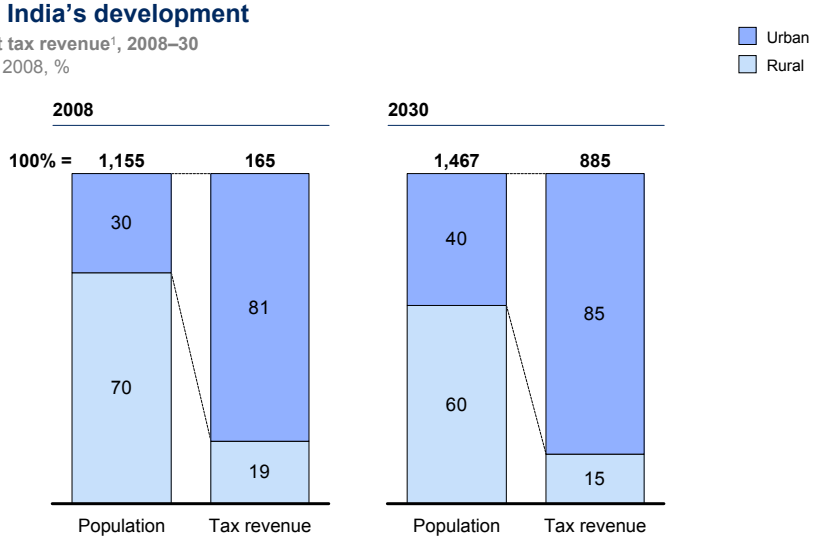
Cities are also vital for the funding of development because they generate the lion's share of India's tax revenue—between 80 and 85 percent.

In 2008, cities accounted for more than 80 percent of India's tax revenue despite accounting for only 58 percent of economic output. While we can partly attribute this disproportionate share to the location of headquarters of pan-national companies in major cities, the fact remains that tax collection is more robust in India's urban areas than in its villages. By 2030, MGI projects that 85 percent of tax revenue will come from cities. So the robust health of urban India will be vital to enable sufficient spending on the development of the whole economy—urban and rural (Exhibit 1.14).

Exhibit 1.14

Cities will continue to generate disproportionate tax revenue—and fund India's development

Government tax revenue[1], 2008–30
$ billion, real 2008, %



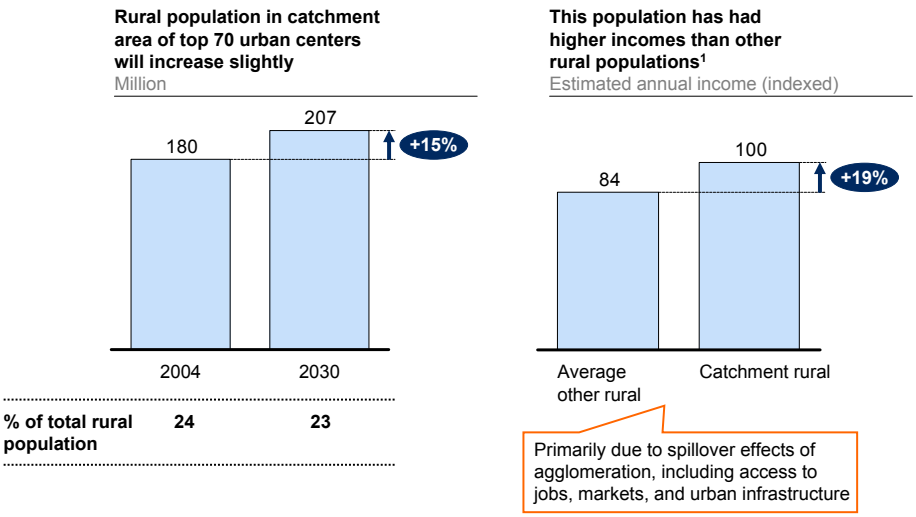
1 Includes income tax, VAT, service taxes.
SOURCE: India Urbanization Econometric Model

Rural areas near India's large cities will benefit directly from urban growth

Cities have benefits beyond their own boundaries. Our research finds that some 180 million people who live close to cities will benefit because they will enjoy improved access to jobs, markets, and the connecting infrastructure. Rural populations adjoining large urban centers today have an estimated 10 to 20 percent higher incomes than the rural average. We estimate that 180 million such rural residents live next to the 70 largest urban centers in India, a number that will increase to around 210 million by 2030 (see box 7, "Building good cities is critical to boosting rural incomes, too") (Exhibit 1.15).

Exhibit 1.15

Around 180 million to 210 million people in rural areas will benefit from their proximity to the 70 largest cities



1 Index calculated on per capita district data from NSSO's 61st round data for the catchment and other districts.
SOURCE: National Sample Survey Organization (NSSO); India Urbanization Econometric Model

Box 7. Building good cities is critical to boosting rural incomes, too

There is a clear and absolute overlap between the agenda of improving cities and boosting rural incomes. Urbanization is not a substitute for programs aimed at improving agricultural incomes. Indeed, urbanization complements efforts to improve rural incomes. Improved agricultural productivity and resulting higher incomes are possible only if India creates substantial nonagricultural jobs to absorb the surplus labor force in agriculture. Cities will play a vital role in this job creation. MGI's 2001 report, *India: The growth Imperative*, examined scenarios for raising agricultural productivity. The research found that a twofold increase in agricultural productivity is possible through improved yields and mechanization, but will release an estimated 50 million to 130 million agricultural workers. These workers will need to find alternative jobs, the vast majority of which will be in cities.

THE RESULTING INDIA WILL HAVE CITIES OF AN IMMENSE SCALE EVEN IN A GLOBAL CONTEXT

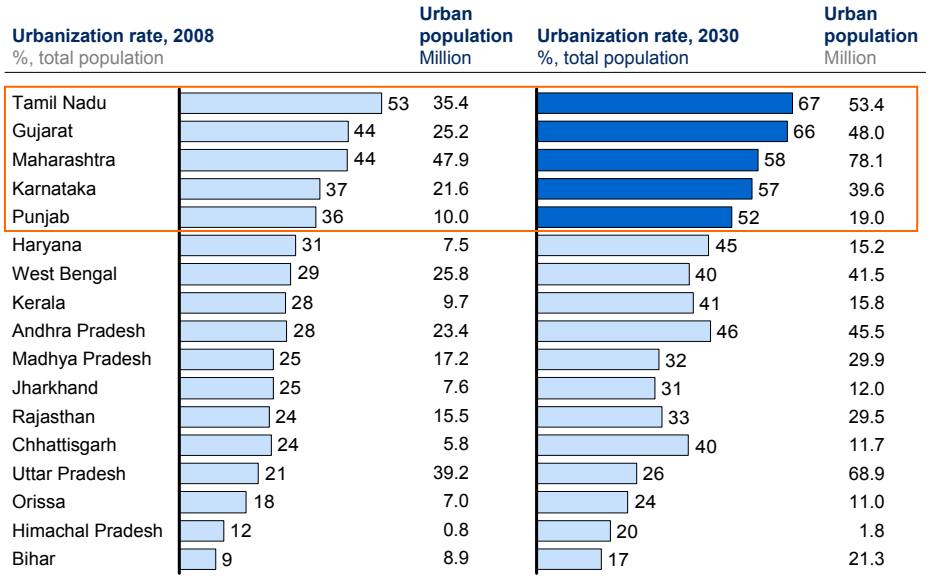
Driven by these trends, urban expansion in India will happen at a speed quite unlike anything the country or the world has seen before. It took nearly 40 years (between 1971 and 2008) for India's urban population to rise by nearly 230 million. It will take only half the time to add the next 250 million.

Urbanization will spread out across India, impacting almost every state. For the first time in India's history, the nation will have five large states (Tamil Nadu, Gujarat, Maharashtra, Karnataka, and Punjab) that will have more of their population living in cities than in villages (Exhibit 1.16).

Urbanization will be accompanied by a three- to sevenfold increase in total GDP, and a four to eightfold increase in urban GDP in every state. Four states alone will together contribute more than 40 percent of India's total GDP as well as its urban GDP. While states such as Chandigarh, Delhi, and Gujarat will have the most rapid rise in per capita GDP (four- to sixfold), even a state like Bihar will see a more than threefold increase in per capita GDP. All states will have at least half of their GDP coming from urban areas, and at least ten states will have more than 70 percent of their economic output located in cities (Exhibit 1.17).

Exhibit 1.16

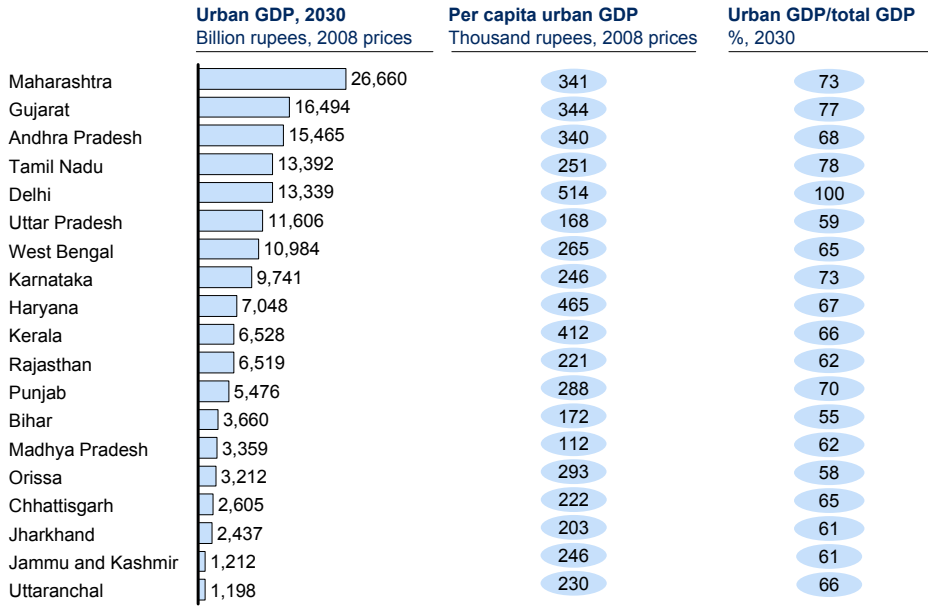
Five states are likely to be more than 50 percent urbanized



SOURCE: India Urbanization Econometric Model; McKinsey Global Institute analysis

Exhibit 1.17

All large states will have more than 50 percent of GDP coming from cities

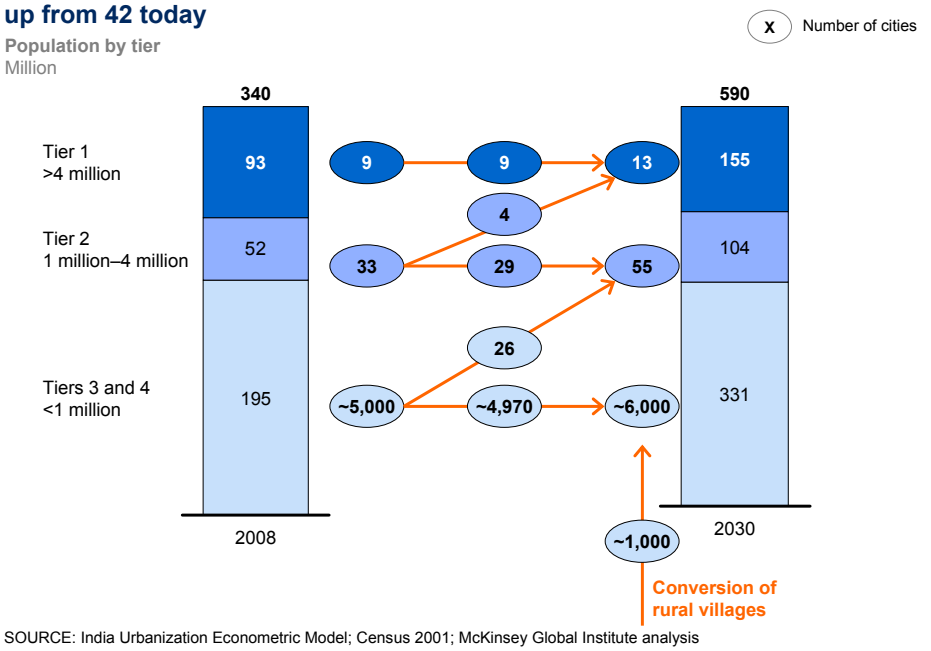


SOURCE: India Urbanization Econometric Model; McKinsey Global Institute analysis

Turning from states to cities, India will have 68 cities with populations of more than 1 million, compared with the current 42; 13 cities with more than 4 million people; and 6 megacities with populations of 10 million or more, at least two of which (Mumbai and Delhi) will be among the five largest cities in the world by 2030 (Exhibit 1.18).

Exhibit 1.18

India will have 68 cities with population of more than 1 million by 2030, up from 42 today

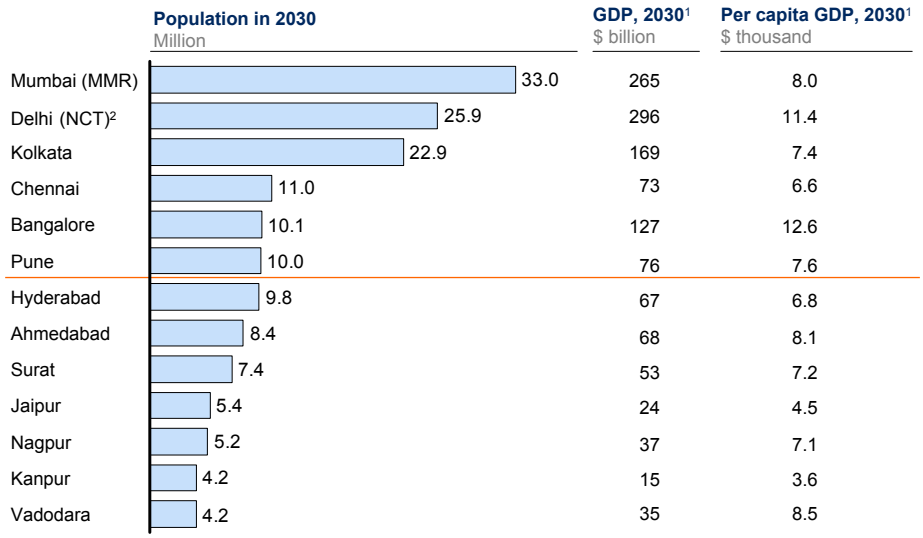


SOURCE: India Urbanization Econometric Model; Census 2001; McKinsey Global Institute analysis

In terms of both population and GDP, many Indian cities will become larger than many countries today (Exhibit 1.19). For instance, Mumbai Metropolitan Region's GDP is projected to reach 11.9 trillion rupees ($265 billion) by 2030, larger than the GDP of many countries today, including Portugal, Colombia, and Malaysia (Exhibit 1.20).

Exhibit 1.19

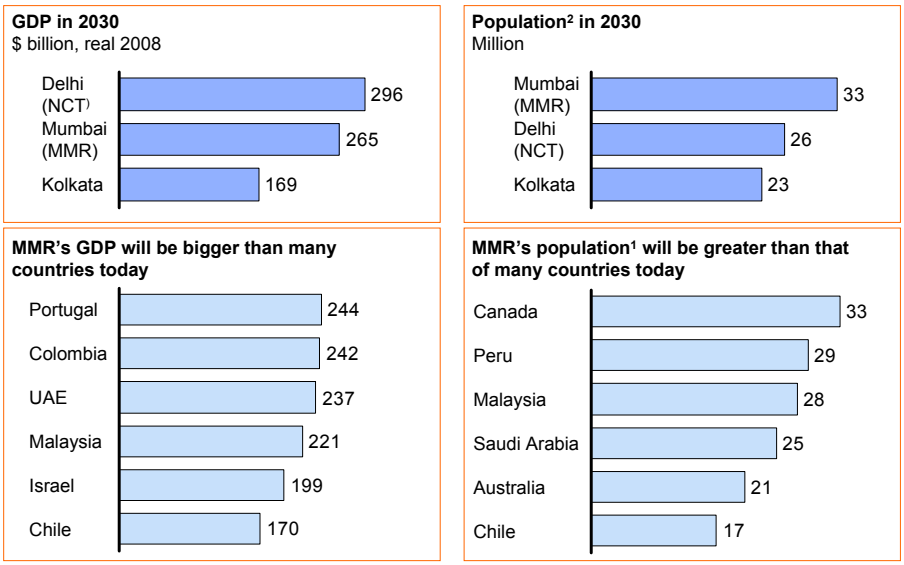
Thirteen cities will have a population of more than 4 million



1 2008 prices.
2 National Capital Territory; excludes Noida, Gurgaon, Greater Noida, Faridabad, and Ghaziabad.
SOURCE: India Urbanization Econometric Model; McKinsey Global Institute analysis

Exhibit 1.20

Some of India's largest metro regions would become the size of many countries today



1 Population is total population for countries and urban population for Indian cities.
SOURCE: India Urbanization Econometric Model; Economist Intelligence Unit

The next 20 years will therefore see the emergence of majority urban states and at the same time the rise of a large number of cities in the list of the largest cities in the world, not just in population but in the size of economic output as well. In many ways, the scale of India's urbanization and the portfolio of cities it will generate will be a significant part of the contours of the world's global urban population by 2030.

□ □ □

Cities already play a large and significant role in India's economy and society, and they will be an even more dominant force in the near future. Indeed, by the middle of this century, India's cities will exert a central influence on the global economy and community. This transformation has the potential to be a compelling platform for India to leapfrog into a new era of rising incomes and quality of life. But the sheer scale and pace of the urbanization will present many challenges, too. In chapter 2, we describe the nature of these challenges and explain the need for a new approach to managing the country's urban transformation.

2. India's current approach will lead to urban decay

As a result of deep-seated economic reform in recent years, India has made significant strides, achieving strong rates of economic growth and raising incomes. But it is questionable whether India can sustain its economic momentum unless it acts decisively to manage its growing cities.

Even at today's urban scale, India is struggling. The infrastructure of its cities is looking decidedly tattered and access to basic services in urban areas continues to be poor. Superimpose a surge in demand for services from an expanding urban population and rising incomes, and India's aspiration for social cohesion and sustainable economic growth could reach a breaking point. The risk is that the quality of life in urban India will deteriorate, gridlock will hopelessly compromise productivity, and investors will decide that India's cities are too chaotic for their businesses to thrive.

We believe that today's *laissez-faire* attitude to managing India's cities will no longer do. India's current approach to urban development is insufficient for the mammoth task ahead and needs an immediate revamp. To mitigate the undoubted strains that will develop as cities expand, and to maximize the potential economic opportunity that well-managed cities can offer, India urgently needs a fresh, proactive approach to addressing the challenges of urbanization.

GOOD CITIES OFFER ROBUST ECONOMIC GROWTH AND A SUSTAINABLE QUALITY OF LIFE

Cities have existed throughout modern history in every part of the world. Some have been successful, others not. Cities that have prospered have always delivered a compelling proposition to citizens who choose to bring their talent and energy to the city's fabric, and to investors who opt to bring their capital and enterprise, thereby sustaining urban livelihoods and growth (Exhibit 2.1).

Those cities that offer an attractive proposition to business and people create a virtuous cycle that creates jobs, fosters talent, attracts capital, boosts productivity, and improves the quality of life for residents. Not all cities achieve this virtuous cycle—and lose out to other urban centers that offer a more attractive proposition to skilled people and business investors. Such cities simply cannot leverage the potential economic benefits that urbanization can confer and suffer not only a deteriorating quality of life but also, eventually, subpar economic growth.

Exhibit 2.1

Good cities deliver robust economic growth, as well as a sustainable quality of life

	What good cities deliver	
Robust economic growth	**Sustained productivity advantage**	▪ Cities have established a robust economic growth agenda and provide a favorable investor climate
	Robust job creation	▪ Ensures creation of sufficient jobs and livelihoods
Sustainable quality of life	**Scaled public infrastructure**	▪ Uninterrupted access to clean water supply for every resident ▪ 100 percent coverage, proper treatment of sewage and solid waste ▪ 45 minutes maximum intra city travel time for all citizens
	Reliable social services	▪ Quality, affordable education and health care facilities for all ▪ Access to affordable housing for all sections of the society; no urban slums
	Good recreational and community infrastructure	▪ Parks within 15 minutes of walking for every resident ▪ Open spaces throughout all cities ▪ Entertainment hubs and community spaces that celebrate diversity and foster innovation for all residents
	Sustainable environment	▪ Preservation of natural resources and ensuring access to clean air, water, and land ▪ Matching national standards on climate change, emissions, and sustainability

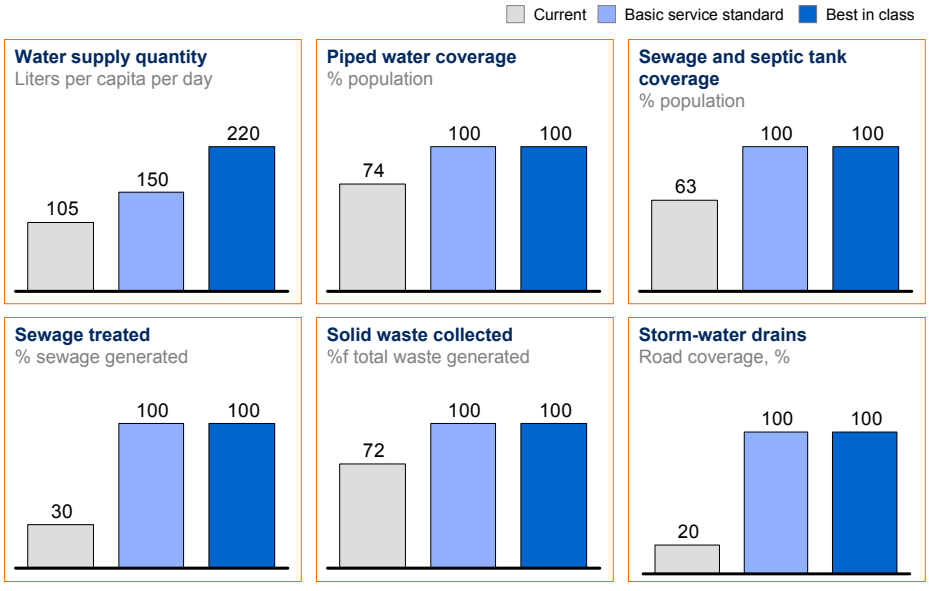
SOURCE: McKinsey Global Institute analysis

INDIAN CITIES ARE ALREADY STRUGGLING TO PROVIDE A BASIC QUALITY OF LIFE

Urban India has attracted investment on the back of strong growth but is failing its citizens. Across all major quality-of-life indicators, India's cities fall well short of not only the levels of service to which international cities aspire but even a "basic" standard of living for their residents (these basic standards have been defined using a combination of Indian and international benchmarks). While this is true across every service, we are choosing to highlight the poor quality of physical infrastructure as a particular example of the crisis affecting Indian cities (Exhibits 2.2 and 2.3).

Exhibit 2.2

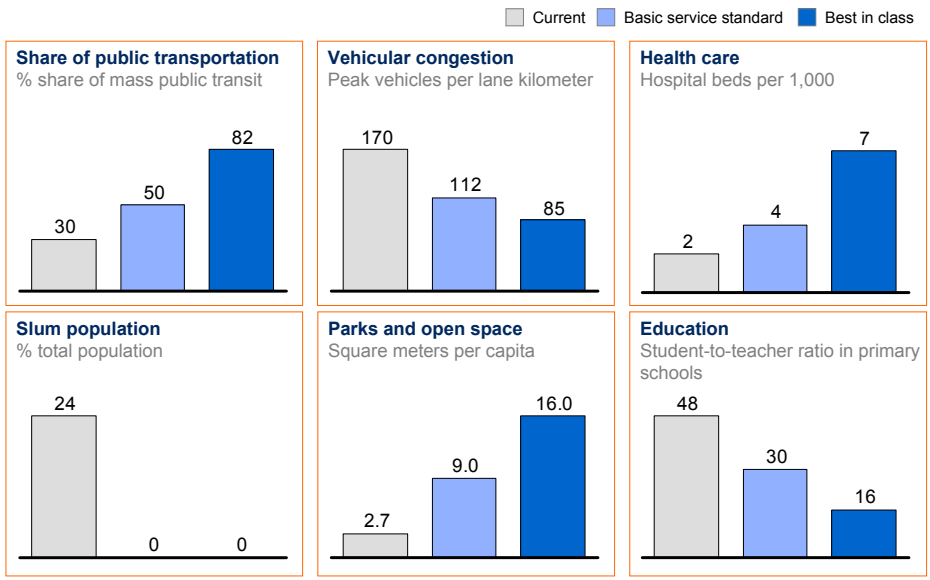
The current performance of India's cities is poor (1/2)



SOURCE: United Nations; press search; City Development Plans; The Energy and Resources Institute; Planning Commission; Census 2001; Central Pollution Control Board; McKinsey Global Institute analysis

Exhibit 2.3

The current performance of India's cities is poor (2/2)



SOURCE: United Nations; press search; City Development Plans; The Energy and Resources Institute; Planning Commission; Census 2001; McKinsey Global Institute analysis; *Study on Traffic and Transportation Policies and Strategies in Urban areas in India*, Wilbur Smith, 2008

Life for the average city dweller in India is tough. Across India, urban citizens have access to only 105 liters per day of potable, piped water supply, as compared to a minimum basic requirement of 150. Only 63 percent of population has access to sewerage and septic tank facilities, and only 30 percent of sewage generated actually gets treated. This is true even for large cities—Mumbai, for example, treats only 30–40 percent of its sewage today. Another key urban pressure point is affordable housing. Nearly 80 million people live in slums across the country. Transportation, too, has deteriorated over the years. Lack of investment in public transportation has resulted in a significant decline in share of public transportation, from nearly 40 percent in 1994 to 30 percent today. Private transportation infrastructure is equally dismal. Peak private vehicular density has already touched 170 vehicles per lane kilometer—50 percent higher than the basic requirement.

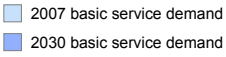
ON CURRENT POLICIES, INDIAN CITIES WILL FACE WORSENING DECAY AND GRIDLOCK

As the urban population and its incomes increase in India, demand for every key service will increase many times (Exhibit 2.4). This will be true in cities of every size and type across the country (Exhibit 2.5).

And if India continues to invest in urban infrastructure at its current rate—very low by international comparison—in 20 years' time the urban infrastructure will fall woefully short of what is necessary to sustain prosperous cities (Exhibit 2.6). On current trends, India is likely to invest $300 billion in urban infrastructure over the next 20 years, a twofold increase in per capita spending of $17 today. Even with such a large investment program, capacity building in urban India will not come anywhere close to meeting the surging demand for services. For example, peak vehicular densities will likely reach as high as 610 vehicles per lane kilometer. At such densities, an average journey may take up to five hours in peak morning traffic—similar to the acute congestion that disfigures some Latin American cities. Similarly, the per capita water supply could drop from 105 liters today to 65 in 2030.

Exhibit 2.4

The massive scale of India's urbanization will create a huge surge in demand



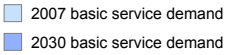
	Description	Metric	Demand forecast
Water supply[1]	Water demand will increase 2.3 times	Million liters per day	83 / 189
Sewage	Sewage generated will increase 2.3 times	Million liters per day	66 / 151
Solid waste	Solid-waste generation will rise 5 times	Million tons per annum	71 / 377
Cars	Total number of cars will rise 5.8 times	Urban stock of cars, million	10 / 58
Public transport	Number of public trips per year will increase 2.7 times	Public trips per day, million	120 / 328
Affordable housing	Demand will reach 38 million housing units	Affordable housing demand, million units[2]	25 / 38

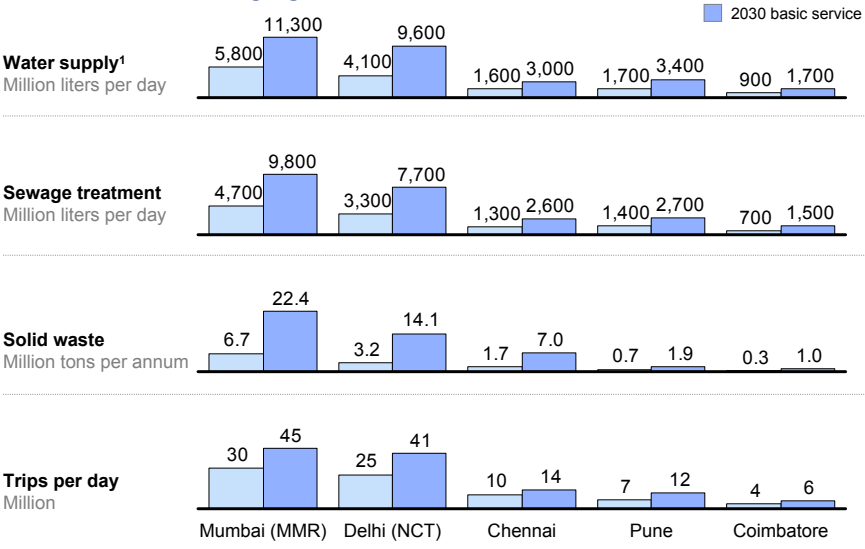
1 Assuming constant rate for unaccounted for water (UFW).
2 Net of existing supply.

SOURCE: United Nations; Handbook of benchmarks, Ministry of Urban Development; W. Smith, *Transportation Policies and Strategies in Urban India*; National Council for Applied Economic Research; press search; McKinsey Global Institute analysis

Exhibit 2.5

All cities will see surging demand for services



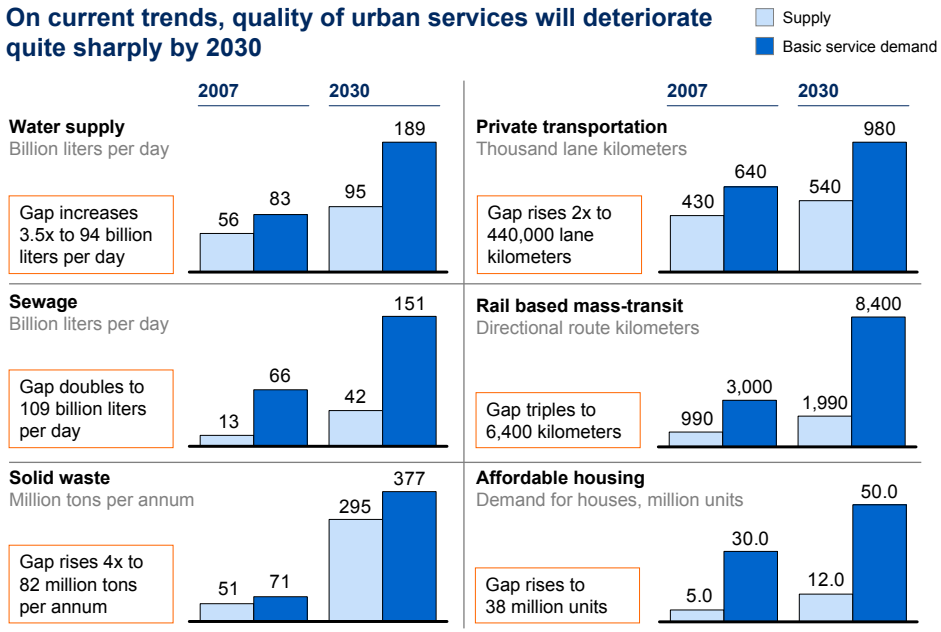


1 Assuming constant rate for unaccounted for water (UFW).

SOURCE: United Nations; Handbook of benchmarks, Ministry of Urban Development; W. Smith, *Transportation Policies and Strategies in Urban India*; National Council for Applied Economic Research; press search; McKinsey Global Institute analysis

Exhibit 2.6

On current trends, quality of urban services will deteriorate quite sharply by 2030



SOURCE: United Nations; Handbook of benchmarks, Ministry of Urban Development; W. Smith, *Transportation Policies and Strategies in Urban India*; National Council for Applied Economic Research; McKinsey Global Institute analysis

We have seen the strains that arise from such unplanned urbanization elsewhere. For example, in many Latin American countries, rapid urbanization without a corresponding stepping up of infrastructure construction has led to a steep deterioration in quality of life. Until recently, the metropolitan city of São Paolo, Brazil, with a population of 19 million, had only 38 miles of public rail transportation, which resulted in traffic queues at peak hours that could stretch out for more than 120 miles. More than 60 percent of citizens who moved into the city since the 1980s lived in slums *(favelas)*. Brazil may also have not fully leveraged the economic opportunity of urbanization, unable to generate sufficient jobs to match the movement of people into cities. Unlike in many other countries, the transition to a mostly urban population (e.g., from 50 to 80 percent) was accompanied in Brazil by only a twofold increase in per capita income, compared to double that in other countries.

This is a stark warning for India. If India continues with its current unplanned urbanization path, it will result in a sharp deterioration in the quality of life in its cities, putting even today's rates of economic growth at risk.

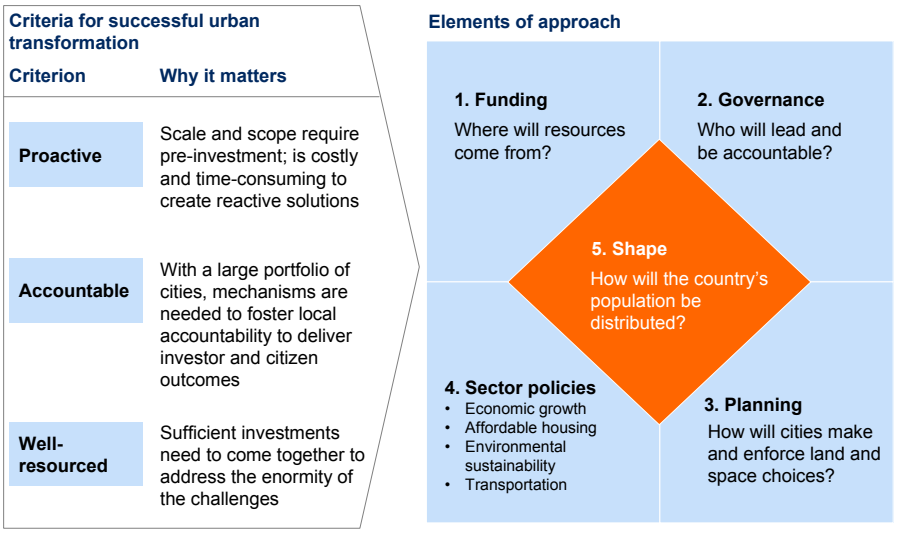
INDIA NEEDS A NEW APPROACH ACROSS FIVE ELEMENTS

Many countries have faced the challenges that urban India is grappling with today, albeit not on the same scale, and emerged as successes. So what can India learn from the successes and mistakes of others? Our analysis finds that, although countries naturally make different choices, there is a broad consistency in the basic approach employed by countries with thriving cities. Our study shows that five dimensions are important: funding, governance, planning, sectoral policies, and shape (Exhibit 2.7).

India scores poorly on all five of these aspects of the urbanization challenge (Exhibit 2.8).

Exhibit 2.7

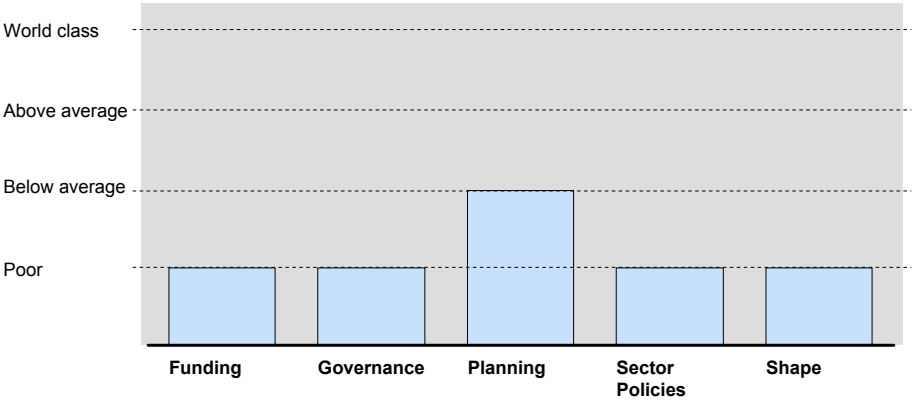
To manage urbanization, countries around the world have used a common approach consisting of five elements



SOURCE: McKinsey Global Institute analysis

Exhibit 2.8

India scores poorly on four, and below average on one, of these five elements to date



SOURCE: McKinsey Global Institute analysis

- **Funding.** Sufficient resources for investment to build services for citizens, preferably anticipating demand rather than playing constant catch-up as we see in India, are the bedrock of successful cities. In countries around the world governments have devised mechanisms to ensure cities have reliable access to four sources of funds: land monetization; property taxes and user charges; debt and private participation; and a formula based grant system from the government. With some exceptions, India has barely leveraged these sources of funding, resulting in significant underinvestment (one-eighth of what is necessary) in its cities. In addition, central and state governments do not follow a systematic formula in their approach to provide funds to cities.

- **Governance.** Choices that cities make on leadership and management are a second vital component. The most successful governance is a devolved model that empowers local leaders but holds them accountable. India has not devolved power to the local level, leaving states to run cities from a distance and with weak accountability. India is the only G20 country that has not adopted a system in which empowered mayors run cities, and where dedicated expert agencies deliver services. Moreover, Indian cities have a large shortage of administrative and technical talent.

- **Planning.** Effective and systematic urban planning has been part of the fabric of successful cities for decades. Planning is important to allow cities to make informed trade-offs on their use of scarce resources such as land. Cities around the world use micro-plans to ensure effective use of every aspect of the city's urban space. Usually a metropolitan master plan sets out the overall strategy for the economy, mass transit, and affordable housing which is then applied in detail at the local level. Indian urban plans, on the other hand, exist on paper but have little impact on the ground. The choices India's cities make on land use and other aspects of planning are ad hoc. Exemptions are so systemic that there is a very weak relationship between what plans prescribe and the decisions that unfold at the local level. A significant shortage of world-class urban planners exacerbates the poor quality of India's urban planning.

- **Sectoral policies in job creation, public transportation, affordable housing, and climate-change mitigation.** Great cities invest effort in designing policies for the most important sectors that influence the city's economy and quality of life. Take affordable housing as an example. In general, cities plan for affordability and work to create policies to match affordability with income levels to ensure wide access to housing. India does not plan for affordable housing systematically and has built fewer than 200,000 units a year, in comparison to the minimum that India needs: 2 million annually. While models exist, India has not found a large-scale, economically viable model that can be executed nationally. As a result, 17 million households live in slums, a number that could double by 2030.

- **Shape.** Most countries in the world have had the luxury of urbanizing organically through history and have ended up with different portfolios and distributions of cities. China is exceptional in that it proactively shaped a concentrated pattern of urban expansion in the beginning, with the development of its dynamic coastal cities. India can proactively shape the overall portfolio of cities in a way that optimizes their economic contribution, investment and land requirements, and the objective of regional equity. India has not made any active attempt to do this. MGI sees no evidence that central and state governments in India are addressing the issue of how best to shape its portfolio of cities to maximize their potential to drive growth.

□ □ □

The need for a new approach to managing India's urbanization is urgent and critical. If it adopts a new approach, India could turn its urban expansion into a compelling opportunity to attract investment and drive social transformation. The next chapter offers a detailed discussion of what India needs to do on the five elements of effective urban management and development.

3. The five building blocks of sustainable urban living in India

India needs to examine its potential for change in the five dimensions of the management of urbanization that we have identified in cities around the world. In each case, we offer recommendations based on our analysis of the most effective way forward.

Together, these five building blocks constitute a potential operating model that can act as a framework for India's urban reform.

3.1 Funding. India needs to ensure that cities have a sufficient scale of public infrastructure to support their needs as they develop

3.2 Governance. Urban management will be more effective if cities have local "owners," more closely accountable to residents, rather than being run top-down by the state

3.3 Planning. A shift from ad hoc and sporadic to planned and facilitated urban growth is critical

3.4 Sectoral policies. From today's piecemeal approach, India needs to put in place a systematic set of policies for all the key urban sectors

3.5 Shape. India needs to facilitate a distributed shape of urbanization, ensuring that cities of all sizes can thrive by using a clearly defined long-term strategic approach.

3.1 Unlocking $1.2 trillion in urban investment

India has chronically underinvested in its cities for many years, and the results are plain to see—gridlock, slums, poor provision of public services, and subpar urban economic growth. India first needs to face up to this backlog and provide its urban population with at least basic services. But just as urgent is to find sufficient resources to get investment flowing into cities as they expand. If India fails to unlock new sources of funding, it will see growing cities fall into a state of disrepair, deepening and prolonging India's urban crisis.

With $1.2 trillion in capital investment needed over the next 20 years, the funding challenge is arguably one of the most difficult that India faces. However, the good news is that by unlocking four sources of funding including government funding support, it is possible for the nation to meet this challenge.

In this section, we explore:

- India's current urban funding patterns and the overall funding requirement
- Five elements of an effective urban funding system
- India's performance on these five elements
- Key recommendations to bridge the urban funding gap
- Potential next steps to unlocking urban investment

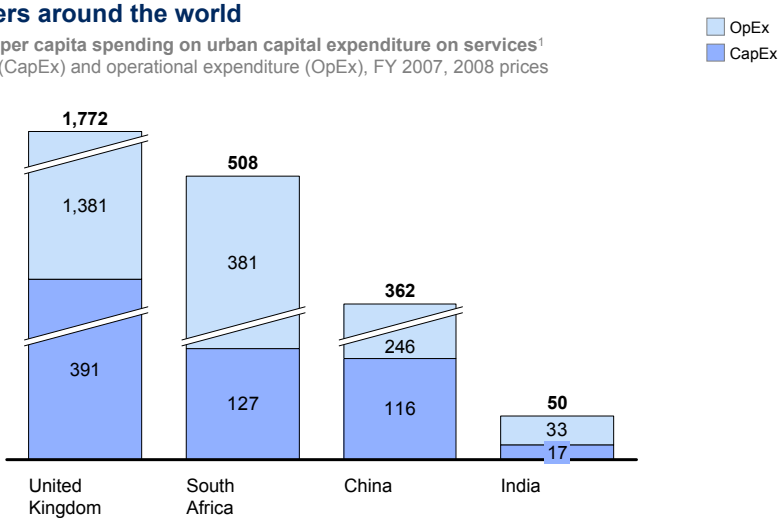
INDIA SIGNIFICANTLY UNDERINVESTS IN ITS CITIES

India's urban spending remains at a dismally low level in comparison with other countries. In per capita terms, India's annual per capita spending including capital and operational expenditure of $50 is only 14 percent of China's $362 and less than 3 percent of the United Kingdom's $1,772 (Exhibit 3.1.1).

Exhibit 3.1.1

India chronically underinvests in its cities in comparison with other urban centers around the world

Comparison of per capita spending on urban capital expenditure on services[1]
$/capita, capital (CapEx) and operational expenditure (OpEx), FY 2007, 2008 prices



1 Urban services include water, sewage, city roads, storm-water drains, mass transit (including rail-based mass-transit), solid waste, and low-income housing.

SOURCE: Press search; McKinsey Global Institute analysis

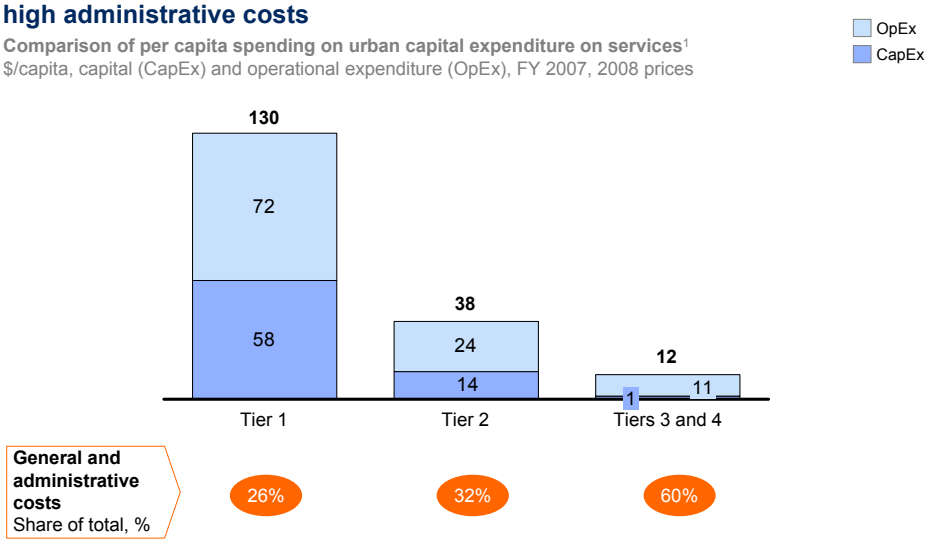
In terms of capital expenditure, the situation is even worse. India spends only $17 per capita annually on urban capital investment, compared with $116 per capita in China and $391 in the United Kingdom.

In addition, India's current urban spending varies dramatically according to the size of city. Tier 1 cities spend an average of $130 per capita each year, with 45 percent of this total on capital spending. However, owing to high general and administrative costs, most Tier 3 and 4 cities support per capita capital spending of only $1 currently (Exhibit 3.1.2).

Exhibit 3.1.2

Tier 3 and 4 cities have very low per capita spending due to high administrative costs

Comparison of per capita spending on urban capital expenditure on services[1]
$/capita, capital (CapEx) and operational expenditure (OpEx), FY 2007, 2008 prices



1 Urban services include water, sewage, city roads, storm-water drains, mass transit (including rail-based mass-transit), solid waste, and low-income housing.

SOURCE: Government of India budgets; Finance Commission; India Urbanization Funding Model, McKinsey Global Institute analysis

TO DELIVER BASIC SERVICES, INDIA NEEDS $1.2 TRILLION IN CAPITAL EXPENDITURE AND $1 TRILLION IN OPERATING EXPENDITURE OVER THE NEXT 20 YEARS

We used bottom-up estimates from MGI's sector models to estimate the expenditure needs of key urban sectors, linking basic service parameters directly with funding requirements (see box 8, "Summary of approach to estimating urban investment requirements," and appendix B for more detail on our methodology).

To make up for years of underinvestment and prepare for the demands of a surging urban population based on delivering basic standards of services in all core urban sectors, we estimate that India needs to spend $1.2 trillion in capital expenditure and $1 trillon in operating expenditure (a total of $2.2 trillion) in its cities over the next 20 years (Exhibit 3.1.3). In per capita terms, this is the equivalent of average annual spending of about $250.

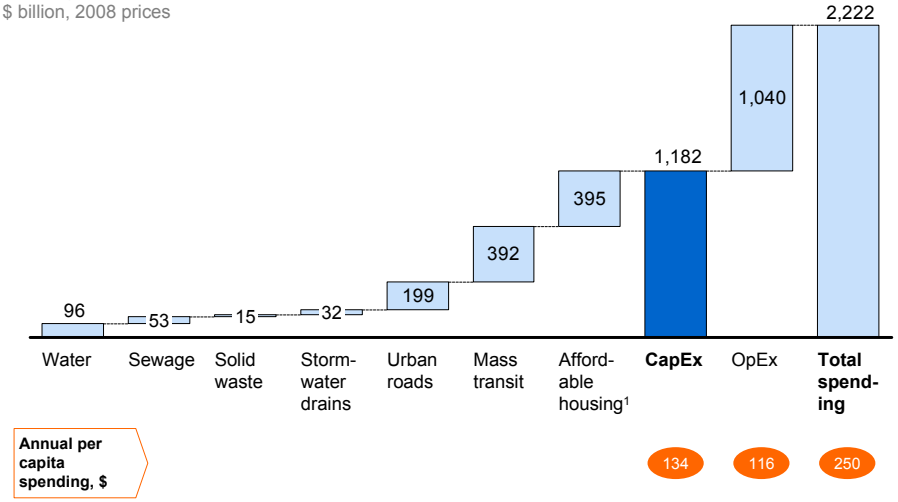
Our analysis reveals that more than half of this amount needs to be devoted to capital expenditure. Within capital expenditure, almost half the amount is necessary to erase India's existing infrastructure backlog in its cities and the rest need to be devoted to their future needs. Transportation and affordable housing for low-income groups stand out as the most capital-intensive sectors while mass-

transit, including fares of metro, subways and bus systems dominate operating expenditure (Exhibit 3.1.4).

Exhibit 3.1.3

Indian cities need capital funding of $1.2 trillion and a total funding of $2.2 trillion over the next 20 years

Funding requirement for urban sectors, 2010–30
$ billion, 2008 prices



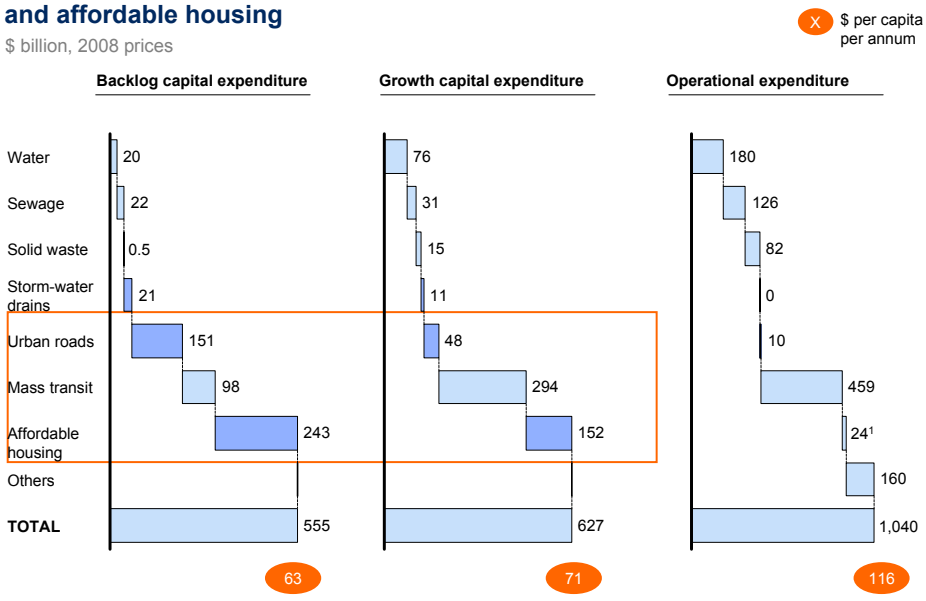
1 Net of beneficiary contribution, Operating costs of rental stock included separately.

SOURCE: India Urbanization Funding Model; Detailed Project Reports from the Jawaharlal Nehru National Urban Renewal Mission; McKinsey Global Institute analysis

Exhibit 3.1.4

The majority of capital spending in cities will need to go to transportation and affordable housing

$ billion, 2008 prices



1 Operating cost of rental stock.

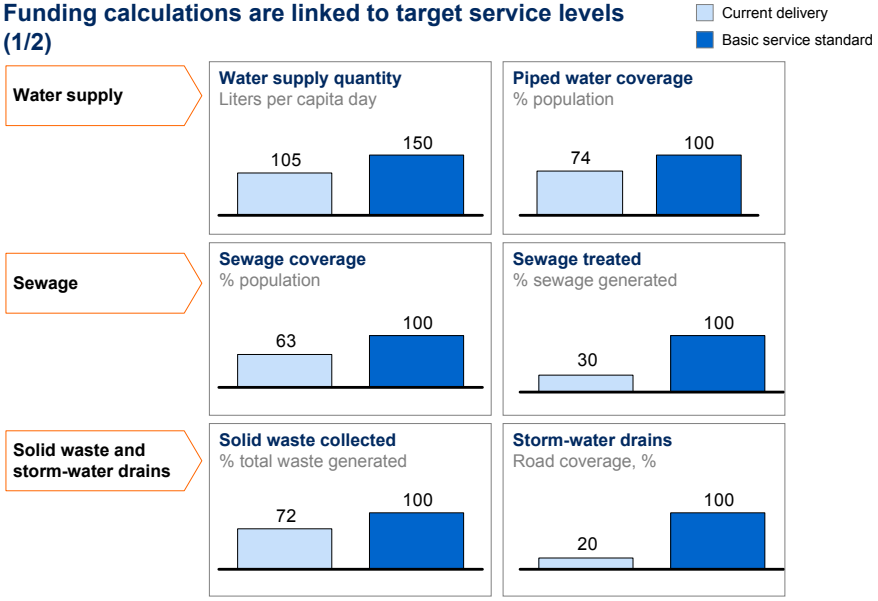
SOURCE: India Urbanization Funding Model; McKinsey Global Institute analysis

Box 8. Summary of approach to estimating urban investment requirements

We estimated urban investment requirements using independent satellite models for each of the core services, linked to the overall econometric model projections on population and income at a city level (Exhibits 3.1.5 and 3.1.6). For each of these services requirements, we defined target service levels using government benchmarks where they existed and setting broad guidelines where no benchmarks existed. We also used standard cost benchmarks from detailed project reports (DPRs) sourced from the Jawaharlal Nehru National Urban Renewal Mission to arrive at these funding estimates. We now provide a brief summary of the key parameters:

Exhibit 3.1.5

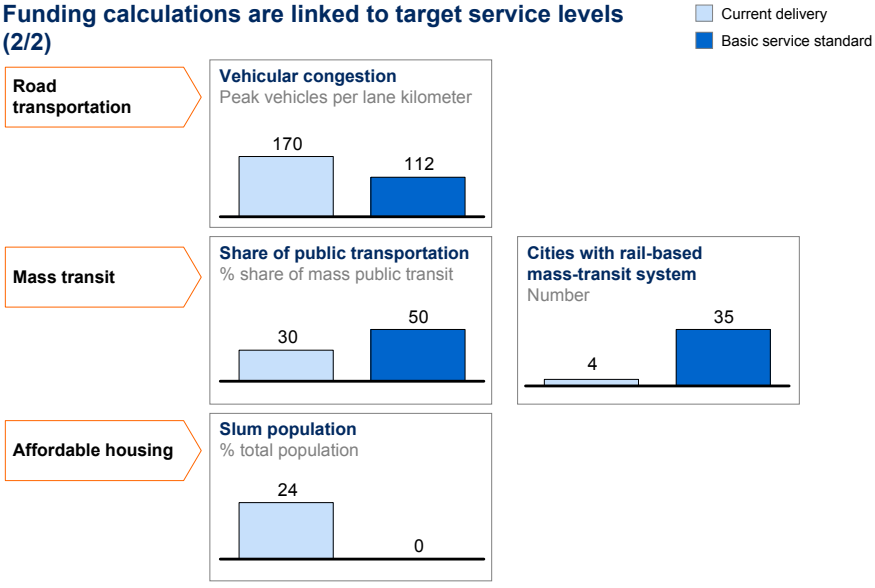
Funding calculations are linked to target service levels (1/2)



SOURCE: United Nations; City Development Plans; The Energy and Resources Institute; Planning Commission; Census 2001; Central Pollution Control Board; McKinsey Global Institute analysis

Exhibit 3.1.6

Funding calculations are linked to target service levels (2/2)



SOURCE: United Nations; press search; City Development Plans; The Energy and Resources Institute; Planning Commission; Census 2001; McKinsey Global Institute analysis; *Study on Traffic and Transportation Policies and Strategies in Urban areas in India*, Wilbur Smith, 2008

- **Water supply: Ensuring 150 liters per capita per day supply with full coverage.** Residential piped water supply in Indian cities is limited today to 105 liters per capita per day with only 74 percent coverage. By 2030, India should aim for at least 150 liters with full coverage to bring its cities into line with established international benchmarks. In addition, another 40 to 60 liters per capita per day capacity is required to meet commercial and industrial requirements, which we calculated separately using standard water intensity values for these sectors. Assuming that the amount of unaccounted for water doesn't change, India will need to increase water supply from 56,000 liters per day to 189,000—a 3.3 times increase.

- **Sewage: Providing full coverage and treatment.** Today India treats only 30 percent of the sewage generated, and it has sewer and septic-tank coverage of only 63 percent. To reach full coverage in terms of both infrastructure and treatment by 2030, we estimate that India needs to boost its treatment capacity by a factor of 11 and the total length of its sewer piping by 2.4 times.

- **Solid-waste management: Aiming for full coverage and treatment.** India's rate for the collection of solid waste hovers around 72 percent today. However, we project a tripling in per capita waste generation because of higher incomes and consumption resulting in a sixfold increase in waste generation to reach 377 million tons per annum, inclusive of construction debris.

- **Transportation: Moving toward a public-transit-led system.** India already has a peak vehicular density of 170 vehicles per lane kilometers, leading to an average peak morning commute in excess of one-and-a-half to two hours. This is a serious pressure point that threatens to compromise urban productivity. The strain on urban roads is set to intensify. Our projections suggest that the urban vehicle stock (including cars, two-wheelers, and other automobiles) will quadruple by 2030 to touch 200 million. If India were to reverse today's trend of a declining share of public transportation and target a 50 percent share for public transport in 2030 from 30 percent today, the implications are as follows:

  — *Intrercity mass transit: Accommodating rising public trips.* Our review of cities around the world shows that mass-transit systems are an essential lifeline of large cities, especially as the population increases above a million. India's challenge will be to ensure the rapid construction of rail-based mass-transit and bus rapid transit systems (BRTS) in Tier 1 cities, where the need is already acute, as well as begin the process in Tier 2 cities before their populations become too large for the capacity of public transportation systems to cope. In this context, we estimate that, to accommodate rising public trips, India will need to build at least 35 rail-based mass-transit systems in top Tier 1 and Tier 2 cities sequenced over the next 20 years with a cumulative track length of more than 8,400 kilometers. In addition, India should aim to provide 8,000 kilometers of world-class Bus Rapid Transportation System in 68 cities with populations of more than 1 million. We also recommend a fivefold increase in the stock of urban buses by 2030, in order to provide effective bus-transit systems in all cities. Overall, this would increase the share of public transportation in Tier 1 cities to 60 percent, in Tier 2 cities to 50 percent, and in Tier 3 and 4 cities to 35 percent. At an urban India level this will result in a 50 percent share of public transportation.

— *Intracity roads: Achieving a 50 percent increase in the urban road network.* To accommodate the additional journeys taken by private transport (15 percent of the overall trips) and to keep vehicle congestion to a manageable 112 per lane kilometer, India would need to construct more than 900,000 lane kilometers by 2030. Of this total, 15 to 20 percent would need to be arterial and ring expressways, while the rest would need to be local roads.

- **Storm-water drains: Providing storm-water drains equivalent to 100 percent coverage of urban roads in 2030.** Given the water-logging problems associated with rainy seasons in India, an efficient drainage system in cities is a must. India should aim to increase coverage of covered storm-water drains to 100 percent of roads by 2030.

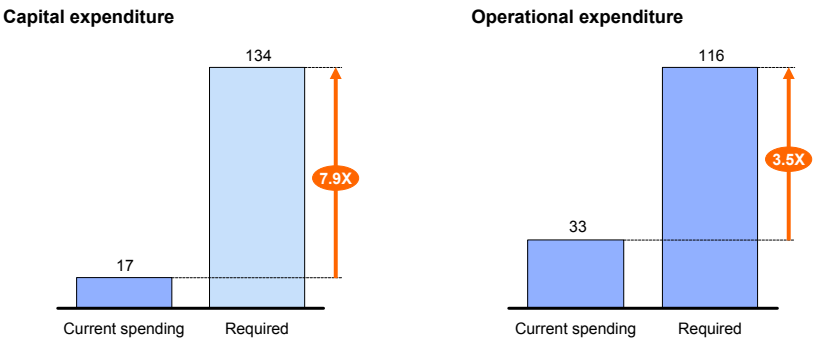
- **Affordable housing for low-income groups: Building 38 million affordable homes to plug the current backlog and meet the projected gap in urban demand.** Creating slum-free cities would require India to satisfy the demand for affordable housing. Using an MGI affordability analysis, demand for affordable housing could rise from 25 million households today to more than 38 million households in 2030. To calculate the funding requirements for affordable housing, we netted off the beneficiary contribution (based on affordability) from the market price of the house.

Taking these core urban services together, we estimate that India needs to boost its annual per capita urban capital spending eightfold from $17 to $134 (an increase in urban infrastructure spending from an average of 0.5 percent of GDP annually today to 2 percent of GDP a year) and per capita operational spending more than threefold (Exhibit 3.1.7).

Exhibit 3.1.7

If India is to provide services to these basic levels, per capita spending needs to increase substantially

$ per capita per annum, 2008 prices



SOURCE: Jawaharlal Nehru National Urban Renewal Mission; City Development Plans, 12th and 13th Finance Commission of India; McKinsey Global Institute analysis

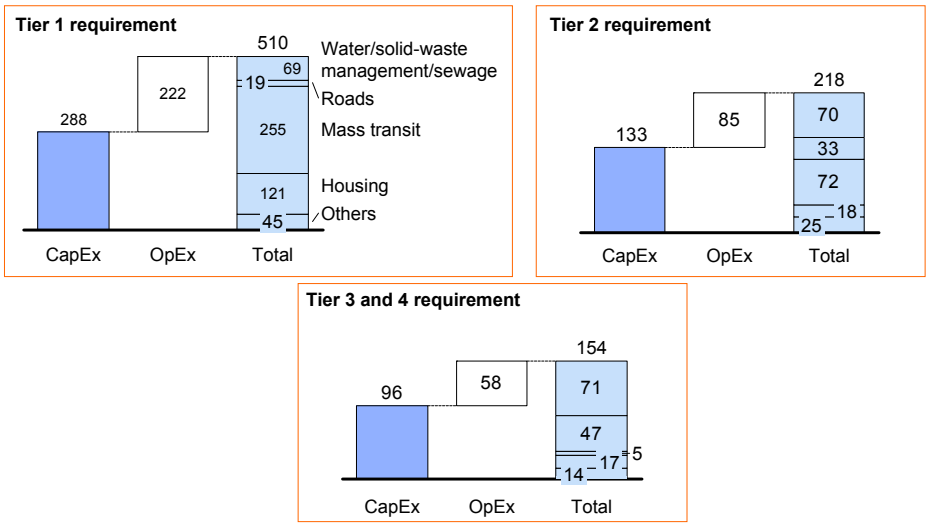
The necessary spending varies widely according to the size of urban centre. In per capita terms, Tier 1 cities need almost three times the amount required by smaller Tier 3 and 4 cities (Exhibit 3.1.8). This is largely because of a much greater need for creation of affordable housing stock due to the high slum population in these cities today, as well as the need to construct high-capacity mass-transit

systems (Exhibit 3.1.9). We note that, due to lower mass transit modal share, residents of Tier 3 and Tier 4 cities will invest in private vehicles, the cost of which is not reflected in these calculations.

Exhibit 3.1.8

The capital spending required in Tier 1 cities is higher due to greater need in affordable housing and mass-transit systems

$ per capita per annum, 2008 prices

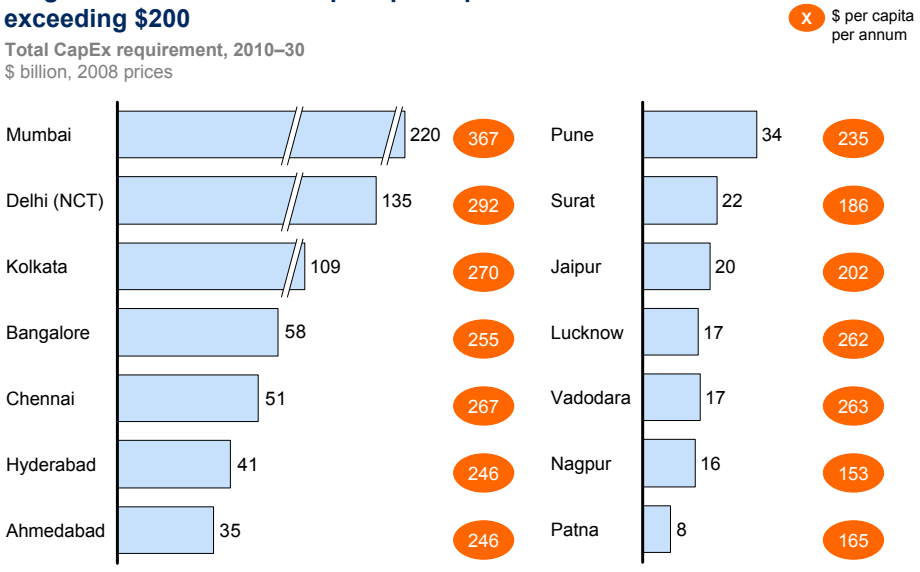


SOURCE: India Urbanization Funding Model; McKinsey Global Institute analysis

Exhibit 3.1.9

Large Tier 1 and 2 cities require per capita investment exceeding $200

Total CapEx requirement, 2010–30
$ billion, 2008 prices



SOURCE: India Urbanization Funding Model; McKinsey Global Institute analysis

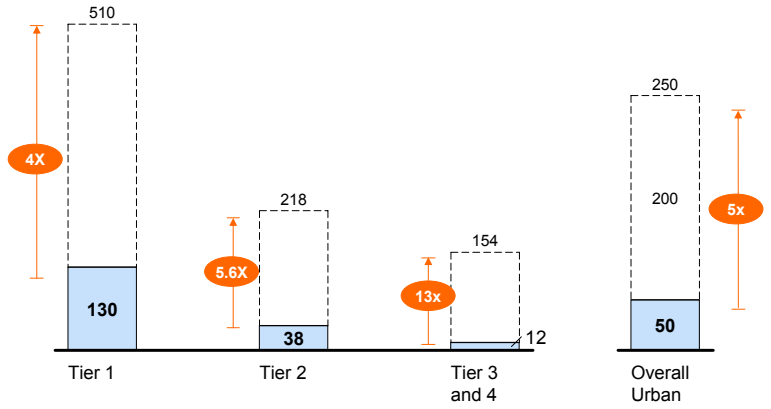
Although additional spending requirements vary widely between India's largest and smallest cities, the fact is that a sharp rise in spending is still necessary across the board (Exhibit 3.1.10).

Given the sheer scale of the investment that is required and the current low levels, we suggest that India might consider designing a staggered program that sequences spending over a 20-year period, ramping up spending over time (Exhibit 3.1.11).

Exhibit 3.1.10

Although the funding requirement varies in cities of different sizes, the need for steep increases in funding is present in all

Current and required spend across tiers
$ per capita per annum, capital and operational expenditure, 2008 prices

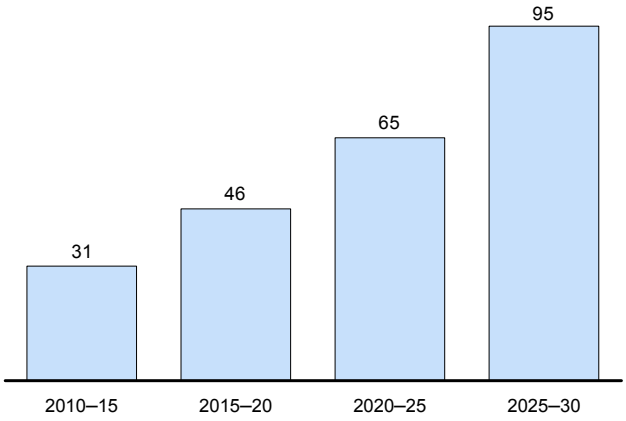


SOURCE: India Urbanization Funding Model; City Development Reports (CDPs); McKinsey Global Institute analysis

Exhibit 3.1.11

India could consider a staggered investment plan

Capital expenditure, $ billion per annum, 2008 prices



SOURCE: McKinsey Global Institute analysis

FIVE KEY ELEMENTS OF A SUCCESSFUL URBAN FUNDING SYSTEM ARE OBSERVED CONSISTENTLY AROUND THE WORLD

There is little doubt about the magnitude of India's funding challenge. However, India has options available. Many other countries around the world have faced similar tests as they have urbanized and devised effective approaches to the funding challenge suited to their stage of economic development and the shape of their respective public-finance systems.

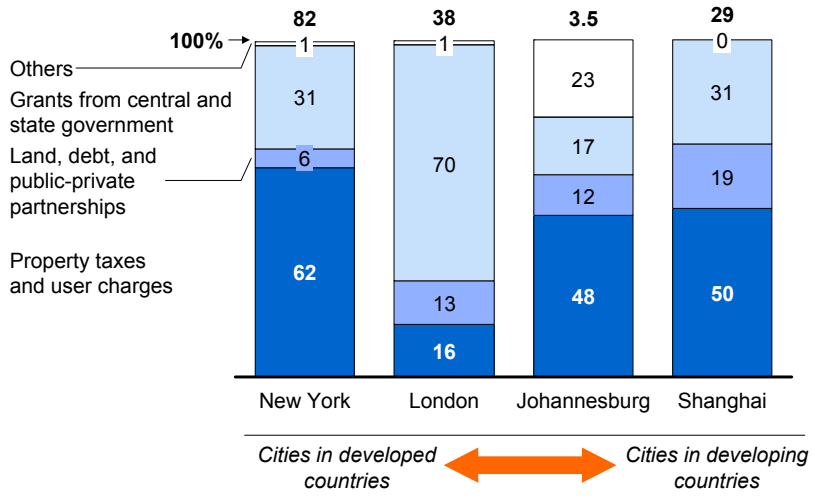
In very broad terms, cities in developed countries tend to rely on user charges and municipal taxes (such as property tax) in addition to state and central government tax sharing, grants, and debt to fund urban services. However, cities in developing countries with lower per capita incomes tend to be unable to finance capital expenditure through just user charges and property taxes. Instead, such cities have tapped other sources of revenue, including the monetization of land and access to bank loans at preferential rates to supplement substantial grants from government. We illustrate these types of approaches by highlighting four examples:

- **China.** China's urban transformation in the last few decades has been breath-taking. At the core of this transformation is China's ability to invest in urban infrastructure ahead of demand, a significant achievement for a developing country. Here we showcase how Shanghai, China's leading economic and financial center, has been able to provide a relatively high quality of life for its 19 million residents. Our analysis reveals that only half of Shanghai's estimated $29 billion spend on urban services is funded through local taxes and user-charges. The rest is financed through monetization of land assets and bank loans on preferential terms as well as a 30 percent share in local taxes such as VAT (Exhibit 3.1.12). This last source of funding has been particularly important as an incentive to invest significantly in the city's infrastructure. Because municipal governments cannot borrow directly in China, most of the city's financing has been through state-owned investment companies such as the Shanghai Construction Investment Development Corporation (Chengtou). Today, China is increasingly diversifying its urban funding sources. For example, in 2009, the Chinese government issued $29.2 billion in bonds for investments in urban infrastructure. China is also encouraging the private sector to invest in revenue-generating infrastructure projects through concession contracts, leasing, and franchise, and other joint venture agreements.

Exhibit 3.1.12

Sources of urban funding depend on stage of development, but the role of states and central government is always important

Sources of urban funds
$ billion, %



SOURCE: McKinsey Global Institute analysis

- **United States.** Cities in the United States fund urban services largely through local taxes (such as property tax, local income tax) and user charges, where these sources are not only used for operating and maintenance expenditure but are also securitized through debt and private participation to pay for capital expenditure. Take New York for example: In fiscal 2006, New York spent more than $82 billion on urban services, including education, health care, and affordable housing. Almost 62 percent of this spending was financed through New York's own taxes and user charges, including property tax, a tag-along income tax, and a local sales tax. Consistent with other cities in the United States, property tax collections are buoyant in New York and reflect 2 to 3 percent of property values. The tag-along income tax and local sales tax, meanwhile, provide an incentive to grow. An additional 31 percent came from inter-government transfers, largely from the state government for specific sectors such as education and health care. For the remaining 7 percent of funds ($5.7 billion), which the city largely channels into capital expenditure, New York relies on bond issues by local governments as well as utility companies such as the New York Water Authority. In fact, New York has put in place a ten-year capital expenditure program totaling $88 billion, three-quarters of which is funded through such bond issues while the rest is financed via grants from central and state governments.

- **United Kingdom.** The United Kingdom has a unique public finance system in which the central government continues to fund most urban services. In London, for example, 70 percent of the aggregate $38 billion spent in fiscal 2007 by local governments came from direct grants from the central government. Local council and business taxes financed around 16 percent of the rest of London's spending, while debt, the sale of assets, and internal accruals financed the remaining 14 percent of expenditure that the city channeled largely into capital formation. Three types of central government grants exist in London: (1) formula grants that are unconditional and include revenue-support grants as well as redistributed business rates; (2) area-based grants; and (3) "ring-fenced" grants for specific sectors. Most of these grants are based on a formula that takes into account current and target service levels, as well as local variations in costs. Recently, a 2007 local government inquiry has recommended, among other things, a migration toward a local income tax.[4] To ensure that the city appropriately uses the funding it receives, the United Kingdom also has in place standardized data collection protocols and a strong auditing system.

- **South Africa.** South African cities depend equally on their own revenue sources and on grants and loans from the central government to fund their urban services. In Johannesburg, for example, 48 percent of the total $3.5 billion urban spending in fiscal 2007 came from user charges and property tax collections, 17 percent from central government grants and the rest from a combination of debt, private participation and other revenue sources. South Africa, too, has employed three different types of grants from the central government: (1) a Local Government Equitable Share Grant, which is an unconditional, formula-driven grant with the dual objective of compensating local governments for providing free basic services (e.g., 6,000 liters of water per capita per month) to the poor and for covering the revenue deficit of weaker municipalities; (2) infrastructure grants, which provide direct funding for building key infrastructure projects; and (3) capacity grants to assist local governments (e.g., to introduce reforms and boost public-sector productivity). As a result, larger cities rely on grants only for capital expenditure, while smaller cities may

4 Sir Michael Lyons, *Place-shaping: a shared ambition for the future of local government*, March 27, 2007 (http://www.lyonsinquiry.org.uk/).

depend on them for revenue expenditure. South Africa estimates these grants for each municipality for a period of three years to enable sound expenditure planning.

Synthesizing the experience we have observed in the cities of both developed and developing economies, we identify five key elements of funding that are applicable to India in its current stage of development:

1. Monetize land assets to fund urban infrastructure
2. Maximize the potential of property taxes and user charges
3. Create a formula-based grant system from state and central governments
4. Use debt and private-sector participation appropriately
5. Create enabling mechanisms such as SPVs and city development funds to facilitate use of these revenue sources

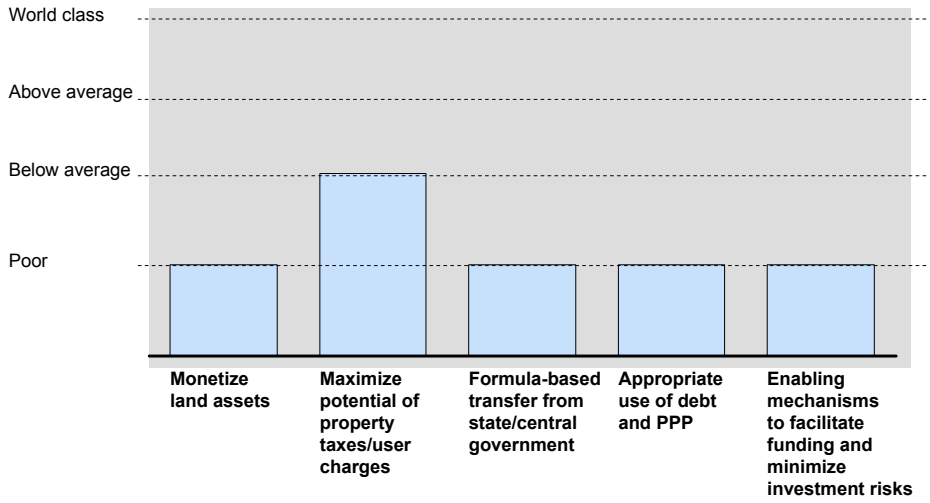
In the next section, we explore how India's urban funding system performs on these five dimensions.

INDIA PERFORMS POORLY ON ALL FIVE ASPECTS OF URBAN FUNDING PRACTICES

The 74th constitutional amendment called for the transfer of financing powers and assets to local governments in line with their functions. However, the fact remains that today India's performance on four out of five components of the typical urban funding system is poor, and below average on the fifth (Exhibit 3.1.13). We now look at India's record on the five dimensions in turn:

Exhibit 3.1.13

India's scorecard on five aspects of urban funding is poor and below average on one



SOURCE: McKinsey Global Institute analysis

1. **Monetization of land assets.** India has not yet used monetization of land assets to finance urban infrastructure to any great degree. The few examples of using land as a source of revenue have been at metropolitan development authorities, the Mumbai Metropolitan Region Development Authority (MMRDA) being the most notable example. MMRDA has auctioned its land assets in Bandra-Kurla in Mumbai and funded more than $4.5 billion of spending on projects including road, mass transit, and affordable housing for low -ncome groups over the past five years. Over the next five years, MMRDA is expected to spend more than $22 billion, largely funded by land assets, debt, private-sector participation, and some viability gap funding from the central government.

2. **Maximizing the potential of property taxes and user-charges.** Tapping revenue from property taxes and user charges—two sources of funding that states have consistently transferred to the local level—have been held back by low tariffs (adopted for populist reasons), poor assessment methods, and noncompliance. For example, India is managing to collect only an estimated 0.04 to 0.08 percent of property values as property taxes—one of the lowest rates in the world. Some cities, including Bangalore and Delhi, have moved toward better assessment of property taxes, but there is a long way to go before India can maximize its use of this type of revenue. In the case of user charges, India needs to recover a lot more. One recent report suggested that only around 60 percent of operational expenditure and zero percent of the capital expenditure in water supply is being recovered through user charges.[5]

3. **Formula-based grant system from central and state government.** In India, local governments bear the majority of the burden of urban expenditure with very little support coming from state and central governments. State governments have not augmented local government revenue in any meaningful manner. The state finance commissions, recommended by the 74th constitutional amendment to drive revenue-sharing mechanisms with local bodies, have not performed. Across states, their appointment is delayed and most of their recommendations remain on paper. In recent years, the central government has taken a more proactive role in urban investments by launching JNNURM with an annual allocation of $2.2 billion. While this is a good start, much more needs to be done.

4. **Appropriate use of debt and private-sector participation.** Poor internal financial management and control in local government has discouraged the use of debt to finance investment. For example, over the past 15 years, local governments in India have raised only $800 million in debt through the bond market. In addition, private-sector participation in urban infrastructure remains nascent due to lack of proper revenue streams and enabling structures.

5. **Enabling infrastructure to facilitate funding sources and minimize risk of urban investment.** India does not currently have the right enabling infrastructure to facilitate these revenue sources. For example, municipalities are not allowed to raise debt, and there are no clear guidelines for formation of SPVs. Municipalities also lack basic accounting infrastructure. For example, even Mumbai did not have a double-entry–based accounting system until recently. As a result, it became difficult to forecast revenue and expenditure, and most spending programs remained focused on solving immediate problems.

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5 *Benchmarking and data book of water utilities in India*, Asian Development Bank and Ministry of Urban Development, India, 2007.

REFORM ALONG THESE FIVE THEMES WOULD GO A LONG WAY TOWARD FIXING INDIA'S URBAN FUNDING TASK

MGI analysis finds that fixing today's deficiencies in India's urban funding system is largely possible as long as India unlocks new revenue streams and ensures a balanced support from state and central government. But even before that, India needs to understand the magnitude of investment required in its cities and commit to a capital investment program of $134 per capita annually. In this section, we elaborate on a range of ideas that, if implemented effectively, have the potential to bridge the funding gap and transform Indian cities within five to ten years.

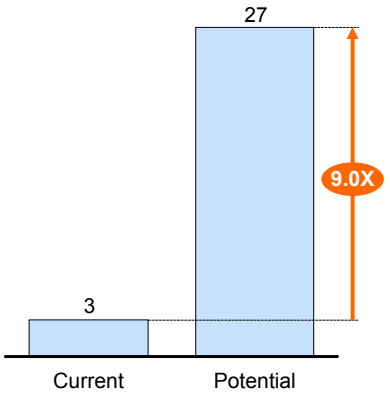
1. Aggressively monetize land assets

On a conservative estimate, India can generate up to $27 billion a year (or $58 per capita per annum) through land monetization (Exhibit 3.1.14). The revenue streams are likely to be much larger in Tier 1 cities (Exhibit 3.1.15). This revenue target can be achieved through three initiatives:

Exhibit 3.1.14

India can generate $27 billion per annum from land monetization

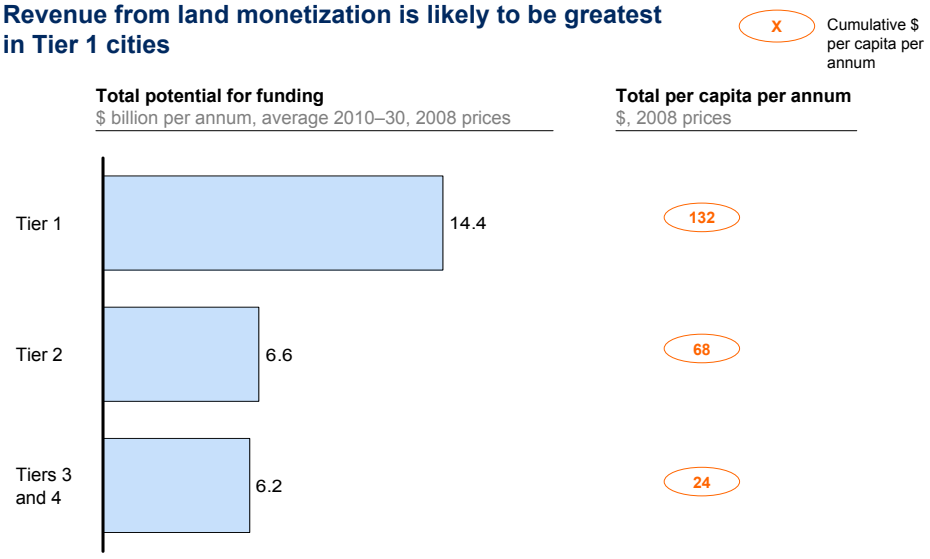
Total revenue from land monetization, current and potential
$ billion per annum, 2008 prices



SOURCE: India Urbanization Funding Model; McKinsey Global Institute analysis

Exhibit 3.1.15

Revenue from land monetization is likely to be greatest in Tier 1 cities



SOURCE: India Urbanization Funding Model; McKinsey Global Institute analysis

- **Charge a development fee on FAR increases.** At current land-use and FAR values, India has an opportunity to extract revenue from increases in FAR. Local governments could systematically increase FAR around central business districts and major transport corridors based on a master plan and charge a development fee linked directly to property rates. In fact, we would argue that India should not allow any increase in FAR in the absence of such a development fee. We recommend that 40 to 50 percent of the property price be charged as development fees. For example, in Mumbai, an FAR increase from 1.3 to 4 in key commercial centers could fetch the government 4,000 to 5,000 rupees per square foot.

- **Auction of developed greenfield sites.** Cities could also generate significant funds through the auction of greenfield development sites. Based on long-term, transparent master-plans, a city could identify such parcels of land, acquire them and develop supportive infrastructure, and then auction them off. Such parcels of land should ideally be adjacent to existing or planned transportation projects. For example, city governments could acquire additional strips of land next to new road construction projects or new metro rail stations at the time of construction, provide basic infrastructure such as water supply, sewerage, and electricity, and then auction them off after the construction is completed.

- **Charge impact fees on all construction to fund urban infrastructure.** Cities could charge fixed impact fees for all new developments on a per-square-foot basis to provide for incremental trunk infrastructure such as roads, water supply, sewage collection, solid-waste management, and storm-water drains. The level of fees should be directly linked to property rates. On average, we recommend a rate of 2 to 3 percent of property values in Tier 1 cities as a one-off impact fee.

2. Maximize the potential of property taxes and user charges

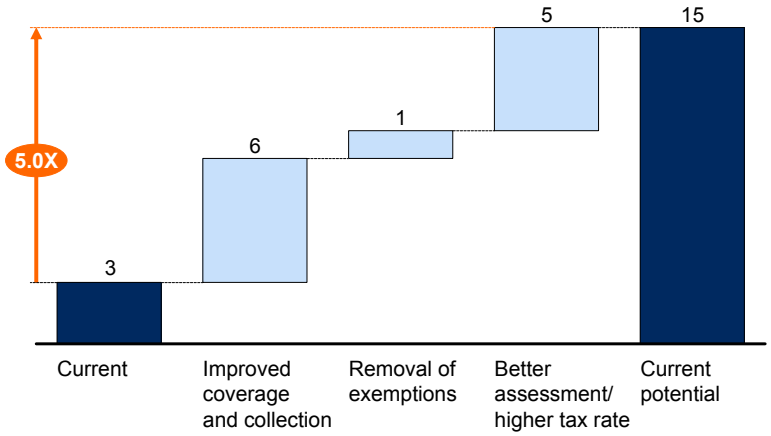
India can generate $50 billion per annum (or $112 per capita per annum) by maximizing the potential of property tax and user charges. Doing this would require two initiatives:

- **Increase property-tax collections to $15 billion ($36 per capita) through better assessment and greater compliance.** Property tax is widely recognized as an important source of municipal revenue, and we would argue that Indian cities need to collect at least 0.3 percent of their total property value every year as property tax in order to fund the cost of provision of public-services (e.g., solid waste, street lighting, parks, and open spaces). This can be done by implementing three initiatives: (1) improving collection and coverage rates from the current 70 and 63 percent, respectively, to 85 percent through better enforcement and GIS mapping of properties; (2) removing major exemptions (e.g., on properties owned by government subsidiaries such as airports and port trusts); and (3) moving toward a capital-value or unit area method based system with the appropriate property tax rate. We recommend that the rate be such that the municipality can generate up to 0.3 percent of the property value annually in property tax collections. Our research finds that if urban India implements these measures, it can increase property tax collections fivefold to $15 billion per annual ($36 per capita) (Exhibit 3.1.16).

Exhibit 3.1.16

India can increase its property tax collections by five times

Current and potential property tax collections
$ billion per annum, average 2010–30, 2008 prices



SOURCE: O. P. Mathur, et. al, *Urban property tax potential in India*; McKinsey Global Institute analysis

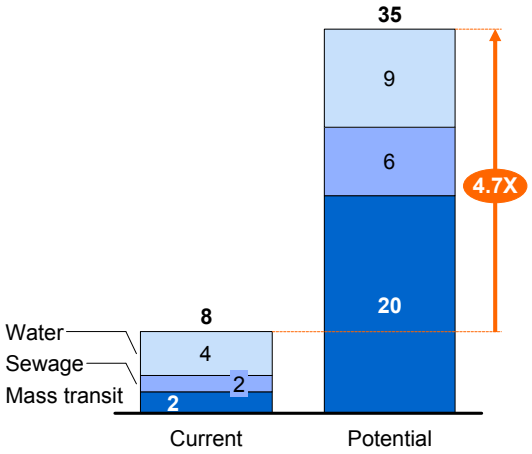
- **Improve user-charge collections to recover at least operational and maintenance expenditure on water, sewage, mass transit, and affordable housing.** Collection of user charges, which primarily relate to water supply, sewage, mass transit, and affordable housing in India, is low as a result of a lack of enforcement and low tariffs. We recommend that India aim to recover 100 percent of its operation and maintenance costs (Exhibit 3.1.17). In the case of water supply and sewage, local governments should aim to meter all water connections and introduce progressive charges (e.g., providing free water supply for the first 40 liters per capita per day but then setting progressive rate-slabs for higher consumption) to achieve operational break-even. In case of mass-transit, full recovery may not be possible and we recommend at least 70 to 80 percent of operating and maintenance expenditure to be recovered through fare-box and non-fare-box revenues (e.g., advertising space, right-of-way for telecom and electrical cables etc.). Indian cities should link these rates directly to inflation to account for rising input costs. We estimate that user charges can generate revenue of $35 billion annually (or $76 per capita per annum).

In both of these areas, too, India's Tier 1 cities would generate the most revenue (Exhibit 3.1.18).

Exhibit 3.1.17

India should aim to recover the majority of at least operational and maintenance costs in water, sewage, and mass transit

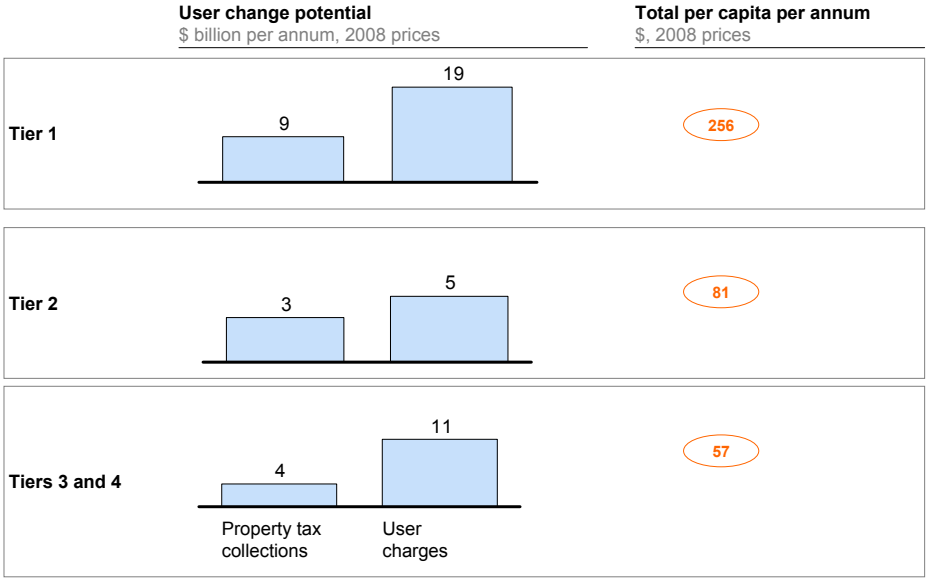
Total user charges, current and potential
$ billion per annum, real 2008



SOURCE: India Urbanization Funding Model; McKinsey Global Institute analysis

Exhibit 3.1.18

The recovery of costs through tariffs would have the greatest impact in India's largest cities



SOURCE: India Urbanization Funding Model; McKinsey Global Institute analysis

3. Use debt and private participation appropriately

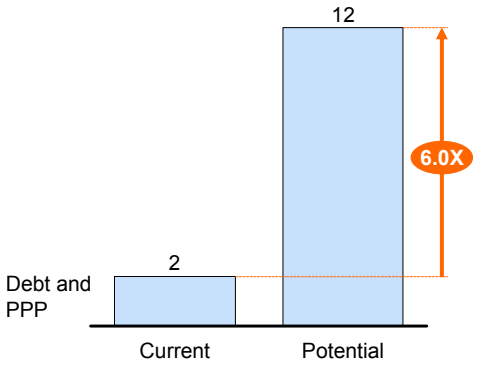
We believe that India can raise up to $12 billion per annum (or $26 per capita per annum) by leveraging debt and attracting private-sector participation in urban sectors (Exhibit 3.1.19). India's city governments have had a poor record on raising debt either from public or private sources because of the weak state of local government finances, the absence of a deep bond market in India, and the lack of a developed and effective public-private partnership architecture. Traditionally, debt and private-sector participation have contributed less than 5 percent of urban investment. But based on recent trends, we believe that there is significant potential in this area. Consider a recent metro project in a leading city in India. 30 percent of the project cost is paid for by the

central government's viability gap funding model; 20 percent is being infused as equity from the private concessionaire, while the remaining 50 percent is financed through debt. To replicate such a model across the country, we recommend two initiatives:

Exhibit 3.1.19

India can also raise up to $12 billion annually by leveraging the private sector and tapping the debt markets

Total debt and PPP potential
$ billion per annum, 2008 prices



SOURCE: India Urbanization Funding Model; McKinsey Global Institute analysis

- **Create project-specific SPVs.** Cities should execute most of the major urban projects costing more than $50 million using SPVs, and follow target debt-to-equity ratios.
- **Encourage private-sector participation through monetizable models.** Cities should aim to fund 25 to 30 percent of projects, particularly in water-supply, sewage treatment, solid-waste management and mass-transit sectors, through some form of private-sector participation. While in terms of private equity infusion this would amount to only $2 billion per annum, by leveraging this amount with sufficient debt, India could raise up to $12 billion per annum. To do this, India would need to put in place an effective and enabling PPP framework in which risks and rewards are shared in an optimal way.

4. Create a sufficiently funded grant system from state and central government

India must provide a sufficiently funded grant system to local governments by tripling JNNURM allocation in the short term and by sharing 18 to 20 percent of GST with cities in the medium term.

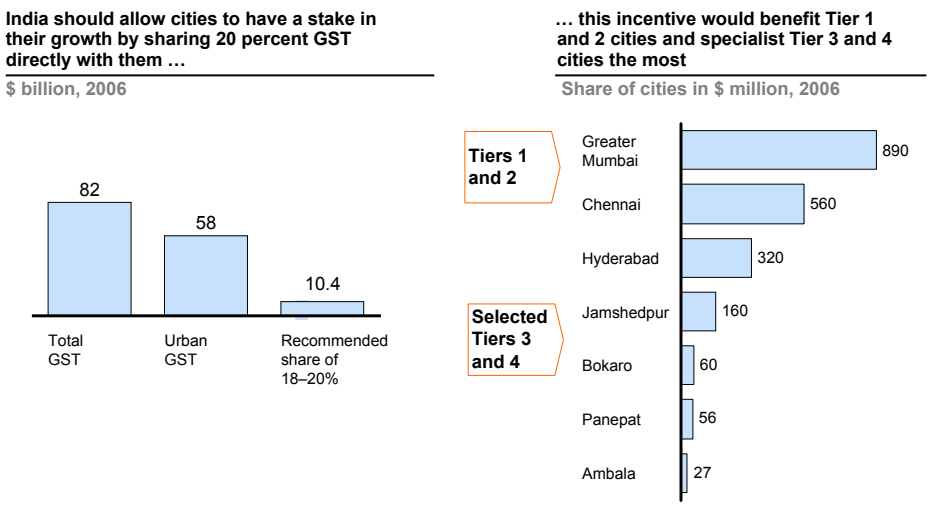
As we have seen across the world, central and state governments have a key role to play in ensuring that sufficient funding flows into urban infrastructure. The time is right for India to create a similar system of transparent, formula-based grants.

In the medium term, India should allow its cities a stake in their own growth by sharing a portion of the taxes that they generate directly. We recommend that, like China which shares 25 percent of its value-added-tax (VAT) collections directly with local governments, India share at least 18 to 20 percent of the GST directly with its cities (Exhibit 3.1.20). We believe that such a share would allow local governments to take advantage of their own growth, become financially stronger, and create a virtuous cycle of internal revenue generation, public investment in infrastructure, and economic growth. This is consistent with the 13th Central Finance Commission's assessment

that GST, a consumption-based tax that creates local incentives for growth, is well suited for direct allocation to the third tier of government. In fact, a beginning was already made with the commission allocating $1 billion (or 4,700 crore rupees) of central taxes per annum directly to cities. Given that cities generate almost 70 percent of the total $82 billion that India receives from consumption taxes overall, an 18 to 20 percent share would imply an additional $10.4 billion, or an average of $43 per capita through 2030. Such a transfer would most directly benefit Tier 1 and 2 cities and "specialist" Tier 3 and 4 cities the most.

Exhibit 3.1.20

India should share 18-20 percent of GST revenue directly with cities



SOURCE: India Urbanization Funding Model; Government of India Finance Statistics; McKinsey Global Institute analysis

In the short term, however, India should consider providing a similar amount by leveraging a proven existing vehicle in the JNNURM as well as the recently launched Rajiv Awas Yojana (RAY) scheme. India should triple the JNNURM's allocation from 10,000 crore rupees per annum ($2.2 billion) today to 30,000 crore rupees per annum ($6.7 billion) with an equivalent contribution from states and municipalities and simultaneously allocate 15,000 crore rupees per annum ($3.3 billion) to RAY to kick-start this urban investment program.

5. Create the appropriate enabling mechanisms to facilitate funding sources

India needs to create strong enabling mechanisms to facilitate these new funding sources. We suggest the following initiatives in this regard:

- **Distribute land revenues and government funding support equally between municipal and metropolitan authorities.** Traditionally, a combination of local and development authorities and state parastatals have delivered all core urban services. In the future, as we discuss in section 3.2, we believe that larger urban agglomerations will need metropolitan authorities to drive metropolitan-wide issues, including the planning and execution of projects for the region (such as metropolitan-wide transportation projects and affordable housing for low-income groups). It therefore becomes important to provide funding sources to local and metropolitan authorities that match their responsibilities. We propose sharing land revenue and government funding support (share of GST) between the two on a

50:50 basis, a figure we arrived at to balance responsibilities between the two, as explained in section 3.2.

- **Deepen bond markets and encourage municipalities to tap them for urban infrastructure.** India should consider how it should progressively deepen its bond markets. This would involve action to ensure efficient price discovery, creating a level playing field for bonds and bank loans, removing hurdles to long-term debt, and building an effective dispute-resolution mechanism. In addition, municipalities should be encouraged to tap these bond markets by creating project-specific SPVs.

- **Create ring-fenced "city development funds" for all Tier 1 and selected Tier 2 cities.** Tier 1 and selected Tier 2 cities should create their own city development fund to hold the receipts of all key revenue streams (with land and GST revenue streams available equally to local and metropolitan authorities) and ring fence it for the sole purpose of financing urban infrastructure. This would ensure that funding raised from within cities is effectively used for the city's own development in line with its economic and population growth.

- **Create an effective accounting system at the local level.** City governments should follow standardized accounting norms as specified in the National Municipal Accounting Manual based on the principles of accrual accounting. This will help codify data on urban finances to enable effective oversight by state and central finance commissions. In addition, all cities must implement a double-entry–based accounting system as well as create asset inventories to effectively plan and use their revenue. All local governments should also be subject to regular audits.

WITH SUCH MEASURES, MOST TIER 1 AND 2 CITIES COULD SATISFY THEIR FUNDING REQUIREMENTS; TIER 3 AND 4 CITIES MAY NEED ADDITIONAL ASSISTANCE

India needs to unlock the four revenue streams that we have described if it is to pay for the nation's continuing urbanization and put urban funding onto a more sustainable long-term footing (Exhibit 3.1.21). Such changes can have a dramatic impact on the ground as we explain (Exhibit 3.1.22).

- **Most Tier 1 and 2 cities can fund themselves with 80 to 85 percent of funds generated internally.** With the implementation of the measures that we have described, we estimate that India's large Tier 1 and 2 cities can mostly fund themselves. We also estimate that 80 to 85 percent of the total funds required by these cities can be generated within them. This would relieve the strain on the central government's budget and at the same time would be a powerful incentive for city governments to perform and give them a major confidence boost. However, this is not true for Tier 3 and 4 cities.

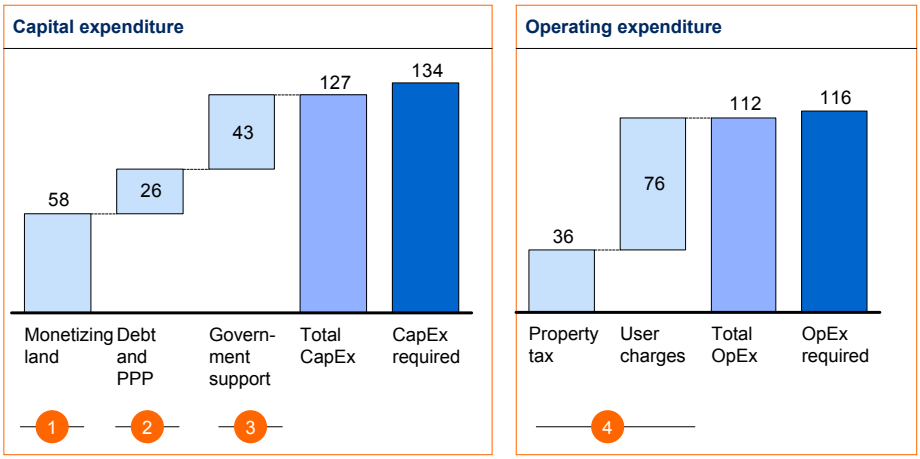
- **Tier 3 and 4 cities will need additional support (at least $20 per capita per year) from the central and state governments.** Despite a near sevenfold increase in urban spending from $12 per capita today to $81 per capita, Tier 3 and 4 cities will still fall short of their urban funding requirements. Central and state governments need to "hand-hold" these cities until they become large enough to be able to fund themselves. In the short-term, we recommend that the state and central governments provide a minimum basic grant of $20 per capita to these cities. While we recognize that such a grant would not be enough, it would at least enable these cities to provide some necessary urban services to their residents

at minimum service levels (e.g., 90 liters per capita per day of water, 50 percent sewage treatment, 100 percent sewerage or septic tank coverage, and the concreting of major roads).

Exhibit 3.1.21

India needs to access four key extra funding streams to pay for urbanization

$ per capita per annum, 2008 prices

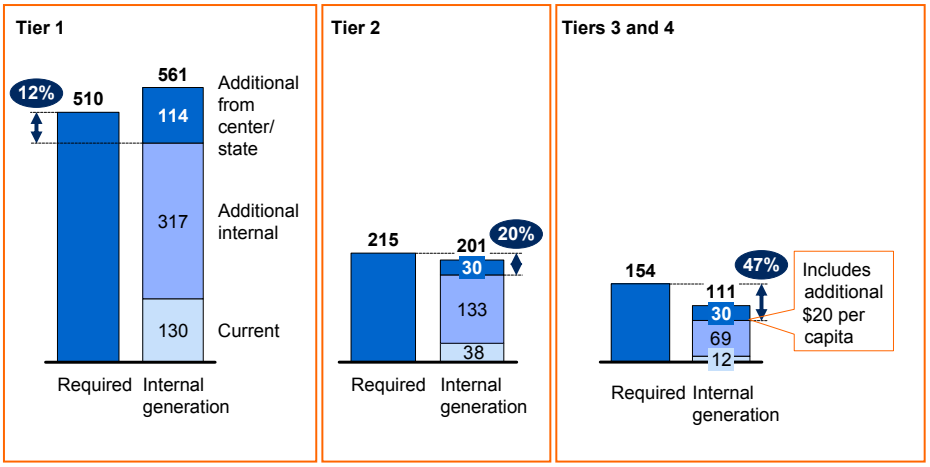


SOURCE: India Urbanization Funding Model; McKinsey Global Institute analysis

Exhibit 3.1.22

Tier 1 and Tier 2 cities can fund themselves, with 80 to 85 percent of funding through internal sources

Funding requirement, and potential
$ per capita in CapEx and OpEx, 2008 prices



SOURCE: India Urbanization Funding Model; City Development Plans; McKinsey Global Institute analysis

BY IMPLEMENTING THIS URBAN FUNDING PROGRAM AND PURSING URBAN REFORMS, INDIA COULD BOOST ITS NATIONAL GDP BY 1 TO 1.5 PERCENT ANNUALLY

If India were to implement all the measures that we have outlined, India would increase its urban spending nearly eightfold on a per capita basis and deliver an improved level of urban services to its urban citizens. However, India could achieve much more than this—achieving a national boost to the nation's economic prospects.

Our research finds that the increase in spending that we have outlined, coupled with reforms in urban sectors (e.g., urban land) would produce significant productivity gains that would have the potential to boost India's long-term GDP growth rate by 1 to 1.5 percentage points.

INDIA CAN ACHIEVE MANY FUNDING REFORMS WITHIN FIVE TO TEN YEARS

The implementation of all the measures that we have described would put India's urban funding on a wholly new and improved footing—and provide the basis to transform India's cities. And we would argue that the implementation of a majority of the steps is achievable within five to ten years. For these measures, India could begin to consider a systematic process to put them into action. For the remaining measures (e.g., sharing 18 to 20 percent GST directly with cities, raising user charges to recover 100 percent operating and maintenance expenditure), India may first have to build a political consensus. However, there is no reason that India shouldn't make a start in putting its urban finances on a healthy and sustainable footing.

So what could be the next steps for India on urban funding? In the course of our research, we believe that the following action at the central, state, and local government levels can constitute a plan of near-term action:

Central government still has an important short- and medium-term role to play in funding

We have identified a number of initiatives that the central government might consider that would enhance its ability to act as a facilitator to urban reform.

- **Short term.** In the near term, we would recommend that the central government focus on building upon the success of the JNNURM by tripling the Mission's annual allocation to 30,000 crore rupees ($6.7 billion), with an equivalent contribution from the state and municipalities, and approving the Rajit Awas Yojana (RAY) scheme with an annual allocation of 15,000 crore rupees ($3.3 billion). This next-generation JNNURM could prove to be a good interim solution until India implements the GST sharing mechanism. Within this overall initiative, we see three additional changes:
  - Keep the base fund of 10,000 crore rupees ($2.2 billion) per annum for mission cities based on current reform conditionalities.
  - Create an incentive fund of 8,000 crore rupees ($1.7 billion) for states that have the capacity and will to push ahead with the next set of reforms (e.g., land monetization policy along with a "ring-fenced" fund for every large city, mandating formation of SPVs for all projects above $50 million with target debt to equity ratios, incorporating state government regulation on impact fees).
  - Bolster the program of urban capacity program by allocating 2,000 ($0.4 billion) that provide technical know-how in the short term (e.g., hand-holding for PPP projects) and bolster capacity in the long term (e.g., creation of urban planning institutes).
  - Establish a separate grant of 10,000 crore rupees ($2.2 billion) for Tier 3 and 4 cities and distribute the money based on an appropriate set of conditionalities.

- **Medium term.** In the medium term, we argue that two central government initiatives would prove useful:
  - Enact legislation that would lead to sharing 18 to 20 percent of GST taxes directly with local governments.
  - Implement key recommendations for financial sector reform as mentioned in the Patil, Mistry and Rajan committee reports to strengthen Indian bond markets, and encourage municipalities to tap them.[6]

State governments should work in tandem with the central government on this program

The role of state governments is likely to be crucial in the short term to push through urban investment and reforms. Over the short term, state government should aim to implement reforms relating to land monetization, user charges, property taxes and debt, and private-sector participation. In addition, they should clearly demarcate the funding sources for metropolitan authorities and municipalities by sharing half of land revenue and government funding support between them. They should also contribute their share in line with the center's contribution in JNNURM and RAY to the cities.

Metropolitan authorities and municipalities, too, should aim to leverage the new sources of funding to push urban investment. They should start the ball rolling by creating a five-year capital investment plan that they deem sufficient to meet their requirements.

□ □ □

Indian cities today are paying the price of years of chronic underinvestment. To clear this backlog and meet the rising demands of expanding urban India, the nation needs to find $1.2 trillion to spend on capital investment over the next 20 years. Although this is arguably one of the toughest challenge India faces, there are tried and tested revenue streams into which to tap. The prize of doing so is considerable. India's cities could nearly fund their requirements.

6 Report of High Level Expert Committee on Corporate Bonds and Securitization, Government of India by Dr. R. H. Patil, December 2005; Committee on Mumbai as an international financial centre (IFC), Percy Mistry, 2007; *A hundred small steps*, Report of the Committee on Financial Sector Reform, Government of India by Shri Raghuram Rajan, August 2007.

3.2 Empowering city administrations

The second critical pillar of managing India's cities is their governance. Building effective governance is about ensuring a suitable mandate, designing effective structures, delegating power, embedding accountability, and making sure cities have appropriate and sufficient capabilities at their disposal.

The poor state of governance in Indian cities is evident to any citizen living in one of them. Simple questions—"Who is the single point authority in an Indian city?" "What is the relationship between a metropolitan authority and local municipality?"—have no answers. Given that, by 2030, many of India's cities and metropolitan areas will become larger than most countries in terms of both GDP and population, it is vital that India address such questions. For without comprehensive city governance reform, India will deteriorate even further—and rapidly.

Despite the fact that the 74th Amendment to India's constitution devolved power and responsibility from the state government to cities on 18 key functions, state policy makers have been mostly silent on the implementation of these reforms. This is even more surprising considering that the amendment and the subsequent JNNURM set forth a specific set of governance and accountability mechanisms for state and city governments.

In this section, we will discuss the following:

- Six areas where Indian city governance mechanism is lacking
- Lessons learned from well-run cities around the world
- Recommendations for governance reforms
- A potential way forward to make reforms happen

INDIAN CITY GOVERNANCE IS LACKING IN SIX AREAS

Cities develop over the course of generations and clearly need long-term vision, planning, and execution across a wide array of sectors. It is particularly important to integrate the planning of land use, transportation, and housing; ensure coordination across administrative departments; maintain alignment among all stakeholders; and deliver services to a large and growing population.

India has not sufficiently recognized the complexity of city management

Managing the scale, the level of integration, and the degree of operational excellence makes the running of cities among the most difficult administrative challenges in the modern era. Yet India has scarcely faced up to the job at hand. Without acknowledging the complexity of governing large cities and therefore the need for administrative structures and processes sophisticated enough to manage it, India continues to rely on outdated leadership and delivery choices.

Surprisingly, there is little bottom-up pressure from citizens to improve governance

Throughout the world, major reform in city administration and performance has come on the back of citizens demanding change and setting out markers for what they expect from their cities in return for their talent and their tax contributions. Except for isolated efforts in some cities, India has not experienced a consistent citizen movement

demanding better structures and more accountability from city administrators. For example, one political party in recent state government elections promised a "directly elected mayor" for a major city; after the election, the promise was quickly forgotten. Urban citizens have not forcefully adopted the agenda of city governance reforms, an area that could have the greatest impact on the quality of their daily lives.

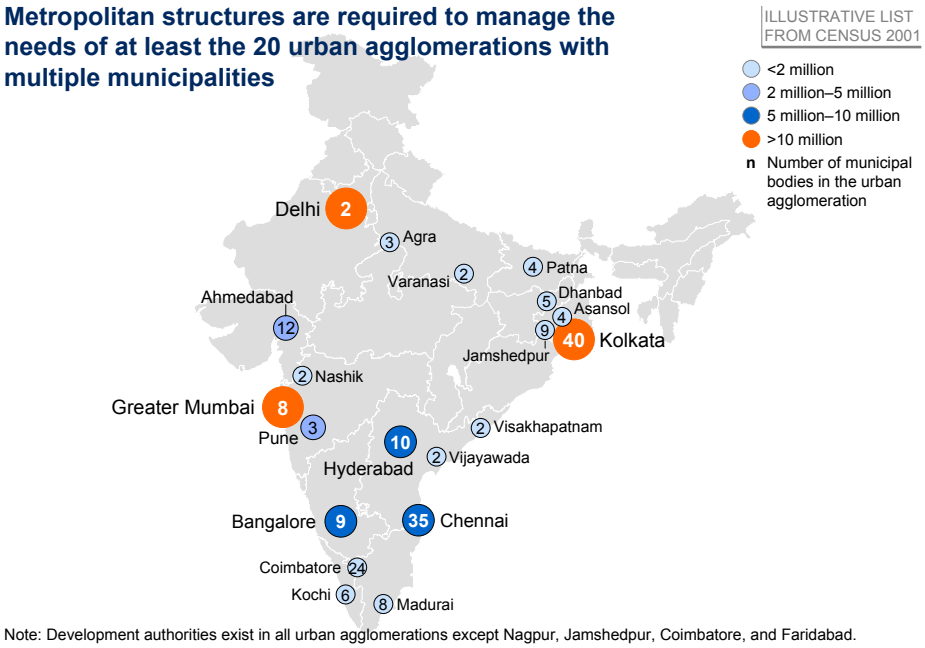
As a result, India's city governance is lacking in six specific areas:

1. **Devolution of powers to cities.** India has not sufficiently recognized and defined the third tier of government at the city level, nor has it made clear what a city is expected to deliver to its residents. India has defined governance quite well for the first two tiers of administration—the central and state levels—and to some extent, the third tier of administration for villages through the Panchayati Raj. But no clear definition of governance and accountability yet exists for the third tier comprising India's 5,400 cities and metropolitan areas. The low level of political importance accorded to cities has been an extraordinary oversight that the 74th Amendment to the Constitution aimed to address. The 1992 amendment voiced India's preference for a devolved model of local governance, but there has been a gap between intention and implementation. The amendment provided for the transfer of 18 functions from states to urban local bodies (ULB) and to District Planning Committees (DPC) and Meropolitan Planning Committees (MPCs). Among these functions are land use, urban planning, economic development, water, and roads. But thus far, no state has fully devolved the entire slate of assets and functions to cities. Even when the transfer has happened on paper, most decision-making power remains with the states. The reluctance of state governments and chief ministers to devolve power to the cities remains at the heart of this situation.

2. **Appropriate balance between local and metropolitan structures.** With 35 urban agglomerations, each with more than a million in population today and 20 that stretch across multiple municipal boundaries (e.g., Kolkata), local governance structure cannot be designed around local bodies alone (Exhibit 3.2.1). First, the dynamics of the city are rarely contained within municipal boundaries. While some solutions are local, many challenges such as mass-transit systems and affordable housing for low-income groups (both currently seen to be in the remit of state governments more than local bodies) need metropolitan-wide answers that India lacks today. Second, with many urban agglomerations having a large number of ULBs (for example, Kolkata has 40), the need for a single entity that is able to identify and mediate cross-municipal issues is key. This balance between metropolitan and urban local body administration has received scant attention in India to date. While the 74th Amendment called for the establishment of MPCs to coordinate metropolitan-wide urban planning, only three state governments have so far constituted them.

Exhibit 3.2.1

Metropolitan structures are required to manage the needs of at least the 20 urban agglomerations with multiple municipalities



Note: Development authorities exist in all urban agglomerations except Nagpur, Jamshedpur, Coimbatore, and Faridabad.
SOURCE: Census 2001; Jawaharlal Nehru National Urban Renewal Mission reforms status; Association of Municipalities and Development Authorities

3. **"Single point" empowered leadership at the metropolitan and municipal levels.** India's cities do not have empowered leaders with the clout and tenure to deliver against explicit mandates (Exhibit 3.2.2). While many cities have mayors, their tenures are short and they rarely have the power to drive new investments, hire key personnel, fund projects, or reorganize departments—all critical to revamp a city's performance. In large cities, power is distributed between the municipal commissioner and the Municipal Corporation in a way that makes neither of the two fully accountable for the city's decisions. Many municipal commissioners, who currently form the bulwark of day-to-day city administration rarely, stay for more than three years. These commissioners therefore have no long-term stake in the city and invariably shy away from making the big decisions important for the city's long-term health.

Exhibit 3.2.2

India is among a small group of countries that do not have elected executives for their large metropolitan areas

Elected or empowered mayor

Rank	City	2010 population, million	Metropolitan leaders	Nature of national political system
1	Tokyo	31	●	Parliamentary
2	Seoul	24	●	Presidential
3	Jakarta	24	●	Presidential
4	Mumbai	24	○	Parliamentary
5	Mexico City	21	●	Presidential
6	New York	20	●	Presidential
7	Sao Paulo	20	●	Presidential
8	Shanghai	19	●	Communist
9	Kolkata	18	◔	Parliamentary
10	Osaka	18	●	Parliamentary
11	Delhi	17	◑	Parliamentary
12	Cairo	16	○	Presidential
13	Moscow	15	●	Semi-presidential
14	Manila	14	●	Presidential
15	Los Angeles	13	●	Presidential

SOURCE: www.citymayors.com; McKinsey Global Institute analysis

4. **Appropriate organization structure for service delivery and fast decision making.** The problem of unclear mandates and diffused power at the leadership level extends to the internal organization structure, too. India still runs its cities through departments that are encumbered by time-consuming legacy processes and that lack clearly defined targets with supporting budgets. While the complexity of city administration requires the application of the best organizational principles, the third tier of government is locked in a time warp with structures that lag best practices.

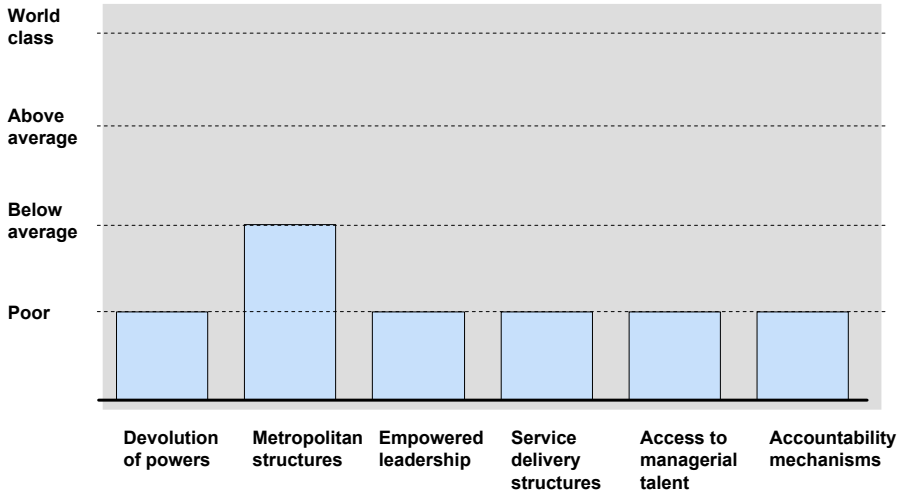
5. **Access to managerial talents and key skills.** Exacerbating the absence of empowered leaders and structures that are designed to deliver large-scale services efficiently is a deep and persistent gap in the critical skills needed to run cities. Across India, there is a severe shortage of such talent. The Ministry of Urban Development estimates that India needs around 40,000 planners across its cities, while the number of registered planners is closer to 3,000. Of equal importance, cities have not created meaningful jobs and cadres to attract the kind of talent of the caliber that the Indian Administrative Service pulls in. At the same time, city administrations, by and large, remain highly resistant to leveraging talent from the private sector.

6. **Clear accountability and transparency mechanisms.** Too many city administrations in the country are overly focused on defining tight processes while being very loose in tracking outcomes. This is exactly opposite to what is necessary—tight outcomes with flexibility in the processes used to deliver outcomes. No department or unit within the government is held accountable for annual outcomes. In fact, it is often difficult to understand what the goals were in a particular year and what outcomes were delivered.

In summary, India's record on the governance of its cities is poor on five and below average on one of the six dimensions discussed (Exhibit 3.2.3).

Exhibit 3.2.3

India scores poorly on five dimensions of good city governance, and below average on one



SOURCE: McKinsey Global Institute analysis

India clearly needs a better way to run its cities. And, because of the scale and speed of ongoing urban expansion, it is equally evident that incremental change would be insufficient. Now is the time for India to seek lessons from well-managed cities from around the world and learn from the best practices.

WELL-RUN CITIES OFFER EXAMPLES OF SUCCESSFUL PRACTICES IN GOVERNANCE

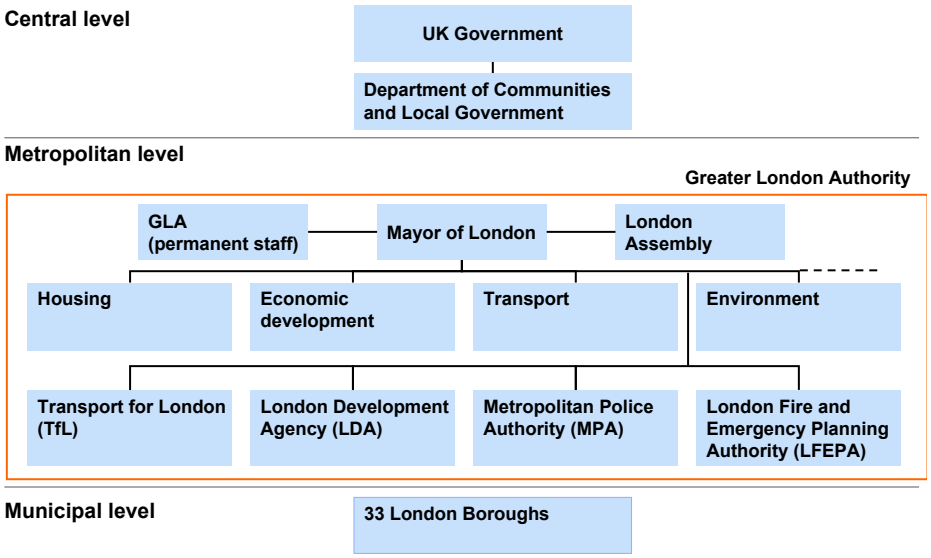
Although cities are built over many generations, the experience of other cities around the world suggests that good governance can be achieved in as little as a single decade. Many cities across the globe have faced challenges similar to those with which India grapples today, and in response have devised solutions that have led to effective management.

Cities around the world have taken different journeys toward sustainable living and prosperity—but these journeys share several common themes. McKinsey's analysis of city governance in many countries finds that successful cities have implemented outstanding and proven practices across the six areas we have articulated. As illustration of key examples of these practices, we share three examples—the United Kingdom (London), South Africa (Johannesburg), and China (Shanghai):

- **United Kingdom.** Take London as an example. In metropolitan London, there is clear articulation of what the city has to deliver. While the boroughs (equivalent to India's municipalities) are responsible for local services including schools, social services, waste collection, and local roads, the mayor drives key citywide strategic functions, including economic development, transportation, metropolitan planning, and police and emergency services. In its push for strong executive accountability, the city has adopted, in the heart of a parliamentary democracy, a directly elected mayoral system (Exhibit 3.2.4).

Exhibit 3.2.4

London has pioneered a combination of a directly elected mayor with corporatized agencies that selectively involve the private sector



SOURCE: McKinsey Global Institute analysis

In fact, this is not limited to London; other cities have the choice of adopting a directly elected mayoral system, too. The mayor of London has wide financial powers and

will oversee spending of around £14 billion in 2010–11. The Greater London Authority, headed by the mayor, sits as a strong metropolitan authority on top of the 33 boroughs in the city. With a two-thirds majority needed to veto the mayor's budget, the role of the Greater London Assembly (with members elected from the boroughs) is more to ensure checks and balances than to make decisions. London has also been at the forefront of innovation in the delivery of services. Independent agencies with leaders appointed by the mayor are responsible for key functions and have the freedom to hire talent and expertise from outside. For example, Transport for London (TfL) is run as a corporatized agency with an independent board appointed by the mayor and a CEO responsible for running the operations (Exhibit 3.2.5).

Exhibit 3.2.5

Transport for London (TfL) was designed on the principle of effective coordination between the political leadership and executive bodies

Independent entity	▪ Created under Greater London Authority Act 1999
Independent board	▪ TfL is controlled by a board of 17 members; members are appointed/removed by the Mayor of London who also chairs the Board
Empowered executive	▪ The commissioner of TfL reports to the board and leads a management team with three major operating units (underground, surface transport, and London Rail), supported by five corporate directorates ▪ Each directorate is headed by a managing director (chief officer), reporting to the commissioner
Clear delineation of roles	▪ Board responsible for approving budget, business plan, and major infrastructure schemes; oversees performance of the executive team ▪ The commissioner and chief officers are responsible and accountable for the delivery of the day-to-day operations ▪ Advisory panels like Rail Transport Advisory Panel and Surface Advisory Panel act as the mechanisms through which board Members provide strategic advice to the commissioner and the mayor on development and implementation of TfL policy
Funding	▪ Overall budget of £7.9 billion in 2008–09, primarily funded by fare/other revenues (£3.6 billion) and transport grant from government (£2.7 billion)

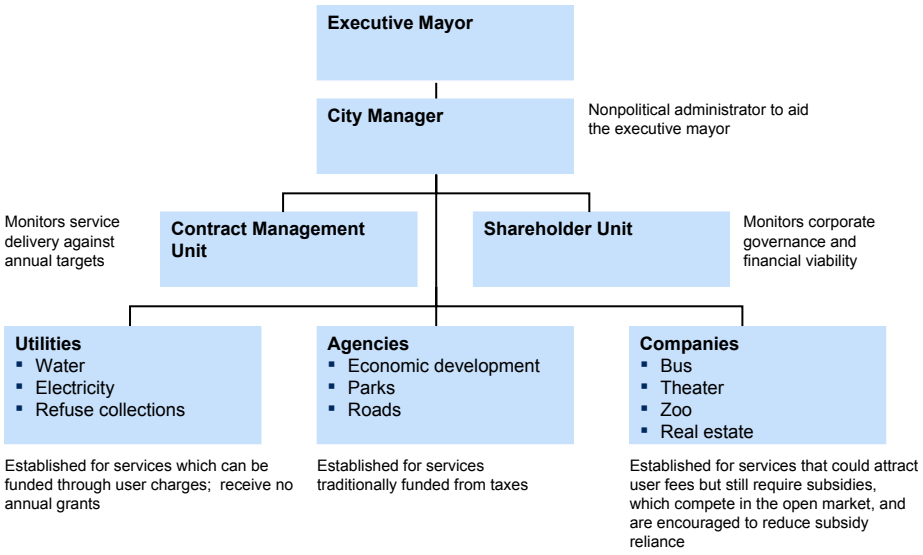
SOURCE: www.tfl.gov.uk

At the same time, these agencies use contracts with the private sector drawn with clear service agreements and predefined tenures to stimulate competition and to improve the efficiency and quality of services (e.g., fixed-fee contracts for operating specific bus routes). These agencies can leverage talent through these private-sector contracts and by hiring the best managerial talent directly into them. Accountability flows both ways. Through the chief executives of the agencies, the mayor ensures delivery on annual targets. At the same time, the central government holds Local Strategic Partnerships (comprising local governments, development agencies, and other organizations) accountable through Local Area Agreements (which cover 1,200 measures of performance and 198 indicators). Each local area selects a maximum of 35 indicators, the performance against which is used to review budgetary allocations from the national government. Boroughs also need to get their local development plans ratified by the mayor before sending them to the secretary of state for approval. Overall, London provides an excellent guide for large cities in India, having created a strong unified executive capable of attracting top talent with agencies responsible for service delivery in a country whose overall political system resembles that of India. These changes have helped to create a city whose GDP grew at an annual rate of 5.3 percent between 2003 and 2008, higher than the national average.

- **South Africa.** While London's governance structure was the result of experimentation and incremental changes over decades, the South African government was forced to make rapid innovations in the governance of Johannesburg in the wake of the city's near bankruptcy in the late 1990s. First, five previously independent local municipalities were merged into a single metropolitan government for the entire city of Johannesburg with a clear mandate to deliver all key municipal services. Second, a clear separation was made between the city government's role as a policy maker and its role as a service provider, through the creation of three kinds of agencies whose leaders report to the city government but with clear mandates and supporting budgets. The nature of the agencies depends on the nature of service provided and the extent to which they rely on tax collection and government funding support (Exhibit 3.2.6). Finally, the reforms created a clearly empowered political executive supported by an appointed city manager who aids professional administration of the city. These changes were reinforced by a new accountability system that included memorandums of understanding (MOU) signed between the mayor and the chief executives of the agencies. The continuation of the chief executive's contract as well as compensation depend on the performance measured against these MOUs (Exhibit 3.2.7). A new performance management unit called the Contract Management Unit was given the task of coordinating the creation and monitoring of these agreements. Since these reforms, the city of Johannesburg moved from near insolvency to a surplus of 1 billion rand in 2006, and it has seen average annual GDP growth of 5.3 percent between 2003 and 2008 compared with 4.7 percent nationally.

Exhibit 3.2.6

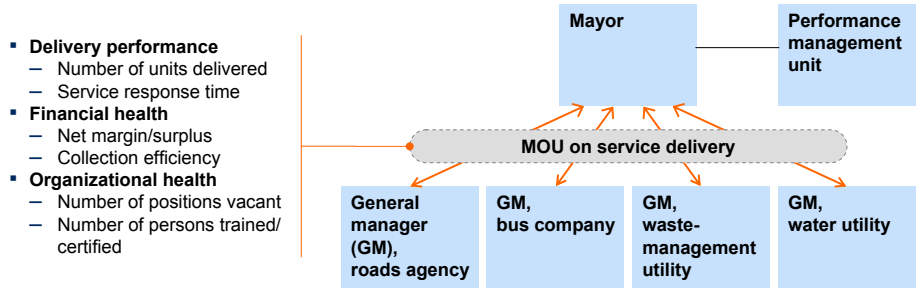
Johannesburg has built accountability through autonomous agencies balanced by strong oversight



SOURCE: Laila Smith, *Neither Public Nor Private: Unpacking the Johannesburg Water Corporatization Model*; McKinsey Global Institute analysis

Exhibit 3.2.7

Johannesburg holds chief executives of municipal enterprises accountable through memorandums of understanding with the mayor

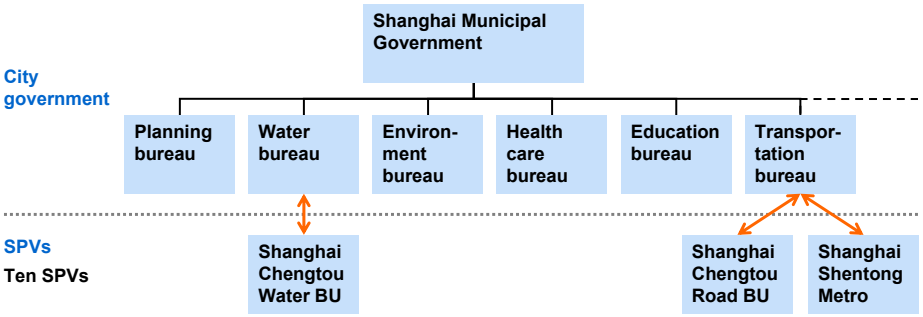


SOURCE: McKinsey Global Institute analysis

- **China.** London and Johannesburg are both examples of city governance in the context of democracies. China has a different polity but has driven transformation of its cities through two key choices similar to changes in London and Johannesburg. First, Shanghai (like Beijing) has special status in China's administrative system as a directly administered municipality, the equivalent of a province or a state. Second, China's major cities have mayors who are powerful political appointees and whom the central government holds accountable for delivering economic growth and improvements in the quality of life of their cities. The fact that the role of mayors of large cities is seen as a stepping-stone to leadership positions at the central government is a powerful incentive. Jiang Zhemin and Zhu Rongji were first party secretary or mayor in Shanghai before being elevated to the standing committee of the Communist Party's Politburo and top government positions in Beijing. Finally, China's cities, too, have recognized the necessity of separating policy making from infrastructure construction and service delivery, especially given the scale of the country's urban transformation. Large cities have created stand-alone SPVs to build basic infrastructure, supplementing the work of policy bureaus that exist inside the city government; the Shanghai-Chengtou Water business unit, for example, has mobilized $17 billion in loans and bonds to build the metropolitan area's water supply and distribution network working in collaboration with the Water Bureau. While many of these SPVs were carved out from within government departments, some were created from scratch (Exhibit 3.2.8).

Exhibit 3.2.8

Shanghai uses special-purpose vehicles to design and deliver complex urban projects



Example of project-specific SPVs created to build and operate the city railway and viaduct

- SPVs were established as vehicles to channel revenue from land sales and debt to focused project delivery
- SPVs work in coordination with the bureaus of the municipal government

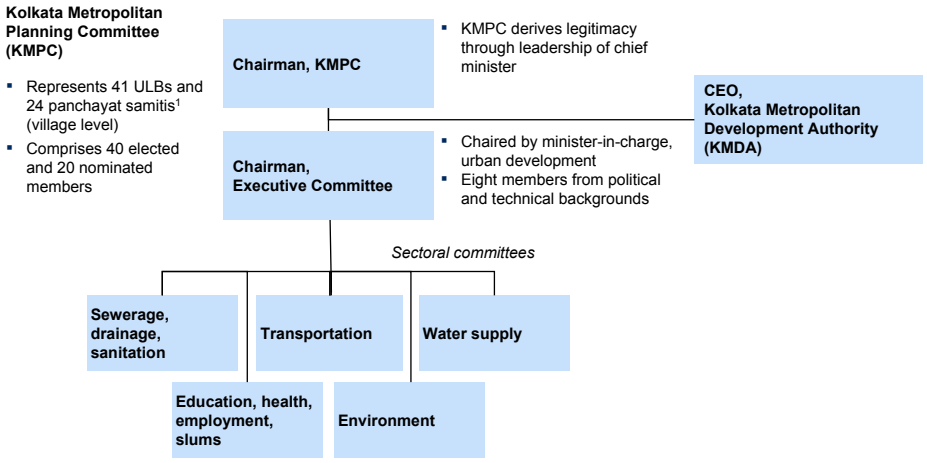
SOURCE: McKinsey Global Institute analysis

India has experimented with some of these practices as well, registering successes, modest though they may be.

- **Kolkata.** Kolkata has had some success in two out of the six areas of an ideal city governance model: The modified mayor-commissioner architecture at the municipality level, and the metropolitan governance structure. The mayor-commissioner system adopted at the Kolkata Municipal Corporation (KMC) represents an improvement in the leadership structure from the traditional system in other cities. First, the city's mayor serves a five-year term and is the executive in charge of the KMC, which comprises a mayor-in-council that meets weekly. Second, the commissioner is directly accountable to the mayor, who has influence over his selection, removal, and annual confidential report. Third, the mayor-in-council acts as the de facto cabinet, with members drawn from the assembly by the mayor to full-time salaried positions as heads of portfolio departments. And, finally, critical to the success of the system is the granular definition of roles and the balance of power between the mayor and commissioner, in which the commissioner's role provides effective checks and balances on the mayor. In fact, our analysis suggests that not having this appropriate balance of power was responsible for Mumbai's failed mayor-in-council experience. At the metropolitan level, Kolkata has constituted one of the few functioning MPCs in the country, as proposed by the 74th Amendment. With the chief minister leading the committee, there is strong political legitimacy for its work. This is further bolstered by four key committees that report to the MPC (planning, traffic and transportation, sewerage, and program monitoring), in which state bureaucrats from the relevant state government ministries coordinate between the state government and the metropolitan government. The presence of the Kolkata Metropolitan Development Agency (KMDA) as the secretariat to the MPC gives heft to implementation. The metropolitan government also wields the power of coordination across municipalities by stipulating that all municipal plans need to conform with metropolitan development plans (Exhibit 3.2.9). Kolkata's model is far from perfect, but its structure still represents progress in local administration in India.

Exhibit 3.2.9

Kolkata is a rarity in India with an elected body and executive agency working at the metropolitan level



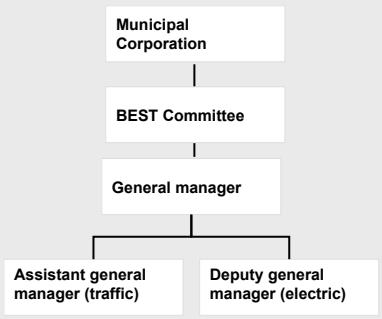
Sectoral committees prepare sectoral plans within overall perspective plan for Kolkata Metropolitan Authority; presence of central/state department bureaucrats ensures alignment between state and metropolitan policies

SOURCE: McKinsey Global Institute analysis

- **Mumbai.** While India's largest city exhibits some of the failures of the nation's current urbanization path, nuggets of good governance practices are evident. A key success is the existence of BEST, an autonomous agency within the Municipal Corporation of Greater Mumbai (MCGM) responsible for public bus transportation and electricity supply (Exhibit 3.2.10). First, a general manager heads the agency, acting as the CEO. The general manager has operational autonomy over new routes, vendor selection, recruitment, and other day-to-day decisions. Second, the presence of the BEST committee allows the board to make decisions more quickly than it traditionally would have. Finally, there is clear accounting of revenue and expenses.

Exhibit 3.2.10

"BEST," Mumbai's transportation agency provides an example of successful corporatization for a municipal service



- The 17-member BEST committee comprises chairman of standing committee and other members appointed by the corporation; at least one member must be a councillor, who will also be the chairman of the board
- General manager appointed by the state government

Autonomy

- Clear accounting for revenue and expenses through streamlining of budget. Revenue from operations utilized only for BEST activities
- Faster decision making/greater sensitization toward transport issues through a dedicated BEST committee
- General manager works under BEST committee and Corporation; has operational autonomy over new routes, vendor selection, recruitment and other day to day decisions

Checks and balances

- BEST committee presents budget to the corporation and takes decisions on wage revisions, fare changes (within limits prescribed by state government notification)
- Expenditure above 10 lakhs has to be approved by BEST committee

SOURCE: McKinsey Global Institute analysis

Our findings from the many cities we have analyzed and visited offer clear implications for how Indian cities can proceed.

TO IMPROVE CITY GOVERNANCE, INDIA NEEDS TO MAKE TWO CHOICES AND TAKE SIX ACTIONS

India needs to discuss and make significant political choices in six areas to design a solution that is feasible and desirable in the Indian context.

1. Devolve power to city governments

The first major area that India needs to debate is to what extent it should empower urban leaders and administrators, the nature of that devolution, and the standards of service delivery and urban management that it should expect. This is a fundamental starting point for any effort to improve the governance of India's cities, and all else flows from it.

Choice 1: How far should India devolve responsibility and power to its cities?

The first key choice is on the level of devolution, and India has a whole spectrum of options (Exhibit 3.2.11). At one end of this spectrum, cities have some powers in the delivery of a selected list of functions but decision rights on all key issues rest largely with the state government. On the other end is true devolution in which local governments have complete control over all key functions (including police) and the state government retains veto power over city decisions only in clearly defined "exceptional" circumstances.

Exhibit 3.2.11

India's first serious choice is on the extent of devolution of power to cities

Path toward greater devolution

	Current (partial devolution)	74th constitutional amendment	Full devolution
Functions	▪ Transfer of few functions in 10 states	▪ Urban planning ▪ Regulation of land use ▪ Roads and bridges ▪ Water supply ▪ Health, sanitation, waste management ▪ Fire ▪ Slum improvement ▪ Urban poverty alleviation ▪ 10 other discretionary functions (e.g., maintenance of birth and death certificates)	▪ Urban planning ▪ Regulation of land use ▪ Roads and bridges ▪ Water supply ▪ Health, sanitation, waste management ▪ Fire ▪ Slum improvement ▪ Urban poverty alleviation ▪ 10 other discretionary functions + ▪ Police ▪ Sector based economic strategies
Devolution of decision-making	▪ State government retains the power to suspend resolutions, orders and contracts of the municipality	▪ Intention was decision making on the 18 functions devolved mostly to local governments	▪ State government veto only in the most exceptional of circumstances, and subject to review

SOURCE: McKinsey Global Institute analysis

In an important sense, India has already decided to embark on this journey of devolution, with the 74th Amendment as the model of partial devolution, involving complete transfer of 18 key functions. We recommend that India start with implementing the 74th Amendment in full now, at least for Tier 1 and 2 cities, and then gradually move toward more cities and more complete devolution. The starting point of local administrative reform in India will have to be adherence to a choice the country has already made through the constitutional amendment.

- **Implement the 74th Amendment in full.** It is our view that full devolution, backed by the transfer of functions and associated funding to the cities, is a key first step to establish effective local government (Exhibit 3.2.12). Without this devolution on paper and in spirit, cities will continue to occupy a hazy third tier of government that is neither fully formed nor fully empowered. The most important area is to ensure that appropriate decision rights are given to local governments.

Exhibit 3.2.12

India needs to fully implement the transfer of functions and assets contained in the 74th constitutional amendment

74th constitutional amendment contains two key reforms …	… that have not been faithfully implemented to date
Transfer of 18 functions from states to ULBs	▪ Around 12 functions transferred in 10 states ▪ Water transferred to ULBs in only 12 states ▪ Even when transferred on paper, conflicting role of parastatal agencies not clarified ▪ No state has devolved the full state of assets, budgets, liabilities, and allocations to ULBs
Constitution of State Finance Commissions to make recommendations on sharing of revenue	▪ 25 states have State Finance Commissions set up, only 9 states have submitted action taken reports ▪ Mismatch in timing between Central Finance Commission and State Finance Commission ▪ No real conversation on creating funding independence at ULBs

SOURCE: McKinsey Global Institute analysis

In the long term, however, India should aspire to a solution that resembles the systems forged in other countries based on complete devolution (including police and economic development, coupled with complete decision rights) that recognizes a city government as a full and legitimate third tier of government.

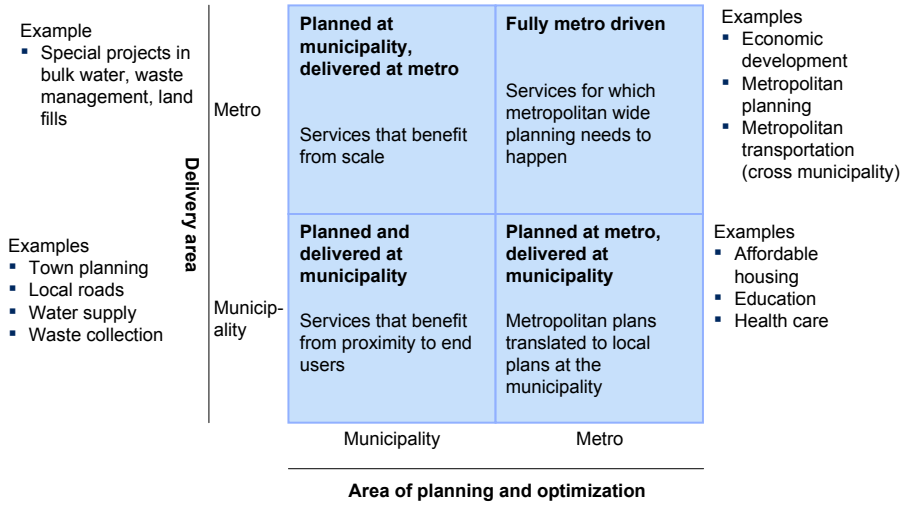
2. Create functioning metropolitan structures

Even as India debates the appropriate degree of devolution for cities, it is absolutely imperative to consciously design the administrative structure for large cities that have multiple municipalities. We believe that the need for clearly defined, functional metropolitan governments is critical to improve the construction and maintenance of large-scale urban infrastructure as well as to create a level of government that is actively driving the long-term economic planning of the entire city.

- **Institutionalize metropolitan structures, starting with 20 urban agglomerations with multiple municipalities.** Given the size of India's cities and the scale of delivery challenges, we believe that at least 20 urban agglomerations (exceeding 1 million in population and consisting of multiple municipalities) must have a metropolitan government that can plan and deliver on metropolitan-wide issues. The lesson from global practices is that while some services are better planned and delivered locally, when proximity to citizens is a key advantage, others benefit from the scale advantages of being planned and delivered at the metropolitan level. Sharing of services between the local municipality and the metropolitan government should fit into one of four modes of delivery (Exhibit 3.2.13):

Exhibit 3.2.13

India should consider separating responsibilities between municipal and metropolitan levels, as part of local governance



SOURCE: McKinsey Global Institute analysis

- **Planned and delivered at the local municipality.** Services that have traditionally been executed by local municipalities that will also benefit from proximity to citizens and do not have significant scale benefits should be planned and delivered locally. These services include town planning, local roads, water supply, and waste collection.
- **Planned and delivered at the metropolitan level.** Services that benefit from scale and optimization across municipal boundaries are good candidates to be driven by the metropolitan authority. These services could include strategic transportation (e.g., metro rail or inter-municipal connectivity), economic development, and metropolitan planning.
- **Planned at the metropolitan level, delivered by the municipality.** Services that benefit from planning optimization (either across municipal boundaries, needing arbitration, or involving population movements across municipal boundaries) but are better delivered by municipalities fall into this category. Such services could include affordable housing, education, and health care.
- **Planned at the municipality, delivered by the metropolitan authority.** These are services whose requirements are determined by individual municipalities but whose implementation requires scale and capabilities. While likely to vary across cities, these could include special projects in environmental management, bulk water supply and landfills.

3. Empowered leadership for municipalities and metropolitan authorities

The second choice that India needs to debate is what kind of leadership would best suit the Indian context and polity and how officials should be elected or appointed. The question of who should run cities is a key one. The choice in different countries tends to reflect their particular governance models and style of political leadership. But a common theme arising from our work is that a single leader should be in charge.

Choice 2: Who will lead India's cities?

India must make a choice on the leadership of its cities, both at the municipal level and at the metropolitan level (Exhibit 3.2.14). At the municipal level, the choice is whether to continue the current structure; adopt a modified structure that allows for a strong political executive supported by a technocrat; or directly elect the mayor. At the metropolitan level, the choice ranges from an amalgam of MPCs and development authorities to the adoption, again, of a directly elected mayor.

Exhibit 3.2.14

India faces key choices in how to ensure empowered leadership at the metropolitan and municipal levels

Metropolitan level	**Status quo: Lots of parastatal agencies** Nothing at the metropolitan level	**Modified metropolitan authority under MPC** Metropolitan development authority under Metropolitan Planning Committee	**Directly elected metropolitan mayor** Strong political executive for the entire metropolitan area	**City-states** Independent states out of the largest cities (like in China or in Delhi)
Municipal level	**Status quo: commissioner, weak mayor system** ▪ No clear leader for the municipality ▪ Commissioners get transferred at short notice	**Modified mayor-commissioner system** ▪ Mayor-in-council for decision making ▪ Supported by commissioner	**Directly elected local mayor** Strong political executive for the municipality	

SOURCE: McKinsey Global Institute analysis

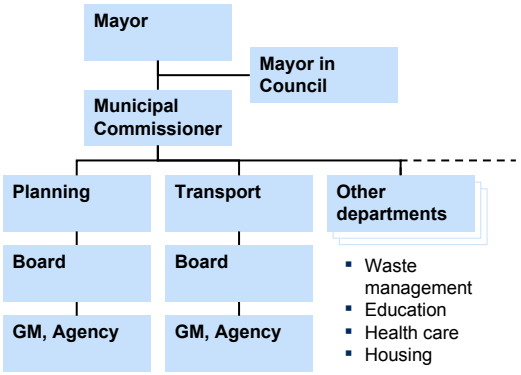
- **Implement at least a modified mayor-commissioner system in the municipal corporations of the top 35 to 40 cities.** The modified mayor-commissioner system built on the Kolkata model is a good first step for India in all its municipal corporations. The system allows for a political executive with a five-year term to serve as the leader of the city, with the commissioner acting as the chief administrator. A member of the mayor's council will lead each department with assistance from an additional commissioner or general manager. In many ways, it replicates the administrative structure in state government departments and central government ministries. What will be the key in such a leadership structure is the division of powers between the mayor and the commissioner. While this structure falls short of a directly elected mayoral system in terms of accountability, it would create clear political leadership for a municipality while retaining the checks and balances inherent to the civil service (Exhibit 3.2.15). This system allows for India to move firmly toward empowered leadership structures while minimizing risk in the move through gradual, incremental change.

Exhibit 3.2.15

India should consider a political executive in the form of a mayor-in-council at the municipal level

Executive

- Mayor elected by councillors forms mayor-in-council from elected councillors
- Standing committee system replaced by "cabinet" system in the form of mayor-in-council
- Executive power with mayor-in-council; each member responsible for own department/portfolio
- Mayor responsible for appointment and performance appraisal of municipal commissioner



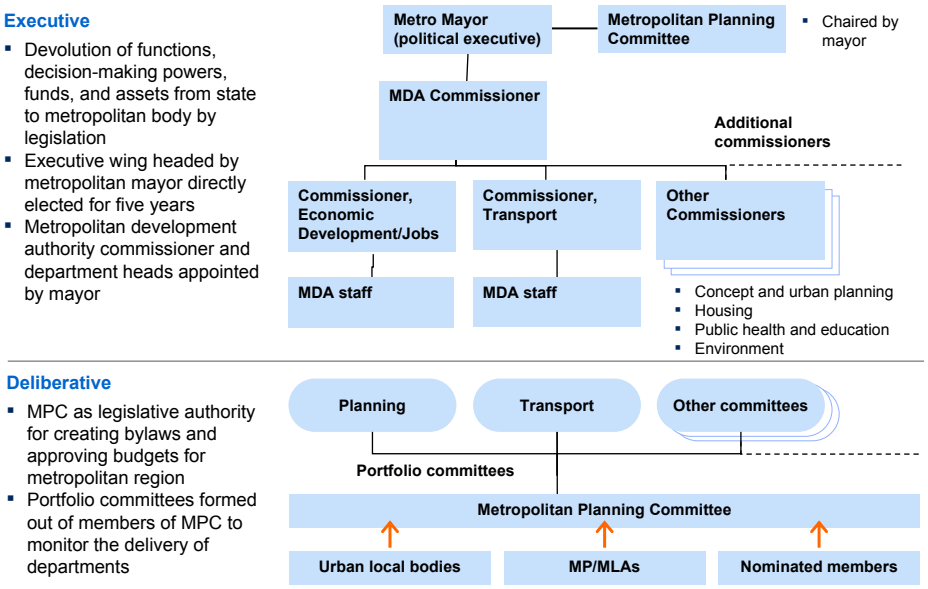
SOURCE: McKinsey Global Institute analysis

- **Allow for directly elected mayor for metropolitan areas in the medium term (five to ten years); rely on MPC-metropolitan authorities in the short term.** India has the advantage of experimenting with city leadership models at the metropolitan area, while municipal structures may well be more entrenched and take longer to reform. In this context, we believe that, over the medium term, India should have directly elected mayors to run the metropolitan governments in its largest urban agglomerations. The lesson from international cities is also that this model is more relevant and effective at the metropolitan level. As a first step, the country could adopt a directly elected mayoral system in all nine of its Tier 1 cities (whose populations exceed 4 million) (Exhibit 3.2.16). This clearly would require a national debate as well as political consensus. In the short term, the solution is to build on existing structures but with revamped leadership and decision structures. Most of the large urban agglomerations have metropolitan development authorities leading key development projects. At the same time, the 74th Amendment calls for MPCs to be set up in these areas. We propose an interim structure for the metropolitan government with the MPC (chaired by the chief minister or the urban development minister) acting as the primary policy making body and the Metropolitan Development Authority (MDA) as the secretariat and the implementation arm (Exhibit 3.2.17). The presence of political leaders in the MPC and the executive committee, and representation in the MPC from the municipalities, would allow for a clear forum to debate policy issues in the metropolitan area that cut across local city boundaries.

The journey toward an effective leadership model in India may take some time—as it did in London—and involve many experiments and innovations to reach a workable solution. However, even in the short term, these definitive steps can have a dramatic impact on the ability of cities to deliver critical services to their citizens.

Exhibit 3.2.16

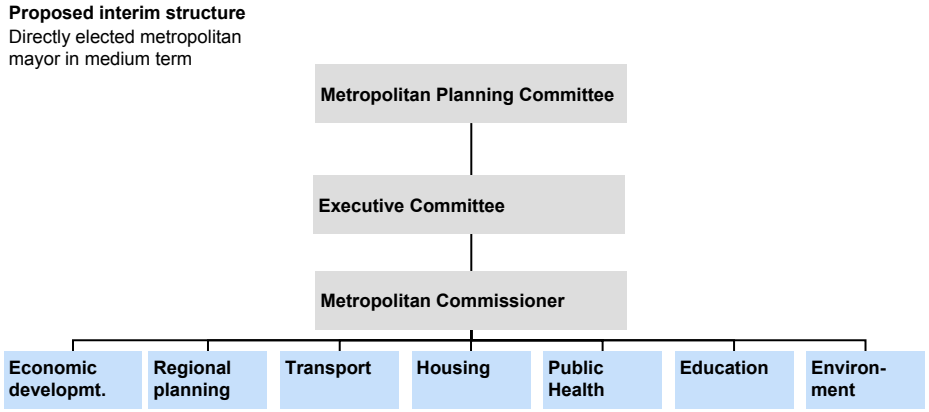
In the medium term, India should adopt a directly elected mayoral system for the metropolitan government



SOURCE: McKinsey Global Institute analysis

Exhibit 3.2.17

In the short term, India could create functional metropolitan authorities in urban agglomerations with multiple municipalities



SOURCE: McKinsey Global Institute analysis

4. Make the transition to modern service delivery structures, with appropriate private-sector participation

Once India addresses the question of city leadership, the focus necessarily shifts to the question of how cities can deliver services at scale. Given the scale and complexity of India's urbanization, the need is urgent for modern structures at the city level that can build infrastructure and deliver services at scale. Internal government departments with cumbersome decision-making processes will be a serious drag on India's ability to improve its citizens' quality of life. India needs to follow the one reform that has been adopted by every successful city in the world: the creation of focused agencies with clear mandates, reliable budgets, and empowered CEOs.

- **Consider corporatization of select municipal functions as well as targeted partnerships with the private sector.** A key lesson from cities around the world, as well as the example of BEST in Mumbai, is that cities can achieve dramatic improvement in the delivery of key services when they are run by empowered agencies carved out of government departments and guided by their own boards for quick decision making. This is not privatization—just an effective mechanism to build focus and ensure service excellence. The agencies continue to be a part of the government but are able to act with the speed and focus that government departments traditionally lack. This could be one of the biggest levers for India's cities to dramatically improve the quality of municipal services.

  The appropriate functions for corporatization will vary by tier of city and by local conditions. The government alone is capable of delivering some services, such as security and planning, as well as some public utility services, such as education and health care. These services should remain as government departments run inside of municipal governments. In the case of services that are fully chargeable, cities have the choice to opt for either corporatization or full privatization, depending on the degree of control intended. While it is possible to choose privatization with regulation, we recommend a corporatized model in which empowered agencies deliver services but with full accountability to the city government. Services such as transportation, water supply, and waste management are ideal candidates for corporatization. Within these agencies, though, selected functions can be open to private-sector involvement. In fact, private participation is possible across the board, including in education, primary health care, waste collection, water distribution, and the operation of selected public transportation routes. Overall, PPPs could account for as much as 30 to 40 percent of operations and maintenance budgets in large cities (Exhibit 3.2.18):

Exhibit 3.2.18

Every core urban service can benefit from increased private participation

	Candidates for corporatization	Degree of private sector participation (illustrative)
Water and sewage	√	▪ Collecting tariffs and managing water distribution infrastructure ▪ Fixed-fee contracts to lay out water and sewage pipe networks
Waste management	√	▪ Fixed-fee contracts for waste collection and processing
Transportation	√	▪ Construction and operation of toll roads ▪ Construction and operation of mass transit systems with viability gap funding and regulated user tariffs
Planning		▪ External fixed-fee consulting contracts for draft master plans, with access to world-class planning ideas and technology tools
Education		▪ Fixed per student funding for running municipal schools with agreed benchmarks and target outcomes
Health care		▪ Concession agreements for running municipal hospitals
Housing	√	▪ Subsidies and incentives to private-sector developers in return for a handover of a fixed number of affordable housing units ▪ Fixed-fee construction contracts for units built directly by the government

SOURCE: McKinsey Global Institute analysis

A metropolitan authority can also create special purpose vehicles (SPVs) in cases where it undertakes projects in economic-development and transport. Such SPVs could act as focused agencies with clear mandates to construct specific infrastructure projects, and with an added ability to structure financing and access commercial debt in ways that municipalities may not be able to.

5. Improve local government capacity

Important questions need to be addressed about what support capabilities should be available to urban political leaders and how India can best develop the talent needed to administer its growing cities. Whichever model India decides to adopt, it is clear that it needs to build capacity to improve its delivery of services in the urban setting.

Most cities use multiple routes to build up their talent pool. One of these is developing a municipal cadre by developing a group of experienced people who are capable of providing leadership as well as through training skilled new officials to expand managerial capacity. Second, many cities have programs designed to attract the best private-sector talent. Third, some cities, particularly in emerging markets, often leverage international talent, including consultants. In India today, there are critical gaps between the demand and supply of talent.

- **Create a new city cadre.** The top 60 cities alone are likely to need 650 department and city heads, 4,500 managers, and 15,000 technical staff. In the area of waste management alone, India needs around 1,000 trained engineers and 11,000 diploma holders. Government services—and particularly local government services—struggle to attract talent because they offer lower salaries, and have no clear growth path. To hire these engineers, municipal departments compete with the private sector, which offers much more attractive careers to good performers. Indian cities need to offer attractive and sustainable career paths to attract talent through the creation of a new city-specific cadre. Statewide tests could be the basis of screening the potential pool from which cities can build the cadre. The cadre should be supported through clear technical and managerial paths, including allowing city leaders to hire the top ten positions in the city (including that of the commissioner) from within this cadre as well as from outside. If building the civil service was the burning need for the country after independence, building an equivalent service for cities is the pressing need for the 21st century.

  India would need to match the creation of a cadre inside city governments with a proliferation of urban planning and management institutes. India will need six to eight urban planning and management institutes to train 600 to 700 city leaders, 4,000 to 5,000 managers, and 15,000 technical staff. In addition, two to five urban management programs, with an annual intake of 100 students, would need to conduct leadership development programs for department and agency heads.

- **Allow lateral hires from the private sector.** While the creation of a municipal cadre can be the basis of a long-term strategy to infuse talent into local city administrations, the gap in capacity will persist in the short term. One way to bridge the gap would be to allow local city governments, through the corporatized agencies, to hire from outside the government service on clear, specific contracts. This tactic has been used by cities around the world to attract the best of technical and managerial expertise available to them. It is time for Indian cities to start tapping into the talent available in the country's thriving private sector.

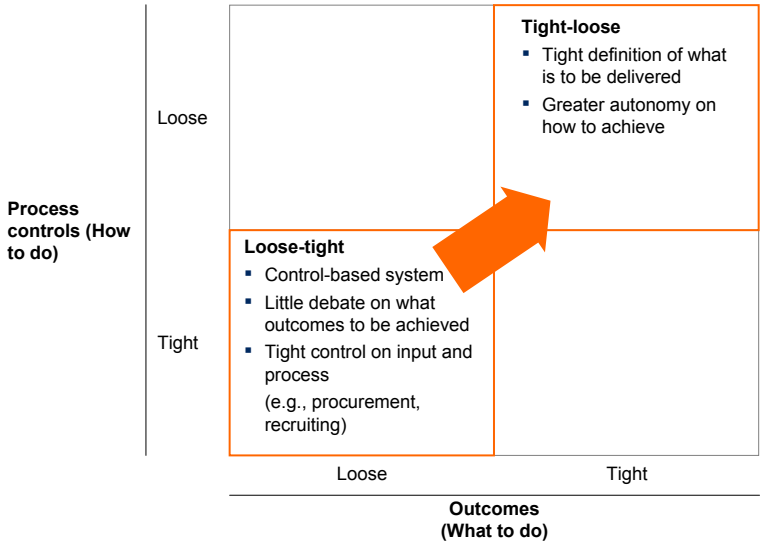
6. Drive transparency and accountability in city government

The final area for India to consider is what mechanisms it should adopt to ensure the accountability of its urban administrators to the citizens they represent. While elections represent the most powerful form of accountability, many cities supplement this with three mechanisms that ensure the accountability of local governments to state and national governments; the accountability of service agencies to the city government; and the accountability of the city government to the citizens. The underlying principle of these

mechanisms is the need to move from a loose-tight system, which emphasizes process and inputs, to a tight-loose system, which gives cities the freedom to make their own processes and decisions but holds them accountable for the outcomes (Exhibit 3.2.19).

Exhibit 3.2.19

Accountability systems in India need to focus more on outcomes and less on process



SOURCE: McKinsey Global Institute analysis

- **Push for city charters.** Every city should be pushed to create a charter for itself that will list specific outcomes the city government pledges to deliver for its citizens over a five-year period, with clear markers for annual implementation. Such charters force a process to list priorities with both public and institutional support. In the context of the renewed planning system we have recommended, these charters can be used to set the vision for the city, on economic growth and quality of life. It is a way of holding local governments accountable and setting aspirations for a city. The charter could, for example, comprise 10 to 15 indicators of performance across areas such as transportation, health care, and education and act as a measure of performance and governance and as a coordinating device between all city agencies and the local governments.

- **Draft MOUs between mayors and agencies.** City charters can provide a clear guide for what agencies are expected to deliver. However, this is not enough. In a governance structure in which agencies have a high degree of autonomy over budgetary allocations and operational decisions, it is imperative that the work be guided by MOUs set between the city government (through the mayor) and the agencies. These MOUs have to clearly outline what the agencies must deliver in any given year, and the city's financial and nonfinancial support to ensure achievement of these objectives.

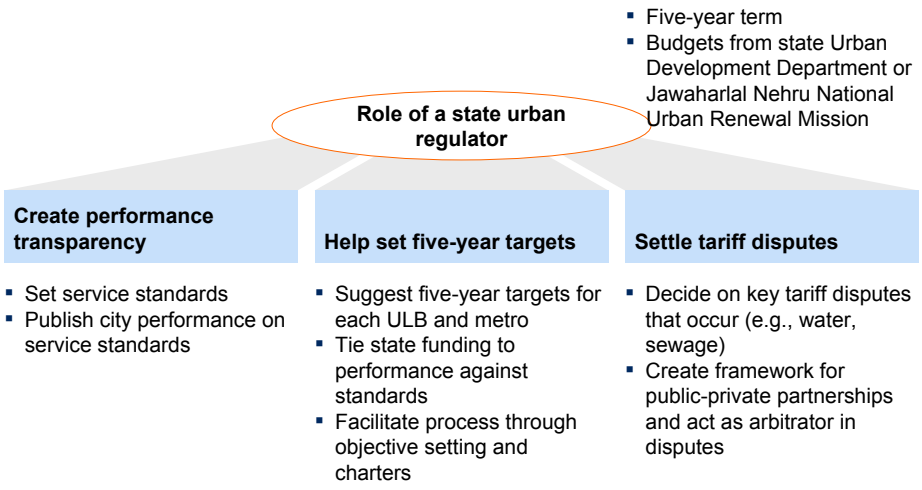
To create more transparency on city performance as well as to provide the basis for central and state governments to judge performance to determine rewards and consequences, we recommend the creation of an urban regulator at the state level.

- **Create a state-level urban regulator.** Such a regulator can play a critical role in monitoring and settling tariffs, setting benchmarks, and providing transparency on delivery standards. Political leaders clearly need to frame policy, but it is helpful

to have independent regulatory bodies handle the benchmarking and monitoring of service delivery (Exhibit 3.2.20). This would also allow the urban administration to focus on delivery.

Exhibit 3.2.20

India should consider creating a state level urban regulator to set norms and facilitate performance transparency



SOURCE: McKinsey Global Institute analysis

The establishment of an urban regulator would be an effective way to track the delivery of services against the city's own charter.

The regulator could also act as an arbitrator on tariffs and play an oversight role in tracking the financial health of municipal agencies, including the recovery of costs and reinvestment goals. The regulator could collect consumer feedback from city wards on delivery and customer service and could elicit responses from the relevant municipal departments and agencies. The 74th Amendment recommended that ward committees play a major role in holding city governmental authorities accountable. The active participation of citizens needs to be stimulated through proactive disclosure and greater accessibility to information and feedback channels. An urban regulator could give the information to citizens to hold their elected officers accountable. In a bid to raise awareness among citizens about whether they are receiving the minimum standards of services promised to them by government, the regulator could submit findings on compliance to local government and to the state's urban development department. The regulator could also publish a service-delivery scorecard for citizens.

One mechanism that can institutionalize a forum for citizens to demand accountability from their local municipal representatives is the area sabha, composed of every registered voter in a polling part of a ward. The area sabhas can allow citizens to have a direct role in holding their elected representatives accountable.

BUILDING POLITICAL MOMENTUM FOR CHANGE

Reform of local governance and city administration is probably the toughest area of change in India. There is a high degree of comfort with the status quo, and there are strong institutional actors resistant to change. However, as highlighted in chapter 2, and in this section, the need for change is urgent and there is an imperative to start on the journey of local reforms that are so absolutely critical to India's goal of inclusive growth.

Central to this debate are the two choices we have outlined: how far should India devolve power to the states, and who will lead the cities? The making of these choices requires a national debate initiated and facilitated by no less than India's prime minister.

Chapter 4 details what we see as the series of steps available to the central government to push for reforms, including in governance. Briefly, if India can achieve political consensus around the reform of urban governance, the central government has a ready-made vehicle in the JNNURM to push for the next generation of reforms. Conditionality related to embracing reform may well have to be part of a new incentive fund within JNNURM available to the more progressive states willing to be aggressive in pushing through change.

However, financial incentives are not the only lever to make change happen. Many states, for lack of local capabilities and technical expertise, are unable to push for the reforms. The central government should be willing to provide specialized assistance and hand-holding to states that are willing to make reforms but do not have the know-how. At the same time, central government has the opportunity to assist the states through the creation of model municipal laws specifying the nature of devolution and changes to service delivery structures.

Progressive state governments and chief ministers have the opportunity to use governance reforms to improve service delivery dramatically. These states should seek to experiment with the creation of a metropolitan mayor, the adoption of the modified mayor-commissioner system, the corporatization of key agencies, and the establishment of urban regulators. Our discussions with state governments found that many states are willing to take the next leap on reforms. For these state governments, the step forward may be to try some of these big changes in a few of their cities.

□ □ □

Whatever final choices India makes about the governance structure, it is imperative that the nation engage urgently in a political debate on this issue. As long as the solution is internally consistent, any decision implemented well would be better than the suboptimal governance structures of today.

3.3 Planning matters

As cities grow, they need to make informed trade-offs about their use of scarce resources such as land and its supporting infrastructure. This is a challenge that India needs to approach in a deliberate manner by putting in place a modern urban planning system that makes vital choices about where people of all incomes live, work, and spend their leisure time. Planning is necessary to help link land usage with urban flows (mobility of people and goods) in such a way as to ensure that a city's infrastructure is capable of delivering basic urban services (such as water supply, sewage treatment, waste management, and storm-water drains)—and that a city functions effectively for all of its citizens.

The sheer scale and pace of India's impending urbanization makes urban planning critical. As India's urban population swells to 590 million by 2030 and projected per capita income nearly quadruples, anticipating and planning for the future needs of citizens will be the key to building integrated infrastructure capacity in line with demand. Take the Mumbai Metropolitan Region (MMR) as an illustration. By 2030, we project that MMR's population will rise from 23 million today to 33 million, with per capita GDP quadrupling from $1,800 to $8,000. As a result, demand for built-up land could rise from 800 square kilometers to 1,850 square kilometers. Failure to anticipate the city's infrastructure requirements at such scale will result in deteriorating quality of life, especially for the poorer sections of society. For example, average trip lengths could rise from 9.8 kilometers today to 14 kilometers. Given a projected near six-fold increase in stock of urban cars in India between 2010 and 2030, if there is insufficient public transportation, rising trip lengths could lead to urban gridlock. Moreover, a majority of the population will continue to not have access to affordable housing units, resulting in further proliferation of slums. Even the availability of schools and hospitals could decline, unless states and cities plan for future demand and incorporate that demand into clearly articulated zoning norms.

Indeed, in the absence of rigorous planning, demand for urban land could rise by 11 million hectares, posing a serious risk that India could lose significant tracts of nonurban, potentially agricultural land near cities to unplanned urban sprawl (see section 3.5 for a more detailed discussion).

While India can point to good urban planning examples in Le Corbusier's Chandigarh and Lutyen's Delhi, overall, the planning process has not delivered in recent years. Statutory planning documents have failed to enforce change beyond the incremental and the reactive variety. As a result, signs of unplanned, urban sprawl are increasingly visible.

So what would it take to fix India's urban planning system? In this section, we explore:

- Four characteristics of good urban planning and what India can learn from international best practices
- The state of India's current urban planning system
- Recommendations to transform the urban planning system in India and restore planning as a tool for effective urban development and management
- The way forward

GLOBAL BEST PRACTICE OFFERS FOUR LESSONS FOR GOOD URBAN PLANNING

Several global cities have made giant strides in the field of urban planning in the past few decades. To understand these developments better and identify key implications for India, we studied urban planning practices in Singapore, London, and New York.

- **Singapore.** Singapore's rise from a congested city to a thriving financial center has been breathtaking. At the heart of this transformation has been a robust urban planning system, the responsibility for which lies with the Urban Redevelopment Authority (URA). The URA operates under the auspices of the influential Ministry of National Development and is responsible for creating and executing Singapore's land-use plans. Singapore created its first concept plan in 1971 and has since created two more, in 1991 and 2001. These concept plans have acted as anchors to Singapore's 40- to 50-year development strategy and have been refreshed every decade using state-of-the-art geographic information system (GIS) mapping. The 2001 concept plan, for example, starts with a target population of 5.5 million and cascades down to employment estimates by sector and high-level land use, including a sequencing of areas for greenfield development as well as block-by-block redevelopment (e.g., the development of the Tampines, Woodlands, and Jurong East regional centers, and even the development of Marina city on 690 hectares of reclaimed land south of Singapore in the previous concept plan) (Exhibit 3.3.1).

Exhibit 3.3.1

Singapore has balanced short- and long-term priorities using two types of urban plans

A 40- to 50-year high-level concept plan …

Components of concept plan
- Vision for the city
- Target population, GDP, and employment by region
- High-level land-use plan including areas for greenfield development and regeneration
- Strategic transportation projects

… is broken down into an actionable 20-year master plan

Components of master plan
- Detailed land-use plan including zoning, FAR, setback etc., by region
- Greenfield development and regeneration projects
- Identified infrastructure projects and policies with sequencing and financing plans
- Sectoral norms such as urban design, sustainability, etc.

SOURCE: Singapore Urban Redevelopment Authority; interviews; McKinsey Global Institute analysis

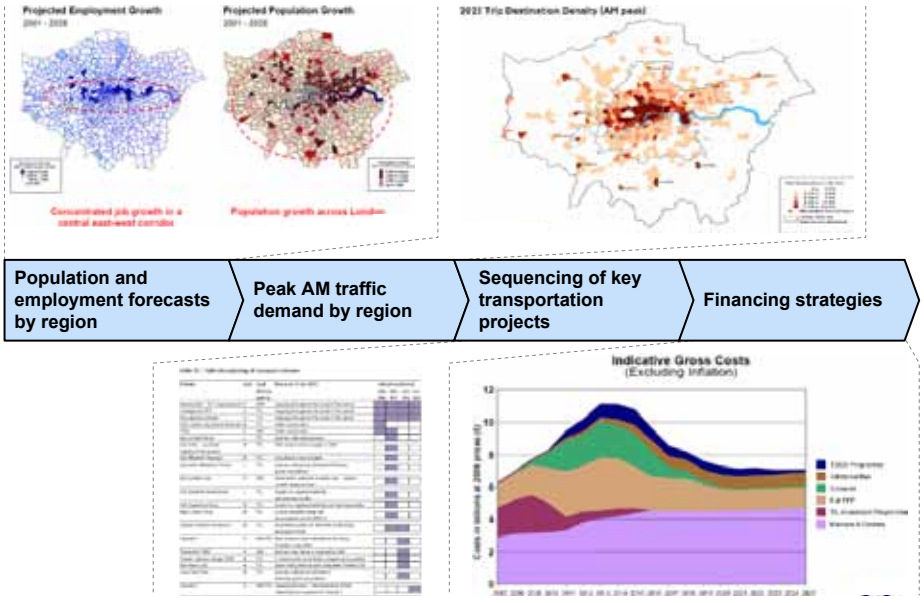
The concept plan also provides broad guidelines for a set of key projects and policies essential to serve expected demand for physical and social infrastructure (such as Mass Rapid Transport Systems and affordable housing units) as well as urban design and form. This 40- to 50-year concept plan is then cascaded down to 20-year master plans that translate broad land use into actionable parcel-by-parcel planning norms and distinct infrastructure projects. To ensure the development of world-class urban plans, Singapore has invested upfront in capacity and technology and has ensured a participatory process. The URA team

consists of more than 300 professionals (including urban planners, economists, architects, designers, and sectoral engineers) and spends around $160 million per annum. In addition, Singapore displays its draft concept plans to the public using physical models, fly-throughs, and animation. Planners then consider the views of the public before moving to finalize content. The process of granting exemptions is clearly articulated, and when granted, exemptions are transparent.

- **London.** In London, the Greater London Authority (GLA), headed by the mayor, and individual borough councils share responsibility for urban planning. The city follows a unique cascaded model of urban planning that works largely because of a clear set of mandates and roles assigned to the different organizations involved in London's urban planning effort. The GLA is responsible for creating the 20-year statutory metropolitan master plan. Local borough development plans must be in line with these guidelines. In fact, the mayor has to approve local borough plans before they are made statutory. London's plans are also good examples of integrated planning. Like Singapore, London's metropolitan master plan starts off with the city's vision and key socioeconomic forecasts, including population and employment. These forecasts are then translated into a broad land-use plan and key initiatives in transportation, affordable housing, basic services (including water supply, sewage treatment, and solid-waste management), and, in recent times, environmental sustainability. These initiatives are usually backed by a broad plan that sets forth priorities in a sequenced manner with financing mechanisms identified (Exhibit 3.3.2).

Exhibit 3.3.2

London master plan includes detailed peak transport planning



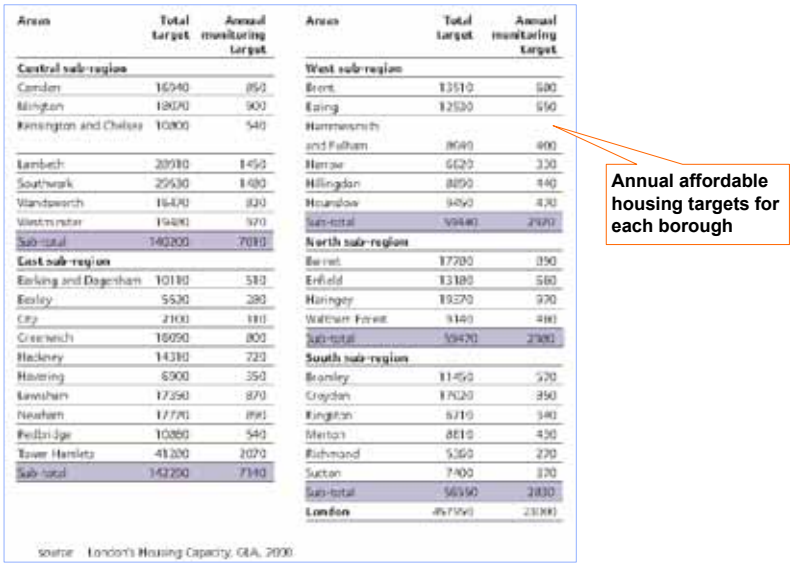
Source: The London Plan; Transport for London (TfL)

Individual borough development plans flow from this metropolitan master plan and often include plot-by-plot land use and initiatives in local transportation, water supply, sewage treatment, and solid-waste management. In major sectors such as affordable housing and transportation, the metropolitan master plan even articulates a key set of initiatives that individual boroughs must follow. For example, an annual target for creating affordable housing stock is stated

for individual boroughs (Exhibit 3.3.3). Besides the key physical and social infrastructure sectors, London's metropolitan master plan emphasizes urban design. In fact, the new plan even includes templates for signage in key areas, ensuring that development is interwoven with the unique historical and cultural heritage of the city (Exhibit 3.3.4). An interesting addition to the master plan has been a section on climate change, which enlists current and target greenhouse emissions and a list of supporting initiatives. To ensure the quality of these plans, GLA and the boroughs boast a team of 500 to 600 personnel.

Exhibit 3.3.3

The Greater London Authority emphasizes affordable housing, including targets for individual boroughs



Areas	Total target	Annual monitoring target
Central sub-region		
Camden	16040	850
Islington	18870	900
Kensington and Chelsea	10800	540
Lambeth	20930	1450
Southwark	29630	1480
Wandsworth	16470	820
Westminster	19480	970
Sub-total	140200	7010
East sub-region		
Barking and Dagenham	10180	510
Bexley	5530	280
City	2100	110
Greenwich	16050	800
Hackney	14380	720
Havering	6900	350
Lewisham	17350	870
Newham	17770	890
Redbridge	10880	540
Tower Hamlets	41200	2070
Sub-total	142290	7140

Areas	Total target	Annual monitoring target
West sub-region		
Brent	13510	680
Ealing	12530	630
Hammersmith and Fulham	8690	400
Harrow	6620	330
Hillingdon	8850	440
Hounslow	9450	470
Sub-total	59640	2950
North sub-region		
Barnet	17200	850
Enfield	13180	660
Haringey	19370	970
Waltham Forest	9140	460
Sub-total	58890	2380
South sub-region		
Bromley	11450	570
Croydon	17020	850
Kingston	6210	340
Merton	8810	430
Richmond	5360	270
Sutton	7400	370
Sub-total	56590	2830
London	457990	23000

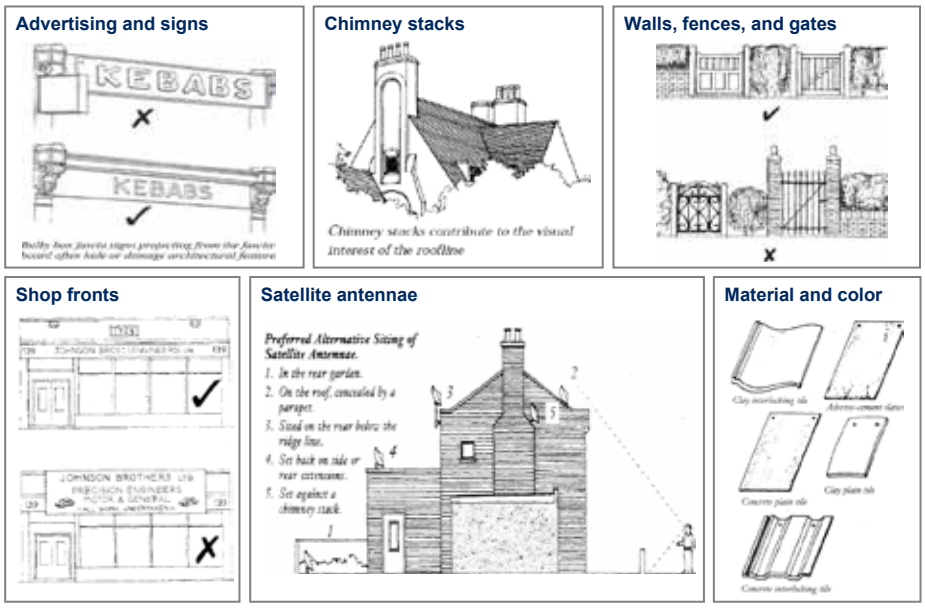
source: London's Housing Capacity, GLA, 2000

Annual affordable housing targets for each borough

Source: The London Plan, Greater London Authority

Exhibit 3.3.4

Urban form and design guidelines to create a distinct city character

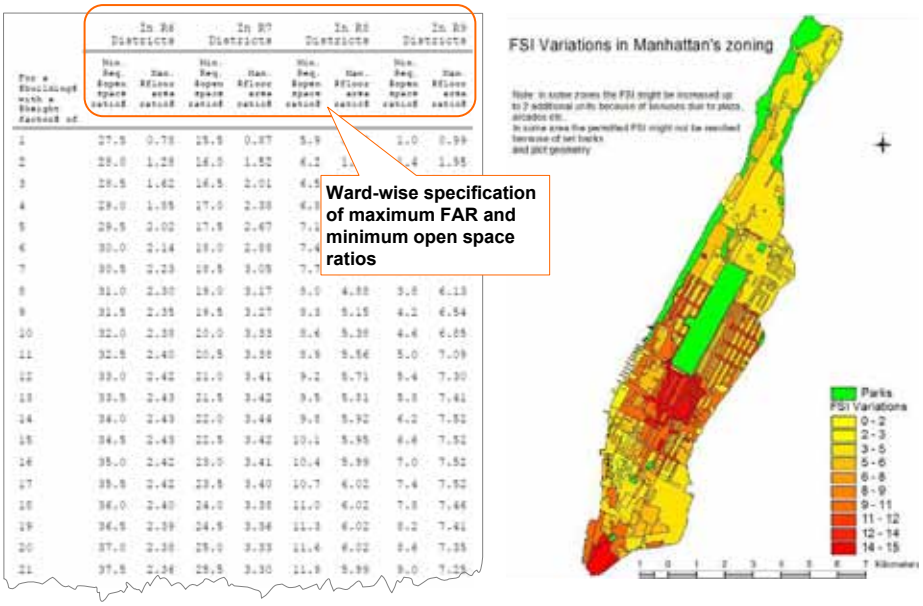


Source: The London Plan, Greater London Authority

- **New York.** New York's department of city planning, in collaboration with the metropolitan city planning commission, reports to the deputy mayor and is responsible for crafting development plans for the city's five boroughs. Even in New York, the core planning principles remain the same. "PlaNYC," the city's master plan, estimates a holding population of 9 million and employment of 4.3 million by 2030. Based on these estimates, the plan provides guidelines for policies and projects for more than 95 initiatives across six priority areas: land use (including housing and open spaces), water supply, transportation, energy (including gas infrastructure), air pollution, and climate change. New York's plans have a reputation for being rich in detail. For example, key planning norms such as FAR and setback are laid out for every district within a borough (Exhibit 3.3.5).

Exhibit 3.3.5

New York uses granular planning norms instead of one-value-for-all

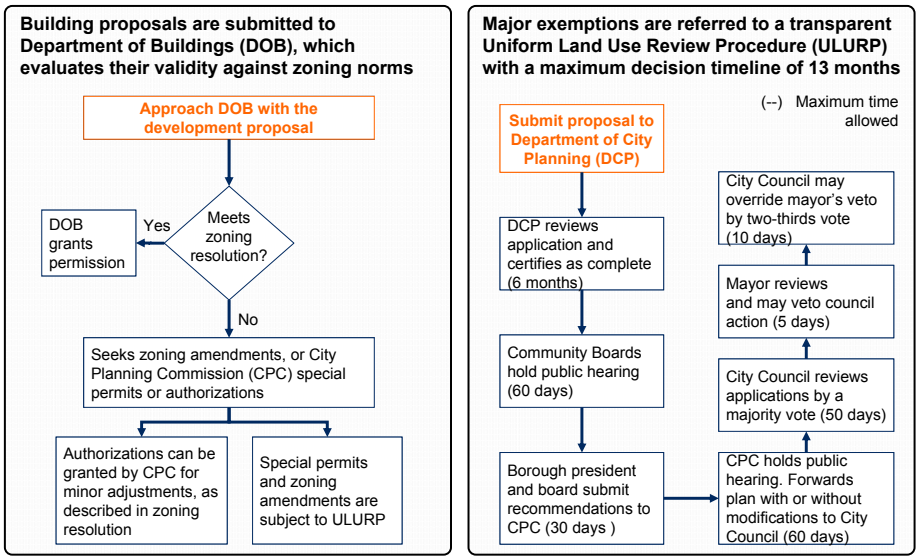


Source: MMR Regional Plan 1996–2011; The London Plan

Another important aspect of the planning process is the transparency with which the city creates and executes its plans. The planning team conducted several town-hall events and met with numerous advocacy and business organizations across the five boroughs before finalizing the contents of the plan. Once the plan is finalized, granting exemptions is also subject to a transparent process, even involving public hearings for major exemption proposals (Exhibit 3.3.6). New York's planning department consists of more than 200 planners.

Exhibit 3.3.6

In New York, urban plans are sacrosanct and exemptions transparent



SOURCE: Department of City Planning, New York City; New York City Charter; McKinsey Global Institute analysis

While each of the cities that we have described has had distinct urban challenges, four broad consistent tenets of urban planning practices emerge:

1. Clear planning mandates and roles

- Responsibility for creating and executing urban plans rests with the political owners of the city
- In large cities, a two-tier planning structure exists at the metropolitan and local municipal levels with clear mandates for each
- Metropolitan plans are binding on municipal development plans by cascading down key parameters such as broad land use and FAR to the municipal levels.

2. Cascading plans with integrated content

- A long-term, 40- or 50-year metropolitan-level concept plan is developed, starting with the city's vision, anticipated population, GDP, and employment by sector and high-level land use
- This metropolitan concept plan then flows down into an actionable 20-year detailed metropolitan master plan and ultimately into a 20-year plot-by-plot city development plan; integration is ensured by making four key metropolitan parameters binding on development plans
- Land-use plans are integrated with detailed transportation planning, including estimates of peak morning public and private traffic
- Sequencing of projects are identified and broad financing strategies are developed
- Affordable housing, education, and health care are emphasized in plans, including provision of specific zoning norms

3. Planning organizational structure with effective reporting relationships, talent, budgets, and technology resources

- The head of planning is deemed a prestigious position, staffed with a senior person who reports directly to the mayor or commissioner
- Staffing consists of 200 to 300 planners (roughly 1 planner for every 10,000 population) across metropolitan and city levels for major cities, and they are equipped with the latest planning technology (such as GIS maps, econometric and transportation models)

4. Effective execution and enforcement mechanisms

- Urban plans are considered sacrosanct, and a transparent exemption process is created that includes a public hearing for major exemptions
- Citizens are key stakeholders in the planning process with multiple opportunities provided to shape the final plan

So where does India stand with respect to these practices?

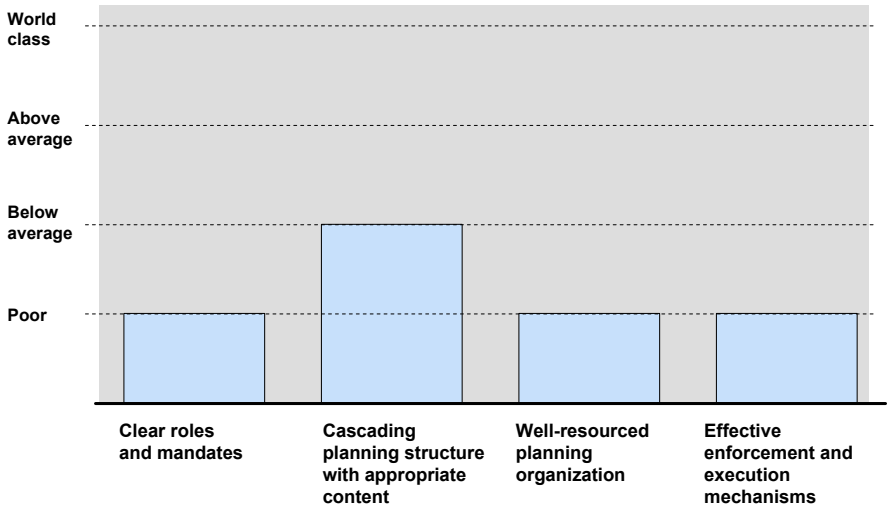
INDIA'S CURRENT PLANNING SYSTEM IS NOT EFFECTIVE

India already has an institutional framework for urban planning. After independence, the State Town Planning Acts suggested the setting up of town and country planning departments (TCPD) to create master plans for cities. Then, in 1991, the 74th Amendment to the constitution suggested three main urban planning reforms: the full transfer of city planning to local governments; the formation of a Metropolitan Planning Committee (MPC) for each of the 20 metropolitan areas to ensure integrated outcomes at the metropolitan level; and the formation of a District Planning Committee (DPC) for each of India's 626 districts. Indeed, the creation of city development plans is a key prerequisite for accessing funds from the JNNURM.

And yet, examples abound of limited urban planning—or, worse, bad planning. We now turn to our assessment of India's current urban planning systems against the four dimensions of international best practices (Exhibit 3.3.7).

Exhibit 3.3.7

India scores poorly on three out of four dimensions of effective urban planning and below average on one



SOURCE: McKinsey Global Institute analysis

- **Clear planning roles and mandates**. There's no single owner of urban planning in India. At the metropolitan (or regional) level, only 4 of the requisite 10 states and 20 of the 29 states have constituted MPCs and DPCs, respectively. In addition, the metropolitan master plans created by these MPCs are not binding on city development plans, negating the benefits of metropolitan planning. At the local level, the planning function has not been fully transferred to municipalities in 12 states. Even where this function has been transferred, state government interventions are still strong and often completely bypass the city administration. For example, state governments still grant FAR exemptions on a case-by-case basis, and the plan norms are taken only as indicative figures.

- **Cascading plans with the appropriate content.** India's metropolitan (or regional) master plans and city development plans lack integration across sectors and are not granular enough. In one metropolitan plan that we studied in detail, we found at least five major deficiencies:

  — No mention of anticipated GDP and employment by sector and specific job-creation projects, including creation of new growth centers and rejuvenation of old ones

  — No clear articulation of target quality of life for citizens across sectors, such as what percent should have access to sewage treatment

  — Lack of peak transportation demand estimates, such as total trips, average trip length, and target modal share; as a result, identified public projects were mostly incremental and lacked even broad sequencing and financing plans

  — Little attention paid to social services such as education, health care, and affordable housing; no estimates of demand for hospitals, schools, and affordable housing units or any indication of policies and zoning norms for these sectors

  — No articulation of specific planning parameters, such as anticipated employment or FAR, that need to inform individual city development plans

A similar story evolves at the city level. In one of the city development plans we studied, we found at least six major deficiencies:

  — Only one planning norm for the whole city (e.g., FAR, setback) instead of separate norms for separate growth centers

  — No mention of regeneration projects for old areas

  — Affordable housing demand forecasts are absent; no clear articulation of appropriate zoning norms for affordable housing for low-income groups

  — Only incremental transportation projects without estimates of peak transportation demand in 2030

  — Infrastructure projects identified without a broad plan for sequencing or financing them

  — No mention of urban form or design to create a unique visual feel and to build the city's character

- **Planning organization staffed with sufficient talent, budgets, and technology resources.** Few metropolitan cities in India have a functioning planning department supported by a metropolitan authority. Even where they exist, they are staffed with only eight to ten planners and are usually led by engineers. At the local level, cities have a local planning department housed in

the municipal government. Overall, the current staff is only four to six strong, compared with the need that we estimate of between 80 and 100 planners for a large city. In general, there are very few urban economists, sectoral experts, architects, or designers in these departments. In addition, these departments usually have small budgets and lack modern planning technologies, such as GIS, and econometric and traffic modeling. In addition, the majority of the staff is involved in building permissions rather than creating urban plans.

- **Effective execution and enforcement mechanisms.** Given the lack of specificity, exemptions are frequent and usually ad hoc, without consideration of the impact on surrounding infrastructure. A common example, as explained earlier, is the state government's case-by-case FAR exemptions without corresponding infrastructure investments in local transportation, water-supply, sewage treatment, solid-waste management, and storm-water drains.

So how can India tailor the best practices we have observed around the world to solve its urban planning problems?

INDIA CAN FIX URBAN PLANNING BY FOCUSING ON 12 KEY RECOMMENDATIONS ACROSS THE FOUR DIMENSIONS

We believe that fixing the deficiencies in India's planning system is possible and will perhaps be easier than the funding and governance challenges. In this section, we discuss 12 recommendations across four themes that, if well implemented, have the potential to transform Indian city planning in five to ten years.

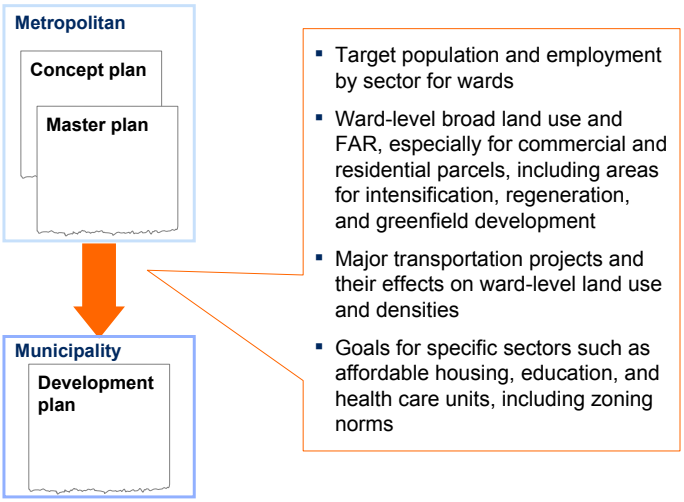
1. Clarify mandates and roles by transferring the planning function to local governments in the appropriate way

India first needs to define the roles and mandate of the five government institutions involved in the planning process—the state government, metropolitan and district planning committees, regional authorities, local governments, and other parastatal agencies. Three key initiatives can make this work:

- Constitute and empower MPCs to create statutory metropolitan plans in at least the top 20 metropolitan regions that have multiple municipalities. A metropolitan authority should act as its secretariat. For the remaining towns, create and empower equivalent DPCs to create regional plans at a district level.
- Make the metropolitan (or regional) plan binding on municipal plans through four parameters (Exhibit 3.3.8):
  - Target population for key wards
  - Broad land use and FAR, especially for commercial and residential parcels, including areas for intensification, regeneration, and greenfield development
  - Major metropolitan transportation projects and their effects on land use and densities at a ward level
  - Goals for specific sectors, such as affordable housing, education, and health care units, including zoning norms
- Outside of the subjects for metropolitan (or regional) planning, all local governments should fully transfer the appropriate set of local urban planning powers, among them parcel-by-parcel planning norms such as those governing FAR and land use.

Exhibit 3.3.8

Four parameters from metropolitan plans should be binding on city development plans



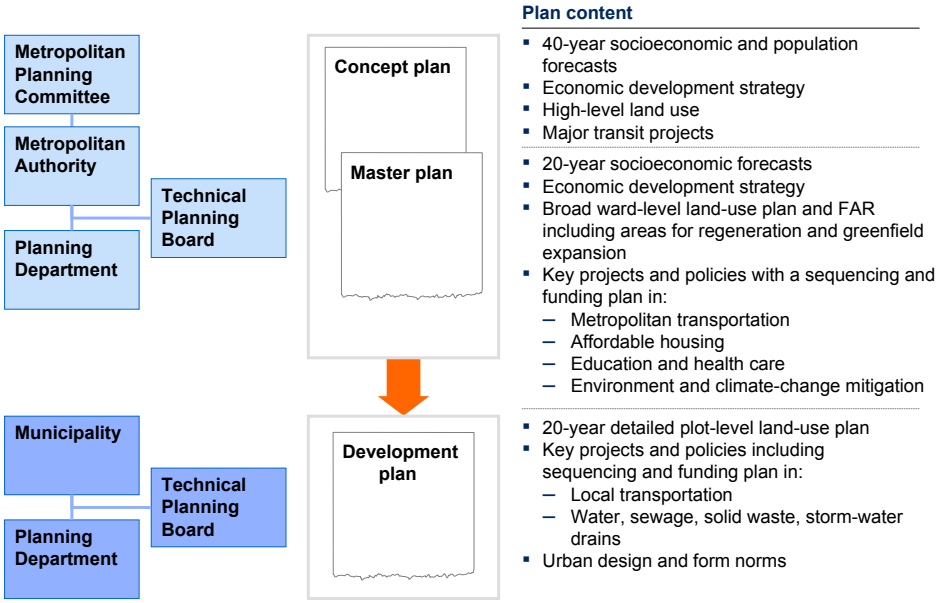
SOURCE: McKinsey Global Institute analysis

2. Execute an integrated, cascaded planning system with the appropriate content

For large metropolitan areas, MPCs would need to prepare two types of metropolitan plans—a 40-year concept plan and a 20-year master plan. For other cities, DPCs, in partnership with state TCPDs, could create just the 20-year district master plan. These plans could then flow down into a detailed 20-year municipal development plan. All plans must be integrated across sectors (Exhibit 3.3.9). We now summarize this cascading structure and the plan contents:

Exhibit 3.3.9

India should consider a cascaded planning system



SOURCE: McKinsey Global Institute analysis

- **Create 40-year concept plans for the top 20 metropolitan regions.** This long-range plan should articulate the broad vision of the city (including the economic proposition to investors and the quality-of-life targets for citizens), key projections on population, employment by sector, and land demand, as well as a broad distribution of a population in new and old growth centers with sufficient high-capacity transit systems. Broad land use should be specified, ideally to a 1:100,000 scale. This concept plan could also provide high-level guidelines for projects and policies in key priority sectors, such as transportation and affordable housing. These plans should be updated every ten years.

- **Cascade the 40-year metropolitan concept plans into 20-year metropolitan master plans.** These 20-year metropolitan master plans need to translate concept plans into a detailed 1:25,000 scale land-use plan that includes distribution of population across new and old growth centers along with key planning norms such as FAR, setback, density, and land use. These plans should also contain detailed reports that enumerate key infrastructure projects and policies in strategic transportation, environment, affordable housing, education, and health care, as well as urban design. Cities need to sequence these projects and back them up with a broad financing plan. For smaller cities, the DPCs should directly create these 20-year regional master plans with a similar content.

- **Cascade 20-year metropolitan master plans into 20-year municipal development plans.** Municipal (city) development plans must conform to the four cascading parameters mentioned in the metropolitan (or regional) master plans. Based on the specified target holding population and employment by ward, broad land-use and FAR and goals for specific sectors, these development plans should then create parcel-by-parcel land-use norms (including such matters as zoning, FAR, and setback) as well as key projects in basic services (e.g., water supply, sewage treatment, solid waste, storm-water drains), local transportation (local roads and highways, local mass transit), environment, cultural heritage, and social services (education, affordable housing, and health care) in line with the metropolitan master plan (Exhibit 3.3.10). These plans should also emphasize urban design norms to give a unique character to the city. As with regional-level planning, a plan should set forth priorities for projects, what sequence they should follow, and how to pay for them.

Exhibit 3.3.10

Plans should start with a vision linked to econometric forecasts and then integrate land use across sectors

SOURCE: McKinsey Global Institute analysis

3. Create well-resourced planning organizations

The quality of urban plans is only as good as that of the planning organization. More often than not, large-scale urban planning has been the forte of government organizations around the world. However, India faces capacity shortages in both personnel and technology, and this makes the creation of high-quality plans more challenging. We recommend four broad areas of action to address these deficiencies:

- **Build an effective planning organization at the metropolitan and city levels and clearly separate technical and political aspects.** At the metropolitan level, India needs to create separate planning departments housed within the metropolitan authority. In addition, there's a need for metropolitan planning boards that could consist of four or five eminent urban planning experts (such as planners, economists, and architects), heads of other parastatal agencies active in the region, and two or three citizen representatives. The planning board could be chaired by the head of the metropolitan authority and would be responsible for all the technical decisions in the planning process, including coordination with different agencies. The decisions of the planning board would ultimately need to be ratified by the appropriate MPC and DPCs, which would define the overall vision for the region and key projects and policies. A similar structure is needed at the city level; the planning department should be housed within the municipality and be overseen by a similar planning board. The decisions of the planning board would need to be ratified by the MPC (ultimately headed by the metropolitan mayor), who would be responsible for the overall vision of the region and key projects and policies. For smaller cities, state TCPDs could help create city development plans and should be strengthened appropriately.

- **Build sufficient urban planning capacity.** India needs 200 to 300 planning professionals (such as planners, geographers, demographers, economists, architects, and digital experts) per city in the larger Tier 1 and 2 cities and 15 to 20 in smaller Tier 3 and 4 cities, against the current aggregate annual supply that is below 200. Clearly, there's an urgent need to augment this capacity by building new institutes. Until India builds the necessary capacity, it could access talent

by leveraging global expertise; simplifying the writing of new plans by creating common templates that can be used and reused across cities; and creating standards and specifications that enable existing talent to work more effectively.

- **Innovate with planning technology and models to ensure quality plans.** A high-quality plan requires reliable base data. India's cities need to improve the country's data in such fundamental subjects as land availability and usage, population growth and movement, job mix and its prospective evolution, and income mix and forecast changes in that mix. For each of these, smart technology solutions are likely to be available. As we have already noted from our summary of best practice in other world cities, every urban center in India should create rigorous econometric models to project likely economic and demographic evolution, devise a detailed GIS mapping of existing land use, and conduct detailed studies of future needs in various sectors, especially in transportation. We recommend an investment of $10 million per city for Tier 1 and 2 cities and $2 million per city for smaller Tier 3 and 4 cities to build these capabilities over the next five to ten years.

4. Create tight execution and enforcement mechanisms with sufficient public participation

Three initiatives could help improve execution of India's urban plans:

- Ensure community participation in the planning process by collecting public feedback through public exhibitions of draft regional concept and master plans.
- Make urban plans an anchor to the development priorities of a city, with all subsequent policy and investment trade-offs based on those plans.
- Minimize exemptions and ensure that they are fair by creating a simple, streamlined process that provides a mechanism for public hearings on major exemption proposals and allows for appeals to the local council, the MPC, or the DPC.

ACTION IN THESE FOUR AREAS CAN TRANSFORM PLANNING EVEN IN THE SHORT TERM

Implementing the steps that we have discussed could transform India's urban planning in five to ten years. The question is where, and how, India should start. We have identified the following next steps for central, state, metropolitan, and municipal governments.

- **Central government.** The central government should focus the first wave of urban planning reform on the 65 largest cities (including the 20 metropolitan regions) through four key initiatives:
  - Using the flagship National Urban Renewal Mission (NURM) to provide 500 crore rupees for creation of metropolitan concept and master plans subject to four conditions:
    - Creating and empowering the MPC and DPC
    - Transferring the appropriate set of planning functions to all municipalities
    - Making metropolitan concept and master plans statutory and binding on local development plans
    - Issuing effective guidelines for the planning process, plan contents, and exemption mechanisms

  - Creating detailed manuals and templates of best-practice concept and master plans in simple, easy-to-understand language
  - Providing an additional direct grant of 10 billion rupees ($222 million) to upgrade planning technology with such things as GIS maps and economic, transportation, and affordable housing models
  - Launching between six and eight planning institutes with an annual capacity of at least 5,000 urban planners to cope with the expected demand; these institutes could be greenfield or housed in existing institutes such as the Indian Institutes of Technology

- **State government.** The state government would need to initiate four key reforms:
  - Prepare a 20-year urbanization master plan for the entire state that determines the target portfolio of cities with anticipated population and employment, key policies to attract investment and create jobs, and specific major intercity transit projects such as high-speed expressways
  - Form an MPC in at least 20 metropolitan regions and a DPC in each of the remaining districts and transfer regional planning powers to them
  - Make the cascaded planning system official by ensuring regional concept and master plans statutory and that four key parameters from regional master plans are binding on district plans
  - Create guidelines for content, capacity, and technology investment as well as for community participation in planning

- **Metropolitan authorities.** Once formed, the MPCs, with the help of metropolitan authorities, must immediately begin the process of creating 40-year metropolitan concept plans and 20-year master plans with integrated content by leveraging private-sector expertise in the short term. All subsequent major regional infrastructure projects, such as mass transit and affordable housing, must be decided on the basis of these plans.

- **Municipal government.** Local governments should create their own 20-year city development plans based on the new metropolitan or district master plans with integrated content and, like metropolitan plans, ensure that all subsequent infrastructure projects, such as water supply and sewage, are decided on the basis of these plans.

□ □ □

A shift to a systematic planning structure and process is critical to help India anticipate, and facilitate, effective and sustained urbanization. India needs to put in place urban plans that—like any corporate plan—create a vision that articulates a city's value proposition for both citizens and investors, make the best use of finite resources, and create a tight process to ensure effective implementation, with minimal exemptions, and robust enforcement. Our analysis suggests that India can achieve these aims even in the relatively short term.

3.4 Affordable houses for all

Housing is a basic necessity that plays a broad and vital role in cities. It is an urban service around which all others revolve, including water, sewage and sanitation, roads, education, and health care. Houses play another important role, too, by making citizens formal residents of a city and ensuring a stake in its economic and social development. Research around the world indicates that having a house opens access to formal channels of finance and leads to increased consumption.

Today, about 25 million households in India—35 percent of all urban households—cannot afford housing at market prices and around 17 million of these households live in slums. With a further 250 million people expected to join the ranks of India's urbanites over the next 20 years, this number could increase to 38 million households. Provision of affordable housing at such a large scale is unprecedented—no other country, other than China, which had a policy of state provision of housing until the late 1990s, has had a scale and spread comparable to what is necessary in India today.

Unless new affordable housing (see box 9, "Defining affordable housing") is developed, new low-income migrants, like their predecessors, are likely to settle in slums, a socially and economically undesirable development that inserts a dagger into the heart of India's agenda of broad inclusion. Conversely, expanding the stock of affordable housing would bring, in addition to social benefits, substantial economic advantages: More demand for construction, building materials, and housing finance, which in turn spur job creation and further economic growth.

So what would it take to trigger the creation of such a huge wave of affordable housing stock? In this section, we explore:

- Five characteristics of an affordable housing model, and what India can learn from international best practices
- Weaknesses in India's approach today
- Recommendations to bridge the affordability gap, including the role of low-income residents, government, and the private sector
- The way forward

Box 9. Defining affordable housing

Globally, housing is considered affordable if a basic housing unit that provides a minimum amount of personal space and basic amenities is accessible at 20 to 40 percent of gross monthly household income for either rent or mortgage. However, the requirement of minimum personal space differs across countries, and even among developing countries. Historically, the Indian government has defined basic housing units as being between 250 and 275 square feet—i.e., an average of 50 to 60 square feet per capita. In 2008, the government set up a task force—"Affordable Housing for All." This task force suggested that affordable housing for low-income groups—the "deprived" segment with an annual income of less than 90,000 rupees—should be 300 to 600 square feet in area and be accessible at 30 percent of gross monthly household income.

We argue that affordable housing should provide for a range of size options catering to the needs of households of different sizes and incomes, rather than

being limited to a single size. However, for the purposes of analysis, we consider a basic housing unit to comprise 275 square feet in carpet area with attached sanitation and piped water. We assume a maximum affordable outlay toward housing of between 25 and 35 percent of a household's income, depending on the level of income in that particular household, a standard global benchmark.

To determine the maximum house price that is affordable, we base our analysis on the maximum combination of serviceable loan and savings that a household can deploy. We consider the mean income of the segment to which the household belongs to analyze the largest outlay that is affordable (e.g., 25 percent for the lowest-income segment) in the form of a serviceable loan installment. We determine the loan value by linking the interest rate payable by the household assuming a 20-year loan period. We use a typical loan-to-value ratio of 65 to 75 percent to arrive at the house value, except in the case of the deprived segment, where we combine available savings with the loan value serviceable.

ENSURING ACCESS TO AFFORDABLE URBAN HOUSING IS A MAJOR CHALLENGE THAT INDIA MUST FACE

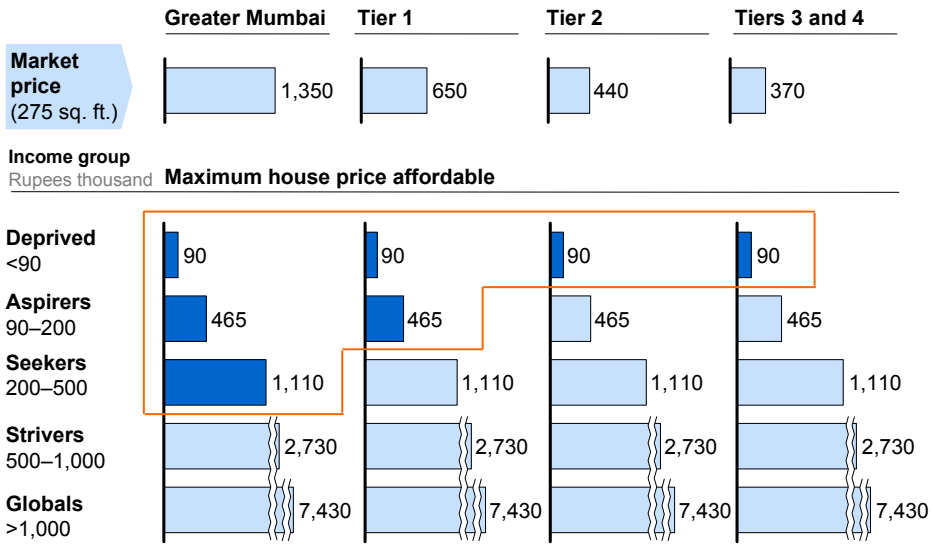
Today, access to affordable housing is an acute problem among India's lower-income groups. Households in the deprived category (annual income of less than 90,000 rupees) are unable to access basic housing across urban India. Using the methodology described in box 9, we have estimated the affordability gap in each income segment across all tiers of cities. In Tier 1 cities such as Mumbai, the housing shortage encompasses even households earning up to 500,000 rupees a year, assuming an income outlay of 35 percent going to housing. The shortage in the bottom two income segments is acute (Exhibit 3.4.1).

Exhibit 3.4.1

The bottom two income segments cannot afford houses at market prices in urban India

2010 ESTIMATES

Rupees thousand



SOURCE: McKinsey Global Institute analysis

We estimate that 25 million households—35 percent of all urban households and 94 percent of the households in the bottom two income segments—cannot afford a house at market prices. Current estimates are that about 17 million of these households live in slums or squatter settlements with poor access to the

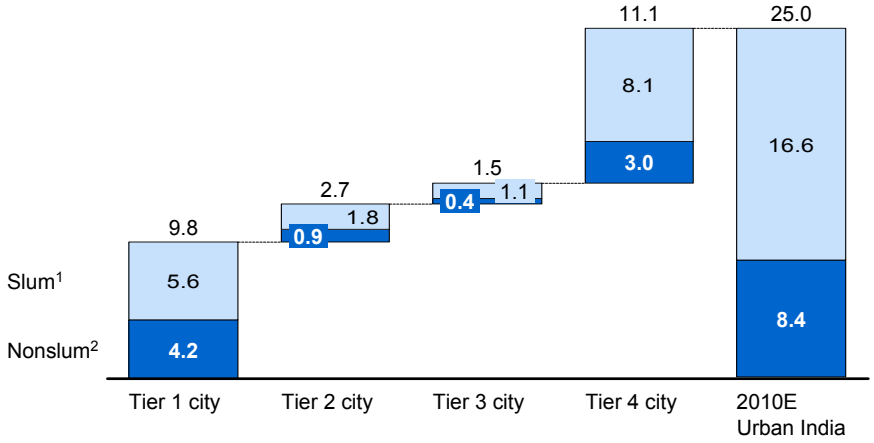
basic services of water, sewage, and sanitation. The remaining households live in formal houses but in highly congested or dilapidated conditions. The majority of the housing shortage is in Tier 1 and 4 cities—and is most acute in India's nine Tier 1 cities, where up to 54 percent of households cannot afford housing at market prices (Exhibit 3.4.2).

Exhibit 3.4.2

Of 25 million households that can't afford basic housing in urban India, two-thirds live in slums

2010 ESTIMATES

Million households



1 Census 2001 slum population reported for 640 cities, scaled up to overall urban India.
2 Nonslum households estimated for each tier as difference between households that cannot afford market-price housing and households residing in slums.

SOURCE: India Urbanization Affordable Housing Model; McKinsey Global Institute analysis

The paucity of affordable housing in urban India is already serious, and without a change of policy, it could deteriorate significantly. As India urbanizes, migration into urban India will continue and more than 70 percent of migrants are expected to belong to the two lowest income groups that are least likely to be able to afford a house at market prices. Our projections for rising incomes and demand for both residential and commercial space suggest that there is likely to be continued pressure on the space available for low-income groups.

Our forecasts suggest that the number of households that cannot afford a house could rise by an additional 13 million to reach a total of 38 million by 2030. One-third of this increase will be in Tier 1 and Tier 2 cities—but the affordable housing shortage will be particularly acute in Tier 4 cities, which will account for 60 percent of the increased gap between affordability and the market price. It is clear that the need to build affordable housing is a pan-Indian problem.

Policy makers in India therefore face a dual challenge. First, they need to upgrade housing for existing slum dwellers and households living in congested and dilapidated conditions. Second, they need to devise mechanisms to ensure that the rising population in cities will have access to affordable houses.

GLOBAL PRACTICES POINT TO FIVE ELEMENTS OF A SUCCESSFUL AFFORDABLE HOUSING MODEL

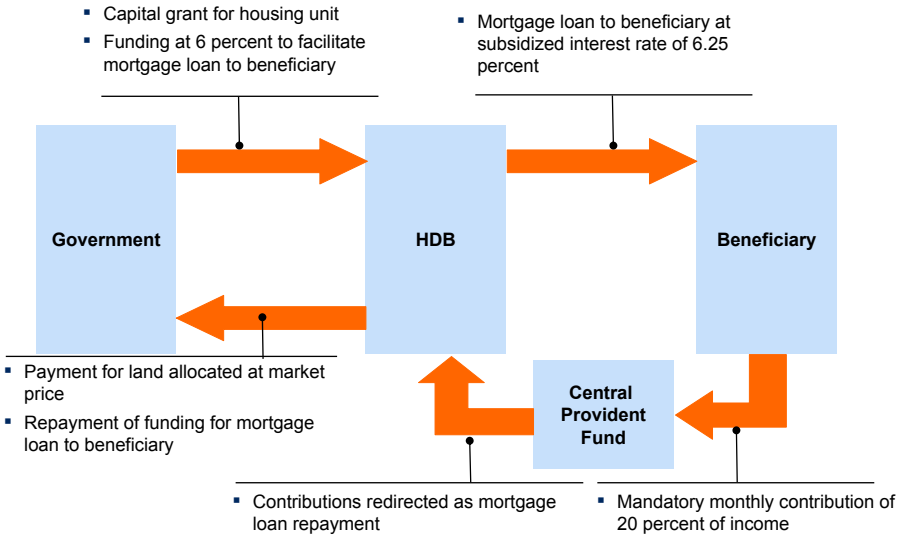
Every rapidly urbanizing country in the world has dealt with the challenge of ensuring access to housing for all its citizens at some stage of its economic development. Even cities in the developed world such as London and New York continue to explore ways to ensure that their low-income residents are not locked out of the housing market.

Our examination of practices around the world finds many examples of successful approaches to the provision of housing. In this section, we briefly describe the experiences of Singapore, which has run one of the most effective public housing programs globally; the United Kingdom, which has used a combination of mandates and not-for-profit housing associations to deliver affordable housing at scale; China, which has made the shift from a state-provided housing model to a private-sector led model for affordable housing; South Africa, which has made access to housing a right; and the United States, which has used rentals and innovative incentives to support affordable housing.

- **Singapore.** The Housing Development Board (HDB) has operated one of the most effective affordable housing programs globally—more than 90 percent of Singapore's population resides in public housing. The HDB has an explicit mandate to create and operate affordable housing and draws up annual budgets for the number of units to be built every year (Exhibit 3.4.3). While Singapore used "eminent domain" to obtain land for public housing in the early years of the program, more recently success has been built on a combination of making the economics work for all participants and maintaining flexibility in house sizes and tenures. Singapore has used a mix of demand and supply-side subsidies to make the economics work. The city prices affordable housing at or below the cost of construction—the typical contribution by the householder is about 50 percent of the total production cost, and the government covers the rest (Exhibit 3.4.4).

Exhibit 3.4.3

Singapore's Housing Development Board (HDB) is the key intermediary between the government and the beneficiary of affordable housing

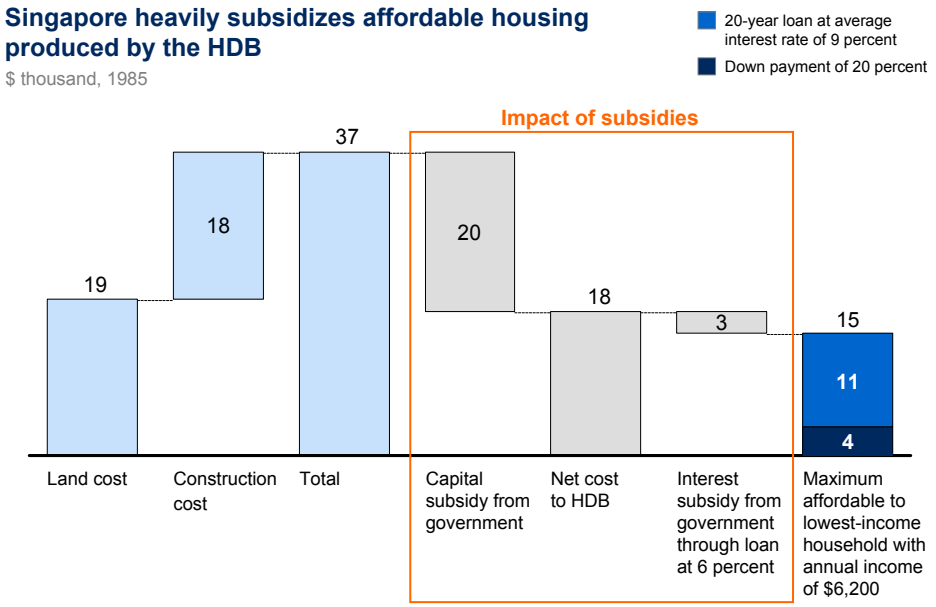


SOURCE: McKinsey Global Institute analysis

Exhibit 3.4.4

Singapore heavily subsidizes affordable housing produced by the HDB

$ thousand, 1985

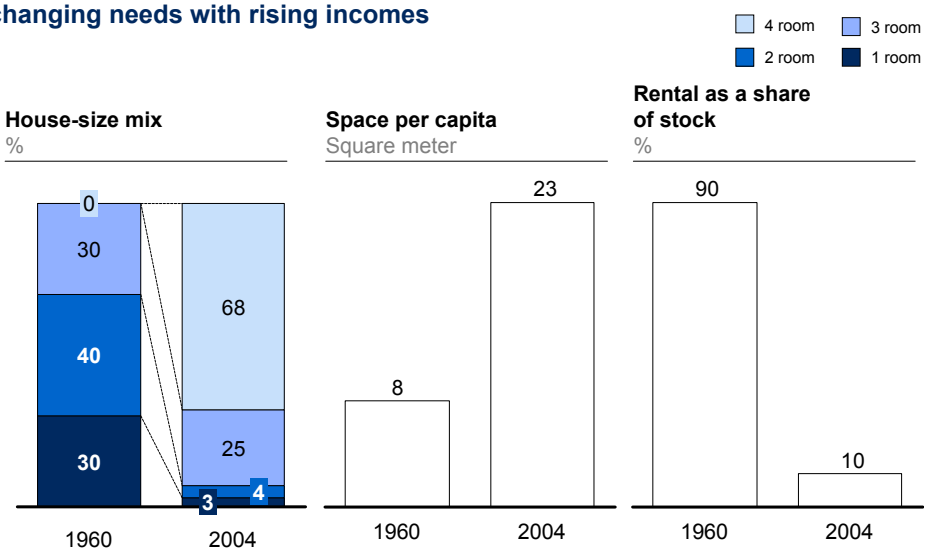


SOURCE: McKinsey Global Institute analysis

- The government has provided active support to the HDB, which has accounted for up to 40 percent of the government's capital expenditure at times. The HDB tackles the affordability issue by providing 25- to 30-year loan terms at fixed interest rates 1 to 5 percent below market rates. Singapore's overall policy is to enable every household to own a home but the city has, in fact, adopted a flexible approach over time, including the provision of rented accommodation to those in the lowest-income brackets (Exhibit 3.4.5). The HDB has always offered a range of house sizes, focusing on smaller units in the early years of its programs but in more recent years moving toward larger units as incomes started rising. In the 1960s, rental housing was dominant, accounting for 90 percent of all units; however, the share of rented affordable housing has now dropped to 10 percent. One of Singapore's successes has also been in the use of forced savings through the mechanism of the Central Provident Fund, which has enabled residents to build up the capital required to buy houses. The fund demands mandatory monthly contributions from all salaried employees (matched by contributions from employers), which they can use as down payments for home purchases.

Exhibit 3.4.5

Singapore adapted affordable housing size and tenure mix to address changing needs with rising incomes



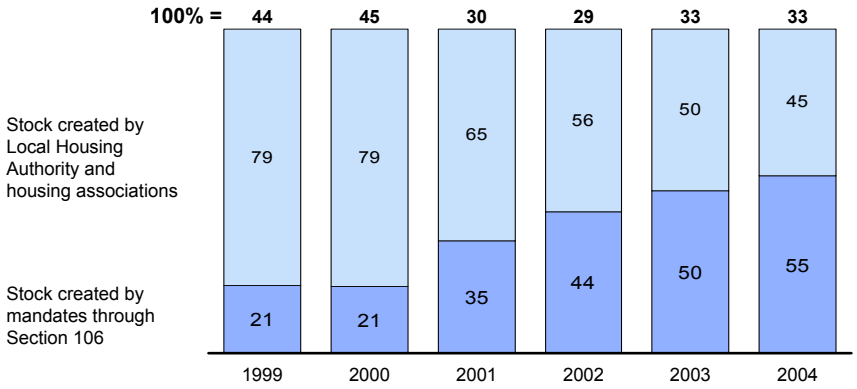
SOURCE: www.singstat.gov.sg; Housing Development Board Annual Report 2005–06; McKinsey Global Institute analysis

- **United Kingdom.** The United Kingdom is an example of a country that has used mandates (in tandem with incentives) to piggyback affordable housing construction onto investments in market housing. The country has used planning mandates, termed Section 106, since 1981 (Exhibit 3.4.6). They require all new housing developments of more than 25 units to build a pre-agreed number of affordable units. While the proportion of affordable units built is project-specific, 15 to 25 percent on average fall into the affordable category. This program accounts for 50 to 80 percent of affordable housing units built thus far in the country. To make the economics work, the government provides capital subsidies on affordable housing construction typically accounting for 30 to 40 percent of the overall cost of the unit. The United Kingdom has also actively supported rental housing using subsidies through the Housing Benefit program. In the 1970s, the United Kingdom started transferring the rental stock that had been under the direct management of local councils to not-for-profit housing associations. These associations have brought management expertise, capital (through philanthropic contributions), and effective delivery into large-scale affordable rental housing. To monitor and regulate these associations, allocate government funding, and ensure the accountable use of government subsidies, the United Kingdom set up the Housing Corporation—a corporatized agency under the auspices of the national government.

Exhibit 3.4.6

Mandates through Section 106 have contributed significantly to the creation of affordable housing stock in the United Kingdom in the recent past

Thousand houses



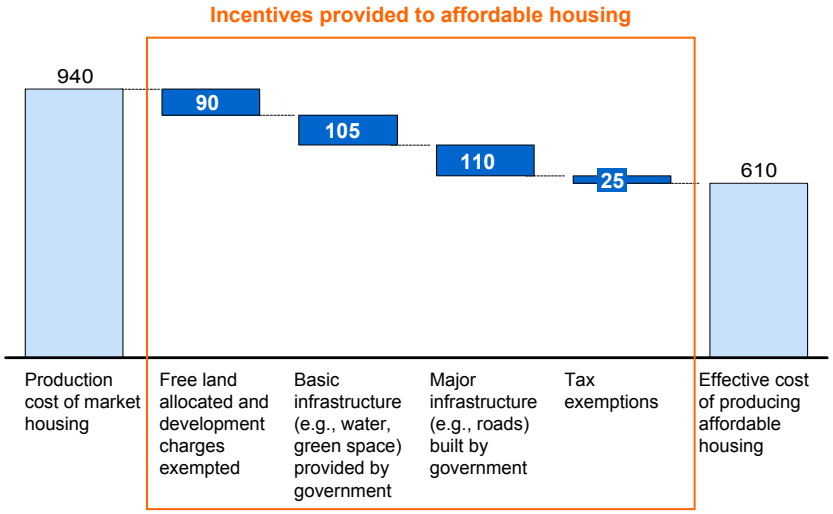
SOURCE: Royal Institution of Chartered Surveyors; McKinsey Global Institute analysis

- **China.** China moved from a state-provided housing model to a private-developer-led model in the mid-1990s, but with significant incentives from the government. The government initiated an affordable housing program *(jingji shiyong fang)* to develop houses through private developers for lower- and middle-income groups at 50 to 75 percent of the market price. To make this market attractive for the private sector, the government extended multiple incentives, including free land allocation, provision of basic infrastructure, and tax exemptions, which significantly reduced the effective cost of producing affordable housing with the aim of facilitating sales below market prices (Exhibit 3.4.7). Employers usually provide housing for low-income migrants in the form of shared accommodation, often as dormitories. China also recognizes rental housing as an option for lower-income groups and provides these groups with rent subsidies. As illustration, a household in central Shanghai earning below $3,500 per year, representing the bottom income quartile in the city, is eligible for a rent subsidy of $80 a month; this, together with the household's own contribution, makes a 250-square-foot apartment affordable.

Exhibit 3.4.7

Shanghai provides multiple incentives to make affordable housing attractive to the private sector

$ per square meter



SOURCE: McKinsey Global Institute analysis

- **South Africa.** Access to housing is a constitutional right in South Africa, and the country aspires to eliminate all slums by 2015. This policy has prompted a significant government-led construction supported by free land allocation and capital subsidies as high as $5,000 per household for households in the bottom third of the population in terms of income. Cities plan affordable housing requirements through detailed five-year plans. For example, Johannesburg has a detailed Integrated Development Plan for Housing that decides on the number of new affordable housing units to be built, the number of settlements to be redeveloped, the share of rental stock in new developments, and the mechanisms to engage the private sector in affordable housing developments. The government encourages mixed-income developments through the allocation of free land and capital subsidies provided if private developers allocate part of the units they construct for affordable housing at below market rates. South Africa's experience also points to the importance of the proximity of affordable housing to other urban developments and access to economic opportunities and transit facilities. While South Africa has aggressively pushed stock creation, it has struggled to ensure that the units are constructed near to where low-income residents make their livelihoods, which has left a large part of the stock being developed on the outskirts of cities where employment opportunities are minimal and transport links inadequate.

- **United States.** The United States is an example of a country where the government has played an active role in bridging the affordability gap for low-income households in urban areas. City housing authorities are responsible for the planning, production, and operation of affordable housing stock. City governments have either allocated land or brought it in from the private sector through inclusionary zoning (using mandates similar to those in the United Kingdom). Although the United States emphasizes home ownership, it also recognizes rental housing as the practical solution for the lowest-income groups. The US rental housing program provides housing at rents about 40 percent below market rents. With its Section 8 voucher subsidy, the United States encourages private households to rent out units to

lower-income groups (who pay 30 percent of their monthly income) while providing the building owner a representative market rent. To encourage private-sector developers to undertake affordable housing projects, the United States provides additional FAR and tax credits to subsidize part of the project cost. The United States pioneered mortgage insurance to boost housing finance lending. While adequate credit-risk assessment and sharing of mortgage risk are vital to prevent moral hazard, mortgage insurance has given a boost to lending to the lower-income segments, as it has in other countries.

While each of the countries that we have described has had distinct housing challenges, five broad tenets of a successful affordable housing model emerge from their experiences:

1. **Planning for an adequate number of affordable housing units including earmarking land as part of the city master plan.** With competing demands for land and space, the market allocation will invariably move toward the use of land that delivers the highest returns. Cities around the world have learned that creating a stock of affordable housing sufficient to address the needs of low-income groups requires them to allocate land for this purpose. Cities can achieve this by making available a portion of government land or by attaching mandates to planning permits when new developments are proposed.

2. **Making the economics work through a combination of mandates, incentives, and beneficiary contributions.** A combination of adequate incentives, subsidies, and contributions by beneficiaries (people receiving affordable housing) is necessary to make the economics work. Irrespective of income growth, the lesson from around the world is that a segment of the city's residents will not be able to afford a house at market prices. If cities want to ensure that all residents who contribute economically to the city have some form of formal shelter, they have to design policies to match the cost of a housing unit with what beneficiaries are able to pay. The implication is not that governments should provide free housing. In fact, any free housing scheme is not likely to be feasible or sustainable. Beneficiaries should be required to contribute in line with their financial capacity; we expect typical contributions to be in the range of 20 to 40 percent of monthly household income. However, to make affordability work for low-income residents and development attractive for private-sector investments, the government will have to create mandates, incentives, and subsidies.

3. **Government acting as facilitator and a direct contributor.** In every country, the government has played an important role not just as a policy maker but also as a direct contributor to the creation of affordable housing stock. Government participation is necessary to ensure private-sector involvement in the creation of affordable housing. The scale of the government's contribution can be significant, as it is in Singapore and South Africa, whose governments created the bulk of the affordable housing stock, or moderate, as in the United Kingdom, where the government has accounted for less than half of the affordable housing stock in recent years.

4. **Ensuring flexibility in housing size, format, and ownership.** While the long-term objective of government can be to provide adequate space and ownership of affordable houses, in the short term, policy makers should nevertheless be flexible about size, format, and the structure of ownership to ensure that the largest number of low-income groups can have access to formal shelter. Rental needs to be an option for low-income groups in the near term, and dormitories

and hostels providing shared accommodation should complement self-contained houses to allow for a range of solutions catering to all requirements in cities. Demand for space is a function of income, and once cities have met basic space requirements for every city resident, they need to factor in rising incomes in their affordable housing solutions.

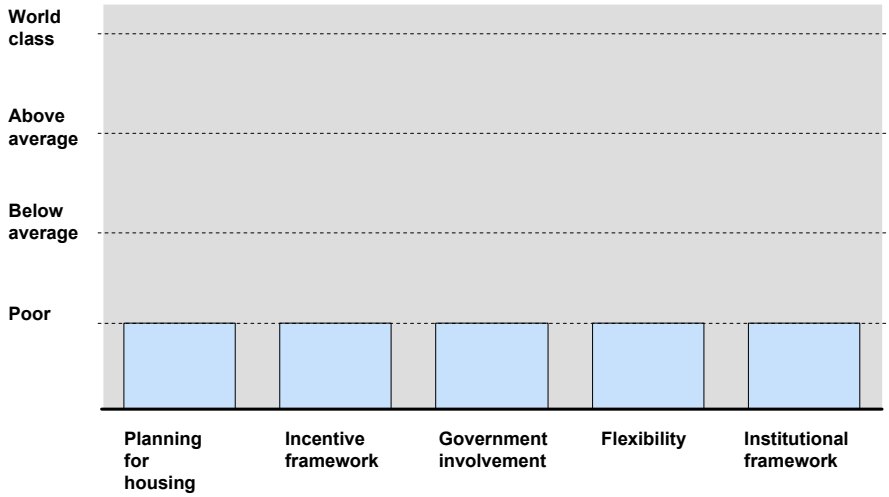
5. **Ensuring an enabling institutional framework is in place to make affordable housing sustainable.** While the biggest challenge is making the economics of affordability work, governments at the same time need to ensure that they put in place institutions and organizations that focus on affordable housing and have a mandate to pursue it. Empowered, dedicated agencies responsible for the delivery of affordable housing, together with a set of transparent processes, are vital to ensure the effective execution of policy. In addition, cities need a tax structure that does not place a burden on affordable housing and provides incentives for the creation of affordable housing stock. Vehicles such as mortgage guarantee funds create an environment that will boost access to affordable housing and drive financial inclusion in the long term.

INDIA HAS NOT DEVELOPED A VIABLE AFFORDABLE HOUSING MODEL; ITS SCORECARD ON THE FIVE DIMENSIONS IS POOR

Despite the evident—and growing—need for affordable housing in India, policy makers have thus far failed to develop a workable model for its provision. On all five dimensions of the affordable housing challenge that we have discussed, India scores poorly (Exhibit 3.4.8):

Exhibit 3.4.8

India scores poorly on the five dimensions of good local governance



SOURCE: McKinsey Global Institute analysis

India's cities have not planned for affordable housing or incorporated necessary space demand in urban plans

No Indian city actively forecasts demand for affordable housing, let alone creates mechanisms to allocate the necessary space. Affordable housing has not been a key focus in the development plans of municipalities or the regional plans of metropolitan areas. Cities have not allocated land through their planning processes or zoning norms. Even when cities have allocated land for affordable housing, poor governance

has too often meant that land or housing units have been diverted to high-income beneficiaries or for commercial use.

India has not addressed the economics of affordable housing adequately

In India, the government has not systematically thought through the combination of incentives, subsidies, and beneficiary contributions to bridge the gap between affordability and market cost. For example, to encourage creation of affordable housing stock, the government extended a 100 percent income tax exemption to affordable housing projects. However, this incentive on its own addresses only 5 to 10 percent of the gap and is therefore not sufficient to stimulate creation of the necessary affordable stock.

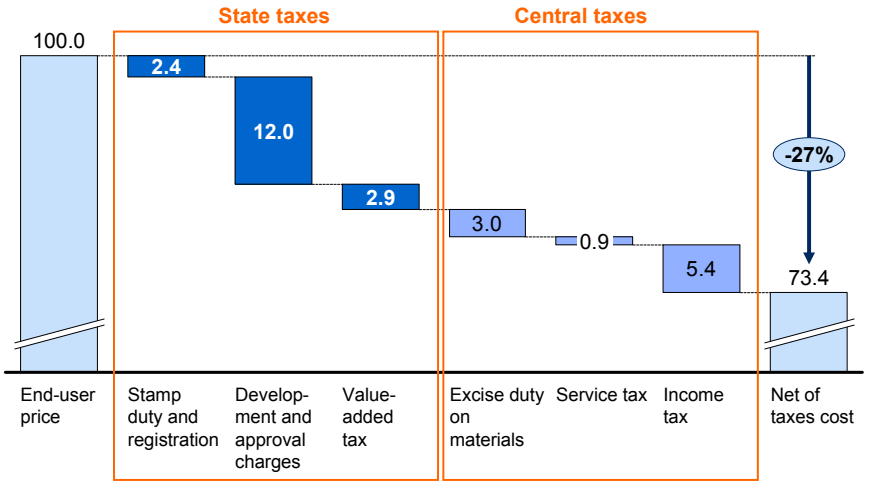
Also, the reality is that taxes account for more than 25 percent of the final cost to households of affordable housing (Exhibit 3.4.9). Yet the government has not put in place a tax regime that effectively incentivizes the creation of affordable housing stock.

Exhibit 3.4.9

As high as 27 percent of the end-user cost of housing may comprise of taxes and levies

%

TIER 2 CITY



SOURCE: Maharashtra stamp duty reckoner; McKinsey Global Institute analysis

Moreover, the government's current 5 percent interest subsidy scheme is ineffective in the case of lower-income groups because these groups do not have access to the credit they need to afford the houses in the first place. The scheme simply assumes that housing finance is available to these groups through conventional banks and housing finance companies at rates comparable to the prime lending rate of banks. The reality, however, is that because of customized credit assessment and collection requirements, the available rate is considerably higher than the prime lending rate. This makes lending to low-income groups—the principal target segment—not eligible for the interest-subsidy scheme.

Even in cases where sufficient incentives are available, a rigid incentive structure has hampered the development of affordable housing. For example, Mumbai's Slum Redevelopment Scheme offers incentives for land to be sold at market rates to cross-subsidize the cost of the city providing free housing to slum dwellers. But the incentive structure does not reflect variations in property prices across the city. This has meant that redevelopment is highly attractive in parts of the city where

property prices are higher, but unattractive in lower-priced areas. Moreover, because the scheme has a fixed-incentive structure that does not take into account cyclical movements in property prices, redevelopment is aggressive in boom times and subdued in depressed market conditions. The scheme has also suffered from a lack of transparency in the allocation and monitoring of projects.

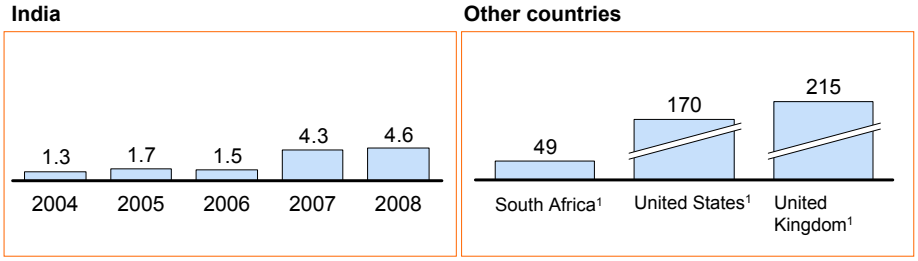
Government participation has been limited

India's overall record on government participation in the affordable housing sector is weak. Until recently, funding allocations by the government had not taken into account the necessary scale of the exercise. Even in comparison with other emerging economies, this spending on affordable housing has been very low (Exhibit 3.4.10). As recently as 2005, government spending on urban affordable housing was about 30 billion rupees per year. At that rate, it would take a century to address even today's need for affordable housing. Further, schemes have not provided for adequate funding. For example, India's VAMBAY scheme provided for only 20 percent of the true redevelopment cost of slums. Nor have state housing boards delivered on the scale required. In Mumbai, where 2.4 million households cannot afford formal housing, the housing board has constructed only 0.2 million affordable units over the last 30 years, an annual construction rate of just 6,700 units per year.

Exhibit 3.4.10

Indian government spending on housing has been much lower than international benchmarks

$ per capita



1 Average over 2005–08.

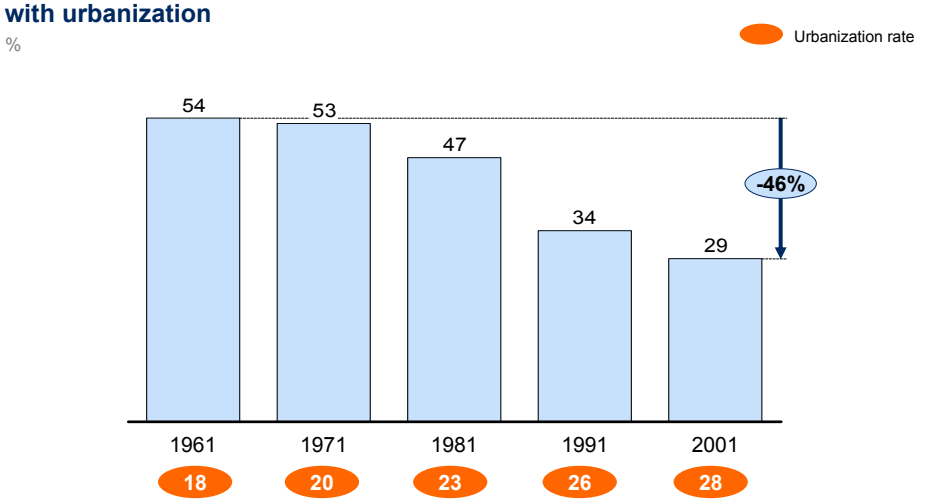
SOURCE: WMM (Global Insight); Euromonitor; Rossstat; IBGE-PAIC; Indian Public Finance Statistics, Ministry of Finance

Housing solutions have lacked the necessary mix of tenure and flexibility

A mix of rental and ownership housing is required to address affordable housing needs effectively. Rental housing is particularly important for addressing the needs of low-income residents in the context of a rapid rise in the urban population. However, rent control policies aimed at protecting renters have had the unintended consequence of deterring investment in rental housing, causing the share of rental stock to decline by 46 percent between 1961 and 2001 and driving lower-income households into slums (Exhibit 3.4.11). In addition to the inconsistent delivery of housing units, most government programs (including the recent "Affordable Housing in Partnership" and schemes under JNNURM) promote ownership housing and do not look at creating rental stock—the most feasible first option for the lowest-income groups.

Exhibit 3.4.11

Rental share of housing stock in India has progressively declined with urbanization



SOURCE: National Housing Board; Census 2001

An institutional framework to support affordable housing is not in place

India has failed to create an institutional framework on two fronts. First, India has not built up a supporting ecosystem to trigger the construction of affordable housing stock including a favorable tax regime as well as a mortgage guarantee fund that provides a degree of security for lending to low-income groups. At the same time, affordable housing has never received the serious attention of the urban planning process to date. Second, India has lacked a systematic network of institutions that are responsible for facilitating or building affordable housing units in a manner that coordinates policies across central, state, and local governments. The absence of organizations dedicated to housing has been particularly absent at the municipal and metropolitan levels.

INDIA CAN CREATE A VIABLE HOUSING MODEL BY PUSHING INITIATIVES ACROSS THESE FIVE AREAS

India can trigger a surge in affordable housing stock if it pushes forward with a set of policies that make the economics work, supported by a renewed focus on affordable housing at the state, metropolitan, and municipality levels.

1. India needs to incorporate affordable housing in urban planning and allocate land dedicated to this purpose

India can no longer let affordable housing be an afterthought; instead, it needs to incorporate the sector into the full range of its urban planning. To do this effectively, India should take the following steps:

- **Start estimating affordable housing requirements in every municipality and metropolitan area at least once every five years and plan for space to accommodate the demand.** India should estimate its need for affordable housing, taking into account projected population growth and changes in income distribution. It should also bring into play adequate land for affordable housing through zoning. It should use slum land to house slum residents formally. In addition, it should bring private land into play through zoning and mandates. India can also deploy more tracts of government-held land for affordable housing along with new pockets of land

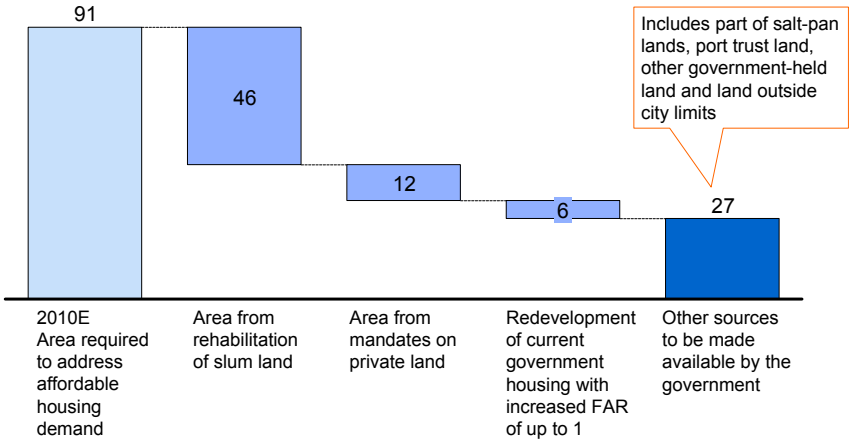
opened up by investments in public transportation as well as through increases in FAR in a systematic, planned manner (Exhibit 3.4.12).

Exhibit 3.4.12

The government needs to make new sources of land available to complement slum and privately owned land

GREATER MUMBAI EXAMPLE

Square kilometer



SOURCE: McKinsey Global Institute analysis

- **Mandate an allocation of 25 percent space in all urban developments above an acre in Tier 1 and 2 cities.** India should allocate land for affordable housing according to the need of a particular city in new developments of more than an acre. Overall, cities should allocate up to 25 percent of built-up area to affordable housing. To ensure that the allocation is not a tax, India needs to complement mandates with incentives and to monitor allocations closely to make certain that they are actually used for the intended purpose. With a huge expansion in residential space expected over the next 20 years, this is not only an opportunity but an absolute necessity.

2. Offer a basket of incentives and subsidies to make affordable housing economics work

India needs to design a mix of subsidies and incentives to make affordable housing economically viable for all potential participants in the value chain. The assumption, of course, is that governments see broader economic and social value in making the investments that are needed to bridge the gap between what housing costs in cities and what low-income residents can afford. The nature of these subsidies and incentives can vary based on ownership of land and whether the land is currently occupied by slum dwellers. We propose one potential framework for making the economics work and developing a viable affordable housing model in India:

- **Offer three incentives to trigger around 500,000 affordable units a year on private land.** Since affordable housing is not economically viable without government support, India should offer three specific incentives to create affordable housing stock on private land: an additional FAR grant of up to 1 on land used for affordable housing (depending on type of city and land prices); a capital grant to support infrastructure between 50,000 and 100,000 rupees (depending on the tier of city); and allowing utilization of up to 5 percent of incentive area for commercial use. With such a combination of incentives, our research indicates that private developers can hand over to the government 25 to 30 percent of the

built-up area consisting of 200 to 500-square-foot housing units and still make a healthy return of between 20 and 30 percent. The government housing agency, in turn, can either sell or rent these units at affordable prices through a fair and transparent process (e.g., a publicly notified lottery) to low-income beneficiaries. In the case of outright sales, governments should seek a minimum contribution of 80,000 rupees to 130,000 rupees from beneficiaries. The minimum contribution would entitle a household to a housing unit in the range of 200 to 300 square feet (depending on the policy adopted by the state), with additional square footage purchased by the household at market prices. In parallel, India could design a rental system centered on an average monthly rent around 1,500 to 3,000 rupees in Tier 1 cities. To leverage scale, such a scheme is most likely to be effective in new private developments above an acre (Exhibit 3.4.13).

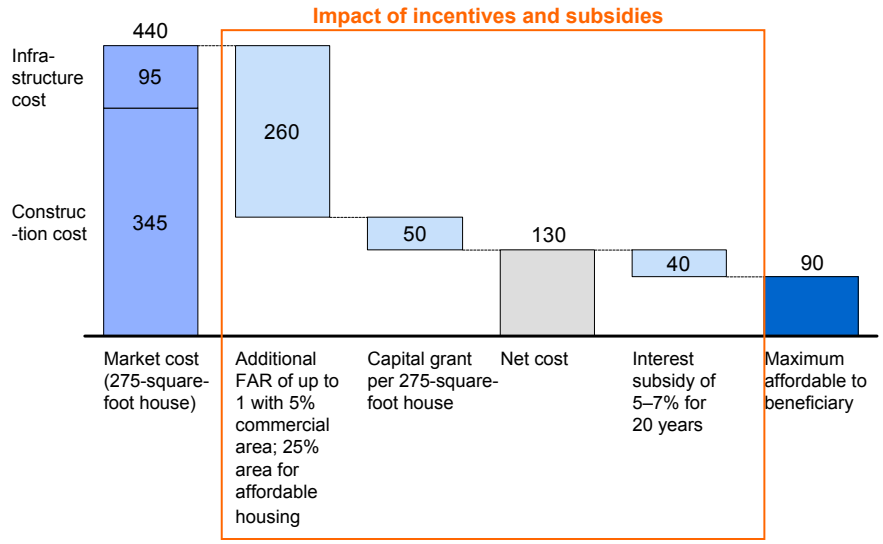
The underlying aim of any such model would be to make investing in affordable housing attractive to the private sector and to minimize the strain on the public purse. However, it is important for city governments to be judicious in the use of the FAR increases to ensure that they are consistent with the overall urban plan of the city, that infrastructure is developed in tandem, and that any surplus value is retained by the city. Using FAR to finance a part of affordable housing is consistent with our recommendations on urban funding where land monetization is a key source of revenue to support the development of infrastructure, including affordable housing (see section 3.1).

Because the cross-subsidy model requires a corresponding sale of residential and commercial land to the market, the number of affordable units that can be created may be limited by the market's demand for space. However, we estimate that this policy approach can trigger at minimum the creation of 500,000 units a year.

Exhibit 3.4.13

A combination of incentives and subsidies can bridge the affordability gap – Tier 2 example

Rupees thousand



SOURCE: McKinsey Global Institute analysis

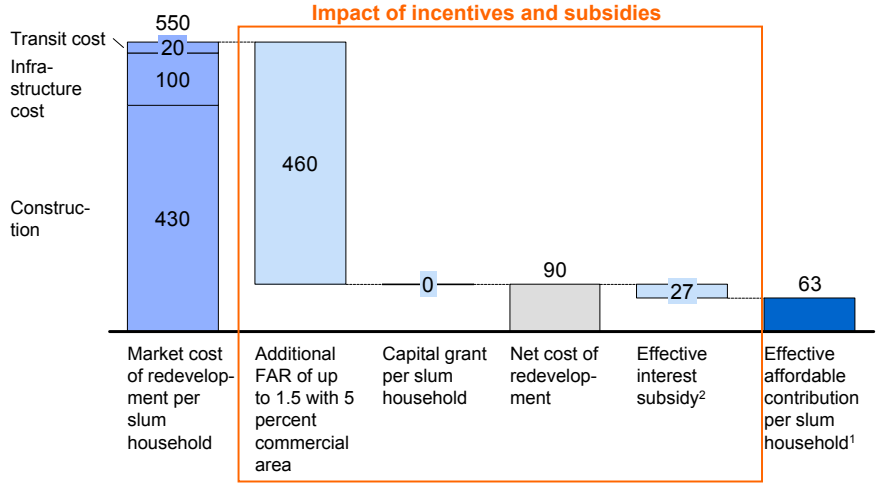
- **Offer the same three incentives (but with different support levels) to develop 1 million slum households annually.** The package of incentives that would be effective in the case of private land would also work in the case of slum redevelopment—but the level of public support would need to be different.

We estimate that the redevelopment of slums would require an additional FAR grant of up to 1.5; a capital grant of around 100,000 rupees; and the use of up to 5 percent of the incentive area for commercial purposes. Unlike many existing slum redevelopment schemes, we recommend that India provide a housing unit with a minimum of 275 square feet in exchange for a beneficiary's contribution. Free housing is not sustainable in the long term, nor, with significant economic value accruing to beneficiaries, is it necessary. India should "discover" the appropriate level of any FAR incentive through an auction process so as to ensure that valuable land necessary to finance development is not given away at too low a price. A combination of FAR incentives and subsidies will be viable in Tier 1, 2, and 3 cities. In fact, in Tier 1 cities, where land prices are in the range of 700 to 1,300 rupees per square foot and property rates command 2,500 to 3,500 rupees per square foot, slum redevelopment with FAR incentives can generate surplus funds that the city should ring-fence to pay for infrastructure development. The size of the capital grants necessary will depend on the price of land (which depends on the tier of city). Even with FAR incentives and subsidies of the magnitude we have outlined, slum redevelopment in Tier 4 cities may not be viable; instead, in these cities, India may have to consider upgrading slums, at least in the short term. Overall, we estimate that 60 percent of slums in Tier 1 and 2 cities and 50 percent in Tier 3 cities can be redeveloped using this model (Exhibit 3.4.14).

Exhibit 3.4.14

A combination of incentives and subsidies can bridge the affordability gap for slum redevelopment—Tier 1 example

Rupees thousand



1 30 percent households assumed to not access a loan and move to renting; contribution from balance 70 percent at 90,000 rupees per household.
2 Interest subsidy at 40,000 rupees per household for the 70 percent households accessing a loan.

SOURCE: McKinsey Global Institute analysis

- **Retain interest subsidies of 5 to 7 percent to make housing finance available to low-income segments.** At the 18 to 20 percent that housing finance or microfinance companies charge, low-income households can barely service a loan of 75,000 to 80,000 rupees. However, allowing for an effective rate of 11 to 12 percent, these households would be able to afford 50 percent more. The government already runs a 5 percent interest subsidy scheme for loans up to 100,000 rupees; we recommend that this program be expanded to a subsidy level of 7 percent. Such a modification to the scheme would potentially open up the necessary finance for housing purchase to the deprived income segment. In addition, the government should make the interest subsidy accessible to bank and housing-finance company loans that are made to the lowest-income groups.

- **Create a favorable tax regime for affordable housing.** Taxes and levies account for around 27 percent of the total cost of a house in India today, a significant burden on the ability of low-income groups to afford housing. To reduce this burden, India should not only provide capital grants to offset development charges, as we have described, but also cap stamp duties at 1 to 2 percent for all affordable units and consider providing 100 percent income-tax rebates for affordable housing projects when all units are below 500 square feet.

3. Government should build 500,000 units annually on government land or on unviable slum land (using the same package of incentives)

With mandates and incentives, the private sector is likely to address 40 percent of the total demand for affordable houses. Like elsewhere in the world, the government needs to fill the gap using the same set of incentives available to private developers: an additional FAR grant on land used for affordable housing of up to 1 (depending on the type of city and land prices); a capital grant to support infrastructure; and the utilization of up to 5 percent of land for commercial use. The government also needs to play the catalyzing role in slum redevelopment projects that are seen as unviable by the private sector. In addition, one of the most significant opportunities for the government is to buy land outside city limits (especially in tandem with rollout of new public transport infrastructure) and develop affordable housing units along transportation corridors. The experience of South Africa shows that when accommodation is provided outside city limits, it has to be supported with public transportation so that these groups have easy access to their livelihoods.

4. Create flexible affordable housing solutions with 30 percent rentals and 5 to 10 percent dormitories

The 25 million households that cannot afford housing today represent a diverse constituency in terms of their income, the nature of employment, and their needs. Some of these households earn less than 40,000 rupees per annum, while others earn as much as 200,000. Some live as singles; others have large households. Some are migrants; others are established residents. Some are looking for short-term accommodation, others for the long term. Some find employment in the formal sector, while others are active in the informal sector or are unemployed. Therefore, a one-size-fits-all solution to affordable housing just will not work. Housing policy should drive a diversity of options through the following four measures:

- **Promote the development of mixed affordable housing**; the range should be between 200 and 500 square feet
- **Increase rental housing stock as an option for lower-income groups**; 30 to 40 percent of affordable stock should be for rent (from the stock that is created through the private land incentives and slum redevelopment) with an average rental payable of 1,500 rupees to 3,000 rupees per month
- **Create dormitories (with specified rents) of 150 square feet as temporary housing options for migrant workers or the unemployed, particularly in industrial and commercial hubs**; given shared spaces and amenities, the cost of such units can be substantially reduced over normal units
- **Create incentives for companies to produce housing for blue-collar employees** through accelerated depreciation or setting off rent paid for employee housing against taxable income

Together, these measures provide an opportunity to create a meaningful amount of housing stock in formats that are consistent with household needs and income levels. Like other countries in the world, India can improve these formats over time. However, the kind of measures and the provisions that we have discussed are necessary in the short term.

5. Construct an enabling framework to bridge the affordability gap, including dedicated organizations, a mortgage guarantee fund, and transparent processes

The successful delivery of affordable housing requires an enabling framework that spurs lending, that has organizations at the city level that are accountable and responsible for planning, construction, and overseeing operations, and that incentivizes processes that are transparent.

We believe that four elements of such a framework are critical:

- **Establish an efficient and transparent process.** To ensure efficiency and transparency, India should link any decision to redevelop a slum to the city's overall development plan. India should allocate projects through an auction to technically qualified bidders who either offer the greatest profit share to government or demand the lowest subsidy. At the same time, India should empower slum residents to form cooperatives that can bid for a redevelopment project either by themselves or in partnership with a certified real estate developer or a relevant state housing board. For their part, state housing boards should create dedicated departments to lend project planning and management support to these cooperatives. A committee of residents, the developers, the housing board, and representatives of local and regional government should make all key decisions on redevelopment projects. The agency involved in redevelopment needs to circulate the reserve surplus or subsidy expected from each project according to standardized templates, and winning bids should be in line with these estimates.

- **Consider setting up a mortgage guarantee fund.** Such a fund can help India's middle-income groups to afford to own their own homes more quickly by making higher loan-to-value loans accessible to them, reducing the size of the down payment. The fund, for instance, could guarantee 20 to 30 percent of a loan, thereby lowering the risk exposure of the primary lender. This same principle might apply to low-income households whose lack of credit history deters lenders. This option is subject to debate—some argue that using a mortgage guarantee fund in this way will encourage defaults and lead to a deterioration of quality in bank lending portfolios. However, we argue that the 70 to 80 percent of a bad loan that lenders would still have to take onto their books is sufficient incentive to perform due diligence, while at the same time having the advantage of a portion of the risk being borne by the mortgage guarantee fund. We propose such a fund with an initial corpus of 15 billion rupees and a capital adequacy ratio of 12 to 15 percent.

- **For metropolitan areas, create a corporatized agency for affordable housing under the Metropolitan Development Authority.** Around the world, local governments are responsible for the delivery of affordable housing, and we regard this as the long-term solution for India, too. For now, however, India's third tier doesn't have the capacity to do this job. Nor do we believe that it is practical to create a city housing authority from scratch in every municipality; it would take time to build scale and expertise, and in the meantime the agencies

currently involved will initially be reluctant to give up their responsibility. The near-term solution is to rely on metropolitan development authorities that are in place in India's large urban centers (see section 3.2). These authorities are already responsible for regional planning and managing transport and infrastructure projects, and they have substantial planning and project management and execution capabilities. We therefore propose that these authorities create a corporatized agency, a Regional Housing Development Authority (RHDA), which would be responsible for planning and delivering affordable housing. We think a corporatized agency with a board (consisting of officials as well as experts) is preferable to a department. This structure would more likely allow for the development of the specialized skills that will be necessary. In the case of cities and municipalities that do not come under the auspices of a metropolitan development authority, the State Housing Board (such as MHADA in Maharashtra) should assist the city and the local municipality. State Housing Boards need to be restructured with targets, mandates, transparent processes, and boards that inspire confidence.

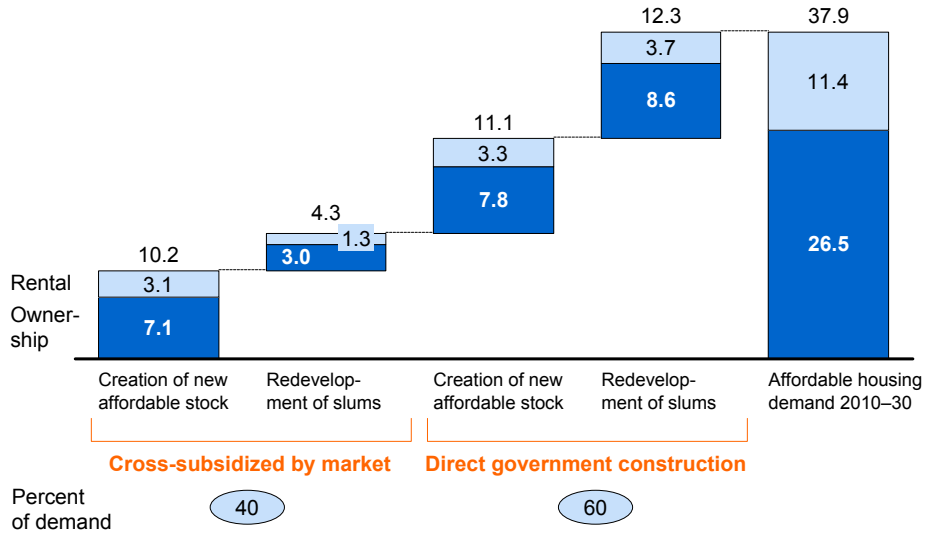
- **Consider creating rental management companies to operate and maintain the rental stock.** Experience suggests that the government should not operate rental stock directly, as this leads to increased rental defaults and poor management. The preferred model around the world is for the private sector or not-for-profit sector to operate rental housing. We propose that the government encourage private-sector companies or nongovernmental organizations to set up rental-management companies, similar to the trusts in the United Kingdom. The rental stock would be leased to these companies, which can in turn charge specified rents from tenants and, in return, maintain their properties. The company would pay a fixed but reasonable dividend to the regional housing authority out of its profits. The authority could make periodic audits and should have the ability to revoke the contracts.

We believe that, as part of a concerted effort by government and the private sector, these measures would allow India to bridge the gap between demand for, and the ability to pay for, affordable housing over the next 20 years (Exhibit 3.4.15).

Exhibit 3.4.15

A combination of cross-subsidization by the market and direct government construction can bridge the demand for low-income housing

Million households



SOURCE: McKinsey Global Institute analysis

INDIA IS CAPABLE OF UNLEASHING A WAVE OF AFFORDABLE HOUSING STOCK EVEN IN THE SHORT TERM

While providing sufficient affordable housing is a daunting challenge, we believe that it is possible for India to unleash a huge wave of private and government investment in housing stock within a relatively short period. By and large, there is a political consensus emerging that the government does need to play an active role in shaping affordable housing. And there seems to be a willingness, especially at the central government level, to commit meaningful resources to making a dent in the shortage of housing stock for low-income groups in cities.

A necessary first step for central government is to formalize a framework for affordable housing, including a significant increase in funds committed to spur stock creation. We believe that the Rajiv Awas Yojana (RAY) scheme is a right step in this direction.

We estimate that with an annual outlay from the government of around 15,000 crore rupees ($3.3 billion) over the next 10 years RAY could help create 1.5 million to 2 million units a year—a significant leap toward delivering affordable housing in India.

While a substantial share of the necessary resources can come from the central government, it is important for state governments to contribute their share of favorable policies and incentives that can make the economics of affordable housing work in their cities. Three measures are critical from state governments:

- **Design a FAR incentive program** in a planned and systematic manner that avoids giving away surplus funds that are needed for infrastructure development
- **Commit to plans on affordable housing construction**, supporting this with adequate budgetary outlay and measures to bring new land areas under development
- **Develop housing organizations** at the metropolitan and municipality levels to ensure a renewed focus on the affordable housing sector.

For city governments, the renewed focus on housing from the central and state governments represents a tremendous opportunity to shape the fate of their cities for the next two decades. It should actively shape the process through creating focused institutions as well as reflecting demand or housing units in their urban plans and zoning norms.

□ □ □

The lack of affordable housing in cities across India is evident in the slums that deface the urban landscape. This may be the most visible challenge India faces. If India fails to ramp up investment in affordable housing, putting in place the enabling policies needed to make the economics of the sector work and attract private enterprise, urban India faces the possibility of 38 million people living in slum conditions. For the sake of social inclusion—and the economic benefits that would come from a construction boom—this is a challenge India needs to face.

3.5 Shaping a land of 6,000 cities

Few growing economies have had the chance to influence the distribution of their urban population across different cities and within them. Most have seen their urban shape emerge by chance. But today's India has an opportunity to anticipate the next 20 years of rapid urban expansion and proactively influence the process.

There are two areas where India can have somewhat of an impact on the shape of its urban expansion. First, policy makers can have a degree of influence over the nation's overall portfolio of cities—how many of each type of cities there should be, and how the country's existing and new urban population may spread out among them. We call this the external shape of urbanization. Countries usually make these choices by deciding on locations for future economic-growth centers (e.g., financial hubs and manufacturing centers), future transportation networks (e.g., expressways, rail routes, and airports), and other investments in urban infrastructure (e.g., power, water, and sewage) within and across cities. It is important for India to think through what external shape is likely to optimize the country's deployment of investment in urban areas.

Second, India can also make choices about the internal shape of its cities—their design in terms of overall look and how each city uses its space for living and working as productively and inclusively as possible. While this aspect of urbanization falls within the purview of urban planning, one reason to highlight the internal shape of cities in this section is its strategic implication for how India can accommodate growing demand for urban land.

In this section, we explore some lessons on urban shapes from other countries, discuss what choices India practically might have about the external and internal shape of its urbanization, and what policy and investment options could potentially achieve the most productive outcome.

EXTERNAL SHAPE NORMALLY GROWS OUT OF HISTORY BUT INTERNAL SHAPE IS ALWAYS DRIVEN BY CITIES

With the exception of China, most countries have urbanized over much longer periods than India and therefore their portfolios of cities have evolved rather than been designed. Looking at urbanization around the world, two main patterns of external urban shape have emerged:

- **Concentrated urbanization.** A concentrated pattern of urban growth can produce one megacity such as Seoul in South Korea, or a small number of very large cities with populations of 20 million to 40 million as we observe in Japan.
- **Distributed urbanization.** Another pattern of urbanization is distributed in shape where a large number of cities are developed simultaneously. One example is the United States where several medium-sized cities with populations of 1.5 million to 5 million have developed in addition to a few megacities. Another example of distributed urbanization is Germany, which has seen a much more fragmented pattern of urbanization through the development of many small cities with populations of 500,000 to 1.5 million. These patterns have inevitably grown out of history. The only exception has been China. The shape of China's urbanization has been relatively dispersed, or distributed, thus far. However, there has also been an element of concentration in its coastal cities, whose development was consciously pushed by investing in building urban infrastructure ahead of demand,

and proactively seeking to attract foreign investment by designating them special economic zones (SEZ). Now, China is moving toward a more concentrated, cluster-based urban development model, especially in coastal areas.[7]

It should be noted that external pattern of urbanization is not just about size. Shape also relates to building a portfolio of cities that have varying degrees of sectoral specialization, and achieving a balance between legacy cities and new green-field developments.

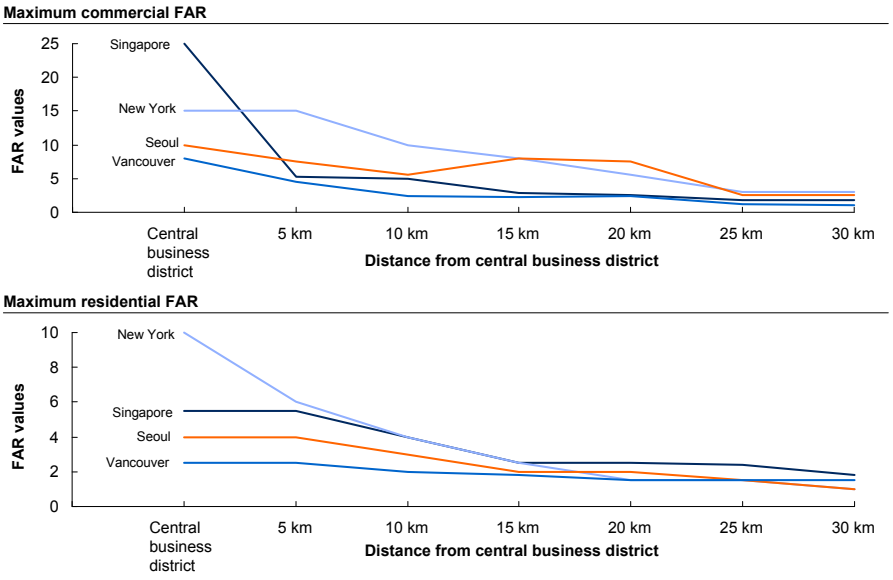
Internal shape is also important. Almost every major city in the world invests substantial resources and policy attention to this question. Cities drive their internal shape by making explicit choices on the distribution of density, land usage, and the linkages between where people live and work, with particular focus on the interplay between public transportation and affordable housing through their urban planning process.

Across the world, large cities, in general, have chosen to accommodate increasing demand for space by expanding upward, especially in Central Business Districts (CBD) and along major transportation corridors (Exhibit 3.5.1). However, this is always done based on long-term systematic plans that ensure construction of supporting infrastructure (such as water-supply, sewerage, storm water-drains, solid-waste management, mass transit, and roads) is in line with such densities. Seoul, for instance, has opted consistently for vertical development, especially in business districts (FAR of 8 to 10) and key transit corridors, including around metro stations (FAR of 4 to 8). This has encouraged walking or taking public transport to work. Singapore, too, has adopted a shape that combines a high-rise central business district (FAR of 8 to 25) with densely occupied commercial buildings along key roads leading out of the center through their master-planning process, a design that has attracted highly productive services sectors. In the case of Singapore, even residential areas next to the business district have an FAR as high as 6 and then dropping to between 1 and 2 as one moves farther away from the CBD. New York, too, has adopted a high-density vertical model that embraces both its central business district and in residential areas of Manhattan (with FAR of 15 and up to 10 respectively). This approach has enabled the island to preserve 25 percent of its land area for the green public space of Central Park. In contrast, Los Angeles has only selectively intensified land usage in downtown areas (FAR up to 13) while the rest of the city has adopted a low-rise model in order to preserve the city's historically widely spaced, single- and multifamily residential neighborhoods.

7 MGI recommended that China consider fostering a more concentrated shape of urbanization over the next 20 year to reap the benefits that would thereby accrue in the form of higher urban productivity. For detail, see *Preparing for China's urban billion*, McKinsey Global Institute, March 2009 (www.mckinsey.com/mgi).

Exhibit 3.5.1

Across the world, FAR values decline with distance from central business district



SOURCE: Alain Bertaud; McKinsey Global Institute analysis

There are many options in the internal design of cities but what is important is that these choices are clear, that development standards are consistent with the approach taken, and that the urban infrastructure is sufficient to make a particular option viable for citizens and investors.

INDIA NEEDS TO START THINKING BEYOND THE TRADITIONAL *LAISSEZ-FAIRE* APPROACH TO SHAPE

In India, there has thus far been no conscious approach to shaping either the external or internal shape of its cities.

Taking external shape first, India has not thought either at the national or state level about what portfolio of cities would most suit India's economic growth and social objectives. India would serve its cities better if it started to make conscious choices on the external shape of its urbanization, and make decisions about which of the several alternatives it has at its disposal would best fit with India's needs. Does India want to mostly focus on megacities or should India mostly focus on its emerging Tier 2 cities? Should India's focus be on investing in the renewal of existing cities or the creation of new cities and satellite townships? How should India think about smaller specialist cities (such as Agra that focuses on tourism, or Bhilai that has world-class steel facilities)?

Neither has the internal shape of cities in India evolved with any strategic objective in mind that takes into account the best outcomes for urban residents; rather the design of cities has come about through private choices (e.g., slums near commercial centers), and sometimes ad hoc public choices (e.g., FAR allowances by state governments for specific projects). Moreover, India's tendency to use just one FAR value across a city is in contrast to the approach in other countries whose cities use a variety of FAR values in different areas. Almost always, India's approach has resulted in urban sprawl that increases the long-term costs incurred not only by the city in question but also the state and the nation as a whole in terms of the suboptimal use of land, increased costs of delivering services, and the adverse impact on the

environment. Therefore, India would do well to start thinking consciously about the internal shape in its cities. How should cities utilize land and what is the best relationship between a city's residential, commercial, and community spaces? What is the best way to bring these spaces together through transportation links? What should be the distribution of densities in a city? Should a city grow vertically or horizontally and what consequences are each of these options likely to have on India's stock of agricultural land?

We argue that India's historical approach to the shape of its urbanization will not work given that the nation is on the verge of doubling its urban population. MGI is convinced that India needs to start a debate and start making conscious choices about both the external and internal shape of its urbanization if the government is to meet its aim of inclusive growth and the expansion of basic services. By making a shift toward proactivism in this regard, India could win itself a powerful lever to shape the contours of its economic growth over the next 20 years.

We now turn to the recommendations for India that arise out of our analysis that we believe can help to shape the external and internal pattern of urbanization in a way that optimizes outcomes.

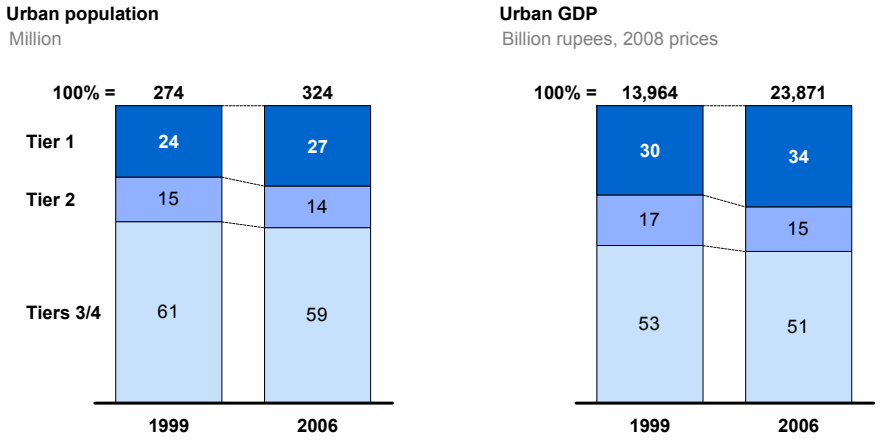
INDIA SHOULD CONTINUE ON ITS PATH OF DISTRIBUTED URBANIZATION

In contrast to China where MGI recommends a shift toward a more concentrated model of urbanization, in India's case our view is that India would do better to continue with the current distributed pattern of urban expansion. There are three reasons for this view:

- First, India's current shape is already distributed. Over the past 100 years, the nation has accumulated a mixed portfolio of cities of a wide range of sizes and types. By 2006, 27 percent of the population lived in Tier 1 cities (with populations of more than 4 million), 14 percent in Tier 2 cities (populations of 1 million to 4 million), and 58 percent in Tier 3 and 4 cities (with populations of less than 1 million) (Exhibit 3.5.2).

Exhibit 3.5.2

India's historic urbanization shape has been distributed



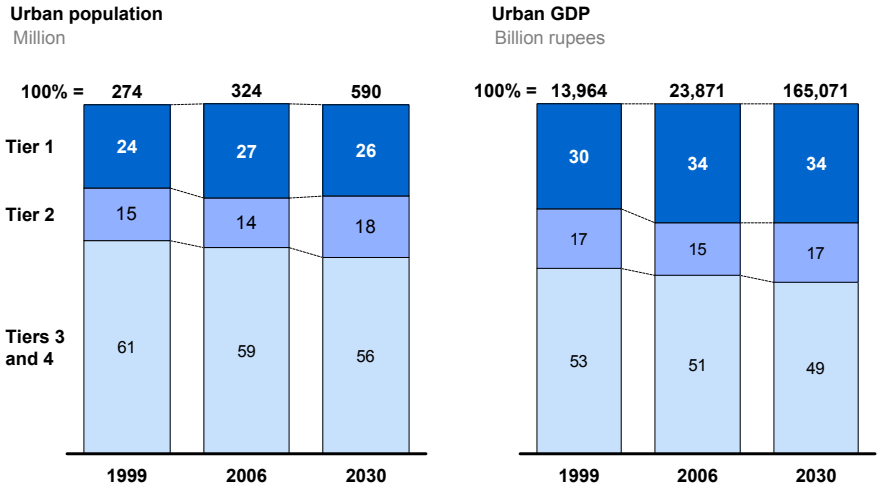
SOURCE: India Urbanization Econometric Model; McKinsey Global Institute analysis

- Second, a distributed shape is more suited to India's federal structure in which individual states play a large role in driving economic growth and are likely to make choices in creating a portfolio of cities relevant to each state's stage of economic development and urbanization.
- Third, a distributed pattern would support India's diversified model of economic growth more effectively. Various types of cities have played different but complementary roles in India's economy. Tier 1 and 2 cities have attracted the lion's share of the most productive sectors including banking, high-end financial services, fashion and entertainment, and modern format retailing. Some smaller Tier 3 and 4 cities are home to important manufacturing centers (e.g., Bhilai, Jamshedpur, Ambujanagar, and Jamnagar) that provide rapid growth in jobs and wages.

If India continues on its current distributed path of urbanization between now and 2030, our projections suggest that a diversified portfolio of cities will develop (Exhibit 3.5.3).

Exhibit 3.5.3

Based on current trends, India's urbanization shape is expected to remain distributed



SOURCE: India Urbanization Econometric Model; McKinsey Global Institute analysis

SIX KEY INITIATIVES WOULD ENABLE EFFECTIVE DISTRIBUTED URBANIZATION TO 2030

If India were to consciously pursue distributed urbanization as its preferred path over coming decades, what policy changes are most likely to optimize investment, enables economic growth, and facilitate a higher degree of social inclusiveness? In this section, we discuss six recommendations arising out of our analysis.

Renew Tier 1 cities through a substantial new investment program

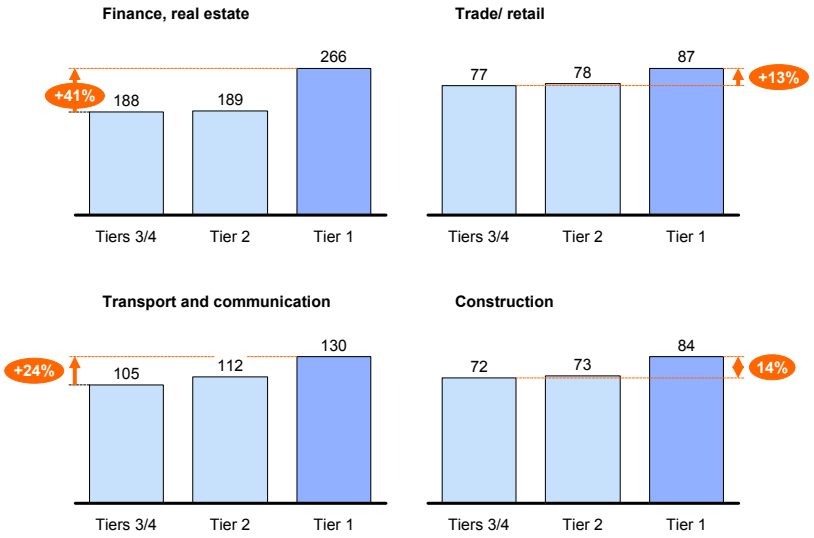
India should renew its focus on its largest nine cities (Mumbai, New Delhi, Kolkata, Chennai, Ahmedabad, Bangalore, Hyderabad, Pune, and Surat—each with a population exceeding 4 million). Today, Tier 1 cities have a combined population of 93 million people and we project that this figure will reach 155 million by 2030. India should seek to unleash the ability of these cities to fund their own growth through the infusion of $288 per capita for capital expenditure in urban infrastructure (see section 3.1).

The case for a renewed focus on India's largest cities is compelling. First, these large cities are critical to the growth of high-value-added sectors like banking and financial services, real estate, transportation, and communication. All of these are anchor sectors that drive India's overall economic growth, and are more productive in the largest cities (Exhibit 3.5.4).

Exhibit 3.5.4

Tier 1 cities house the most productive subsectors crucial to the economy

GDP per worker, rupees real 2000, fiscal 2005



SOURCE: McKinsey Global Institute analysis

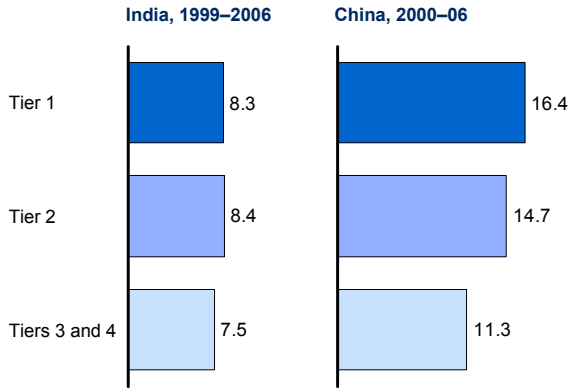
Second, India's largest cities have historically underperformed compared with their international peers due to neglect and underinvestment (Exhibit 3.5.5). The time has now come to return these cities to their potential. Around the world, large cities have fuelled the growth of national economies. For example, the annual GDP growth rates of China's Tier 1 cities were more than double the rate of India's Tier 1 cities between 1999 and 2005. Even in the United Kingdom, London's growth rate has consistently been 20 percent higher than the rest for more than two decades. This suggests that there is large scope for additional growth from India's largest cities that India has failed to catalyze thus far. The scale and agglomeration benefits that have driven productivity and innovation in large cities around the world clearly suggest that India's large cities should be delivering more growth. A lack of investment has clearly been one major hurdle to maximizing growth in these cities.

Third, these megacities are capable of funding 85 percent of their investment program from the internal resources (land, debt, PPP, property taxes, etc.) as long as enabling policies that allow them to unlock these funding sources are in place. This would obviate the need for substantial transfers from state and central governments (see section 3.1). As a result, these large cities can deliver high GDP per dollar invested by state and the center (Exhibit 3.5.6).

Exhibit 3.5.5

India's largest cities have historically underperformed their international peers

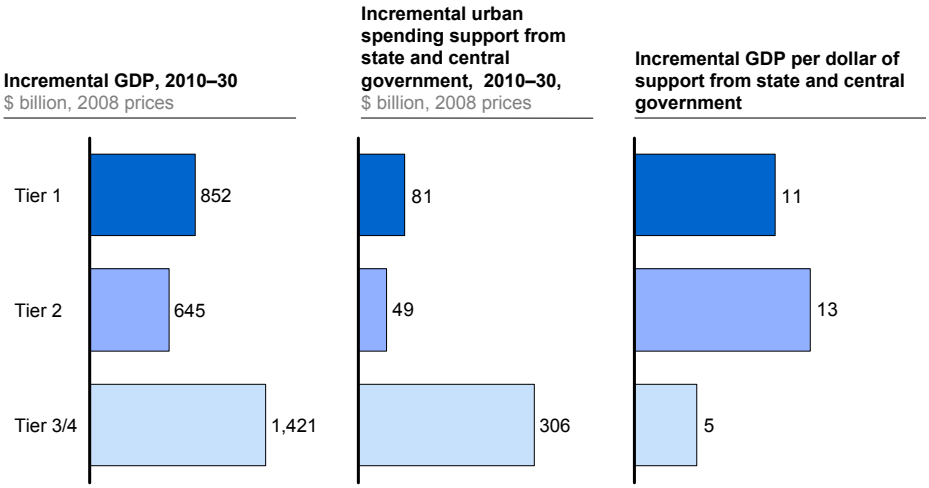
Tier growth rates
%



SOURCE: India Urbanization Econometric Model; McKinsey Global Institute China All City Model; McKinsey Global Institute analysis

Exhibit 3.5.6

Larger cities provide more growth per dollar of investment from the state and central governments



SOURCE: India Urbanization Econometric Model; City Development Plans; McKinsey Global Institute analysis

Preemptively shape the trajectory of the 24 largest Tier 2 cities

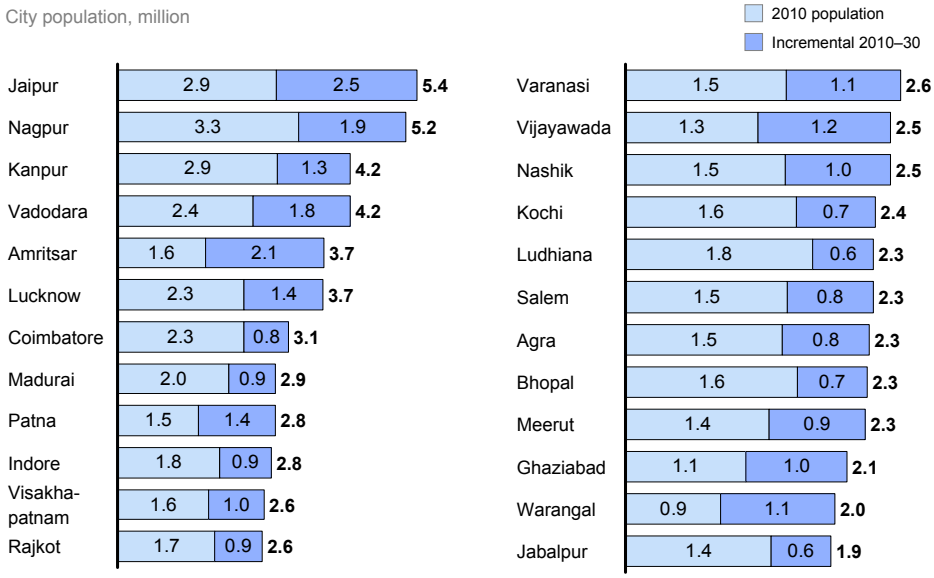
India has a golden opportunity to ensure that, as its Tier 2 cities expand, they do not emulate the urban decay of today's Tier 1 cities. To avoid repeating history, India needs to act preemptively to shape the growth of its Tier 2 cities by creating the right policies and injecting sufficient funds to match the needs that will arise as they expand (see section 3.1). India could use these Tier 2 cities as the test bed for reforms in urban planning and local governance, which would ensure that these cities can sustainably play host to a greater share of India's urban population and account for a larger share of economic output than is likely on current projections.

There is a clear case for picking the 24 large Tier 2 cities and investing $133 per capita and per annum in them. First, as we have noted, investing in their growth preemptively will prevent Tier 2 cities seeing a proliferation of slums, gridlocked movement of people and goods, and a declining quality of life, as we see in many Tier 1 cities today.

Second, even without a particular emphasis and targeted investment, many of these Tier 2 cities will grow rapidly, often doubling their population, in the next 20 years. In short, these cities are destined for expansion even with current policies—and directing this growth will be essential (Exhibit 3.5.7).

Exhibit 3.5.7

India needs to influence the trajectory of its top 24 Tier 2 cities proactively



Note: Numbers may not sum due to rounding.
SOURCE: India Urbanization Econometric Model; McKinsey Global Institute analysis

Finally, like Tier 1 cities, Tier 2 cities, especially the larger ones, have the ability to fund 80 to 85 percent of their own investment requirements. This will again ensure that the external funding provided by the central and state governments is fully leveraged.

Nurture the top specialist Tier 3 and 4 cities

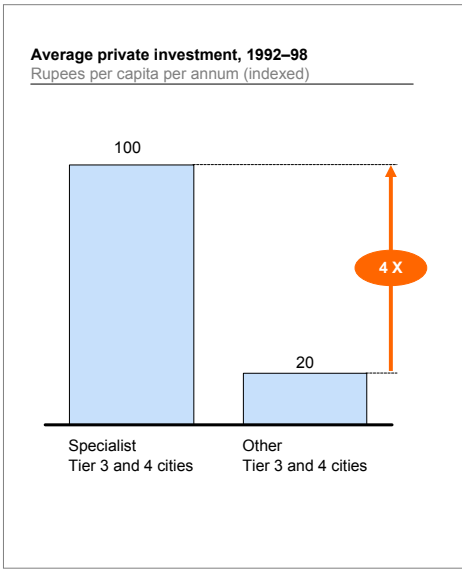
India has 70 to 100 cities that have strong economic propositions linked to an anchor sector, mainly in manufacturing, the extraction of resources, transportation, and tourism and pilgrimage. Such cities, typically in the Tier 3 and 4 categories, have traditionally created a much higher number of jobs and attracted much higher levels of private capital investment than their peers (Exhibit 3.5.8). Given their significance for India's economic growth, central and state government needs to supplement private investment in these specialist cities through the infusion of at least $96 per capita per year in urban infrastructure investments (see section 3.1). Such support would allow these cities to sustain their economic advantage and eventually grow into fully-fledged multisector cities that can provide employment to a larger share of India's urban population, while maintaining the distributed nature of India's urbanization.

Exhibit 3.5.8

India's specialist cities have attracted a disproportionate share of investment

Illustrative list of specialist cities

Iron and steel	▪ Jamshedpur ▪ Bokaro ▪ Rourkela ▪ Durg-Bhilai Nagar
Oil and gas	▪ Jamnagar ▪ Digboi ▪ Rajamundry ▪ Mathura
Mining	▪ Bellary ▪ Chitradurga ▪ Dhanbad ▪ Asansole ▪ Barabil
Port	▪ Porbandar ▪ Haldia ▪ Paradip
Tourism	▪ Haridwar ▪ Siliguri ▪ Bikaner ▪ Agra ▪ Jodhpur ▪ Dehradun ▪ Puri



SOURCE: Center for Monitoring the Indian Economy (CMIE); S. Chakravorty, *Spatial Dimensions of Structural Reform*

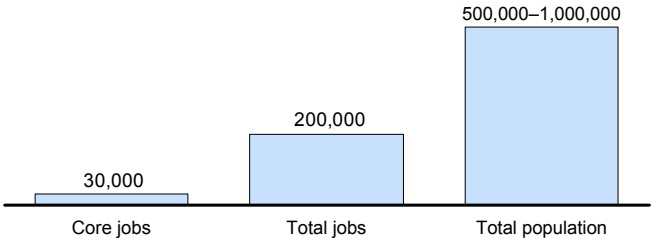
Facilitate creation of 25 new world-class satellite cities near the largest metropolitan areas

There has been a significant recent debate in India about whether the answer to decay in its existing cities is a huge investment program in brand-new cities. Our analysis shows that may not work. Building new cities is an expensive proposition, sustainable only when they create at least 30,000 to 50,000 core jobs and host a population of at least 500,000 to 1 million (Exhibit 3.5.9), a landmark that usually requires strong anchor tenants and several years of incubation. International experience shows that new cities often take 15 to 20 years to reach this level of population.

Exhibit 3.5.9

A new greenfield city is sustainable only when it achieves a population of 500,000 to 1 million, driven by core job creation

Number of jobs and population



	Core jobs	Total jobs	Total population
Description	▪ Jobs in globally competitive industries (up- and downstream)	▪ Industrial services ▪ Enabling services	▪ Dependents of employees ▪ Visitors
Examples	▪ Steel mill ▪ Window frame manufacturer	▪ Freight forwarder ▪ Retail shops ▪ Hairdressers	▪ Spouses, children ▪ Retirees

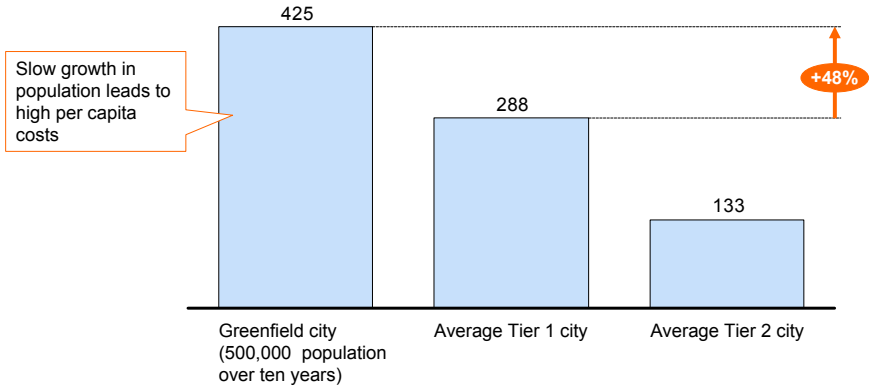
SOURCE: India Urbanization Econometric Model; McKinsey Global Institute analysis

As a result, building these new cities is around 1.5 times more expensive as renewing an existing midsized city on a per capita basis (Exhibit 3.5.10). The costs can escalate even further if these new cities are not built in the vicinity of large, existing metropolitan areas, driven by the need for long transportation links, airports, etc.

Exhibit 3.5.10

Building greenfield cities is around 1.5 times as expensive in per capita terms as rejuvenating existing Tier 1 cities

Funding required per capita (capital expenditure)
$ per capita per annum



SOURCE: India Urbanization Econometric Model; McKinsey Global Institute analysis

We are not arguing that new cities have no role to play in India's emerging urbanization path. We believe that India will definitely need new cities, especially to create and showcase a "model city." However, we urge India to build its new cities in an economically sound manner and recommend that India facilitate the development of new satellite townships within 50 kilometers of existing and emerging metropolitan regions in order to leverage the momentum of existing urban centers.

We estimate that India needs to develop one to two new satellite towns or cities in each of the largest metropolitan regions by 2030. With a population of 0.5 million to 1 million in each, these new cities can absorb as high as 20 million to 25 million additional urban residents.

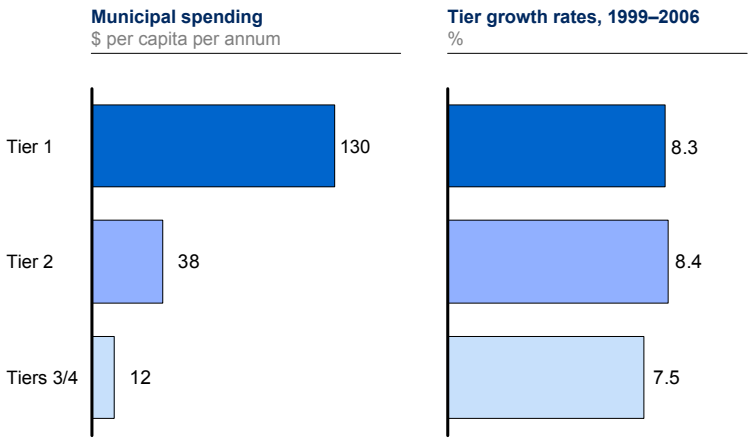
To make these new cities successful, India must also create the right urban policy environment. We recommend two initiatives. First, India should use best practice in planning, funding, and governance from the inception of these cities, rather than utilizing the existing *laissez-faire*, unplanned approach. This would allow these new cities to become benchmarks of planned, well-governed urban centers with a high quality of life and inclusive urban living. Second, the government should not view these cities as a purely private play, and should become an active facilitator especially in the provision of infrastructure with long lead times such as bulk water, electricity, and trunk-transportation connectivity (i.e., roads and rail).

Create a basic quality of life for smaller Tier 3 and 4 cities through a specified minimum funding support

India would be wise not to neglect its smaller Tier 3 and 4 cities. Apart from considerations of inclusiveness, these cities are important for three reasons. First, India's smaller cities have delivered robust economic growth over the last 15 years—comparable with India's largest cities—despite very small inflows of public investment (Exhibit 3.5.11). Second, our model shows that, on trend, smaller Indian cities will add 136 million to the overall urban population and contribute 49 percent of overall urban GDP. Third, provision of basic services in these cities would reduce some of the migration load on larger cities. Given that these smaller cities can only generate around 50 percent of their funding requirement internally (using land monetization, debt and PPP, property tax, and user charges), we recommend that the state and the central government "hand-hold" them till they become self-sufficient by providing an annual grant of $20 per capita. While we recognize that such a grant would not be sufficient to meet their needs, this support would at least enable them to provide some necessary urban services at minimum service levels (e.g., 90 liters per capita per day of water, 50 percent sewage treatment) to their residents. The presence of a large number of towns and cities that offer an improved quality of life will ensure that migration into the largest cities will be driven by the "pull" of more productive jobs rather than the "push" of poor access to services in villages and smaller towns and cities.

Exhibit 3.5.11

Smaller cities have historically posted robust growth despite receiving little funding support



SOURCE: India Urbanization Econometric Model; City Development Plans; McKinsey Global Institute analysis

Seed future urbanization by building selected transportation corridors and creating clusters

India's top-tier cities would be more productive if communication and transport links between them were stronger. We recommend facilitating the emergence of economic clusters of top-tier cities by providing rapid transport systems (such as eight to ten lane expressways) to connect them. We have identified 19 such clusters of two or more big cities together with their surrounding towns that account for 55 percent of the urban population and can seed the next wave of urbanization in India even beyond 2030 (Exhibit 3.5.12). Such transportation corridors cost around $50 per capita to build, and offer a low-cost seeding mechanism for India's ongoing urbanization.

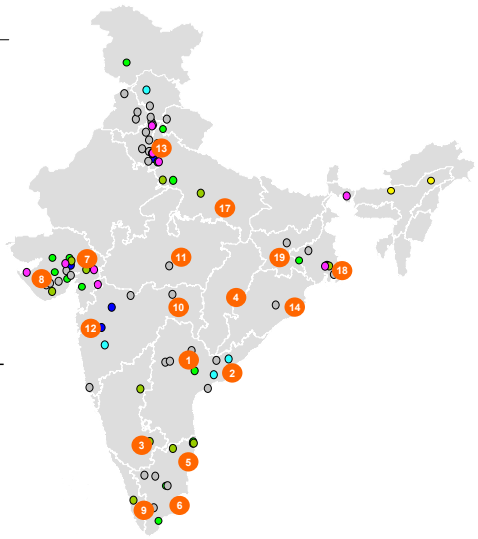
If India were to adopt and implement these recommendations, India's portfolio of cities would develop the shape illustrated in Exhibit 3.5.13.

Exhibit 3.5.12

India should develop its top 19 clusters at the cost of $50 per capita to seed the next wave of urbanization

Illustrative list of clusters

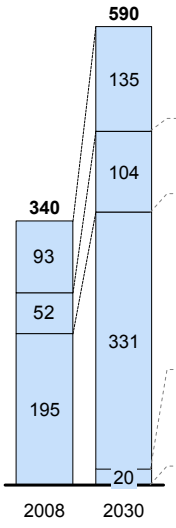
1. Hyderabad – Warangal
2. Vijayawada – Vishakhapatnam
3. Bangalore – Mangalore – Mysore
4. Durg-Bhilai Nagar – Raipur
5. Chennai – Pondicherry
6. Coimbatore – Madurai – Salem – Thanjavur – Tiruchirapalli
7. Ahmedabad – Surat – Vadodara
8. Bhavnagar – Jamnagar – Rajkot
9. Kochi – Kozhikode – Thiruvananthapuram
10. Aurangabad – Nagpur
11. Bhopal – Indore
12. Mumbai – Nashik – Pune
13. Gurgaon – New Delhi – Faridabad – Ghaziabad – Meerut – Agra
14. Bhubaneswar – Cuttack
15. Amritsar – Chandigarh – Jalandhar – Ludhiana
16. Jaipur – Kota
17. Allahabad – Kanpur – Lucknow – Varanasi
18. Kolkata – Asansole
19. Dhanbad – Jamshedpur – Ranchi



SOURCE: 2001 National Council for Applied Economic Research survey; United Nations Industrial Development Organization; McKinsey Global Institute analysis

Exhibit 3.5.13

India needs to facilitate a planned portfolio of cities



Type of city	Number, average size in 2030	Examples
 1 **Tier 1 cities:** Multi-service metropolitan regions	3 cities above 20 million and 10 others with average size of 5–7 million	Mumbai (MMR) Delhi (NCT) Kolkata Chennai
 2 **Tier 2 cities:** Fast-growing multi-service cities	55 cities with population of 1.9 million each	Amritsar Kochi Indore
 3 **Specialist Tier 3/ 4 towns:** Towns specializing in specific sectors (e.g., manufacturing, tourism)	70–100 specialist towns	Jamshedpur Puri
4 **Other Tier 3/4 towns:** Other small towns which hold a major chunk of urban population	5,900 towns of 40,000–60,000 each	Panvel Palghar
 5 **World-class new cities near Tier 1 cities:** Small new cities in metropolitan areas with world-class facilities	25 cities of average population 0.5–1 million	Lavasa

19 super corridors to connect Tier 1 and Tier 2 cities to seed future urbanization

SOURCE: India Urbanization Econometric Model; McKinsey Global Institute analysis

INDIA ALSO NEEDS TO THINK THROUGH ITS POLICIES ON INTERNAL SHAPE

India's cities have so far developed in a way that largely ignores the design or internal shape of its cities—a factor that many other emerging economies have addressed over the past 50 years.

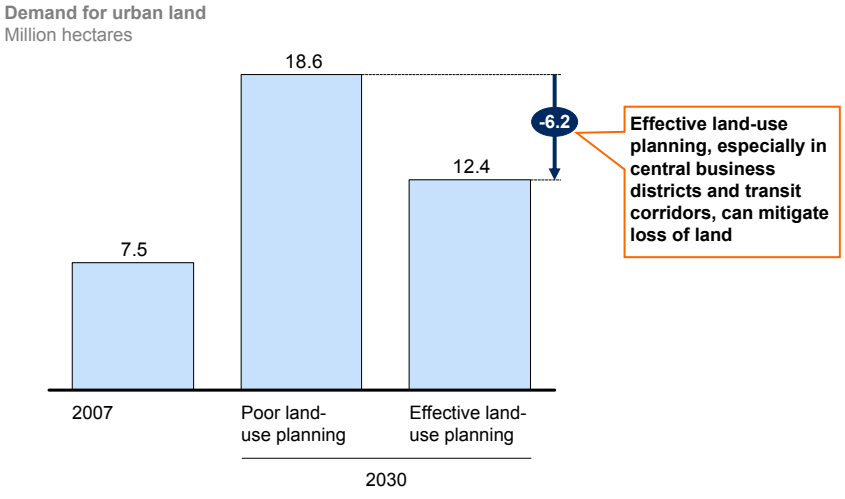
There are consequences for India of not having effective policies on internal shape including the loss of potentially arable land, urban sprawl, and pressure on the environment. Cities already account for almost 2.8 percent of India's land mass, and demand for land is set to increase substantially with the near doubling of India's urban population and quadrupling of per capita urban incomes that we expect over the next 20 years. Based on India's current internal shape (average FAR of 1), we estimate that an incremental 11 million hectares of land may be necessary to meet urban demand. Urban sprawl, which grows out of a lack of planning, increases the cost of delivering services to a population spread over a larger area. And the environmental cost of additional commuter miles adds to a city's carbon footprint. The pressure on the environment is likely to increase dramatically in India in the absence of a more thoughtful approach to internal shape (see appendix B on the mitigation of carbon emissions in urban India). So we offer one key recommendation on internal shape:

- **Proactively plan India's internal urban shape and density to optimize costs, save land, and reduce emissions**

  Our analysis shows that if India's cities systematically plan for higher density around business districts, together with transit corridors and other supporting infrastructure can save up to 6.2 million hectares of land (Exhibit 3.5.14). What is critical is integrated forward planning on infrastructure requirements including water supply, sewage, solid-waste management, and transportation. Besides the mitigation of loss of arable land, proactive planning for shape and a push toward greener buildings can become a powerful lever to reduce cities' carbon footprint (see appendix B for detail).

Exhibit 3.5.14

India could potentially save 6.2 million hectares of land through effective planning for land use



SOURCE: McKinsey Global Institute analysis

ALL THREE LEVELS OF INDIAN GOVERNMENT NEED TO PUSH THE WAY FORWARD ON SHAPE

If India reaches the conclusion that a distributed shape of urbanization is the nation's best option, the next issue is what India has to do to produce this pattern. The role of all three levels of government will be critical. State governments (and to some extent, central government) have the most power to influence the external shape of cities, while state and local governments can determine their internal shape. In this section, we explore potential roles of the different tiers of government and some next steps that each might take.

India's central government can play a powerful facilitating role through the National Urban Renewal Mission (NURM) as a vehicle. Through NURM, it can continue to facilitate the necessary investment into Tier 1 and 2 cities. However, we think NURM should launch another scheme to reflect the requirements of specialist cities as well as other Tier 3 and 4 cities. In addition, central government can support the creation of city master plans that give due importance to the issue of density and internal shape through the NURM conditionality and funding. Finally, and importantly, central government should consider introducing another NURM conditionality that each state submit a 2020 and 2030 urbanization strategy and blueprint in a specified format (including forecasts for urban shape, overall investment requirements, key projects, and funding mechanisms).

States, too, have a major role to play. Every state should create urbanization blueprints and formulate a strategy based on their projections for the development of the urban populations in their states. This blueprint should lay out how states intend to respond to these projections in terms of planning and pre-investment. We would recommend that every state should plan ahead on how to invest in their Tier 1, Tier 2, and specialist cities. In addition, states should give priority to the construction of key transportation corridors over the next five years, and issue guidelines to each city to proactively plan their internal shape to save on precious agricultural land.

Cities themselves can play their part by moving aggressively toward the creation of city strategies including a blueprint for how they intend to plan ahead for the city's needs in 2030, as well as for the internal shape of the city.

□ □ □

Almost no debate on the future shape of India's urbanization has yet taken place. Having such a national conversation is a necessary first step toward a comprehensive national urban strategy. Some of the recommendations that we have made will be easier to implement than others. But a systematic movement toward implementation will create rich dividends for India.

4. First steps toward India's urban awakening

This report has made the case that managing the path of India's urbanization is essential to its agenda of inclusive economic growth and its ability to raise the living conditions of a substantial number of its citizens. It is well within India's ability to put into action the 34 recommendations we have proposed in the next five years. If India does so, it can change the face of its cities in a decade.

However, India is in a state of deep inertia about the urgency and scale of urban reforms. Despite the perilous state of many Indian cities and the impending wave of urbanization, there seems to be comfort with the status quo, resistance to change, and a lack of recognition of the urgent need for change.

In this chapter, we discuss how India can facilitate a debate on reform and make change happen in a way that involves all key stakeholders—citizens, the private sector, and governments (national, state, and city). The 74th Amendment of India's constitution has already laid out the philosophical and legal framework for most of the changes we propose in this report. Our recommendations, in many ways, attempt to translate the intent and spirit of the amendment into specific changes that can help local governments function more effectively on the ground.

We outline a potential way for the country's leaders to put India firmly on a path toward urban renewal the effective implementation of urban reforms. And we highlight the central role of citizens and the private sector in making change happen.

CHANGE WILL REQUIRE POLITICAL WILL AND THE CATALYTIC ROLE OF THE CENTER

While all 34 recommendations are eminently achievable in the short to medium term, we recognize that varying levels of difficulty are associated with implementing them. We have accordingly organized these reforms based on the difficulty in building potential consensus around each and in their implementation. In ranking the reforms in this way, we take into account whether the solutions are completely new or have been tried somewhere in India. (see box 11, "Summary of recommendations" at the end of this chapter for a listing of recommendations in each of the five elements of MGI's proposed operating model for India's "urbanization")

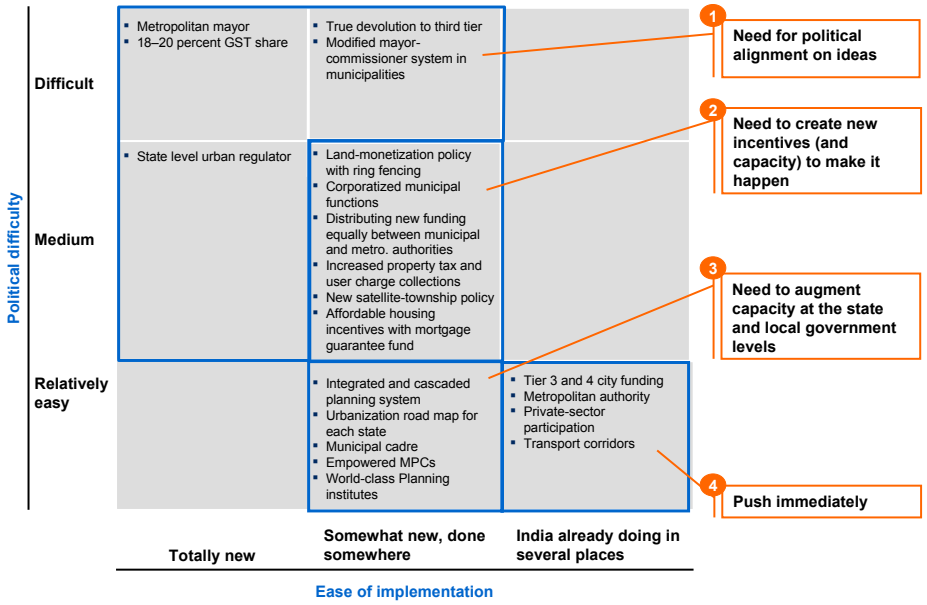
At one end, we have built some recommendations around changes that India has already attempted with a degree of success and that are therefore relatively feasible politically. For these recommendations, the next step should be to replicate on a national scale successful models that have already emerged.

At the other end lie recommendations for tough reforms that are new to India and that would require a process of building consensus and political will before implementation is possible. Many of these reforms require a strong push to create cohesion around the ideas involved, and sometimes financial incentives for the state and city governments to make change happen on the ground. In almost all cases, India needs to augment by a significant margin the physical, managerial, and financial

capacity of city governments. See Exhibit 4.1 for illustration of the segmentation of our recommendations in four categories.

Exhibit 4.1

Mechanisms to make change happen vary



SOURCE: McKinsey Global Institute analysis

The actions that India would need to take vary according to the category of reform:

- **Category 1.** These are reforms that are politically difficult because they have few, if any, precedents in India. These reforms include sharing of 18 to 20 percent GST with city governments, true devolution of power, and empowered political executives for cities. Achieving progress in this category will require political alignment starting from the very top of government, perhaps from the Prime Minister of India himself.

- **Category 2.** This category comprises reforms that have been tried to an extent in India with some success and that involve moderate political difficulty. These reforms include land monetization policies, ring-fenced city development funds, the separation of metropolitan and municipality functions, and the creation of a satellite-township policy. These reforms will require some push from the center (perhaps through new incentives) as well as a helping hand in drafting appropriate rules, regulations, and laws. Progressive states and chief ministers have the opportunity to push this set of reforms ahead.

- **Category 3.** These reforms are somewhat new to India but are not very difficult to implement politically. The only major constraint might be India's lack of sufficient expertise and capacity in state and local government, which means that the need for assistance from the central government is even more acute. Reforms in this category include the creation of a cascaded planning system, the process of creating urbanization road maps at the state level, and the creation of a city-specific cadre.

- **Category 4.** In this category are reforms that have established precedents in India and should not involve much political difficulty. We might characterize this group as "stroke of the pen" measures. This group includes creating a fund aimed at Tier 3 and 4 cities and instituting functional metropolitan development authorities in large urban agglomerations.

Using this segmentation as a framework, we now discuss how India can take the first steps toward urban reform at the three levels of government.

The central government can catalyze urban reform by creating political alignment and by using the JNNURM as the institutional basis for action

We believe that the central government has to play a catalytic role in ensuring implementation of these reforms. This is despite the fact that, according to India's constitution, urban affairs are in the realm of state governments. The center's role is essential for three reasons. First, states have been historically unwilling to cede power to local governments. Without political push and incentives from the center, it is unlikely that change will happen. Second, the center can play a positive role in addressing, through financial as well as technical assistance, the severe capacity shortage that states and cities face. Finally, finding a path to managed urbanization is such a critical priority for India's economic future that there needs to be a national consensus on reforms—and only the central government can orchestrate it.

We think three actions by the central government can pave the way for change at the state and local levels:

- **Facilitate political alignment around category 1 reforms.** India cannot put category 1 reforms into motion unless there is a general agreement among the political parties and key policy makers. Only the central government can trigger this debate and shape national alignment on this, naturally with the active involvement of state governments and national and regional political parties. While the process will take time and require bold political leadership, an immediate step may well be to institute an empowered group of ministers or a high-powered committee to create broad national backing of critical urban reforms.

- **Launch second-generation JNNURM.** In the JNNURM, the central government has a ready-made, proven vehicle to determine the framework of reforms as well as established institutional and incentive mechanisms to push for their implementation. India created the JNNURM in 2006 to advance a set of four objectives: (1) to catalyze investments in the urban sector; (2) to ensure the integrated and holistic renewal of cities; (3) to advance the reform agenda with states and ULBs; and (4) to support capacity development to ensure the sustainability of development and reforms. After four years, these objectives continue to underpin the mission's work. But while the JNNURM has been successful in catalyzing significant investments into the physical infrastructure of cities, the mission could do a lot more to push states and cities to enforce the reform conditionality embedded in the program. While the JNNURM has used conditionality to set states on the path of urban reforms with the added incentive of financial support from the center, the center can do more to reinforce this direction. Our discussions suggest that many states and cities are now willing to go even further than existing conditionality might suggest, as long as the central government provides a framework for change. On the fourth dimension of the mission's work, the central government has a tremendous opportunity to support states and cities in building local technical, managerial, and financial capacity.

Five key changes will be particularly significant as the center launches the second-generation JNNURM:

— **Substantially increase funding support to JNNURM.** Currently, JNNURM funding support from the central government is around 10,000 crore rupees ($2.2 billion) per year. JNNURM has already catalyzed investments in cities to some extent. However, given the enormous gap between current spending and what is required, and given the powerful nature of the financial incentive to states and cities, the central government should consider tripling the mission's annual allocation to at least 30,000 crore rupees ($6.7 billion) per year. If, and when, a formula-based GST transfer to cities becomes a reality, India can scale back this funding to the mission.

— **Launch a new incentive fund under JNNURM to catalyze category 1, 2, and 3 reforms for willing states.** While more money is part of the answer, India needs to couple increased funding with a push for more reforms. Our discussions have revealed a reservoir of willingness, especially within the more urbanized states, to embark on the next generation of reforms. What could give a boost to these progressive states is the creation of an incentive fund within JNNURM of 8,000 crore rupees ($1.8 billion) per year that would allocate additional financial assistance from the center to states and cities that are willing to initiate the second generation of reforms along the lines of the recommendations in this report.

— **Launch a new fund for Tier 3 and 4 cities under JNNURM.** Given the historical under investment in Tier 3 and 4 cities, and the need to bring these cities to at least a basic minimum standard in services, we recommend that a new fund with an annual allocation of 10,000 crore rupees ($2.2 billion) be launched under JNNURM focused on these cities.

— **Bolster the program of urban capacity development.** Financial assistance, especially in a form that creates a sense of competition among states, is essential to move the reform agenda forward. But this in itself would not be sufficient. Even when the political will exists, many states and cities have been unable to leverage available funds or implement reforms, mainly because of a lack of local capacity and technical expertise (e.g., the ability to prepare detailed project reports and making changes to the property tax regime). The central government should consider investing 5 to 10 percent of any augmented JNNURM funding (2,000 crore rupees a year, or around $0.4 billion per year) in initiatives that provide technical know-how in the short term and capacity building in the long term. This funding can be used for the deployment of specialist teams, expert assistance, hand-holding for PPP projects, and giving assistance to states and cities on the ground. At the same time, the central government should facilitate the creation of three or four large-scale, national urban institutes around the country that can provide a reservoir of technical and reform expertise that state and local governments can tap.

— **Develop framework laws and implementation models.** To complement capacity development, there is an opportunity for the center to develop model regulations, guidelines, laws, and frameworks. In most of the areas of recommended reform, the devil is in the detail (e.g., in the case of the roles and responsibilities of the commissioner and the mayor that we discussed in section 3.2). In the long term, each city should be developing its own set of urban policies and plans. However, given the distributed scale and scope of

India's urbanization and the starting point, at least in the short term the central government will need to play the role of facilitator in developing frameworks and policies that state and city governments can use as templates for driving change on the ground. A few areas require specific, urgent attention: model municipal laws for devolution, model land monetization guidelines, model regulation for city development, model guidelines for a cascaded planning system, and framework for the involvement of the private sector in the delivery of urban services.

- **Revamp and launch Rajiv Awas Yojana (RAY).** The central government is currently considering the launch of a new large-scale affordable housing program with incentives and financial support from central government for states and municipalities. We estimate that an annual outlay from the government of 15,000 crore rupees ($3.3 billion) for RAY would trigger the creation of 1.5 million to 2 million affordable housing units a year, a significant step toward eradicating slums in India. A few key changes in the current design of the scheme can enhance the program's effectiveness, including planning for at least 30 percent of the program's construction to be of rental units, the integration of multiple housing schemes, the use of FAR incentives, and seeking contributions from beneficiaries of affordable housing based on their ability to pay.

- Both the JNNURM and the proposed RAY scheme can benefit from a revamp of administrative structure and processes, especially around three changes: converting the current approval process into a two-stage process to facilitate true costing of projects where projects are approved in principle at the first stage, and municipalities are offered an opportunity to revise estimates before final approval; requiring financial closure from municipalities and state governments before funds are released; and through setting timelines and targets for the project appraisal, review and monitoring processes

STATES AND CITIES NEED TO DO A LOT MORE; EARLY MOVERS WILL BENEFIT ENORMOUSLY

Urban reform should not just be about state governments responding to an agenda set by the center on the back of financial incentives. There is absolutely no reason for states and cities to wait for a push from the center. Indeed, it is in their self-interest to act now, not just because a lack of firm action will lead to a rapid deterioration in the lives of citizens but also because urban reforms can give states a compelling new competitive advantage against other states in attracting new investments, and creating jobs (see box 10, "The urban reform journey can deliver positive outcomes for states and cities").

For progressive state leaders, one potentially effective approach to urban reform would be to create the enabling framework of funding, planning, and governance immediately and then to apply the reforms in stages. States could start reform in a few cities at a time, and then use the experience gained as a stepping-stone to deeper reforms across all cities.

So what should the short- and medium-term priorities be for India's states?

Short term. Given that almost no state in India has even considered a holistic urban strategy, a sensible first step should be the creation of a 2030 urbanization blueprint and strategy that sets the framework for the state's portfolio of cities and its model of governance, planning, funding, and sectoral policies. These reforms should include some category 1 and almost all category 2, 3, and 4 reforms. These could

include land monetization policies, ring-fenced city development funds, appropriate frameworks for PPP, and leveraging debt in the arena of funding; the confirmation of an urban regulator law, the creation of functional metropolitan authorities, devolving power to metropolitan and local authorities, moving to a modified commissioner-mayor system at the municipal levels, and the development of frameworks for corporatization of key delivery agencies in governance; and the confirmation of guidelines on the development of concept and master plans, especially in large cities in planning. Willing states can create the blueprint for these initiatives and start applying it to a few cities in 18 to 24 months.

Medium to long term. In the medium to long term, the agenda for progressive states would be to extend reforms undertaken in a few cities to all cities within a state, and to start the process of deepening reforms. We argue that the priority should be to empower city leaderships, including allowing the direct election of metropolitan mayors, especially in Tier 1 cities and extending to Tier 2 cities within five years.

Cities need to provide a parallel thrust on urban reforms and even push state governments for devolution and other reforms—for cities that have the most at stake. We recognize the vast differences across cities in terms of their stage of development, their unique challenges, and their political constraints—factors that have a direct bearing on the urban reform agenda. Clearly, there is no one ideal journey for a city: the path of reform will vary depending on the size of a particular city and its starting point.

States and cities that take a proactive approach delineated in this report can not only escape the fate of urban chaos and gridlock but also reap enormous benefits. These benefits will translate to significant economic growth, boost tax revenue, attract new investments, and create a dramatic improvement in the quality of lives. For state chief ministers and political leaders, therefore, managed urbanization represents a powerful populist vehicle that can be the basis for winning elections, a fact that will be further accentuated by an ever-increasing share of voters being housed in urban India.

Box 10. The urban reform journey can deliver positive outcomes for states and cities

States and cities need to pursue urban reform in an integrated, mutually reinforcing manner, rather than with a piecemeal approach. As illustration, we examine how the reform journey might unfold in Maharashtra, one of India's most urbanized states.

While the state faces significant challenges in its cities, particularly in Mumbai, Maharashtra has taken a comparatively open and progressive approach to urban reform, which gives it a good starting point. However, the state could do more—and reap positive outcomes.

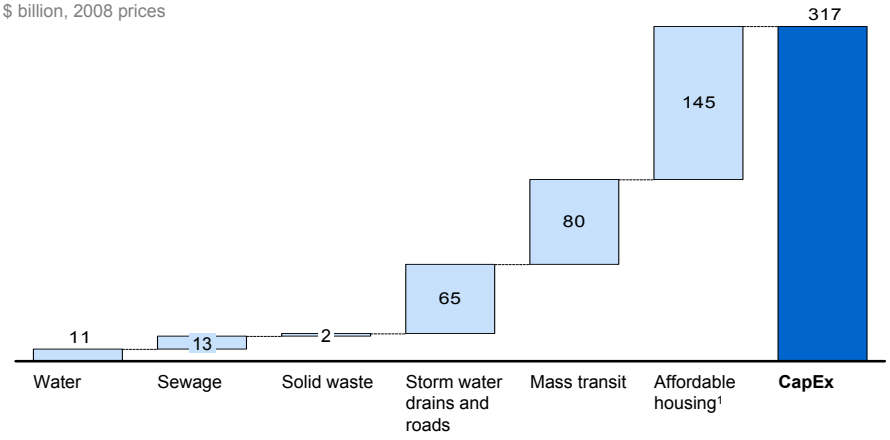
Maharashtra's urban population is set to increase from 48 million (44 percent of the total population) in 2008 to 78 million (58 percent) by 2030. The state's urban GDP will increase from 4,847 billion rupees (or $107 billion) to 26,660 billion rupees (or $592 billion) by 2030, accompanied by a threefold increase in urban per capita GDP from 101,000 rupees per year ($2,250) to 341,000 rupees annually ($7,580). In every respect, Maharashtra is at the cusp of a significant

urban transformation and, like in the rest of India, the state will see a huge surge in urban demand for services and a significantly larger need for investment (Exhibit 4.2). Cumulatively, Maharashtra will require 14,265 billion rupees (or $317 billion) of urban capital investment over the next 20 years. The state will also need 9,315 billion rupees ($207 billion) of operational expenditure over the same horizon. Maharashtra can fund this urban spending program by unlocking key funding levers (see section 3.1).

Exhibit 4.2

Maharashtra needs around $320 billion in CapEx investment over the next 20 years

Funding requirement for urban sectors, 2010–30
$ billion, 2008 prices



1 Net of beneficiary contribution.
SOURCE: India Urbanization Funding Model; Detailed Project Reports from the Jawaharlal Nehru National Urban Renewal

Maharashtra needs to use reform to drive this investment program. We believe that the state—and its major cities—should pursue a program of reform organized into three waves:

- **Phase 1 (12 months).** In the next six months, Maharashtra should develop a state urbanization blueprint and reform road map that formulates and articulates the city's urban vision. In parallel it should focus on deepening some of the institutional architectures that have already worked to a degree in the state; set the stage for new reforms; and pick the first set of city candidates for greater devolution. The creation of a state urban regulator followed by the development of policies in land monetization (including ring fencing of funds) and affordable housing are critical. The blueprint should also address the question of increasing capital investments through the four funding sources we have listed, as well as leverage any model laws and frameworks from the center (covering, for example, satellite-township policies). Other reforms could include the adoption of a modified commissioner-mayor system in ULBs in the chosen cities; the creation of metropolitan authorities with MPCs; and the corporatization of core services, including transportation, water, and waste management at the municipal levels. This would also be the right time to set up functional metropolitan authorities in at least Pune and Nagpur, in addition to MMRDA, the authority that is already functioning in Mumbai. In this first wave, the state should also decide on the first set of cities (e.g., Mumbai and Pune) that will see greater devolution and reforms to service delivery.

- **Phase 2 (12 to 36 months).** With a state urban blueprint in place, Maharashtra can start implementing reforms in its first set of cities (Mumbai, Pune, and Nagpur are ideal candidates). This would be the right phase for the state to start building key transportation corridors as well as pushing for new urban concept plans for at least the three largest cities in the state. The state can also develop a framework for cities to hire and develop their own municipal cadres.

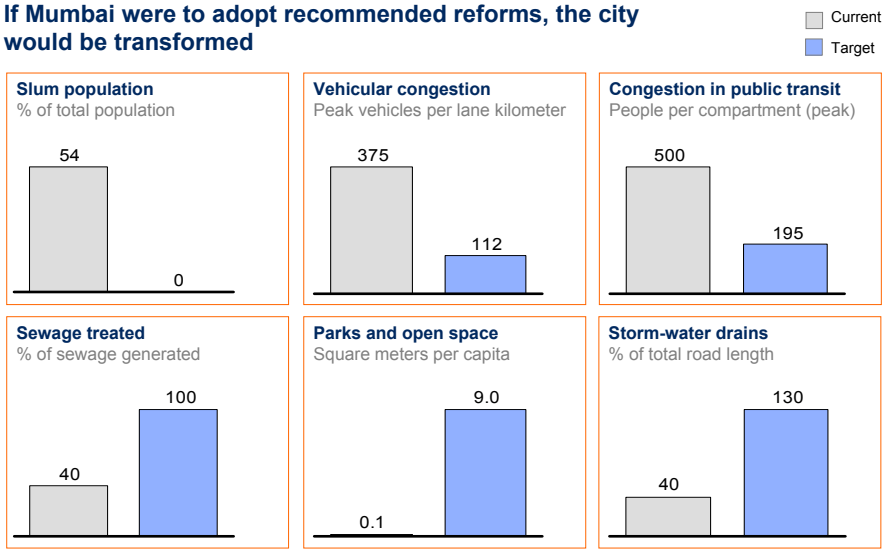
  For their part, cities need to use the umbrella of support for reform from states to deliver real impact on the ground for citizens.

  — *Mumbai.* Mumbai's urban challenges are well known. Despite Mumbai's being the financial and commercial capital of India, its citizens experience a poor quality of life. By 2030, our base case projects that Mumbai's metropolitan population will touch 33 million and its urban GDP 11,925 billion rupees (or $265 billion), at 2008 prices. So Mumbai needs not only to clear the city's existing investment backlog but also to pre-invest in impending growth to establish itself as one of India's prime growth engines. To do so, Mumbai needs to make the transition to a well-resourced, proactive, and accountable urban operating model. In the context of reforms driven by the state government, Mumbai could push for five initiatives in the short term: (1) build on its existing metropolitan authority structure and make a MPC-MMRDA combination work. The city also needs to demarcate clearly the responsibilities of metropolitan authorities and ULBs; (2) accelerate the internal generation of funds through new land monetization policies and leverage these funds using debt and PPP; (3) complete and make statutory a long-term 2032 and 2052 concept plan made binding on local municipal development plans; (4) put in place a modified mayor-commissioner structure at the municipal level for all corporations in the region and corporatize key services in its largest municipalities (e.g., Municipal Corporation of Greater Mumbai, Thane Municipal Corporation); and (5) put in place and disburse a capital investment program of 330 billion rupees (or $7.3 billion) per annum (200 billion rupees, or $4.4 billion, from MMRDA and the rest from municipalities) over the next five years. If Mumbai is successful in pushing through these initiatives, the turnaround of the city would be dramatic in just five years (Exhibit 4.3).

  — *Pune.* The same holds true for a city such as Pune, whose challenge is to manage its rapid development and growth before it faces challenges on the scale that Mumbai faces today. Many of the reforms that Pune should consider are similar to those we suggest for Mumbai, including the creation of a metropolitan authority, the need for a concept plan, creating a ring-fenced Pune city development fund, creating a plan to unlock the four sources of funding for the city, creating a modified mayor-commissioner system, and creating corporatized agencies in water, transportation, and waste management at the municipal level. In terms of capital investment, Pune will need to execute a capital investment plan of 68 billion rupees (or $1.5 billion) per annum over the next five years, with 34 billion rupees (or $0.75 billion) coming from a newly constituted metropolitan development authority and the rest coming from the municipalities. Pune, too, can achieve compelling benefits (Exhibit 4.4)

Exhibit 4.3

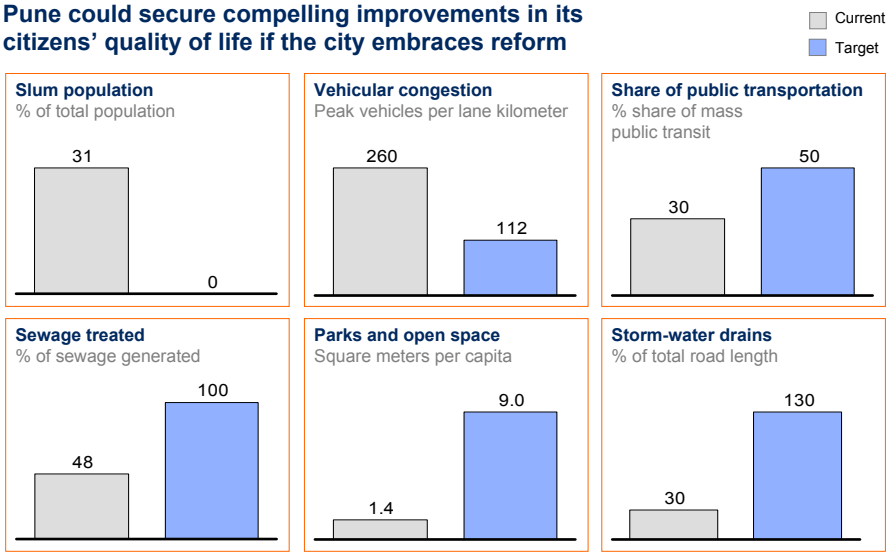
If Mumbai were to adopt recommended reforms, the city would be transformed



SOURCE: United Nations; City Development Plans; The Energy and Resources Institute; Planning Commission; Census 2001; McKinsey Global Institute analysis

Exhibit 4.4

Pune could secure compelling improvements in its citizens' quality of life if the city embraces reform



SOURCE: United Nations; City Development Plans; The Energy and Resources Institute; Planning Commission; Census 2001; McKinsey Global Institute analysis

- **Phase 3 (three to five years).** In the third wave of urban reforms, Maharashtra should consider extending reforms to all the cities in the state, including greater devolution of powers; modifying the leadership of cities to mayor-commissioner systems; and pushing for the corporatization of delivery of all key services. The lessons from the first and second waves will provide a solid platform and a rich set of experiences that the state can use to extend reforms. This will also be the right stage at which to deepen reforms, including allowing metropolitan regions (especially in Mumbai, Pune, and Nagpur) to elect their mayors directly.

A VOCAL CITIZENRY DEMANDING ACCOUNTABILITY IS ESSENTIAL TO CHANGE IN CITIES

While governments have an enormous opportunity to change the face of cities in India, their appetite for change will be bolstered, and many times triggered, by a citizenry that actively demands accountability for the fate of the cities in which they live. While many dispersed citizen movements exist around the country and many outstanding organizations focus on urban causes, the focus by and large has been on roads and potholes. The time is ripe for a fundamental awakening of India's urban citizens. The worst victims of the consequences of inaction will be those very citizens. And it is not just the poorest of the poor who will bear the brunt of urban deterioration if India fails to embark on reform, life will get tougher for every urban resident. History teaches us that change has happened on the ground in cities around the world when citizens have asked for local representation and local accountability for the city's direction, the right amount of funding for the city's development, and improvement in the quality of services delivered. It is time for the citizens of India's cities to recognize that the fate of their future is in their hands. And that the only way to get the improvement that they seek in their lives will come from their advocacy for reforms, including having leaders who represent them, having mechanisms that tell them how well their city is delivering services, and having ways to hold their leaders and organizations accountable.

First, the citizens of India's cities need to understand the complexity of the urban transformation, gaining a perspective on the actions available to them to create real results on the ground. While this report offers a perspective on the urban challenge and ideas for the way forward, citizens need to be convinced on both. Second, the focus of citizens needs to shift from small, reactive, noninstitutional demands to a call for fundamental institutional change. Too often, citizens have expended energy on specific projects or causes that, while worthy, have not had the transformational impact on the ground that India's cities desperately need. In short, India's urban residents need to stop asking their political leaders to "fix the roads" and instead ask them to "fix the institutions that fix the roads."

The demand for institutional change needs to be incessant. Citizens should demand implementation of the reform agenda at every election, every forum, with every state government leader with whom they come into contact, and through every media outlet that will be supportive of their cause. Unless there is a systematic campaign to create a groundswell of support and clamor for change in India's cities, the reform agenda seems destined to be stuck in a pincer between the complexity of the task and the reluctance of state governments to drive change.

THE PRIVATE SECTOR HAS AN OPPORTUNITY TO BE A SUPPORTIVE PARTNER TO PROGRESSIVE CITIES

Citizens demanding change will catalyze India's urban transformation, together with action from progressive state governments that understand the urgent need for change. But a key stakeholder and partner in this transformation is the private sector. For any private institution whose future is linked to India's economic future, urbanization is an issue of vital importance. The ability of cities to create thriving living conditions, facilitate networks that foster innovation, and in general create the basis for attracting talent will be crucial to the ability of private companies to house themselves in productive settings that trigger growth. As investors, they therefore have the obligation to demand urban transformation as a prerequisite for investment—and lobby a lot more vigorously than they have in the past.

It is also in the business interests of investors to engage. India's unprecedented urbanization represents an attractive new investment opportunity for the private sector. As explained earlier, the rise of a new urban population and the accompanying fivefold increase in per capita incomes will accelerate demand in markets across the spectrum, from consumer markets to infrastructure to services. Equally important, urban reforms will unlock a whole new market for private participants in assisting city governments to meet the impending, explosion in demand for urban services, including water, sanitation, waste management, public transportation, and affordable housing. Many billion-dollar businesses will be built on the back of these opportunities. With limited internal capacity and investment resources in the short term, governments will need assistance from the private sector to build infrastructure and to deliver and maintain services. As we have discussed, we project that $2.2 trillion in new urban spending will be necessary over the next 20 years, including $1.2 trillion in new capital investment. For the private sector, this represents an exciting new opportunity that will also transform India's urban landscape.

It was evident from our visits to states that the private sector today is simply not geared up to address this opportunity. Companies therefore need to think through urgently how they can bring their financial and managerial capacity to bear on the difficult but exciting task of India's urban transformation.

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It is easy to be skeptical about India's ability to transform its cities. But we are optimistic. The recent past shows that once India engages in a national discussion, as it did on economic reforms, action soon follows. The same needs to happen now, urgently. Nothing less than the sustainability and inclusiveness of India's economic growth are at stake.

Box 11. Summary of recommendations

1. Funding

— Spend $2.2 trillion in cities over the next 20 years, including $1.2 trillion in capital investment (eight fold increase in spending from $17 per capita per year today to $134)

— Make Tier 1 and Tier 2 cities near self-sufficient (around 80-85 percent) through monetizing land assets, maximizing property tax collections, recovering O&M costs through user charges, and pushing for greater leveraging of debt and private participation

— Create a sufficiently funded grant system from state and central governments by tripling annual JNNURM allocation in the short term and sharing 18-20 percent of GST with cities in the medium term

— Give an additional support to weaker Tier 3 and 4 cities from the central and state governments of at least $20 per capita per year

— Distribute government grant and land revenues equally between municipal and metropolitan authorities

— Create the enabling mechanisms such as a "ring-fenced" city development fund, an effective accounting system and a vibrant municipal bond market

2. Governance

— Devolve real power to cities by implementing the 74th constitutional amendment in full

— Institutionalize metropolitan structures for at least 20 urban agglomerations with multiple municipalities

— Implement the modified mayor-commissioner system in at least 35 to 40 cities

— Allow for directly elected mayor for metropolitan areas in the medium term; rely on metropolitan authorities in the short term under the Metropolitan Planning Committee (MPC)

— Modernize service delivery structures, including corporatization of select municipal functions and leveraging targeted private sector participation

— Improve local government capacity through creating a new city cadre and allowing lateral hires from the private sector

— Drive transparency and accountability in city government through city charters, MOUs between mayors and agencies and through a state-level urban regulator

3. Planning

— Devolve the planning function to local governments by empowering MPCs to create statutory metropolitan plans and transferring local urban planning powers to municipalities

— Execute an integrated, cascaded planning system consisting of 20 year master plans at metropolitan and municipal levels containing calculations of predicted population, GDP, required transportation, affordable housing and other urban infrastructure as well as land use and FAR norms

— Create well-resourced planning organizations at metropolitan and municipal levels and innovate with latest planning technologies and models

— Create tight execution and enforcement mechanisms for city plans with a transparent system for exemptions and sufficient public participation

— Build sufficient urban planning capacity by building six to eight world-class urban-planning institutes to train 3,000 to 4,000 planners annually

4. Sectoral policies: Affordable housing and climate-change mitigation

Affordable housing

— Encourage metropolitan governments and municipalities to plan for affordable housing and allocate land dedicated for this purpose

— Mandate 25 percent area for affordable houses in new developments above an acre, with associated incentives

— Offer a basket of incentives (additional FAR of up to 1, capital grant, utilization of 5 percent incentive area for commercial use, interest rate subsidies and favorable tax regime) to developers and state housing boards to trigger new affordable units and slum redevelopment

— Create flexible affordable housing solutions with 30 percent rentals and 5 to 10 percent dormitories

— Create a national mortgage guarantee fund to spur lending to low-income groups with an initial corpus of 15 billion rupees and capital adequacy ratio of 12 to 15 percent

— Consider creating a corporatized agency for affordable housing within metropolitan authorities and rental management companies to operate and maintain rental stock

Climate-change mitigation

— Reduce vehicle emissions by nearly 100 million tonnes of CO_2 equivalent through greater use of public transportation, improving vehicle efficiency, and use of electric vehicles

— Reduce emissions by nearly 310 million tonnes CO_2e by reducing energy consumption in buildings, appliances, lamps and street lights

— Improve city design to develop energy-efficient clusters to abate nearly 30 million tonnes CO_2e

5. Shape

— Facilitate distributed urbanization

— Renew Tier 1 cities through a substantial new capital investment program of $288 per capita annually

— Preemptively shape the trajectory of the largest Tier 2 cities, through $133 per capita investments a year

— Nurture top 100 specialist cities focused on sectors such as tourism and manufacturing through a capital investment program of $96 per capita a year

— Raise the quality of life to at least a basic standard in smaller Tier 3 and 4 cities through minimum government support of $20 per capita per year

— Facilitate 20 to 25 new cities near the largest 20 metropolitan areas by providing adequate infrastructure such as water, electricity and transportation links

— Seed future urbanization by building 19 transportation corridors linking Tier 1 and Tier 2 cities

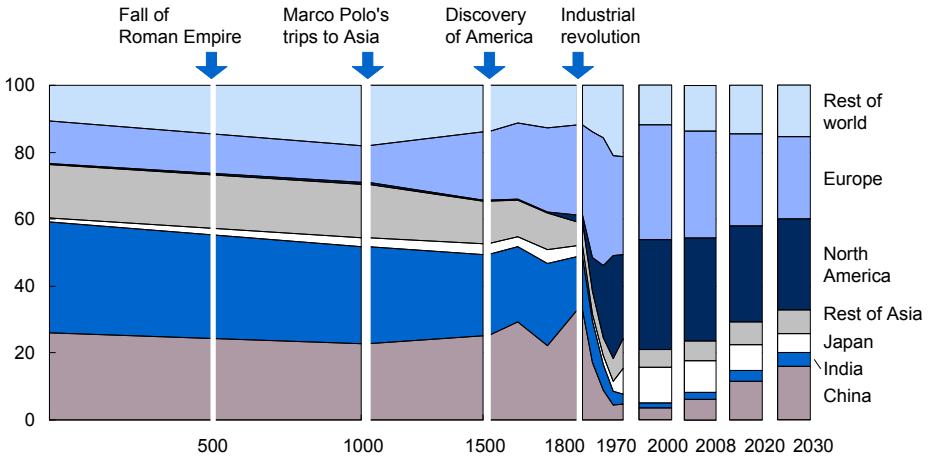
Appendix A: Comparing urbanization in China and India

The economic rise of the developing world is emphatically under way and driving a wave of global urban expansion. At the heart of this story is the spectacular renaissance that we are seeing in Asia, with China and India at its vanguard in returning to the global prominence they played before the European and North American industrial revolution (Exhibit A.1).

Exhibit A.1

Asia's economic renaissance is well under way

Share of total world GDP
%



SOURCE: Angus Maddison, *Historical Statistics for the World Economy: 1-2003 AD*; Global Insight; McKinsey Global Institute analysis

Underpinning this economic renaissance is a wave of global urban expansion. In both economies, urbanization is unfolding on a huge scale and with unprecedented pace. The scale benefits, network effects, and superior productivity of dense population centers mean that urbanization has very significant economic consequences for both nations and potentially large opportunities for businesses.

In this appendix, we take a comparative look at urbanization trends in both countries, drawing out both similarities and differences, and discussing some of the implications for businesses looking to capitalize on the rich potential of these expanding urban markets.[8]

8 The period used for these comparisons between India and China are for 2005 to 2025 because *Preparing for China's urban billion*, McKinsey Global Institute, March 2009 (www.mckinsey.com/mgi) forecast only to 2025.

INDIA AND CHINA TOGETHER ARE AT THE CENTER OF A NEW ERA OF URBANIZATION

The share of the global population living in cities surpassed 50 percent in 2008, according to the United Nations. Urban populations around the world have grown nearly 1.6 times more than rural populations since 1950, driven both by migration from the countryside to cities and higher organic growth in urban populations. Between 2005 and 2025, the global urban population will swell by 1.6 billion.

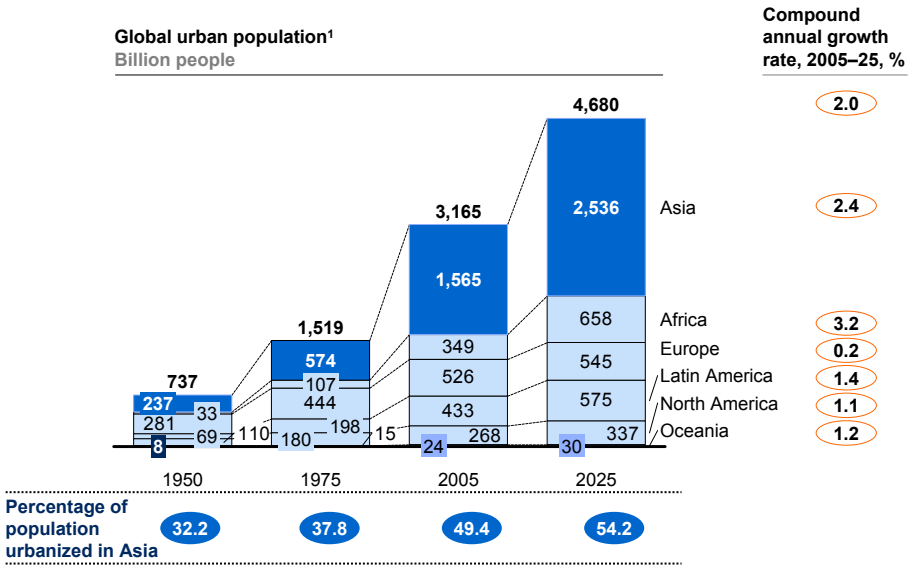
The cities of developing countries will account for nearly 95 percent of this growth. Economies in Asia (and Africa) still have a majority of their populations living in rural areas. At the same time, the proportion of the population living in cities in the developed world, especially North America and Europe, is likely to remain static.

Asia is driving today's wave of global urbanization

The urban expansion that we project in Asia will be nearly 30 times as large as the urbanization that unfolded over half a century ago in the United States—and will take place in less than 20 years. By 2025, nearly 2.5 billion Asians will live in cities, accounting for almost 54 percent of the world's urban population (Exhibit A.2).

Exhibit A.2

Asia will lead the growth in global urbanization



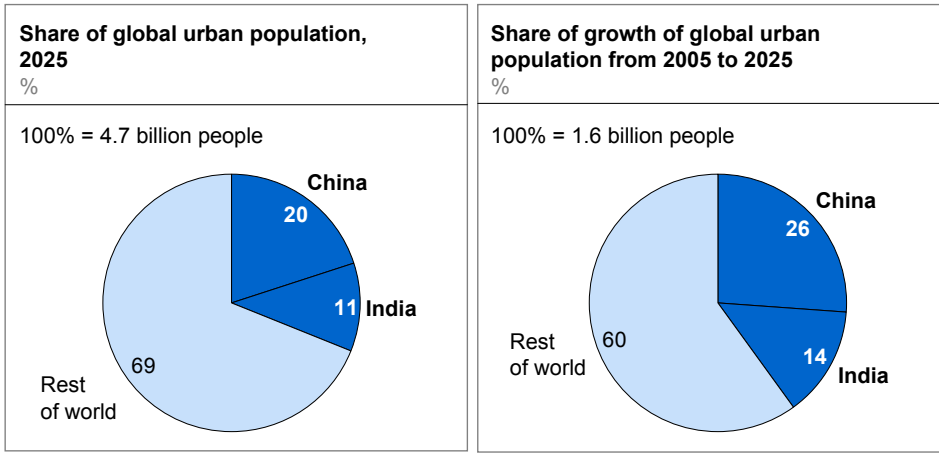
1 Asia's urban population in 2025 is based on MGI estimates for India and China and UN estimates for the rest of Asia.
SOURCE: United Nations; McKinsey Global Institute analysis

India and China are at the forefront of Asia's urbanization

India and China alone will account for more than 62 percent of the overall growth of urban populations in Asia and a 40 percent share of global urban population growth from 2005 to 2025 (Exhibit A.3). China will have the world's largest urban population at triple the size of that of the United States; India's urban population will be double that of the United States.

Exhibit A.3

India and China will account for 40 percent of urban population growth from 2005 to 2025



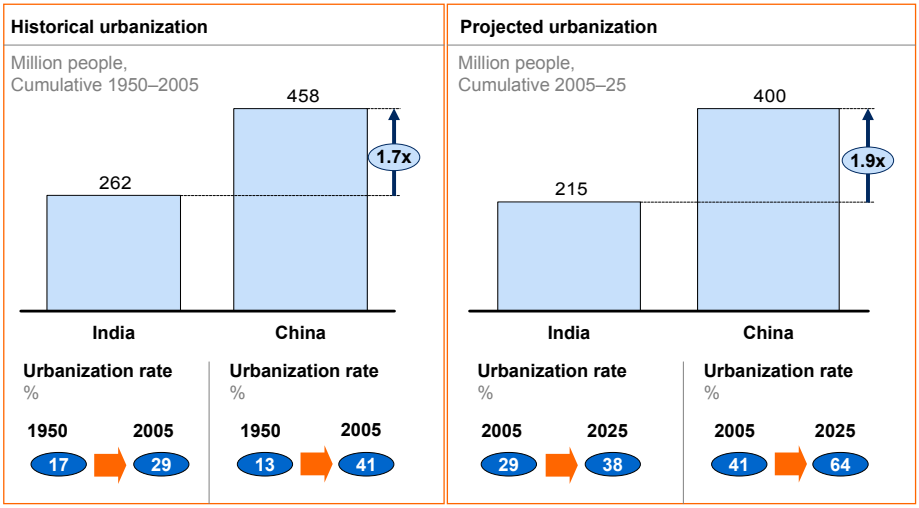
1 India and China urban population for 2025 are based on MGI estimates; rest of world based on UN estimates.
SOURCE: United Nations, World Urbanization Prospects 2007

CHINA IS URBANIZING MORE RAPIDLY THAN INDIA WITH A MORE SYSTEMATIC APPROACH

The scale of urbanization for both countries is far greater than we have seen in any other economy. Never before in history have two of the largest nations in terms of population urbanized at the same time. India and China have already urbanized at a significant speed since the 1970s (see box 12, "Urbanization definitions"). However, China's urban expansion has clearly outpaced India's despite the fact that China had started with a lower proportion of its population living in cities than India (Exhibit A.4).

Exhibit A.4

China's urbanization has outpaced that of India



SOURCE: World Urbanization Prospects 2007, United Nations; India Urbanization Econometric Model; McKinsey Global Institute China All City Model

In our base case, MGI projects that on average China's urban population will increase by 20 million annually from 2005 to 2025, compared with nearly 11 million for India.[9]

Box 12. Urbanization definitions

Definitions of urbanization differ significantly for each country, and the fact that there is no single definition of urbanization makes comparisons difficult. For the purposes of this report, we have taken India and China's own definitions of urbanization with adjustments to data to make the comparison more consistent. We believe that this approach gives us a more accurate picture of the actual state of urbanization in India and China than published estimates based on a "common" definition of urbanization. Even though there are commonly known problems with cross-country comparisons and aggregation using different country definitions, there are also legitimate factors for using differing definitions. Countries have historically adjusted their urbanization definitions to more accurately reflect the "true picture" of each country's unique urban and rural characteristics. For example, in the case of China, definitions were updated in 2000 to incorporate common components used in international definitions of urban (e.g., population density, urban contiguity) as well as such practical issues as ease of data collection. Common definitions, despite using same criteria, can fail to capture such characteristics and thus not provide a realistic picture of each country.

Urbanization for India uses a combination of population, density, and employment thresholds and results in a narrower definition than tends to be the case around the world. India classifies as urban an area with a population of more than 5,000, a density exceeding 400 persons per square kilometer, and 75 percent of its male workers in a nonagricultural profession. State governments also have the flexibility to declare an area as an urban territory for administrative purposes.

China uses a higher density definition of urbanization than India. China bases its definition of urban on density and a particular geography. China defines urban areas as those areas with population densities of more than 1,500 people per square kilometer. In addition, for areas whose population density is less than 1,500 people, China also includes streets, towns, and townships where the district or city government is located, and resident/village committees where the town government is located.

The most commonly cited population data set for city and urban population data is the *World Population Prospects* of the United Nations' Population Division. The UN compiles information on urbanization through questionnaires that countries report to the UN using their own country-specific definitions, and it makes the data readily available through updates every two years. Other data sets combine geo-referenced data with population databases to determine urban populations. Among them are the Gridded Population of the World database, LandScan Global Population database, and the Global Rural-Urban Mapping Project (GRUMP).

9 Details of the base cases for each country include 7.4 percent GDP growth for India and 6.8 percent GDP growth for China from 2008 to 2030. MGI bases its projections for GDP growth rates on assumptions about economic policies and investments that in turn create demand, and increases output and jobs where GDP growth is a consequence. China's 6.8 percent GDP growth rate reflects dated estimates when MGI published *Preparing for China's urban billion* in March 2009. Latest MGI estimates for China's GDP growth are 7.6 percent from 2008 to 2030. For a full discussion of China's urbanization and related assumptions, see *Preparing for China's urban billion*, McKinsey Global Institute, March 2009 (www.mckinsey.com).

Based on findings from the 2007 revision of the UN's *World Population Prospects* report, China is more urbanized than India, and most other urbanization data sets support that finding. GRUMP, which a February 2010 study by the World Institute for Development Economics Research of the United Nations University (UNU-WIDER) considered to be the most promising alternative database, also finds China to be more urbanized than India.[10] As of 2000, the United Nations estimates China's urban population share to be 36.7 percent and India's to be 27.9 percent. GRUMP, in comparison, estimates China's urbanization to be lower at 34.2 percent and India's urbanization higher at 32.6 percent. The differences are meaningful, but China's share of urban population is still higher than India's.

The results of MGI's calculations of urban population share are similar to results published in the 2007 World Development Indicators report, which based urbanization rates on the midyear population of areas defined as urban in each country and reported to the United Nations. However, the World Bank has also compared urbanization using a common definition called the agglomeration index, based on three factors: population density; the population of a "large" urban center; and travel time to that large urban center. Using that measure, India is actually more "urbanized" than China, 52 percent to 36 percent for 2006. This outcome likely reflects the greater density of India overall and is in contrast to India's larger share of the workforce employed in agriculture.

China's urban population will be larger, but India's urban population will be younger

Based on current trends, MGI projects that China's urban population will total 930 million in 2025, which is significantly larger than India's 530 million in the same year (Exhibit A.5).[11] However, India's total population is projected to overtake that of China within two decades as the result of contrasting demographic trends. China will be grappling with the burden of an older population. By 2025, nearly 28 percent of the Chinese population is expected to be ages 55 or older, compared with only 16 percent in India. India's population will be growing more quickly—and have a younger age profile. This relatively youthful population will see India potentially adding almost 170 million workers to its labor force from 2005 to 2025, compared with an estimated increase of nearly 50 million in China's workforce over that period (Exhibit A.6).

Over the longer term, India's economy could benefit significantly from its relatively young and fast-growing population if India can manage its urban expansion in a way that optimizes the productivity and GDP potential of its cities. If India pulls this off, it could reap a "demographic dividend" that supports long-term rapid economic growth. However, if India mishandles its urban expansion, the demographic dividend could

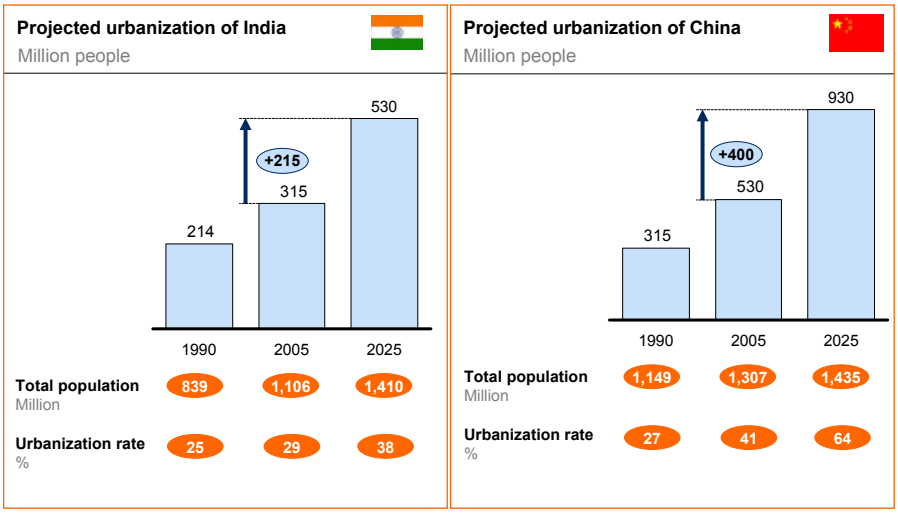
10 *Urban Settlement*, United Nations University, World Institute for Development Economic Research, February 2010.

11 In *Preparing for China's urban billion*, MGI analyzed four possible shapes of urbanization. Two of these envisaged concentrated growth patterns. In a "supercities" scenario, a small number of very large cities—with populations of 20 million or more—could emerge. Under a "hub and spoke" scenario, clusters of medium-sized and small cities could develop around larger ones. Two other patterns would see dispersed growth. Under a "distributed growth" scenario, a large number of cities with populations of 1.5 million to 5 million could spread throughout China. Under a "townization" scenario, many smaller cities—with populations of 500,000 to 1.5 million—could be the model.

turn into a "demographic debt." It is therefore critical that India remove remaining barriers to growth and maximize growth to create sufficient jobs for its citizens.[12]

Exhibit A.5

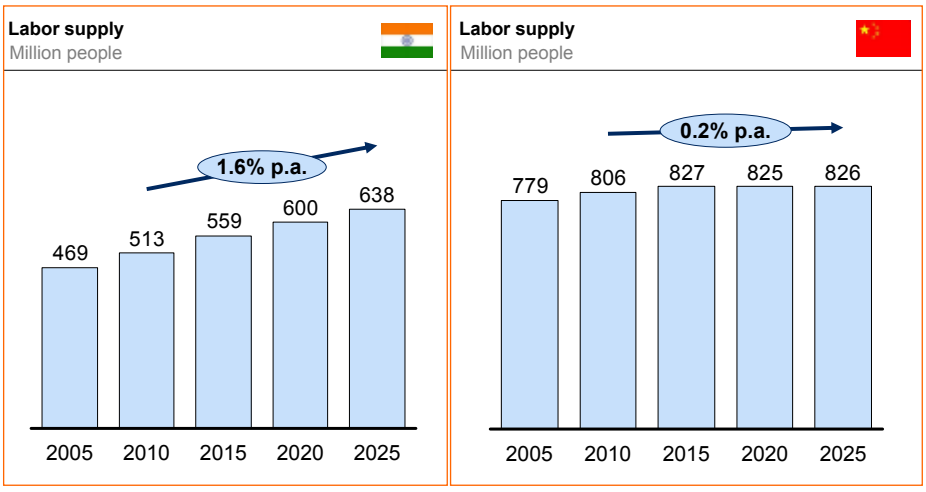
China is more urbanized than India today and will urbanize more quickly



SOURCE: India Urbanization Econometric Model; McKinsey Global Institute China All City Model

Exhibit A.6

India's labor supply is projected to grow at a much more rapid rate than China's



SOURCE: India Urbanization Econometric Model; McKinsey Global Institute China All City Model

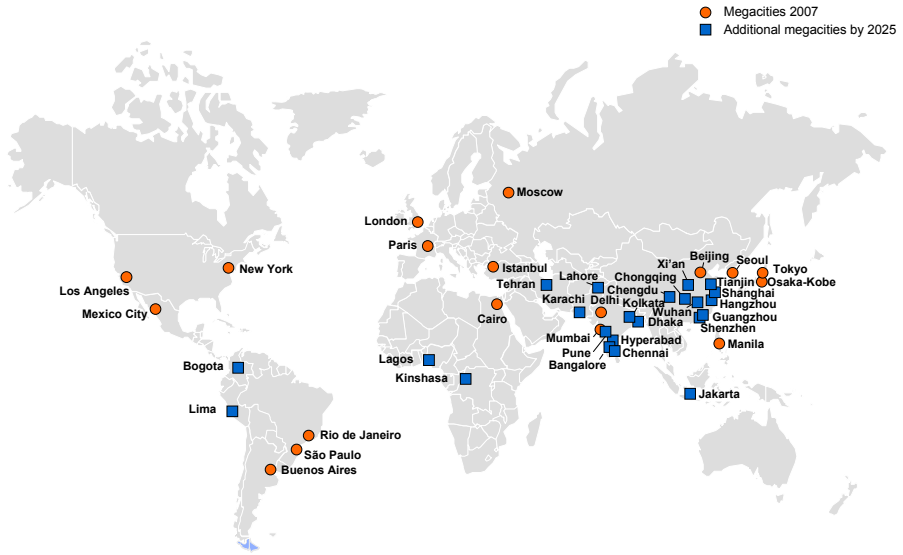
12 *India: The growth imperative*, McKinsey Global Institute, September 2001 (www.mckinsey.com/mgi).

China will have more large cities than India

Around the world, the number of megacities—cities with more than 10 million inhabitants—will at least double over 10 to 20 years, and developing country megacities will start to dominate the megacity size rankings. In 2025, Western megacities such as New York, Los Angeles, London, Paris, and Moscow will remain on the list of megacities alongside the megacities of developed Asian economies that will include Tokyo, Osaka-Kobe, and Seoul. But the dynamic new development will be the attainment of megacity status of cities in India and China that are unfamiliar names today. In China, Chengdu, Hangzhou, Xi'an, and Chongqing will have become megacities by 2025. In India, cities such as Bangalore and Pune will become megacities (Exhibit A.7).

Exhibit A.7

Globally, the number of megacities will double over the next 10 to 20 years[1]

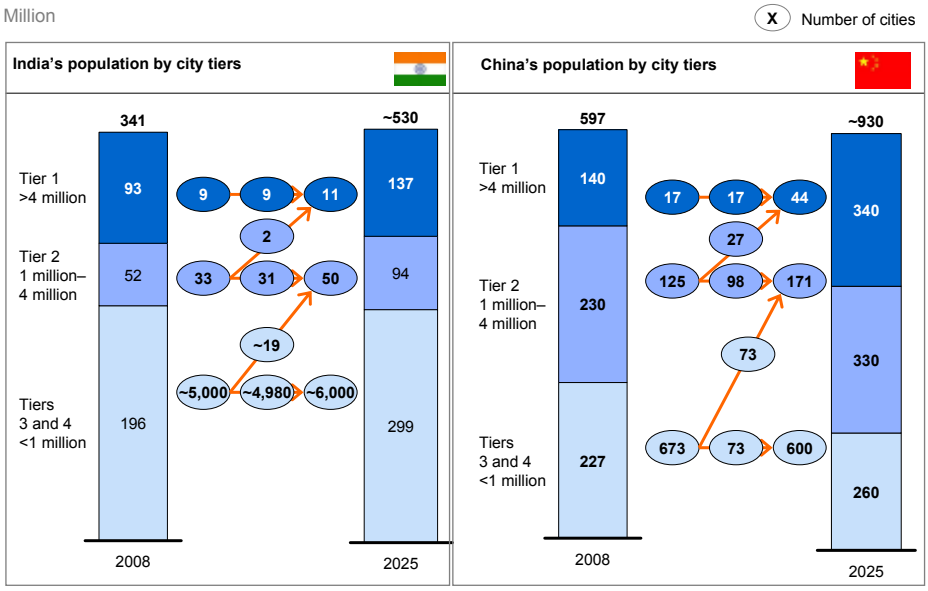


1 Defined as cities with at least 10 million inhabitants.
2 Most recent available data.
SOURCE: World Urbanization Prospects 2007, United Nations; McKinsey Global Institute China All City Model; McKinsey Global Institute analysis

By 2025, more than 35 percent of the Chinese urban population could live in 44 Tier 1 cities (with populations over 4 million), a similar percentage in 171 Tier 2 cities (with populations from 1 million to 4 million), and the rest in many Tier 3 and 4 cities (with populations of less than 1 million). In India, more than 25 percent of the urban population could live in 11 Tier 1 cities, 18 percent in 50 Tier 2 cities, and the rest in Tier 3 and 4 cities (Exhibit A.8).

Exhibit A.8

India and China are both moving toward unprecedented urban populations



SOURCE: India Urbanization Econometric Model; Census 2001; McKinsey Global Institute China All City Model, January 2010; McKinsey Global Institute analysis

China has a more proactive, methodical, and systematic approach to urbanization than India

The most significant difference between the urbanization paths of India and China has been China's deliberate and systematic effort to manage its urbanization, to ensure the sustainability of rapid economic growth and improvement in quality of life. While India has barely paid attention to its urban transformation, China has developed a set of internally consistent and effective practices across every element of the urbanization operating model: funding, governance, planning, sectoral policies, and shape.

Where India has underinvested in its cities, China has invested ahead of demand and given its cities the freedom to raise substantial investment resources by monetizing land assets and retaining a 25 percent share of value added and income taxes. While Indian cities have devolved little real power and accountability to the cities, China's major cities have powerful and empowered political appointees as mayors. While India still runs services in Indian cities out of city government departments, China has experimented with innovative delivery models including the use of corporatized agencies and special-purpose vehicles. While India's urban planning system has failed to address competing demands for space, China has a mature urban planning regime that emphasizes the systematic redevelopment of run-down areas consistent with long-range plans for land use and transportation. Where India has paid little attention to shaping its overall portfolio of cities, China's urbanization had a early focus on the dynamic coastal cities, with the result that these cities now deliver higher than national growth averages. This is the starkest contrast between the two countries: China, that has embraced and shaped urbanization, and India, which is still waking up to its urban reality and its inherent opportunities.

URBANIZATION IN THE TWO COUNTRIES WILL UNLOCK LARGE NEW BUSINESS OPPORTUNITIES

Both China and India are seeing the emergence of large middle classes, focused particularly in their cities. These income groups have the potential to offer international

businesses vital new growth markets. These middle-class income groups are set to become significantly larger, fueling demand for increasingly sophisticated products and services and increasing expectations for better infrastructure.

Per capita GDP will increase significantly in both countries

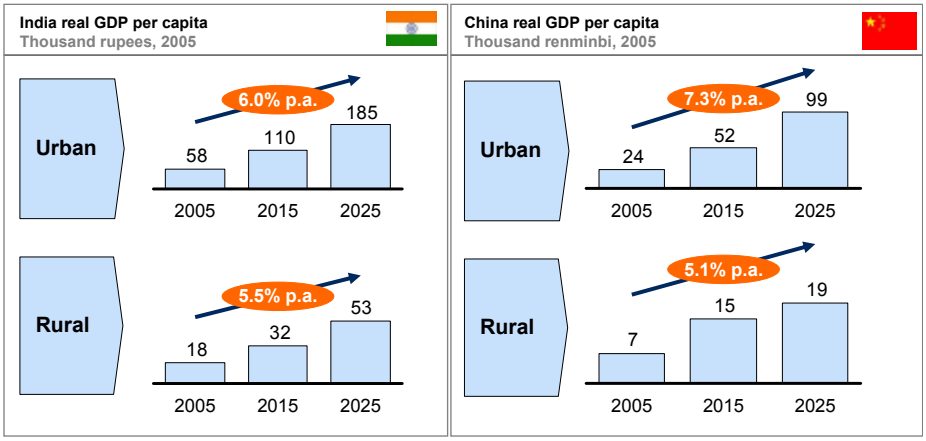
In both China and India, our base-case models show that per capita urban GDP will grow much more rapidly than per capita GDP in rural areas. In India, urban per capita GDP will grow at a rate of 6 percent per year from 2005 to 2025 and, at the end of this period, be 3.5 times as high as rural per capita GDP. In China, urban per capita GDP will grow at 7.3 percent per year in the same period to stand 5.2 times as high as rural per capita GDP (Exhibit A.9). India's urban per capita income will grow at 6.5 percent a year from 2005 to 2025, while China's urban per capita income will grow at an annual rate of 5.9 percent over the same period.

For businesses, the significant increase in per capita urban incomes projected by MGI in both China and India offers the potential of vibrant new consumer markets to serve.[13]

Today, private consumption plays a larger role in India's economy than it does in China, accounting for 60 percent of GDP in 2005, a level similar to the United States and Japan. In comparison, China's consumption share of GDP was only 39 percent in 2005 (Exhibit A.10). However, courtesy of its much larger population, private consumption in China is almost double that of India in dollar terms.

Exhibit A.9

Urban GDP per capita growth is expected to increase significantly compared with rural per capita GDP



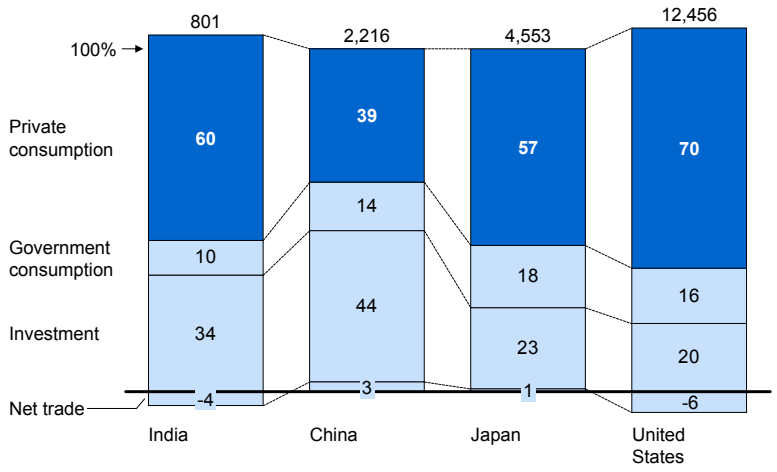
SOURCE: India Urbanization Model; McKinsey Global Institute China All City Model, January 2010; McKinsey Global Institute analysis

13 For MGI research on the consumer outlook for India and China, see *The 'Bird of Gold': The rise of India's consumer market*, May 2007; *From 'Made in China' to 'Sold in China': The rise of the Chinese urban consumer*, November 2006; and *If you've got it, spend it: Unleashing the Chinese consumer*, August 2009. All reports can be downloaded at www.mckinsey.com/mgi.

Exhibit A.10

India's consumption share of GDP is closer to those of Japan and the United States than it is to China's share

Composition of GDP
%, $ billion, nominal, 2005



Note: Numbers may not sum due to rounding.
SOURCE: Global Insight; McKinsey Global Institute

In India, the shape of the country's income pyramid has changed dramatically during the past two decades and will evolve even more significantly. In just one decade—from 1995 to 2005—nearly 14 million households have joined its middle class. MGI finds that the number of urban households with "true" discretionary spending power in India could potentially increase sevenfold, from 13 million households in 2005 to 89 million households in 2025. As a result, consumption driven by "choice" instead of "need" will grow significantly. India's wealthiest segment in cities, defined as earning more than 1 million rupees a year, could number 11 million households, more than the total number of households in Australia.[14]

Meanwhile, MGI projects that China's urban middle-class households could increase by more than fourfold, from 55 million households in 2005 to nearly 280 million households in 2025.[15] By 2025, this group could represent more than 75 percent of China's urban households.

Increases in incomes will significantly raise demand across all consumption sectors

On the back of robust increases in per capita GDP, aggregate urban consumption in India has the potential to increase nearly sixfold from 2005 to 2025—outstripped only by China, whose consumption could rise more than sevenfold.

14 The number of households with discretionary spending power includes both middle class and wealthy segments categorized as globals. We define "middle class" as households earning from 200,000 rupees to 1 million rupees per year, and globals as households earning more than 1 million per year. All figures are from the updated model based on the original Bird of Gold model.

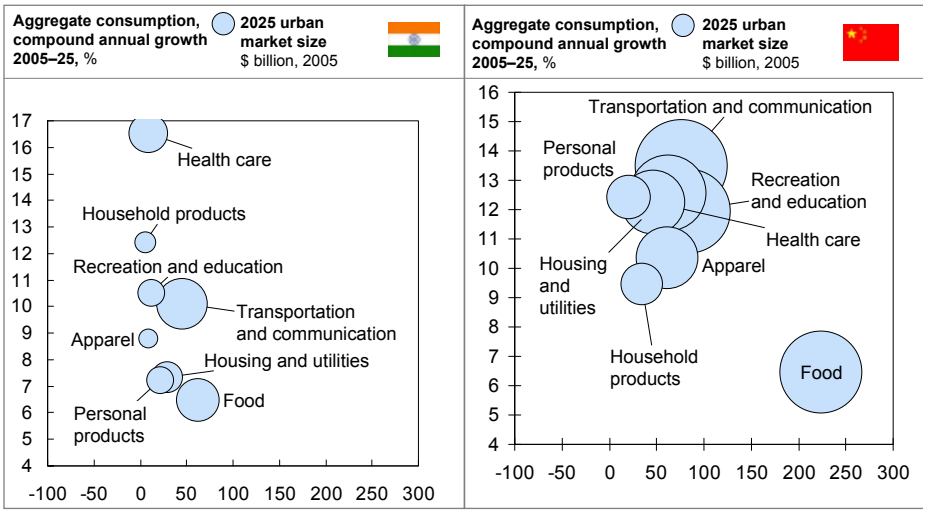
15 Figures are based on updated McKinsey Insights China January 2010 model, which defines "middle class" as earning greater than 45,000 real renminbi and less than 171,000 real renminbi (2005 base year). For more research on the Chinese urban consumer, see *From 'Made in China' to 'Sold in China': The rise of the Chinese urban consumer*, November 2006 (www.mckinsey.com/mgi).

Prior MGI analysis finds that consumption in India could soar across categories, with nearly 70 percent of all consumption coming from discretionary spending by 2025.[16] As India's middle class expands, the share of wallet spent on food and other basic necessities will fall as discretionary spending rises.

Today, the largest categories in terms of market size in Indian cities are food, transportation and communication, housing and utilities, and personal products (Exhibit A.11). In the future, MGI finds that categories including health care, household products, recreation and education, and transportation and communication will be the fastest-growing consumption categories in cities.

Exhibit A.11

Businesses analyzing consumption at the granular level will see that the evolution of consumption categories will vary between India and China



SOURCE: India Urbanization Model; McKinsey Global Institute China All City Model, January 2010; McKinsey Global Institute analysis

In 2025, the largest markets in India will be transportation and communication, food, and health care, followed by housing and utilities, and recreation and education. Even India's slower growing spending categories will represent significant opportunities for businesses because these markets will still be growing rapidly in comparison with their counterparts in other parts of the world. Indeed, India's relative share of world markets will rise in virtually every product and service category.

In China's cities today, the largest consumption categories are food, recreation and education, transportation and communication, housing and utilities, apparel, health care, and household products. The fastest-growing categories are likely to be transportation and communication, housing and utilities, personal products, health care, and recreation and education. Growth in discretionary items will be most noticeable.

Urban infrastructure needs in India and China will be immense

Both India and China will need to expand and build infrastructure on a grand scale to meet the needs of their surging urban populations. This is a significant market opportunity for international firms. From 2002 to 2007, India invested about 5.7 percent of its GDP on infrastructure to China's 9.3 percent. Over the next

16 We base this figure on prior research on Indian consumption; see *The 'Bird of Gold': The rise of India's consumer market*, McKinsey Global Institute, May 2007 (www.mckinsey.com/mgi).

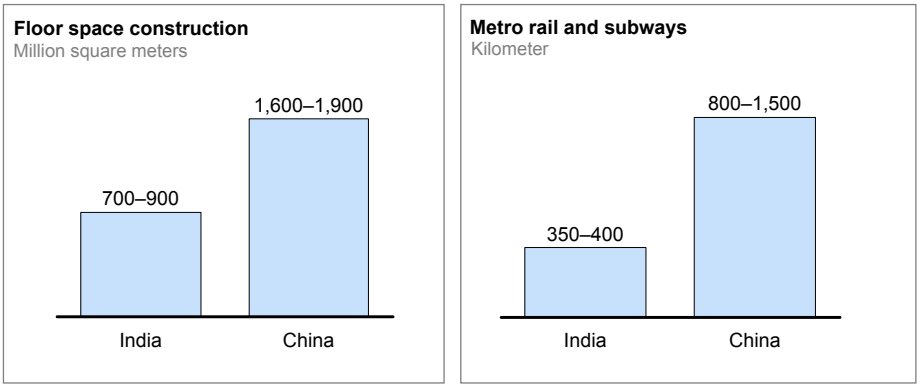
20 years, both countries will need to at least maintain, and, most likely, materially increase this level of infrastructure spending to meet the challenge of urbanization. We should note that India lags far behind China in terms of its stock of capacity because of years of chronic underinvestment. In 2007, India made urban capital investments of only $17 in per capita terms compared with $116 in China.

Take impending demand for residential and nonresidential space. Depending on which urbanization planning scenarios each country pursues, India could potentially need to build 700 million to 900 million square meters of new residential and commercial space every year for the next 20 years, compared with 1.6 billion to 1.9 billion square meters per year for China. Or take metro railways and subways as an example. India could potentially have to construct nearly 350 to 400 kilometers of new metro railways and subways per year, while China may need to construct nearly 800 to 1,500 kilometers per year (Exhibit A.12).

Exhibit A.12

Urban infrastructure requirements will be huge in both India and China

Annual new demand requirements[1]



1 Annual demand requirement estimates differ based on choice of urbanization scenarios by each country.

SOURCE: National Bureau of Statistics, China City Yearbook 2006, McKinsey Global Institute China All City Model; China Urban Statistical Yearbook; Urban Statistical Yearbook 2006; India Urban Satellite Model; McKinsey Global Institute analysis

□ □ □

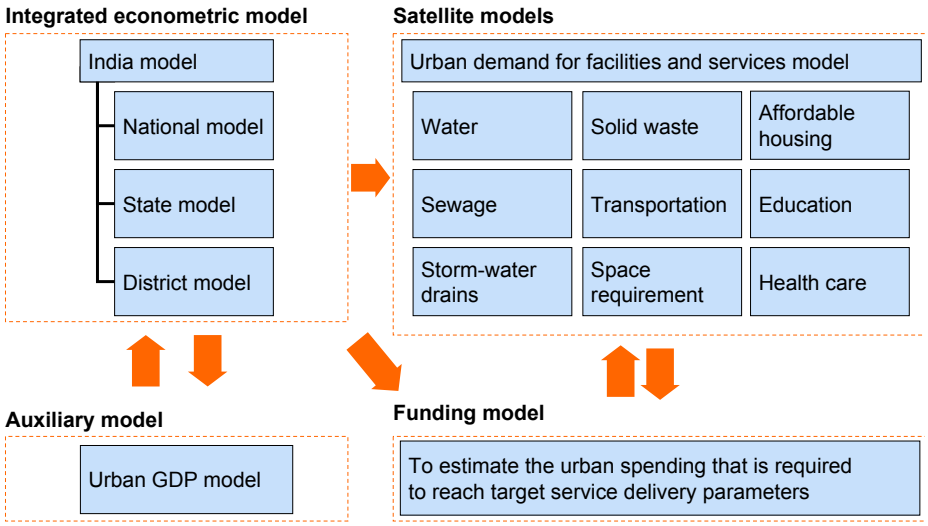
The world has a stake in the rapid urbanization of India and China, which will define the contours and characteristics of the world's urban population and present compelling new experience and lessons for cities everywhere. At the same time, investors and businesses should prepare themselves to address the dynamic new opportunities that this massive transformation of the two most populous countries in the world will unlock.

Appendix B: Methodology

MGI and McKinsey in India constructed a series of models for the purposes of making the forecasts used in this report. We built an integrated econometric model (at national, state, and district levels); nine satellite models (water, sewage, solid-waste, storm-water drains, transportation, space requirement, affordable housing, education, and health care) to estimate demand for facilities and services; a funding model to estimate urban spending requirements; and an additional auxiliary model to estimate urban GDP (Exhibit B.1). In this appendix, we will describe each of the most critical models for this report.

Exhibit B.1

McKinsey Global Institute's India model system



SOURCE: India Urbanization Model System; McKinsey Global Institute analysis

1. INDIA ECONOMETRIC MODEL

Many of the findings described in this report are based on our analysis of the outputs of our proprietary econometric model, which we built on a historical database that integrates data at the national, state, and district levels. This appendix provides an overview of the econometric modeling approach and our data sources. Many of the techniques and approaches are similar to those MGI used in its 2007 report on Indian consumption and we refer to that report in this appendix where relevant.[17]

17 *The 'Bird of Gold': The rise of India's consumer market*, McKinsey Global Institute, May 2007.

We divide this section into five topics:

- **Econometric model overview** examines the three main models—how they are linked together and key points of difference
- **Macroeconomic context** provides the background and relevant detail for the discussion of the state and district models
- **State model** explains how we applied and structured the state-level model
- **District model** explains the structure and approach of the district model
- **Data sources and methodology** describes the various data sources and applications within the model

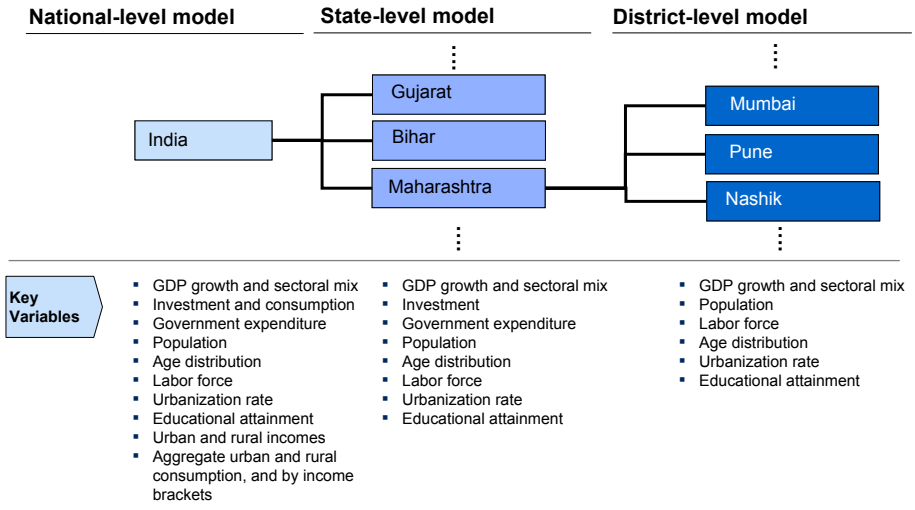
1.1 ECONOMETRIC MODEL OVERVIEW

The India Urbanization Econometric Model is actually a collection of three linked models built onto the base of the Bird of Gold model from 2007. The urbanization model updates the 2007 model and contains separate state-level and district-level models (Exhibit B.2).

Exhibit B.2

We have developed an integrated econometric model at the national, state, and district levels

Integrated econometric models



SOURCE: India Urbanization Econometric Model; McKinsey Global Institute analysis

We applied a "top-down" approach to building these models that has allowed us to anchor our analysis in a broad macroeconomic context. We first set the path for national GDP and its components, demographic trends, prices, and other key variables. We then constrained state-level variables, such as GDP and urban population, and adjusted them to be consistent with national aggregates. This ensures that the overall context is reflected first in the state-level model, and then in the district-level model.

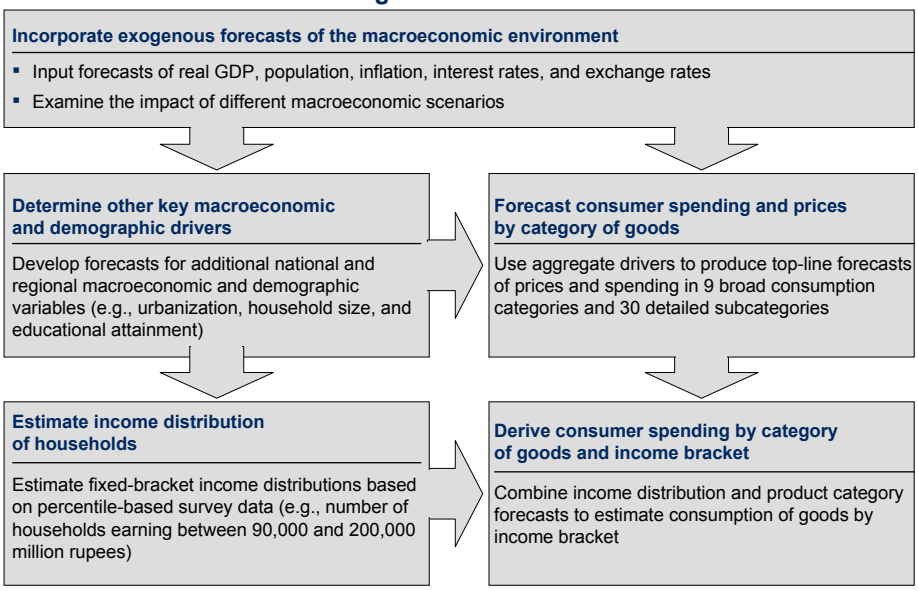
During this process, we updated the 2007 Bird of Gold model with more recent macroeconomic data as well as the latest income and consumption survey data (Exhibit B.3). We also incorporated an updated perspective on the macroeconomy

reflecting the impact of the recent global economic downturn. The essential conclusions from our work using the 2007 Bird of Gold model remained unchanged. However, the updating exercise has illuminated some relevant changes that we believe are important to our work in urbanization. We highlight a few aspects below:

- India's middle class will emerge sooner. By 2012, the so-called seeker class (households earning 200,000 to 500,000 rupees per annum) will be the single largest income class, and the middle class will constitute half of all households by 2015.
- Urban areas will have higher concentrations of better educated and smaller households. Higher educational attainment will increase five times as fast in urban households as it will in rural households, and incomes will rise more rapidly, leading to smaller households.

Exhibit B.3

MGI developed national-level sociodemographic implications of Oxford Economics' base outlook through the Bird of Gold's five-block structure



SOURCE: India Urbanization Econometric Model

The national-level model also provides the macroeconomic as well as the socio-demographic drivers—including urbanization, education levels, and government finance—necessary to develop a perspective about the evolution of the individual states.

The state model covers all 24 of India's major states, in addition to two regional estimates of the North-Eastern states and three Union territories. The North-Eastern region covers the eight North-Eastern states; we treat the three Union territories of Lakshadweep, Dadra and Nagar Haveli, and Daman and Diu as a residual. Limitations with the underlying data including data quality and volatility drove the decision to model the North-Eastern region and the Union territories as two distinct and separate blocks.

The state-level perspective on the evolution of economic and socio-demographic factors informs the evolution of these factors in the district model. The district-level model covers 75 of the 626 districts in India today. These 75 districts cover 66 cities in

India in each of the top three tiers. We chose these cities primarily on the basis of their economic and demographic importance (Exhibit B.4).

Exhibit B.4

MGI modeled India's top 66 cities for the purposes of the research

Tier 1 cities

1. Mumbai (MMR)
2. Kolkata
3. Delhi (NCT)
4. Chennai
5. Hyderabad
6. Bangalore
7. Ahmadabad
8. Pune

Tier 2 cities

1. Surat
2. Kanpur
3. Nagpur
4. Lucknow
5. Jaipur
6. Coimbatore
7. Kochi
8. Vadodara
9. Indore
10. Ludhiana
11. Visakhapatnam
12. Madurai
13. Bhopal
14. Patna
15. Nasik
16. Agra
17. Asansole
18. Varanasi
19. Rajkot
20. Vijayawada
21. Meerut
22. Jamshedpur
23. Thiruvananthapuram
24. Jabalpur
25. Dhanbad
26. Kozhikode

Tier 3 cities

1. Tiruchirapalli
2. Amritsar
3. Faridabad
4. Aurangabad
5. Durg Bhilai
6. Allahabad
7. Ghaziabad
8. Chandigarh
9. Guwahati
10. Salem
11. Mysore
12. Ranchi
13. Gwalior
14. Jodhpur
15. Raipur
16. Bhubaneswar
17. Puducherry
18. Jalandhar
19. Bareilly
20. Cuttack
21. Kota
22. Warangal
23. Jamnagar
24. Aligarh
25. Moradabad
26. Mangalore
27. Gorakhpur
28. Bhavnagar
29. Dehradun
30. Goa
31. Thanjavur
32. Belgaum

SOURCE: India Urbanization Econometric Model; McKinsey Global Institute analysis

1.2 MACROECONOMIC CONTEXT

The structure of the national model remains unchanged from the 2007 Bird of Gold work, but recent macroeconomic developments and the evolving outlook are new. In this section we discuss the current outlook and the impact on main drivers of state- and district-level activity.

Our forecasts of the distribution of state and district growth in India take as exogenous the evolution of the macroeconomy. The primary source for our macroeconomic projections is Oxford Economics (OE). OE projections are developed using its proprietary Global Model, made up of 24 industrialized-country models; 20 emerging-market country models (of which India is one); six trading blocs providing top-line macroeconomic variables for an additional 39 countries; and a world bloc.

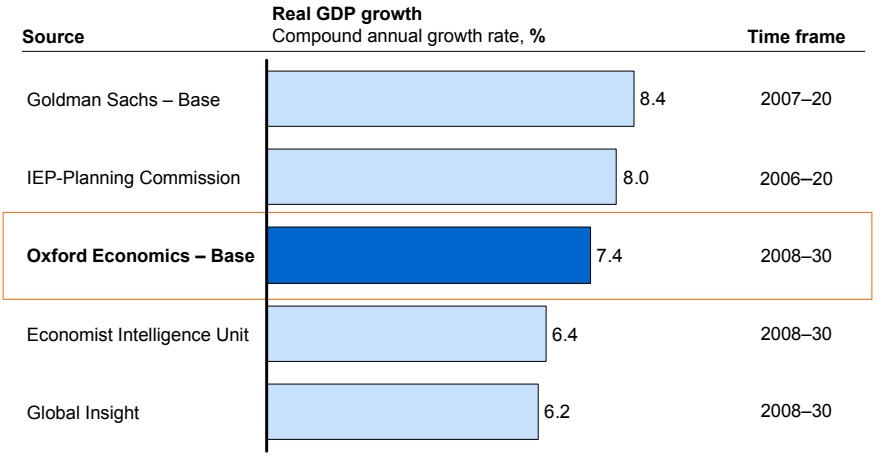
The country models interlink fully via trade, prices, exchange rates, and interest rates and, taken together with the other blocs, provide world coverage. OE offers a ten-year projection with a quarterly frequency, providing us with input through 2018 (2017 on an Indian fiscal-year basis). MGI then developed a trend extension of OE's GDP forecasts through 2035 and validated certain aspects of the forecast by means of our own data and perspective.

Using OE as an input, we assume in our base case that India will continue to grow at an annual rate of 7.4 percent through 2030 (assuming a growth rate of 8.0 percent between 2009 and 2018, stabilizing to 7.0 percent between 2018 and 2030). This seems middle of the range with other known long-term estimates (Exhibit B.5). In the short to medium term, the rate of GDP growth is expected to reach nearly 9.1 percent before slowing down gradually to an average annual 7 percent growth rate between 2020 and 2030 (Exhibit B.6). Growth in fixed investment is responsible for the rapid growth foreseen in the short to medium term.

Exhibit B.5

Oxford's forecast is in the middle of other long-term forecasts

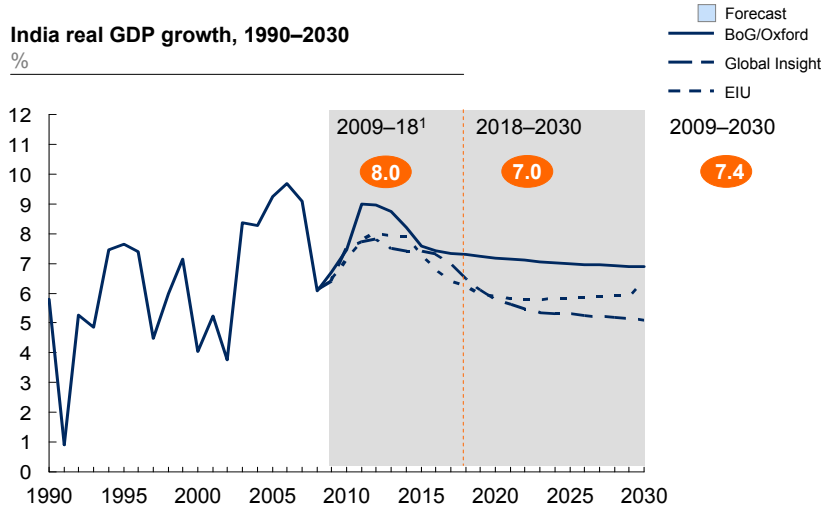
LONG-TERM FORECAST



SOURCE: Oxford Economics; Economist Intelligence Unit, Goldman Sachs, January 2007; Planning Commission; draft report of the expert committee on integrated energy policy

Exhibit B.6

Oxford Economics forecasts a strong post-downturn rebound in India's GDP, resulting in a long-term forecast of 7.4 percent annually to 2030



1 Bird of Gold extends components of GDP at trend and calibrates to ensure that potential and expenditure-based GDP growth tie in the long run.

SOURCE: India Urbanization Econometric Model; Global Insight; Economist Intelligence Unit (EIU)

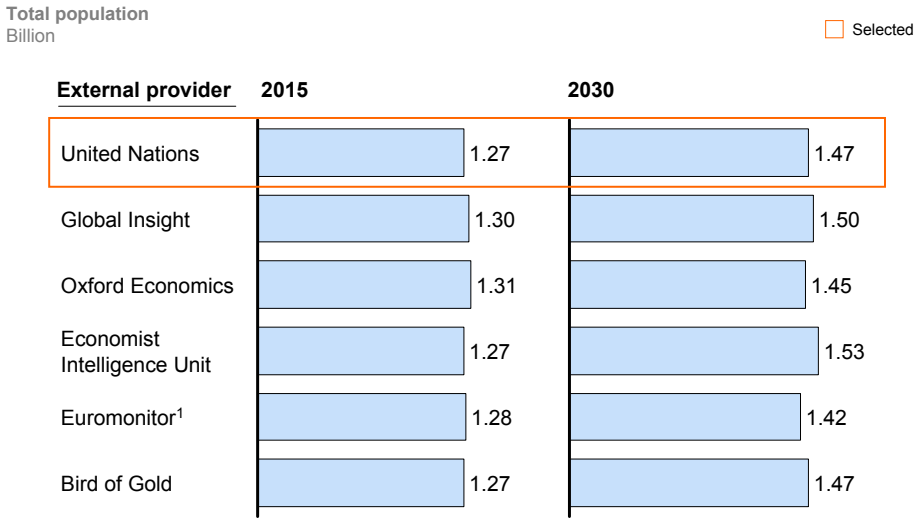
The short-term dynamics of the national model capture the impact of the business cycle, but ultimately the growth rate is tied to the long-term potential of the economy. Potential GDP growth is determined by longer-term trends in capital accumulation, demographics, and productivity.

- **Capital accumulation** is driven by investment and will continue to be shaped by it. Investment growth has nearly doubled over the past decade, rising to 12 percent per year between 2000 and 2009, compared with 6.3 percent between 1990 and 2000. Over the forecast, OE expects investment growth to slow gradually to around 7.7 percent a year.

- **Demographics.** India's population growth has fallen steadily from nearly 2 percent a year in the 1990s to 1.6 percent from 2000 to 2009. We expect that population growth will continue to decline gradually and that from 2008 to 2030, cumulative average growth will fall to 1 percent per year. Our demographic projections are in line with others, notably those of the United Nations (Exhibit B.7). Although labor force participation fell between 1990 and 2000, the participation rate has remained relatively stable over the past decade. We expect that this will continue in coming decades as demographics cause the number of workers to increase. As a result, India's labor force is expected to reach 674 million in 2030 from 493 million in 2008.

Exhibit B.7

India's population will touch nearly 1.5 billion by 2030



1 2030 values are estimated projections based on supplied information.
SOURCE: World Bank; IMF; Global Insight; Oxford Economic; Economist Intelligence Unit; Web search

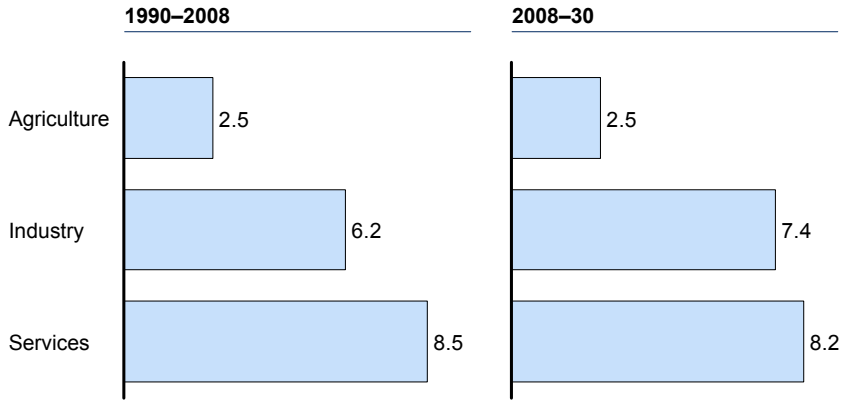
- **Total Factor Productivity.** Productivity growth has accelerated in the past decade. We assume that productivity growth will continue to quicken in the near term and then to stabilize eventually at a higher level.

Thus far, services have played a predominant role in driving growth in India's economy. The share of service sectors in GDP has risen from 42 percent in 1990 to 51 percent in 2000 and to 59 percent in 2009. We expect that services will continue to be an important engine of economic growth in India but that an increase in investment could also benefit the industrial sector in our base case. Growth in industrial sectors will accelerate to 7.4 percent in our base case, compared with 8.2 percent in the case of services (Exhibit B.8).

Exhibit B.8

Services will continue to be India's growth engine

Sectoral growth rates
%



SOURCE: India Urbanization Econometric Model; McKinsey Global Institute analysis

The rest of this section focuses on the impact of these macroeconomic parameters on urbanization.

Urbanization. Urbanization is an important driver for a number of key variables in the national model. For example, it has an impact on the size of urban households, and it increases the dispersion of the urban income distribution. Simiarly, educational attainment tends to affect education levels because educational attainment tends to be higher in urban areas.

In 2006, data from National Sample Survey Organization (NSSO) showed India's urbanization rate at 28.8 percent, indicating an urban population of 324 million, a 50 percent increase from the 1991 Census. These data indicate that the urban population has grown 1 percent higher than overall population in the same period. We expect this acceleration to continue in our base case and estimate India's urbanization rate in 2030 to be 40 percent, in line with other estimates.

Three factors move in tandem with urbanization in our model: services and industry GDP; educational attainment; and increases in urban infrastructure spending. Let's look at each in turn:

- **Services and industrial GDP.** The presence of employment opportunities and higher incomes drives urbanization. These jobs and higher incomes tend to be found in the industry and service sectors, in line with these sectors' growth rates. Since consistent wage data on this sector was not available, we used economic activity in these sectors as a proxy.
- **Education.** Increases in attainment, especially in secondary and higher education, enables people to shift to nonagricultural jobs, encouraging further urbanization as individuals seek out those opportunities. Attainment is defined as the percentage of people in the relevant age group having completed a particular education level. In our model, we also define an overall index of primary, secondary, and tertiary education. Urbanization, household incomes (as a proxy for willingness to spend on education), and government spending are used as variables that move together with higher education. In our base case, educational attainment nearly doubles from 2008 to 2030.

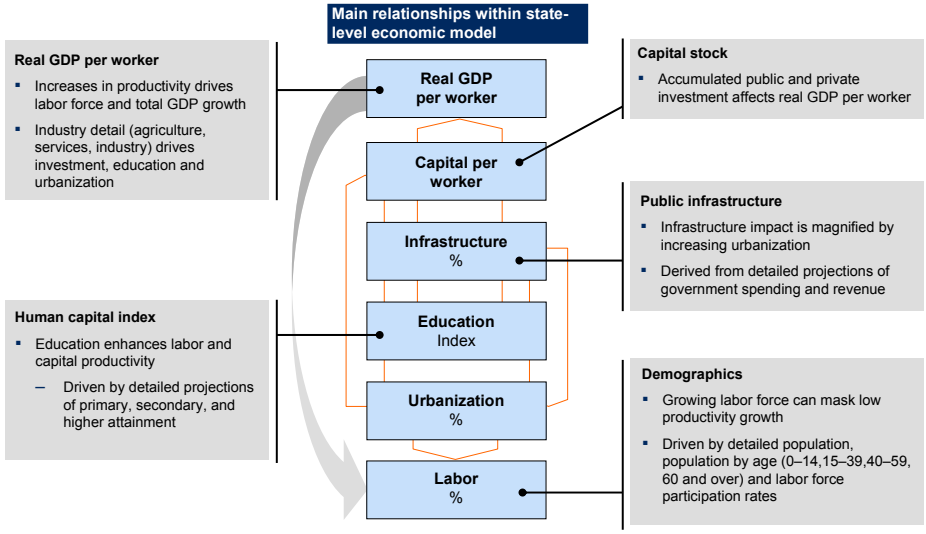
- **Urban infrastructure spending.** Infrastructure is a critical enabler of urban productivity, and therefore increased public spending on infrastructure drives further opportunities and movement toward cities.

1.3 STATE MODEL

We have structured the state model around six interrelated concepts: economic growth driven by labor productivity, capital per worker, infrastructure, education, urbanization, and working-age population. These concepts are all determined simultaneously within the model with associated drivers. However, at the core of the model is an augmented production function with urbanization, education, and infrastructure spending adding to the long-term determinants of investment and employment (Exhibit B.9). In this section, we describe the main equations in the state model and its determinants:

Exhibit B.9

The state model captures critical economic linkages with important supporting details



SOURCE: India Urbanization Econometric Model; McKinsey Global Institute analysis

- **Labor productivity.** We define labor productivity as GDP per worker and it estimated through a classic production function approach, relating output to key input variables such as capital, labor, etc. At the state level, we model labor productivity as a function of capital per worker, education attainment, urbanization, and urban infrastructure.

- **Capital per worker.** We determine capital per worker by the accumulation (using the perpetual inventory method) of investment, in turn determined by state-level nonagricultural GDP, state GDP growth, and urbanization.

- **Infrastructure.** Infrastructure spending is determined by overall government spending, allocation to capital spending, and urban capital expenditure. These variables are, in turn, affected by labor productivity, government revenue (driven by incomes), and urbanization.

- **Education.** Educational attainment, measured as the attainment at the primary, secondary, and tertiary levels, is driven by the industry and services share of GDP and urbanization.

- **Urbanization.** Urbanization is a reflection of the economic development and growth for a respective state and is a function of nonagricultural GDP and the quality of urban infrastructure, both of which affect urbanization positively and significantly.

The state-level model captures the core insights from economic growth theory and the main drivers of long-term growth. Each of the main drivers is determined by other factors included in the model, which as a result captures not only the process of economic growth but also the underlying structural change occurring in individual Indian states.

1.4 DISTRICT MODEL

Districts are one of the most granular administrative units in India, which has 626 such districts. In this study, we modeled 75 districts encompassing 66 of India's biggest urban centers, according to the 2001 Census.

There were two major challenges in building the district-level model. First, districts are not identical to cities. Second, data are extremely limited at the district level.

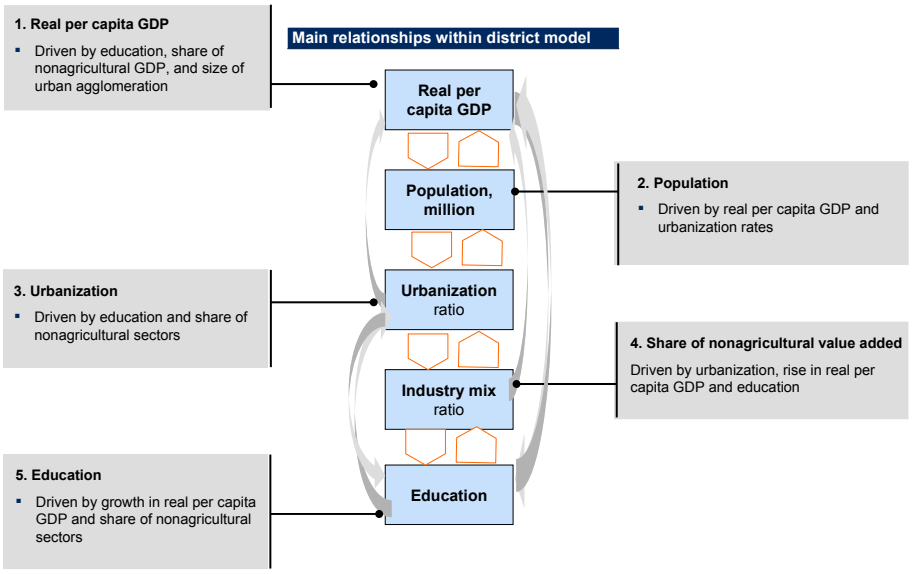
Most cities fall in a single district, but some of the big urban agglomerations, including Kolkata and Chennai, are spread across multiple districts. Other cities, such as Aligarh, are a relatively small part of a larger district—the urban population of Aligarh was less than 31 percent of the overall population of the district in 2006. However, for most districts in our model, the urban population of the district is approximately the same as external estimates of the city size. We work around this problem by first estimating key macroeconomic variables at a district level (e.g., population, GDP), and then cascading these down to the city level.

The government has made significant efforts to improve data collection and dissemination at the district level, resulting in the recent publication of district-level domestic product estimates from 1999 to 2006. These data were supplemented with information from the NSSO 1999–2000 and 2004–05 rounds. However, there remains no authoritative source of other important parameters such as investment.

In summary, our district model is a simplified version of the state model, capturing long-term stylized regularities of economic growth and urbanization in a broad directional sense (Exhibit B.10). At the core of the model are five simultaneously determined equations covering economic growth, population, urbanization, sectoral composition, and educational attainment. Broadly speaking, the model captures the empirical regularities of economic growth and development in terms of rising urbanization, accompanied by an increasing share of nonagricultural GDP and education.

Exhibit B.10

District model captures the long-term stylized regularities of economic growth and development



SOURCE: India Urbanization Econometric Model; McKinsey Global Institute analysis

1.5 AUTHORITATIVE DATA

We assembled the data used in this work from multiple sources with varying degrees of coverage. In this section, we offer a brief overview of the process and techniques used to create a complete historical database.

Sources

We rely on three different types of sources for our data. First, we use macroeconomic sources for projections and top-line socio-demographic data. Second, we use cross-cutting data sources that provide additional detailed data at the national, state, and district levels. Finally, we tap state- and district-specific sources.

For macroeconomic data, we rely primarily on national sources such as the Central Statistical Organization (CSO) and the Reserve Bank of India. We integrate these with data from the United Nations and the World Bank, and forecasts from Oxford Economics. Finally, we rely on survey data for information on income distribution at the national, urban, and rural levels.

- *CSO.* The CSO is responsible for collecting and disseminating India's official macroeconomic data. We use the most recent series available from the National Accounts Statistics and make it consistent across different base years to create an extended time series from 1980 to 2006. The CSO is also the source for GDP data at the state level.
- *Reserve Bank of India.* We use data on monetary aggregates as well as national and state government revenue and expenditures from RBI for the periods 1970 to 2006.
- *National Council of Applied Economic Research.* NCAER has been conducting extensive income-distribution surveys since 1987 at regular intervals. We use its data, including the latest 2004–05 round, for our income-distribution estimates and projections.

- *World Bank/United Nations.* The United Nations and World Bank provides additional extended data on education and population growth for the periods 1970 to 2006.

- *Oxford Economics.* We used OE's March baseline macro scenario through 2019 to provide the broad macroeconomic context for the national, state, and district models.

There is a set of cross-cutting sources that we have tabulated at the national, state, and district levels that supplement the national-level data above.

- *Census.* The Census is the most authoritative source available across all levels. However, the Census provides only demographic data and is available only for 1991 and 2001. We have therefore supplemented the Census with additional information from:

  — *National Sample Survey Organization.* NSSO is responsible for collecting and disseminating survey data on consumption distribution, employment, education, urbanization, and other socio-demographic variables. NSSO conducts these surveys at regular intervals, using both "thick" and "thin" data rounds. The thick surveys can have sample sizes of 59,000 households, compared with thin rounds of approximately 33,000 households. To preserve statistical significance, we rely on the thick rounds for the district model.

At the state level, we supplement these data with investment estimates obtained from the CSO.[18] Other standard sources of state-level investment data, including the Center for Monitoring Indian Economy (CMIE) and Annual Survey of Industries (ASI), are imperfectly aligned with National Accounts definitions.

At the district level, the Directorate of Economics and Statistics (DES) has compiled and disseminated data on sectoral District Domestic Product from 1999 to 2006 for a majority of the districts.

Reconciling sources and methodologies

Many of the challenges we faced were similar to those that emerged when we developed the Bird of Gold model. Specifically, we needed to address survey discontinuities, definitional differences among sources, and missing data. We described these issues in our 2007 report. However, here we describe a number of specific data integration challenges for the state- and district-level models.

- **Estimates of state-level GDP do not equal national GDP.** It is well known that state-level GDP does not equal the national GDP for a number of reasons that include methodological as well as vintage differences. Historically, state-level GDP has averaged 90 to 95 percent of overall Indian GDP. Between 1999 and 2006, estimated total state GDP growth was approximately 1 percent less than national growth estimates. Because the sectoral composition of the data provides important information about the differences between state economies, we have scaled the state-level GDP so that it is consistent not only with total GDP but also so that individual sectors (agriculture, industry, and services) within states are consistent with national estimates of sectoral GDP.

18 Prakash Lakhchaura, *Capital Formation at State Level*, Central Statistical Organization Working Paper; *Gross Fixed Capital Formation at State Level*, 2004-05, Central Statistical Organization Working Paper

- **New states.** Three new states of Jharkhand, Chhattisgarh, and Uttaranchal were created in 2000 from the states of Bihar, Madhya Pradesh, and Uttar Pradesh, respectively. The state model starts from 1985, so we needed separate data for the newly created states prior to 2000. In this case, we estimated historic relations between state-level data and their drivers to extend the series prior to 2000. Where possible, we linked these historic data with existing data by tabulating historic data (e.g., from the Census) in such a way as to make them consistent with the current state configuration.

- **State-level capital formation.** As we have noted, we have estimates of state-level investments from the CSO, developed in two separate vintages—from 1993 to 1999 and from 2004 to 2005. To create a complete and consistent historical data set, we needed to ensure that these data totaled national estimates of investment, and to estimate intermediate values in missing years. To do this, we estimated drivers for the ratio of state investment to GDP and spliced in the predicted values of those regressions. After producing a complete historical series, we scaled the investment data to be consistent with the national estimates.

- **District domestic product (DDP).** Of the 75 districts encompassing 66 urban centers, we managed to collect actual district domestic product data for 59 districts. For a few states, notably Gujarat, Madhya Pradesh, Chhattisgarh, and Haryana, the DDP data were not available when we were developing the model. Since our focus is to capture the directional dynamics of these cities, we created proxy GDP data for these missing districts, using their socio-demographic data from the Census and NSSO and pegging it to similar states.

These challenges overcome, we had a complete historical database and began construction of the main state- and district-level simulation models.

2. SATELLITE DEMAND MODELS

To estimate demand for the facilities and services essential for quality urban dwelling, we developed nine satellite models: water demand, sewage, solid-waste generation, storm-water drainage needed, transportation requirement, space requirement, affordable housing, education, and health care. There are two important features of these models:

- **Integrated.** The nine satellite models derive macroeconomic inputs from MGI's econometric model for India and can work at national, state, or district levels. We have ensured that specific inputs and the outputs are mutually consistent and integrated across these levels.

- **Tied to target service levels.** Each satellite model also incorporates a customized set of relevant variables for providing a particular service or facility to a city dweller. These variables assume targets for the attainment of "basic essential" or "best-in-class" standard of living in each service or facility. For instance, under each facility (e.g., target water supply for residential purposes could either be a basic 150 liters per capita per day based on national benchmarks or a more aggressive 220 liters per capita per day based on global benchmarks). For the purpose of this report, we have factored in targets for basic standards of living (see chapter 2, for a list of current and target parameters for attaining a basic standard of living).

Once we estimated demand levels for facilities and services parameters, we used those results to estimate the actual funding required to meet demands using our funding model. We will first explain in detail seven of the nine satellite models that were directly relevant for our work and then proceed to a full explanation of the funding model in the next section.

2.1 WATER MODEL

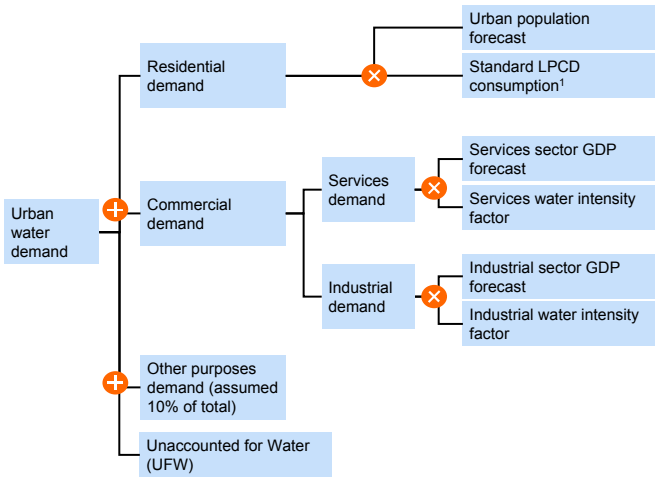
Methodology

We constructed a model to forecast demand for water in urban India. For the purpose of this analysis, we concentrated on two key variables: quantity and coverage. We did not focus on water quality. To forecast water demand for our base case, our model uses a bottom-up methodology structured around three components of water demand: residential, commercial, and other uses (Exhibit B.11). The following is an overview of each of these components.

- **Residential:** Estimates of residential water demand are based on a target daily water consumption of 150 liters per capita per day, which was calculated based on the desirable consumption standard for urban dwellers as specified in several national documents (including the Urban Development Plan Formulation and Implementation guidelines, or UDPFI) and international documents. Urban population forecasts from the MGI econometric model for India were used to arrive at the estimated demand. The base case assumes that 100 percent of households have private water connections.
- **Commercial:** We estimated water demand for industrial and service sectors based on a regression relationship between water demand and GDP growth of industrial and service sectors. Since this information is not readily available at the national level in India, we benchmarked other developing countries to determine the relationship between water demand and GDP for these sectors. For the base case, we used the relationship derived from the China MGI model.
- **Other uses:** We also attempted to estimate the use of water for other nonresidential and noncommercial purposes (e.g., firefighting). Because the data were not directly available for India, we evaluated trends in other developing countries. A factor of 10 percent of total water demand, derived in the China MGI model, was assumed to estimate this usage.

Exhibit B.11

Methodology for estimation of urban water demand



1 Liter per capita per day.

SOURCE: India Urbanization Water Model; McKinsey Global Institute analysis

In determining the actual supply requirement from forecast demand, we also factored in the effect of unaccounted for water (UFW), which includes the water wasted in the supply chain. We assumed the current UFW value of 31.8 percent and held it constant in our base case.

We also estimated coverage requirements for infrastructure necessary to meet the water demand. For the coverage analysis, we looked at three components: estimation of number of connections, total pipe length, and number of storage reservoirs. The number of connections was estimated based on population and household size forecasts available from the MGI India Urbanization Econometric Model. Due to lack of data, we estimated pipe length based on a regression relationship between pipe length and overall population, without accounting for the effect of city size. Similarly, the number of reservoirs was estimated based on standard benchmark per million liters per day of water supply, without accounting for the effects of city size and variation of peak demand factors across cities.

Assumptions

- We have chosen to not factor in the role tariffs can have in constraining water demand, given the reasonably low water tariffs in India and minimum basic target water-supply parameters.
- We made the simplifying assumption that water is not recycled.
- We have also assumed that the UFW value will remain constant at 31.8 percent in our base case. We ran a separate scenario where we estimated that the value would gradually reduce to 20 percent of total demand, resulting in an 8 to 10 percent decrease in overall water-supply demand. Our conversations with experts suggested that a value below 15 to 20 percent may be highly capital-intensive and may not happen, given the paucity of funds at municipal levels.
- We do not envisage major changes in water intensity factors for the commercial sector for industry and services sectors.

Sources

Due to the limited amount of data available, at national, regional, and district levels, we have used multiple data sources to triangulate and inform our basic assumptions in this model.

- For basic benchmarks on water supply, we used multiple sources—Urban Development Plan Formulation and Implementation (UDPFI) guidelines, Central Public Health and Environmental Engineering Organization (CPHEEO) guidelines—Technical Wing of the Ministry of Urban Development, Indian Standard Code; the ADB Water Utilities Handbook; Handbook of Service Level Benchmarks, Ministry of Urban Development (MoUD), Government of India; and the New Delhi Master Plan 2021.
- UFW values are based on multiple sources—ADB 2007 Water Utilities Factbook, the KPMG report on public infrastructure, and expert interviews.
- Figures for the current water supply are based on Jawaharlal Nehru National Urban Renewal Mission project databases and city development plans for more than 65 cities in India as well as the ADB Water Utilities Handbook.

2.2 SEWAGE MODEL

Methodology

For purposes of this analysis, we concentrated on two key variables—quantity and coverage—to determine the amount of sewage generated and subsequent infrastructure requirements.

To estimate the amount of sewage generation, we linked sewage generation to water demand, a commonly followed international practice. We assume that sewage demand would equal 80 percent of water supply. To gauge the amount of coverage required for infrastructure, we estimated the total pipe length from a regression-based relationship with the overall population.

Assumptions

- We do not assume any recycling of water, hence 80 percent of the water that is used is converted to sewage.
- While calculating total pipe length, we did not factor in the effect of city size, and instead based the total pipe length required on population.

Sources

- For sewage, we referenced special reports written at the city level (e.g., Sule, Surekha, "Sanitation system for Mumbai: Understanding our civic issues," Bombay Community Public Trust) as well as by the Ministry of Environment and Forests and other government sources.
- The sewage generation norms are based on reports such as the ADB 2007 Water Utilities Factbook, New Delhi Master Plan 2021, Planning Commission of India, and the KPMG report on public infrastructure.
- For basic benchmarks, we referred to the Handbook of Service Level Benchmarks, Ministry of Urban Development, Government of India.
- For current sewage parameters, we referenced JNNURM project database, and city development plans for more than 65 cities in India.

2.3 SOLID-WASTE MODEL

Methodology

In constructing a model to forecast solid-waste generation in urban India, we used a bottom-up methodology that estimates two critical components—municipal waste and construction debris. We identified a clear relationship between municipal waste generated per person and GDP per capita, using data from several international cities. The regression formula obtained from this relationship was modified to reflect the consumption and waste-generation patterns observed in India today and was used to estimate future per capita municipal waste generation. To calculate construction debris, we evaluated 20 countries to determine a relationship between solid waste generated and GDP growth of the construction sector. For all the waste generated, we have assumed 100 percent collection.

Assumptions

Due to insufficient information and variability of solid waste by country, we did not factor into the model the amount of medical or pharmaceutical solid waste.

Sources

The relationship between per person waste generation and GDP per capita was derived from local country sources for New York, San Francisco, Los Angeles, Chicago, Toronto, Tokyo, Johannesburg, Singapore, London, Paris, Berlin, Hong Kong, Shanghai, and Beijing, among many other cities.

- Published papers and conference material consulted include:
  - For municipal waste management: Singhal, Shaleen, and Suneel Pandey, "Solid waste management in India: Status and future directions," TERI Information Monitor on Environmental Science, Volume 6, Number 1, pp. 1–4; and Kumar, Sunil, "Municipal solid waste management in India: Present practices and future challenge," Asian Development Bank, August 2005.
  - For landfills: Patel, Almitra H., "Bio-remediation of old landfills," Proceedings of the International Conference on Sustainable Solid Waste Management, September 5–7, 2007, Chennai, India, pp. 304–11.
  - Several papers on the solid waste supply chain, including Dasgupta, Shubhagato, "Solid waste transfer systems: India: Country experience and project lesson learnt," World Bank, 2005.
- Construction sector GDP projections were consistent with the overall sectoral forecasts of the MGI India econometric model.
- For basic benchmarks on sewage, we referred to Handbook of Service Level Benchmarks, Ministry of Urban Development, Government of India.

2.4 STORM-WATER DRAIN MODEL

Methodology

We constructed a model to forecast demand for storm-water drains in urban India. We estimated the length of drains required in urban cities today by directly relating it to future requirements for the length of roads. Our transportation model was the source for length of roads required in urban India. We assumed full coverage of road length as a target basic standard of service, as specified by the Handbook of Service Level Benchmarking, published by the Ministry of Urban Development, India.

Assumptions

- In calculating drain lengths, we did not consider the volume of waste generated; instead, we used the standard city planning practice of linking it to road length.
- Drain length as a proportion of road length is taken as 130 percent for basic and 200 percent for best in class service standard, based on national and international standards for city planning.

Sources

- For basic benchmarks on solid-waste management, we referenced Handbook of Service Level Benchmarks, Ministry of Urban Development, Government of India.
- For city comparisons, we analyzed city plans for international cities, including New York, London, and Singapore.
- For benchmarks, we referenced the JNNURM project database, and city development plans for more than 65 cities in India.

2.5 TRANSPORTATION MODEL

Methodology

We constructed a model to forecast transportation demand in urban India to determine the required length of roads and metro and other intracity railway tracks. We developed the transportation demand model based on a bottom-up analysis following a three-step process—estimating total transportation volume; splitting this volume among different modes; and consequently forecasting the capacity required to meet the generated demand (Exhibit B.12).

Exhibit B.12

Methodology for estimation of transportation capacity requirements

Step	Drivers	Basis for projection
Transportation volume forecasts	▪ Projected number of trips	▪ Based on global relationships, based on population (employment), and GDP per capita growth
	▪ Projected length of each trip	▪ Driven by city area and structure
Defining target model shares	▪ Share of public transportation	▪ Target share of public transportation either set by global benchmarks or as residual of increase in private transportation
	▪ Share of private transportation	▪ Estimated based on increase in urban vehicle stock with GDP per capita or as a residual of increase in public transportation
Infrastructure requirements - Roads - Rail-based mass-transit - Buses - BRTS	▪ Length of road lanes	▪ Based on international standards of vehicular density (e.g., vehicles per lane km)
	▪ DRK[1] of rail-based mass transit	▪ Based on modal share of rail-based mass-transit volume and global relationship between DRK and rail-based traffic volumes
	▪ Number of buses	▪ Based on modal share of road-based mass-transit volume and standard bus capacities
	▪ DRK[1] of bus rapid transit system (BRTS)	▪ Based on global per capita benchmarks

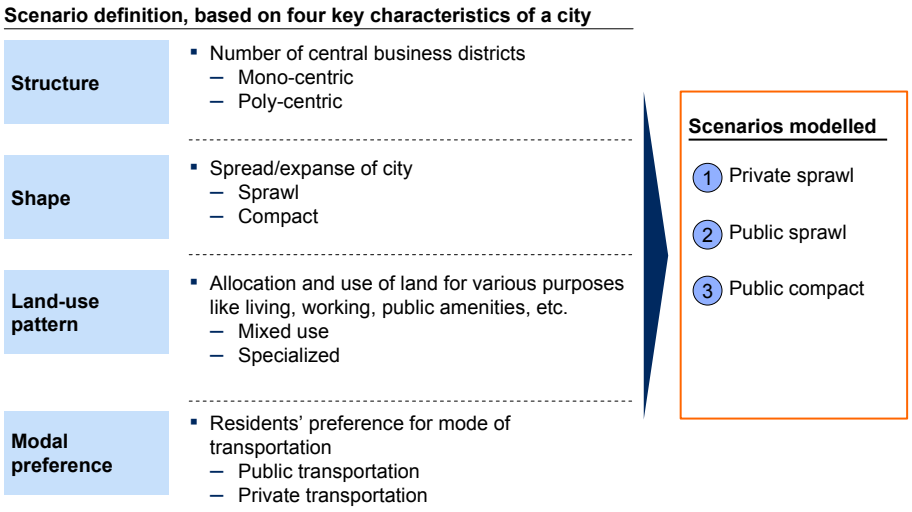
1 DRK – Directional Route Kilometers.

SOURCE: India Urbanization Transportation Model; McKinsey Global Institute analysis

We also evaluated three scenarios for the transportation demand model. The scenarios in the model depend on four key characteristics of a city: structure (i.e., mono-centric versus, poly-centric), shape (i.e., sprawl versus compact), land-use pattern (i.e., mixed use or specialized use), and preference for mode of transport (i.e., public versus private) (Exhibit B.13).

Exhibit B.13

Transportation demand model evaluates three scenarios, factoring in four key drivers



SOURCE: India Urbanization Transportation Model; McKinsey Global Institute analysis

At an urban India level, we defined the three scenarios as:

- **Private sprawl (Scenario 1):** Mono-centric city structure with FAR values in line with current trends and little investment in public transportation
- **Public sprawl (Scenario 2, base case):** Mono-centric city structure with FAR values in line with current trends and high investment in public transportation
- **Public compact (Scenario 3):** Poly-centric city structure with high FAR values and high investments in public transportation

An additional factor of city-structure (mono-centric versus poly-centric) and land-use pattern (mixed use versus specialized use) was included in city-level transportation analysis.

We now explain each component of the three-step process methodology to estimate transportation demand in more detail. First, we estimated total transportation trip volume by disaggregating it into the number of trips and length of each trip. To calculate the number of trips, we found that the number of trips shows two strong independent correlations, one between number of trips and population (used as a proxy for employment) and the other between the number of trips per capita and GDP per capita. We obtained these correlations by evaluating data from several developed and developing countries. The regression formula was further modified to fit the India context based on results from two Indian reports on urban transportation (Rites, 1994, and Wilbur Smith Associates, 2007). To calculate the length of each trip, we evaluated the area and density of cities. We found that the length of a trip depends on the structure and shape of a city. For the scenarios with sprawl as city characteristics (Scenarios 1 and 2), we assumed length of trips to grow linearly over time, as also shown in the Rites, 1994, and Wilbur Smith Associated, 2007, projects. In the scenario where the city pursues compact development (Scenario 3), we held the length of trips constant at their present level.

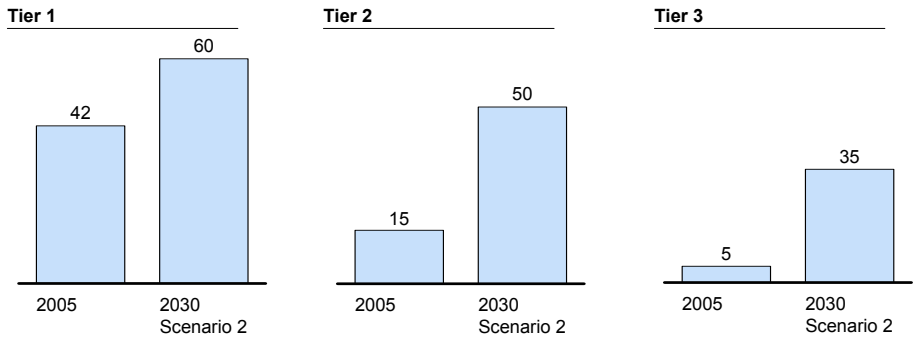
The second step is to estimate modal split, i.e., how much each form of transportation contributes to the trip volume estimated in the first step. In Scenario 1, we estimate modal share of private transportation directly based on growth in vehicle stock and treat modal share of public transportation and nonmotorized transportation (walking and cycling) as residual. In this scenario, we also assume no major investments in public transportation take place. In Scenarios 2 and 3, we fix a target public and nonmotorized transportation modal share and treat the private modal share as a residual. To estimate the right target public model share, we conducted a bottom-up analysis of different cities based on sizes, compared their modal split to our tier-wise city mix, and calculated at an overall modal split for urban India. For each of the scenarios, we also further break down the public modal share into three components: rail-based, road-based, and other independent public transportation. Current and final modal shares vary by different types of cities (Exhibit B.14).

Exhibit B.14

We defined a target 2030 modal share for different types of cities

Modal share of public mass transit
% of total daily trips

SCENARIO 2



SOURCE: Study on traffic and transportation policies and strategies in urban areas in India, Wilbur Smith Associates and Ministry of Urban Development; India Urbanization Transportation Model

Below, we present the methodology for estimating growth in urban vehicle stock for Scenario 1:

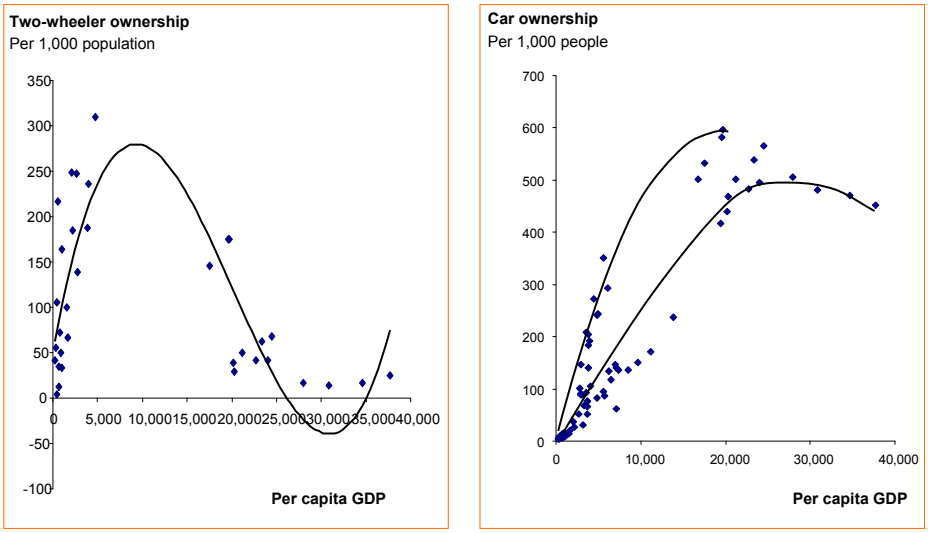
To calculate a bottom-up estimate of vehicle growth in urban India, we divided vehicles into four categories: cars, two-wheelers, jeeps, and others. For the number of cars and two-wheelers, we analyzed global trends and relationships between GDP per capita and car ownership at multiple points in time (Exhibit B.15). We further studied this trend to arrive at a low- and a high-growth scenario for cars. The high-growth scenario relationship was adjusted for the Indian context and used to project the number of vehicles in urban India. To estimate the number of jeeps and other vehicles, we assumed that the historical elasticity for vehicle ownership with GDP would apply in the future as well.

The third and final step involves deriving the capacity of roads and mass-transit infrastructure needed based on the rise in private and public transportation volumes across the three scenarios. To estimate the length of roads, we worked backwards from a target average time to travel in peak traffic and derived a target peak vehicular density of 112 vehicles per lane kilometers. Once this is in place, we can estimate the increase in lane kilometers and road kilometers required to sustain the new private transportation volumes. To estimate rail-based mass-transit infrastructure requirements, we

calculated directional route kilometers based on global trends with peak carrying capacity (passenger kilometers). Similarly, the number of buses was calculated based on maximum carrying capacities. The length of Bus Rapid Transit System (BRTS), meanwhile, was calculated based on global length per capita benchmarks.

Exhibit B.15

As incomes rise, vehicle ownership will rise proportionately



SOURCE: Global Insight; Indiastat; press searches; National Highway Authority of India; McKinsey Global Institute analysis

Assumptions

- For the public transport driven scenario, we have not factored in the effect of increase in traveling cost by public modes of transport.
- We conservatively assume the length of trip remains constant in Scenario 3 (compact public); however, we realize that the actual length may decrease over time as the city moves from its present shape to a compact one.
- In line with global trends, we derive transportation infrastructure requirements for peak AM/PM demand levels.
- We assume provision of rail-based mass-transit infrastructure in each of the top 35 cities in India. For the top 13, the requirement is immediate, while for the rest, the infrastructure may be phased in over the next 20 years. We assume that public bus transportation is applicable to all cities and that BRTS are provided in all cities above the population of 1 million.

Sources

- For information on existing Indian transportation system and basic benchmarks, we referred to the Report on Urban Transportation in India by Wilbur Smith Associates and MoUD (May 2008), RITES report on Urban Transportation 1994, Technical Assistance Report by ADB (2006), and Transport service level benchmarks by Ministry of Urban Development, Government of India.
- For information on international cities (macroeconomic and transportation-specific parameters), we compiled statistics from UITP Mobility in cities from the International Association of Public Transport, local sources from each country and city, congestion reports on cities in the United States and city plans for various

international cities (including New York, San Francisco, Los Angeles, Chicago, Toronto, Tokyo, Johannesburg, Singapore, London, Paris, Berlin, Hong Kong, Shanghai, and Beijing).

- For information specific to Indian cities and states, we consulted city development plans for the top 65 cities in India, specific transportation projects such as the Comprehensive Transportation Survey for Mumbai Metropolitan Region, and master plans for cities (e.g., New Delhi Master Plan 2021).

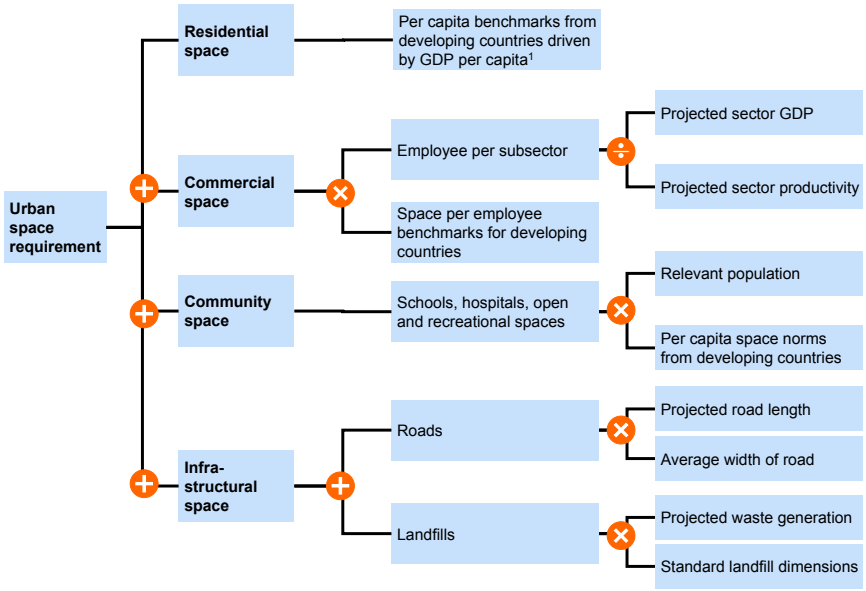
2.6 SPACE REQUIREMENT MODEL

Methodology

We constructed a model to forecast space requirements in urban India. We estimated space demand for four major components: residential, commercial, community activities, and infrastructure facilities. Methodology of the approach is described in more detail below (Exhibit B.16).

Exhibit B.16

Methodology for estimation of urban space requirements

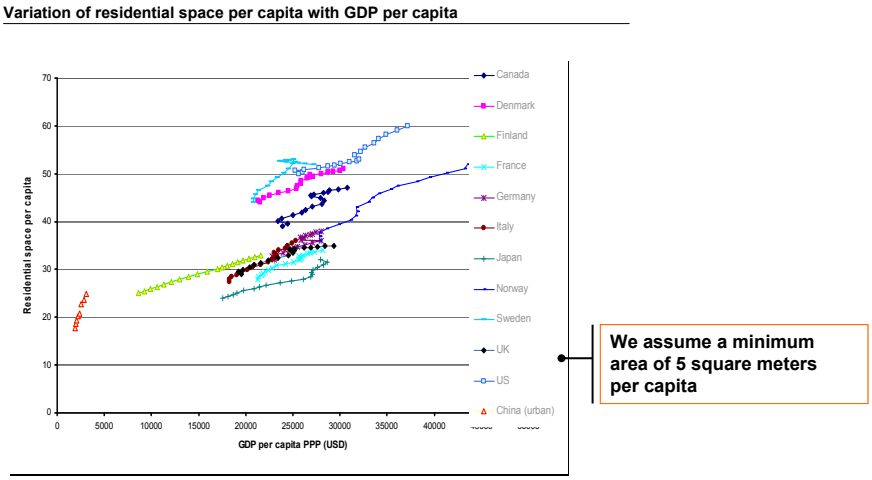


1 Assumes a minimum floor area of 5 square meters per capita in line with standard affordable housing norms in India.
SOURCE: India Urbanization Space Requirement Model; McKinsey Global Institute analysis

- **Residential:** We followed a top-down approach to estimate residential demand for space and used the regression equation derived from a strong correlation between space per capita and GDP per capita for more than 14 countries. Using this equation, we obtained residential demand based on global benchmarks. This equation was used for different income brackets to estimate space required by each income bracket, assuming a minimum area of 5 square meters of space per capita, especially for lower-income segments (Exhibit B.17).

Exhibit B.17

Residential space demand is based on global relationships



SOURCE: India Urbanization Transportation Model; McKinsey Global Institute analysis

- **Commercial:** Commercial space requirement was calculated using both top-down and bottom-up approaches. In the top-down approach, as in the approach followed for residential, we analyzed the trend of commercial space per capita over time for several countries. From this relationship, we projected per capita value for commercial space in India. To triangulate these forecasts, we also did a bottom-up analysis for space demand based on sector employment forecasts, derived from the econometric model, and international norms for minimum space required per employee in each sector.

- **Community activities:** We conducted bottom-up estimates for four public amenities—schools, hospitals, community or recreational centers, and open space. We estimated space required for schools by projecting the number of seats required (primary and upper primary) and using national and international norms for space per child. We cross-checked these norms through field visits to a few institutions in India. Similarly, for space needed for hospitals, we estimated the number of beds required and used specific space per bed benchmarks. We estimated the space required for recreational, community, and religious activities and the area to be reserved as open space by consulting national and international planning standards and choosing those relevant in Indian context.

- **Infrastructural facilities:** We estimated the space needed for infrastructural facilities to meet the fast-growing population of city dwellers for two primary areas—roads and landfills. The transportation model gives us the road lane kilometers needed. We used a width of 12 feet per lane to get the area required. For landfills, we took cumulative solid waste generated over years from the solid-waste model. Assuming standard depth of landfills and density of waste, we calculated the space required for landfills.

Assumptions

- While estimating space demand, we have not factored in affordability as a constraint.

- We assume no commercial space requirement for employment in the household sector (e.g., maids, drivers).

Sources

- Income distribution for the residential demand estimate has been derived from MGI's India econometric model.
- To calculate regression from global countries for residential demand estimation, we analyzed data for 14 countries over multiple years obtained from local country sources.
- Commercial space norms have been sourced from the Urban Redevelopment Authority for Singapore, the New Delhi Master Plan, and IFMA reports for the United States.
- Open space and community space per capita norms are from the New Delhi Master Plan and other available global benchmarks.
- Economic Census for India 1998–99 and 2004–05.
- City development plans for more than 65 cities in India and city concept and master plans for several international cities.
- Urban Development Planning Formulation and Implementation (UDPFI) guidelines.

2.7 AFFORDABLE HOUSING MODEL

Methodology

We constructed a model to forecast the demand for affordable housing in urban India and identify the mix of private-sector and direct government participation required to bridge the gap.

2.7.1. Demand for affordable housing

We first assessed the demand for affordable housing in urban India in 2010. We based our analysis on households having access to a minimum area in a formal housing settlement. To this effect, we estimated the market value of a 275-square-foot housing unit based on the land cost, the construction cost, the infrastructure development cost, the financing cost, the overhead cost, and a return of 20 to 30 percent to the developer. Given that land costs vary across cities and are higher in the larger cities, we took a tier-wise approach to affordability, doing the analysis for each tier of city. Further, given that land prices in the Mumbai Metropolitan Region (MMR) are higher than in other Tier 1 cities, we looked at the MMR region separate from the other Tier 1 cities.

We then estimated the maximum house value affordable by a household. This was determined as the housing loan value serviceable by the household's deploying a stipulated fraction of gross monthly household income toward loan installments (at defined interest rate and tenure) and considering a loan-to-value (LTV) ratio typically applicable to the income group. Tenure for loans is considered as 20 years—the higher end of tenure usually seen in the Indian mortgage market. For example, for the lowest income group earning below 90,000 rupees per annum, we assumed an outlay of 25 percent of monthly income and an interest rate of 18 to 20 percent [typical of housing loans extended by banks or Median Family Income (MFIs) to this income segment]. An LTV factor was not considered for this segment as financial savings are a constraint; instead, savings of 10,000 rupees per household were added to the loan value serviceable to arrive at the maximum house value affordable.

Households for whom the maximum value affordable was less than the market price of a 275-square-foot housing unit in the particular city tier were considered unable to afford housing.

Of the total households identified in a tier as not able to afford housing, the slum population corresponding to the city tier (projected from the 2001 Census data) was subtracted to arrive at households that were residing not in slums but in congested and dilapidated conditions; these households were identified as the non-slum households.

We then looked at how this demand was expected to evolve from 2010 to 2030. The two factors considered to have an impact on affordability are, first, the change in the household income distribution with economic and population growth and, second, the price of residential real estate that is expected to factor the net effect of demand and supply. We used the household income forecasts from the econometric model.

2.7.2. Mix of private-sector and direct government participation to bridge the demand

The cost of building a new affordable house and of redeveloping a slum household was determined for each city tier. A mix of beneficiary contribution (aided by interest subsidy), additional FAR, and capital grants were used to make the economics viable in each city tier. For slum redevelopment, given high dwelling densities to start with, additional FAR to cross-subsidize was assumed to be as Transfer Development Rights being used at one location. For new affordable housing construction where part of the total development area is allocated for affordable housing, additional FAR was assumed as consumed on the development site. Limits on additional FAR were arrived at considering a maximum local density of 400 to 425 dwelling units per hectare on the development site where the additional FAR was deployed. Such a density is representative of local densities suggested for mixed-income housing in notable planning documents. This translated into tier-wise saleable area required per household built or redeveloped. Capital grants were to address the deficit, if any, after beneficiary contribution and cross-subsidy from additional FAR.

To determine the amount of affordable housing that could be supported through additional FAR-led cross-subsidization, we determined the total demand for residential space from 2010 to 2030 on a tier-wise basis. Of this total demand, we arrived at the proportion that could be available for cross-subsidizing affordable housing and accounting for the additional FAR provided. Based on this pool and the tier-wise saleable area needed per household, the number of affordable units produced by FAR-led cross-subsidy was determined. The balance of demand was assumed to be addressed by direct government construction.

Assumptions

- We assume that a group of cities in a tier class have similar real estate prices, economic growth, and income distribution (percentage). We do not assume variations across cities in a tier class for these factors, except in the case of Mumbai.
- A household affording a housing unit in a particular year is assumed to have access to that house going forward and is classified as affording a basic house even if going forward the maximum house value affordable by the household is less than the market price of a basic house.
- We do not make a supply-side assessment of affordable housing units to be built and shortfall from demand. We assume that the increase in real estate prices will represent appropriately the gap between supply and demand.
- We assume infrastructure cost to include the cost of water, sewage, solid-waste management, storm-water drains, and internal roads. Other infrastructure elements such as public transport, mass transit, etc., are not considered in the infrastructure cost while computing the production cost of a housing unit.

Sources

- For information on city income distribution, we tapped the NCAER 2001 survey findings and the India Urbanization Econometric model.
- For assessment of land costs across city tiers, we used a combination of sources—real estate publications and portals as well as primary interviews with real estate consultants.
- For property price appreciation, we used the National Housing Board's Housing Price Index for India and primary interviews with real estate consultants; for mature markets, we used published indices such as the Case-Schiller index for the United States.
- Planning guidelines that we used include the Delhi Master Plan 2021 and from other international cities including Hong Kong and Singapore.

3. FUNDING MODEL

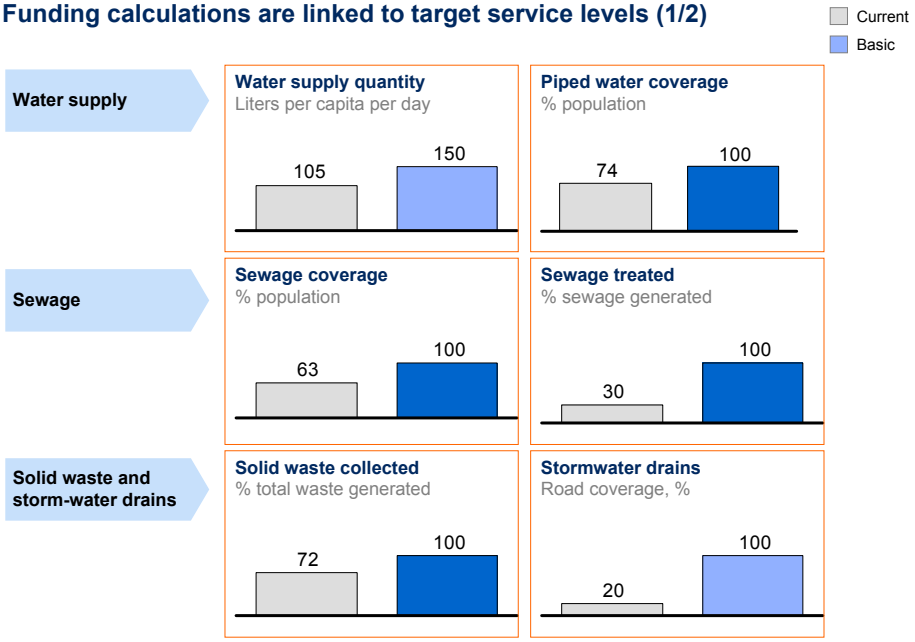
Methodology

We constructed a funding model to forecast capital and operation expenditure required for India's urbanization. This model uses the demand forecasts of satellite models as input and converts them to funding requirements based on standard cost benchmarks. Like the individual satellite models, the funding model is integrated across national, state, district, and city levels and can be adjusted for target service parameters (Exhibits B.18 and B.19).

Cost benchmarks were derived from multiple sources, including the detailed project reports of projects funded under JNNURM (Exhibit B.20).

Exhibit B.18

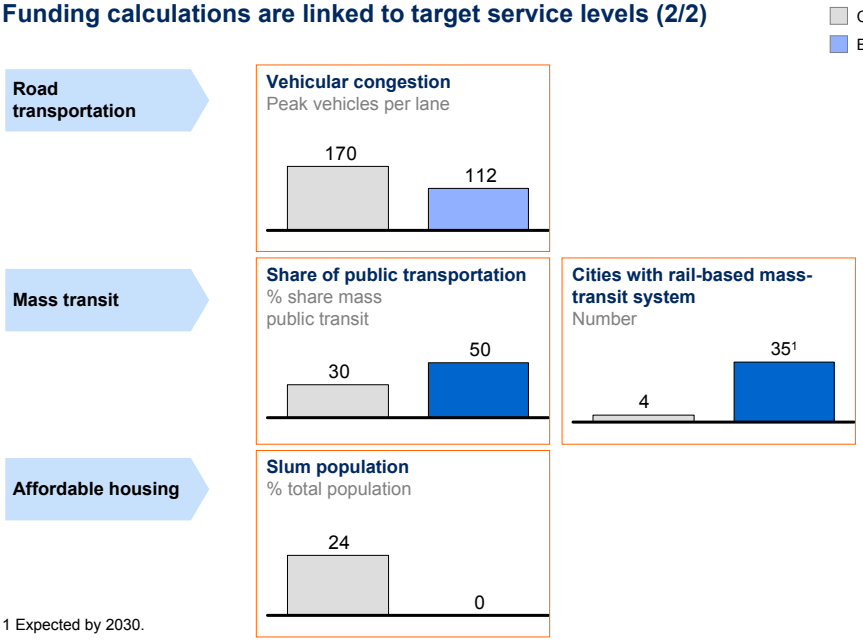
Funding calculations are linked to target service levels (1/2)



SOURCE: United Nations; City Development Plans; The Energy and Resources Institute; Planning Commission; Census; McKinsey Global Institute analysis

Exhibit B.19

Funding calculations are linked to target service levels (2/2)



1 Expected by 2030.

SOURCE: United Nations; City Development Plans; The Energy and Resources Institute; Planning Commission; Census; McKinsey Global Institute analysis

Exhibit B.20

We studied detailed project reports under JNNURM to determine urban cost benchmarks

NOT EXHAUSTIVE

	Illustrative list of projects and description	Selected cost benchmark[1]
Water supply	▪ **JNNNURM (Bansberia):** Water-treatment plant of 58 MLD[1] capacity in Bansberia at a cost of $0.18 million per MLD ▪ **JNNURM (Asansole):** Water-treatment plant of 26 MLD with transmission and reservoir capacity at $0.23 million per MLD ▪ **Mumbai:** Middle Vaitarna project, including dam construction, intake tower and tunnel, treatment plant, pipelines, and pumping for capacity of 455 MLD at $0.6 million per MLD ▪ **JNNURM (Kolkata):** 68 MLD water-treatment plant, 19 elevated reservoirs, 155 km of primary transmission lines at $0.3 million per MLD ▪ **JNNURM (Hyderabad):** Transmission mains and distribution network of mild steel and 3 to 4 km DI at $0.4 million per km	▪ **Source augmentation:** $0.1–0.3 million per MLD ▪ **Distribution and transmission:** $0.05–0.4 million per km ▪ **Connection:** $40–60 per connection (incl. metering) ▪ **O&M[1]:** $0.01–0.05 million per MLD per annum
Storm-water drains	▪ **JNNURM (Ujjain):** Total network of 78 km with 14 outfall structures at $0.15 million per km ▪ **JNNURM (Bangalore):** Improvement to 478 km of drains at $0.05 million per km ▪ **JNNURM (Surat):** 50 km of RCC[1] pipes and 2 km RCC ducts and 9 outfall structure at $0.18 million per km	▪ **Capital cost:** $0.1–0.18 million per km ▪ **Operating cost:** $1000–2000 per km per annum
Mass transit	**Rail-based mass-transit:** ▪ **Delhi Metro:** $38 million per km for Phase 1 ▪ **Mumbai Metro:** $47 million per km for Phase 1 (Andheri-Ghatkopar-Versova line) ▪ **Bangalore Metro:** $32 million per km for elevated and $80–100 million per km for underground **BRTS:** ▪ **Ahmedabad BRTS:** $2.5 million per km (Phase 1 of 58 km) ▪ **Urban Development Report**: $4 million per km	▪ **Construction cost of metro:** $45 million per km ▪ **Operating cost of metro:** 4–6 cents per passenger km per annum ▪ **Construction cost of BRTS:** $4 million per km ▪ **Operating cost of BRTS:** 0.5–1 cent per passenger km per annum ▪ **Capital cost of buses:** $80,000–100,000 per bus

1 MLD = million liters per day; O&M = operations and maintenance; DI = ductile iron; RCC: Reinforced cement concrete
SOURCE: Press search; National Urban Renewal Mission); McKinsey Global Institute analysis

Assumptions

- We assume the use of existing technologies to service urban demand over the next 20 years.
- We considered the use of similar technologies across cities and did not consider significant variations in costs with city size.

Sources

- For capital and operating cost benchmarks, we consulted detailed project reports (DPRs) of projects under the JNNURM.
- Existing city development plans for more than 65 cities in India, including expenditure statements.
- Press searches for some specific cost benchmarks, including Delhi Metro Rail Corporation, Bangalore Metro, Mumbai Metro, and Ahmedabad's bus rapid transportation system.

4. ADDITIONAL ANALYSIS AND MODELS

We also devised many additional models and conducted analyses required for the report. One key additional analysis that we highlight below is the urban-rural split model.

4.1 URBAN-RURAL GDP SPLIT ESTIMATES

Methodology

Since our study is focused on urban India dynamics, one of the key variables we needed was GDP split between urban and rural areas. However, there are no official data on this split at a time series level.

In the absence of any standardized data, we had to estimate the series. There were broadly two options: splitting the GDP using the split of disposable income from NCAER from our national-level model, or using four data points available from the Central Statistical Organization (CSO), where sectoral NDP split is provided, and use it to create a consistent time series.

We experimented with these and a couple of other options. Both the income- and CSO-determined NDP split gave us a strikingly similar spread of urban and rural GDP; for ease of explanation, we resorted to the latter. Below, we describe the methodology in further detail.

CSO provides four data points of NDP split between urban and rural areas, together with the sectoral decomposition. These four data points spread correspond to 1970, 1983, 1993, and 1999. We used these four data points and ran auxiliary regression on the ratio of sectoral NDP in urban areas as a function of growth of respective sector aggregate and urbanization rate. Simply put, sectoral share of domestic product in urban areas is a function of the overall growth of that sector and the extent of urbanization. Given that urban/rural transition is a systemic development, discrete points spread across three decades enabled us to estimate historical relationship. Since we have history and projections for sectoral aggregate and urbanization, we used that to complete the time series and project for the future as well. Rural share is estimated as a residual.

We then used the ratio of household disposable income in urban versus rural areas and the extent of urbanization to split GDP between urban and rural for states and districts under consideration.

Appendix C: Sustainability—Climate-change mitigation in urban India

India's urbanization has every potential to pay a significant economic dividend while fulfilling national aims of achieving social inclusiveness. At the same time, the scale of urban expansion will bring unprecedented multiple pressures on the environment. According to the United Nations, cities account for roughly 75 percent of global energy consumption and 80 percent of greenhouse gas (GHG) emissions. India's economic growth in cities will swell demand for critical resources such as oil with a parallel increase in GHG emissions.

While putting in place the building blocks that will sustain its urban expansion, India needs to think about how to make urbanization sustainable in the long term. India must explicitly incorporate sustainability objectives into its urban planning.

INDIA HAS A UNIQUE OPPORTUNITY TO ACHIEVE SUSTAINABILITY, ESPECIALLY IN GHG EMISSIONS

Building sustainable cities requires careful consideration of energy consumption, water resources, consumption, waste management, and air pollution. In this report, we have chosen to focus on one area: GHG emissions. Given that 70 to 80 percent of the India of 2030 is yet to be built, India has a unique opportunity to pursue its urban development while managing GHG emissions. India will need to leapfrog inefficient technologies, assets, and practices and deploy those that are more efficient and less emission-intensive.

Challenges are daunting, but there are excellent sustainability models to follow

India faces undoubtedly daunting challenges if it is to meet its aspiration of sustainability. Addressing the broad issues of sustainability is complex enough—and is exponentially so when taking into account rapid population growth, vast infrastructure needs, and transportation requirements—all of which are subject to often conflicting short-term political imperatives.

However, cities around the world already offer some excellent examples of innovative approaches for sustainability that India could incorporate into urban planning and development. One interesting example is Masdar, a clean-energy cluster city being developed on the outskirts of Abu Dhabi city. Abu Dhabi is designing Masdar to produce zero waste, be self-sufficient in terms of water, and be powered solely by renewable energy. Masdar city will support 40,000 residents and 50,000 commuters, will be car-free, and will incorporate light rail transit, personal rapid transit, and associated logistics.

India can look to Masdar, and other innovative "carbon-neutral" cities around the world, for inspiration. The successes and failures thrown up by such pioneers can inform India's approach where it involves the development of new towns. New suburbs such as Gurgaon will have many of the characteristics of "new" cities and can follow their own rules incorporating sustainability.

Nevertheless, our analysis suggests that the scope in India to create new "zero carbon" cities will be limited because the majority of India's urban growth will come from the expansion of existing cities—a far more complex undertaking, in fact, than building state-of-art new cities. The biggest and most urgent challenge for India is to focus on how best to incorporate sustainability within India's existing and emerging urban centers, which today score poorly on sustainability.

Fortunately, global precedents for creating sustainability in cities already exist. London is an excellent example of a large, established city that has started to be proactive in shifting toward greater energy efficiency with the aim of abating GHG emissions. The mayor's office and the London Development Agency have established detailed plans and resources to reduce GHG emissions through transport schemes, home and building energy-efficiency development programs, and urban planning partnerships with commercial property owners.

Setting targets is the critical first step to sustainability

The first task for any city seeking to address a complex sustainability issue such as GHG emissions is to establish a baseline and set targets against which it can measure progress. Many cities offer a model for how India might proceed. London, for instance, aims to reduce GHG emissions by 60 percent by 2025 compared with its 1990 baseline. Melbourne aims for a 60 percent reduction in GHG emissions by 2020. Victoria in Canada plans to make all city operations carbon-neutral by 2012. Singapore has set targets for air and climate change, water, nature conservation, and public health; it aims, for example, to increase its overall waste-recycling rate to 60 percent by 2012. Globally, cities including Cape Town, Helsinki, Copenhagen, and Abu Dhabi have all started putting in place initiatives to achieve sustainability by setting defined targets.

Urban India can achieve significant GHG mitigation through urban planning and energy-efficiency standards

Under MGI's base case for this report, GHG emissions in India's cities could increase to nearly 1.6 billion tonnes of carbon-dioxide equivalent (CO_2e) by 2030 from 230 million tonnes in 2005.[19] In per capita terms, this amounts to 1.1 tonnes per capita. This amount represents GHG emissions generated by vehicle transport, buildings, public areas, and city design. We base these estimates on conservative assumptions that abatement from future technology advancements is minimal.

While equal focus is required on all elements of sustainability, our focus here is on optimizing energy consumption and minimizing GHG emissions from India's urban centers.[20] MGI believes that urban India can set an achievable target of reducing GHG emissions by 28 percent, or 440 million tonnes of CO_2e per year by 2030. To achieve such an aspiration would require significant will and execution by all stakeholders—government, businesses, and citizens. The question is how India can best meet such a target.

19 MGI's base case resulting in 1.6 billion tonnes of CO_2e emissions in 2030 assumes that there are no technology improvements, but does factor in efficiency improvements.

20 We will return to the full range of sustainability issues in future research.

WELL-MANAGED URBANIZATION CAN CUT DEMAND FOR ENERGY AND RESULTING GHG EMISSIONS

Experience around the world strongly suggests that denser cities produce lower demand for energy—indicating that India's urbanization has the potential to help, rather than hinder, efforts to cut carbon emissions.

The major sources of carbon emissions today are direct emissions from vehicles and indirect emissions from energy consumption in buildings and public spaces. In India's cities, the total number of cars could rise by nearly sixfold, and the number of public trips nearly threefold, by 2030. India may have to build 700 to 900 million square meters of residential and commercial space by 2030.

Given these enormous requirements, India needs to utilize "smart" urbanization and proactive planning and management policies to have an impact on energy sustainability. The benefits can be significant. For example, previous MGI research indicates that if urban China promoted denser development coupled with the smart deployment of transportation systems, there would be significant benefits, including an improved quality of life in the urban environment, and "hard" impacts, including deep cuts in transportation energy demand. [21] International studies have also shown that for every doubling of residential density, driving declines by 20 to 30 percent. Other academic research also suggests that a 20 to 30 percent reduction in vehicle miles traveled can be achieved by shifting from urban sprawl to compact development of cities.[22] City design is therefore an important factor in urban planning for sustainability.

India could achieve deep cuts in GHG emissions if its cities manage their demand for energy proactively rather than simply focus on building the supply infrastructure necessary to keep pace with demand. Previous MGI research in developing countries finds that, by choosing more efficient cars and appliances, improving insulation in buildings, and choosing lower-energy-consuming lighting and production technologies, developing countries can cut growth in their energy demand by more than half, from 3.4 to 1.4 percent per year, by 2020.[23] In India, MGI has estimated that the total national power demand can be reduced by as much as 25 percent in 2030 by improving the energy efficiency of buildings and appliances, industry, power distribution, agriculture, and transportation.[24]

In the next section, we discuss the practical steps India can take to reduce urban emissions.

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21 *Preparing for China's urban billion*, McKinsey Global Institute, March 2009 (www.mckinsey.com/mgi).

22 *Growing cooler: The evidence on urban development and climate change*, Urban Land Institute, 2007.

23 *Fueling sustainable development: The energy productivity solution*, McKinsey Global Institute, October 2008 (www.mckinsey.com/mgi).

24 *Environmental and energy sustainability: An approach for India*, McKinsey & Company, August 2009

URBAN INDIA HAS SEVEN KEY LEVERS TO REDUCE GHG EMISSIONS BY NEARLY 440 MILLION TONNES OF CO_2E

We see seven key levers for abating GHG emissions from three major sources of emissions (Exhibit C.1):

Exhibit C.1

India can use seven key levers to reduce urban carbon emissions

Emission type	Lever	Description	Potential impact $MtCO_2e$[1]
A Vehicular emissions	A1 Reduce vehicle usage through public transport	▪ Introduction of buses, bus rapid transport, and metro systems in urban areas	~45
	A2 Improve vehicle fuel efficiency	▪ Penetration of fuel economy bundles in cars, buses, and trucks	50
	A3 Electric vehicles	▪ 50 percent of two-wheelers will be electric; 60 percent of all projected two-wheelers will be in urban areas	~5
B Building/ public areas energy consumption	B1 Building envelope (residential and commercial)	▪ Maximum insulation and highest efficiency appliance to reduce HVAC[2] consumption by 55 percent	150
	B2 Appliances and lighting	▪ Penetration of high-efficiency devices and one-watt standby standard for all electric appliances and use of CFL[2]	140
	B3 Street lighting	▪ Replace 80 percent of 250W sodium vapor streetlamps with solar-powered LED[2] lights	20
C City design	C1 Selective densification of core	▪ Cluster design will result in more people walking to work and reduce the need for vehicle travel. Assumes 20 percent reduction in car travel.	~30

1 Metric ton carbon-dioxide equivalent.
2 Heating, ventilating, and air conditioning; compact fluorescent lighting; light-emitting diode

SOURCE: McKinsey Global Institute analysis

1. In vehicle emissions, reduce vehicle usage through public transport, improve vehicle fuel efficiency, and increase the use of electric vehicles.

2. In buildings and public areas, reduce air conditioning consumption through maximizing insulation and appliance efficiency, and utilize energy-efficient appliances, compact fluorescent lamps (CFL), and street lighting.

3. Within city design, improve urban design and planning to produce more energy-efficient denser clusters (supported by adequate infrastructure) within cities.

If India uses these levers to their full potential, MGI finds that it could abate GHG emissions by 28 percent, or 440 million tonnes CO_2e per year by 2030).[25] In per capita terms, this reduction amounts to roughly 0.25 tonnes per capita from a baseline of 1.1 tonnes per capita of GHG emissions in 2030. We believe that India could achieve even greater abatement if it were to pursue more proactive initiatives. We now look at each of these key levers in turn.

25 Case reducing GHG emissions by 440 million tonnes is based on the assumption that there are no technology improvements through to 2030, but that an extra 100 million tonnes of abatement comes from the use of efficient appliances and lighting (90 percent from CFL, 20 percent penetration of efficient appliances and HVAC, and better fuel efficiency of vehicles).

1. India has the potential to reduce GHG emissions from vehicles by nearly 100 million tonnes of CO_2 equivalent (CO_2e) by 2030

- **Shifting toward public transport could reduce nearly 45 million tonnes of CO_2e.** A shift to public transport, including buses, bus rapid transport, and metro rail systems, can reduce the usage of cars from 10,000 kilometers a year to 7,100 kilometers a year. Such a shift could reduce distance traveled per urban cars by 29 percent. In cities with a population above 5 million people, the impact is even higher: the reduction in distance traveled would be nearly 50 percent). The result could be nearly 45 million tonnes of CO_2e abatement.

- **Boosting fuel efficiency could reduce 50 million tonnes of CO_2e.** There is scope for significant fuel-efficiency improvements in cars, trucks, buses and two-wheelers. A series of technical improvements to reduce tire and engine friction, improve power trains, lower vehicle weight, and increase aerodynamic efficiency could significantly improve fuel efficiency in cars and commercial vehicles. We have also assumed that expected technology advancements in cars and two-wheelers would increase the average fuel efficiency of petrol cars to 12.5 kilometers per liter, of diesel cars to 16.1 kilometers per liter, and of two-wheelers to 58 kilometers per liter by 2030. By boosting fuel efficiency from cars, two-wheelers, trucks and buses, India could reduce nearly 50 million tonnes of CO_2e.

- **Shifting to electric vehicles could reduce over 5 million tonnes of CO_2e.** The adoption of electric technology in the case of two-wheelers and electric cars is another source of carbon abatement, with most of the potential being in two-wheelers. Increased use of electric two-wheelers in urban areas could result in over 5 million tonnes of CO_2e abatement. Adoption of electric cars could result in at least 300,000 tonnes of CO_2e abatement, and this amount could potentially be much larger if India encouraged a significant increase in the use of electric vehicles.

2. India can cut GHG emissions by 310 million tonnes CO_2e by reducing the energy used by buildings, appliances, lamps and streetlights by 2030

- **Cutting buildings' energy consumption could reduce 150 million tonnes of CO_2e.** If India were to adopt the most energy-efficient standards of insulation and appliances primarily in new residential and commercial buildings and thus reduce heating, ventilating, and air-conditioning (HVAC) consumption by 55 percent, it could reduce carbon emissions by nearly 150 million tonnes.

- **Raising the energy efficiency of appliances could reduce 140 million tonnes of CO_2e.** India could achieve significant carbon abatement if it were to push the penetration of new high-efficiency appliances and make one-watt standby a standard for all electronic devices. Use of compact fluorescent lamps (CFLs) can raise energy efficiency compared to incandescent lamps. Furthemore, use of the most efficient air conditioners and refrigerators, which comprise about half of electricity consumption in households and offices, could significantly increase energy efficiency in India.

- **Introducing more energy-efficient street lighting could reduce 20 million tonnes of CO_2e.** At current electricity tariffs, solar streetlights are an economically viable option. Today, streetlights account for around 1.5 percent of total electricity consumption in India. Solar-powered lights can save 915 KWh per annum at 10 hours of usage per day. If India replaced 80 percent of streetlights with solar versions, it could reduce emissions by 20 million tonnes, thereby reducing evening peak demand by 1.5 percent.

3. Adjusting city design to develop energy-efficient clusters could abate 30 million tonnes of CO_2e by 2030

India could also take advantage of the higher energy efficiency that comes with density by selectively incorporating compact city centers within urban design. Cluster design can result in more people walking to work and reduce the need for vehicular travel. For our analysis, we assumed that 30 percent of the area of a city is used for commercial areas and 70 percent for residential living, and that the city layout is radial. By planning for higher density (with increased FAR) along with adequate infrastructure provisions, increasing FAR for both commercial and residential, India could, for instance, achieve a 35 to 45 percent reduction in vehicle movement as more people walk to work. Today, India has not planned for higher FAR, but it could do so in a systematic way. India could allow for higher ratios in central business districts connected by high-speed transportation infrastructure and also in proximity to transportation nodes including stations. By building such corridors, India could achieve a 20 percent reduction in vehicle miles traveled and nearly a 30 million tonne reduction in CO_2e.

For the purpose of this analysis, we have not factored in further GHG emissions abatement potential from the use of smart grids, solar rooftops, water heating, and combined heat and power technology.[26] Deployment of these additional levers would further increase CO_2e abatement potential.

Given the multiple and growing strains on India's cities, the danger is that policy makers will allow sustainability and climate-change mitigation to slip down the agenda in favor of near-term priorities such as providing basic services and building the urban infrastructure. This must not happen. If India can adopt a green approach to transport, buildings, and urban design, the nation can reap significant benefits from reduced energy consumption and GHG emissions abatement. Not only would that deliver a more pleasant quality of life in India's cities, but it also would make a contribution to national and global efforts to mitigate the impact of climate change.

26 Solar rooftop retrofitting for water heating could potentially reduce an additional 10 million tonnes of CO_2e, and use of combined heat and power (CHP) plants as a lever for both addressing peak distribution losses and increasing the efficiency of energy use could reduce an additional 15 million tonnes of CO_2e.

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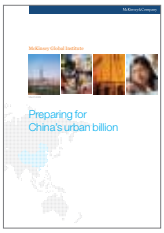

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