EXPRESS COMPUTER

EXPRESS Technology Sabha
An Express Group Initiative

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How smart are our cities?

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Foreword

After 1990, urbanisation in India picked up pace, becoming faster than anywhere else in the world. This rise can be attributed to population growth, opening up of the industry (both manufacturing and services), better quality of living as well as employment opportunities in urban areas.

Recent acknowledgment of the fact that the real India resides in large as well as small cities,has led to the proposition of developing 100 smart cities. This will serve to ease the pressure of migrant population in existing urban enclaves and ensure that the struggles associated with urban living (slums, smog, sewage and congestion) become a thing of the past.

The purpose of this report is to analyse the extent to which Indian cities are employing technology to increase efficiency in administration and empower the citizens. The objective is to do a competitive assessment of the existing infrastructure as well as the various social factors to discover just how far down the path, from start to smart, these cities are. While the focus is on the 10 major cities, the report also evaluates areas where Greenfield smart cities are likely to come up.

The researchers have employed a combination of analytical and comparative methods. The methodology includes desk research, internal assessment and analysis of the quality of life in a city on the basis of parameters such as power, water, transportation, hospitals, disaster management, administration, etc. The information has been obtained mainly from research papers, public reports, statistics and various resources owned by the government as well as the city administration.

How smart are our cities? has been prepared for the 17th edition of the Express Technology Sabha, where there will be panel discussions and presentations on the various aspects of the smart city concept. This report is essentially a precursor to the discussions that will happen at the Sabha. The city-ranking, compiled in this report, is expected to serve as a benchmark for further driving the conversation on smart cities.

Anoop Verma
Editor, Express Computer

Neel Ratan
Leader, Government and Public Sector,
PwC India

Setting the scene

Urbanisation challenges

Globally, with ever-increasing population, the citizen's demand for basic amenities such as water, energy, infrastructure and clean environment is increasing correspondingly. The accelerating trend of urbanisation is straining city resources including space, physical and social infrastructure. A large part of the worldwide population now lives in urban regions. People migrate to urban areas for better employment opportunities, healthcare and educational facilities as well as improved livability and a higher standard of living. This trend is projected to continue in the coming years.

Urbanisation in India is rapid and propels social and environmental challenges. Cities are characterised by strained infrastructure which manifests itself in terms of power cuts and water shortages, high cost of living, and unaffordable real estate resulting in urban sprawl and slums, high volume of traffic resulting in pollution and delays.

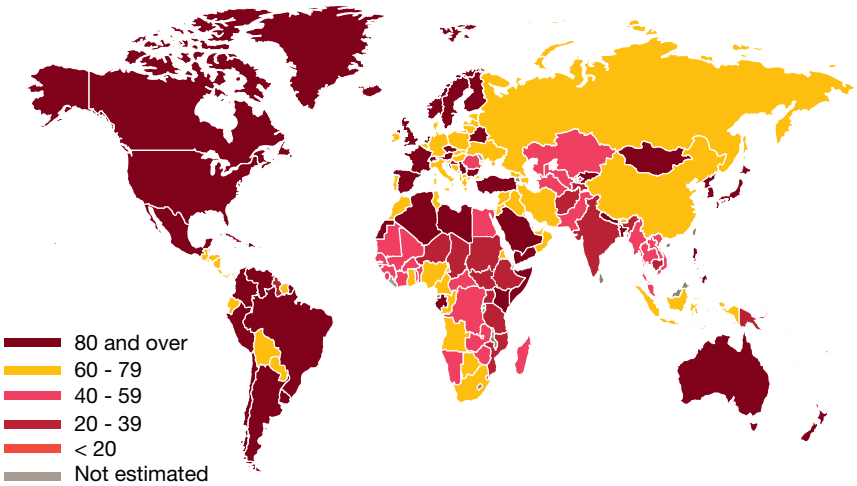
City resources and infrastructure are already stretched beyond capacity. As a result, cities are plagued with the problems of air pollution, waste management, poor water and electricity supply, ageing infrastructure, resource scarcity and traffic congestion. With an increasing inflow of migrants, cities need to alter their way of functioning in order to disseminate public services.

The cities of the future

These challenges are propelling cities across the globe to explore smarter ways of management. Governments have created strategies for smart city transformation in order to improve operational efficiencies, maximise environmental sustainability efforts, and create new citizen services.

The inclination to become a smart city is driven by the inspiration to surpass challenges posed by traditional and conventional cities. Overcoming these critical challenges in a systematic manner is critical for cities inspired to shift towards more sustainable measures among all stakeholders: citizens, businesses and governments.

Percentage of population in urban areas, 2030: District wise (in lakhs)



Source: UN Department of Economic and Social Affairs

** An indicative only.*

World urban population

The world urban population is expected to increase by 72% by 2050

Source: World Urbanisation Prospects: 2011 Revision, produced by the UN Department of Economic and Social Affairs

The smart city concept is a framework for implementing the vision of advanced and modern urbanisation. This vision envisages the achievement of three goals: social equitability, economic viability, and environmental sustainability.

Smart cities leverage technology and utilise existing and planned infrastructure investments to provide higher quality of living to residents, positive investment climate for businesses, and optimum resource utilisation and transparency for governments. Smart cities are an organic integration of the IT, physical, social and business infrastructure. These systems collectively work to generate intelligent and actionable information for decision-makers.

Smart cities and the Indian government

The Indian government has taken up progressive plans to transform its existing cities and has released national-level strategic plans to develop **100 smart cities** in India. This plan defines the various categories of cities that will be taken up for transformation and also mentions the financial, policy and operational support that will be extended by the government.

The Ministry of Urban Development (MoUD) has drafted a concept note that defines the type of cities that will be eligible for selection under the current scheme. As per the MoUD draft concept note, the types of cities are classified as follows:

Shortlisting of cities	
• **Economic criteria**	
– Cities accounting for 54% of incremental GDP till 2025	69
• **Geographic inclusivity**	
– All state capitals (not included above)	12
– Tourist or religious heritage cities (not included above)	8
– Hilly and coastal areas	4
– Mid-sized cities	7
Total	100

- **Precedent conditions**
  - Municipal reforms
  - E-governance
  - Zero emission: Solid and liquid waste
  - Master plan based on spatial mapping or GIS
- **Strategy and approach**
  - Pan-city development
  - Exemplary development through 'city challenge'
  - Pan-city two or three major infrastructural projects
  - Citywide development
    - Citizen engagement and reference Framework
    - Capacity building
    - City development plan based on spatial/GIS mapping, ICT, environmental sustainability
  - Exemplary development through "city challenge"
    - Retrofitting - 500+ acres
    - Redevelopment - 50+ acres
    - Greenfield development - 250+ acres
  - Major citywide infrastructural projects

Retrofitting development	
Where?	• Existing developed area • Minimum 500 acres in size
What?	• Zero emissions: Solid and liquid discharge • Quality electricity and water supply: Smart metering • High-speed, high-bandwidth connectivity • CCTV surveillance of all public areas • LED lighting, intelligent traffic and parking management • Pavements, cycle tracks and roads
How?	• Implementation in three years • SPV (ULB, state, centre) • Selection through competition – “City Challenge”

Redevelopment	
Where?	• Existing urban sprawl (including railway, bus stations, etc.) • Minimum 50 acres in size
What?	• In addition to all retrofitting components • Higher floor area ratio (FAR) and lower ground coverage • Green and energy-efficient buildings • Wide roads, recreational facilities and open spaces
Conditionalities	• Mixed land use and higher FAR • Maximum 50% ground coverage • Maximum 40% commercial, minimum 10% institutional and minimum 10% for parking • MoU with states, ULB, developers
How?	• Implementation in five years • SPV (public or private developer) • Equity participation by the central and state government and ULBs • Selection through competition – “City Challenge”

Greenfield townships	
Where?	• Vacant land • Minimum 250 acres for each township
What?	• In addition to all redevelopment components • Quality infrastructure for education, health and recreation • Multimodal transport • Trade facilitation, incubation, skill development centres
Conditionalities	• In addition to all redevelopment conditions • High speed rail and road connectivity • MoU: States, ULBs and developers
How?	• Implementation in five years • SPV (public or private developer) • Equity participation by the central and state government and ULBs • Selection through competition – “City Challenge”

Proposed funding (per city)
***(Indicative and based on presentation by urban development secretary)**

Phase 1 (3 year time horizon)

• Retrofitting development (of 500 acres)	150 crore INR
• Capacity building, citizen engagement, PMU, CDP	50 crore INR
• E-governance and online public services	50 crore INR

Phase 2 (5-10 year time horizon)

• Equity participation in redevelopment	100 crore INR[#]
• Equity participation in greenfield townships	100 crore INR[#]
• Two or three major infrastructure projects	550 crore INR
Total	1,000 crore INR

[#] Proposed to be pulled out after 5 years at a predetermined return or market value, whichever is higher

69 cities - 54% of GDP	
Andhra Pradesh	Visakhapatnam, Vijaywada
Bihar	Patna
Chattisgarh	Raipur, Durg
Gujarat	Ahmedabad, Surat, Vadodara, Rajkot
Haryana	Gurgaon, Faridabad
Jharkhand	Jamshedpur, Dhanbad, Ranchi
Karnataka	Bangalore, Mysore, Hubli-Dharwad
Kerala	Kochi, Kozhikode, Malappuram, Thrissur, Kannur, Thiruvananthapuram, Kollam
Madhya Pradesh	Indore, Bhopal, Jabalpur, Gwalior
Maharashtra	Mumbai, Pune, Nagpur, Nasik, Vasai, Aurangabad, Solapur, Bhiwandi
Orissa	Bhubaneshwar
Punjab	Ludhiana, Amritsar, Jalandhar
Rajasthan	Jaipur, Kota, Jodhpur, Bikaner
Tamil Nadu	Chennai, Coimbatore, Madurai, Tiruchirapalli, Salem
Telangana	Hyderabad
Uttar Pradesh	Lucknow, Varanasi, Ghaziabad, Kanpur, Agra, Meerut, Allahabad, Moradabad, Bareilly, Aligarh, Noida, Gorakhpur, Saharanpur
West Bengal	Kolkata, Asansol
Others	Delhi, Goa, Chandigarh, Pondicherry

12 state capitals

- Agartala
- Aizawl
- Dehradun
- Dispur
- Gangtok
- Imphal
- Itanagar
- Jammu, Srinagar
- Kohima
- Shimla
- Shillong

8 Tourist or religious heritage cities

- Amaravati
- Ajmer
- Badami
- Dwarka
- Gaya
- Mathura
- Puri
- Warangal

** Source - This information is based on presentation given by the Secretary, Ministry of Urban Development, government of India, as part of the consultation workshop organised on 30 and 31 Jaunary 2015 at Vigyan Bhawan, New Delhi. This document is available on the website of National Institute of Urban Affairs.*

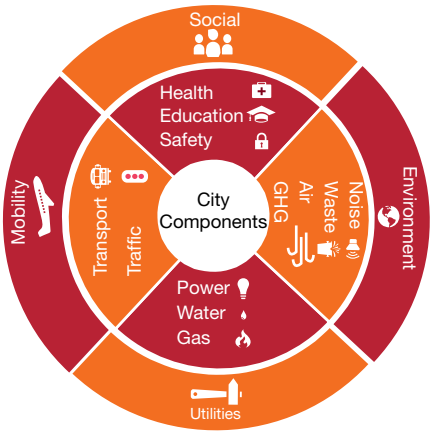
Nature and extent of MoUD support

The central government's support will be in three forms:

- **Financial support:** The current financial resources of the states and cities do not permit the huge investments needed for developing smart cities. Therefore, innovative methods of raising revenues will have to be resorted to by the states and cities. These efforts will be supplemented by the MoUD and other ministries responsible for different sectors, such as Health, Education, Power, Transport, IT, Communications, etc, by way of allocations specifically for the development of smart cities.
- **Policy support and legal backing:** Urban development is a state subject under the Constitution of India. Yet, the central government plays an important supporting role in facilitating appropriate policies that provide a framework for urbanisation. Currently, there is no national urban policy framework. Such a policy, which channels the growth of cities along a 'smart' trajectory, will be crucial for guiding the national government's financial support to cities. Also, existing legal frameworks and policies that regulate the urban sector need to be reviewed by the state and urban local bodies to see what changes, if any, are required.
  - The development acts need to insist on a public transport master plan to be part of a land use master plan and must have the same legal backing as the master plan itself.
  - Floor area ratio (FAR) norms need to be rationalised and made more granular.
  - The existing Urban and Regional Development Plans Formulation and Implementation Guidelines (URDPFI) need to be updated in order to reflect the higher standards expected in a smart city.
  - The current standards for water supply, sewerage and drainage, etc, need to be reviewed.
  - The framework related to investment by the private sector need to be reviewed so that a higher level of private investment in urban infrastructure becomes possible.
  - The framework for making changes in land use need to be reviewed and procedures simplified.
  - Building bye-laws need to be citizen-friendly; laws for making land available for public purposes need to become more liberal.

In this context, the MoUD will play a supporting role by developing model policy guidelines as well as concession agreements.

- **Capacity building:** Leading the change needs implementable capacity building that constitutes structured training, education, contextual research, knowledge exchange and a rich repository on smart cities.



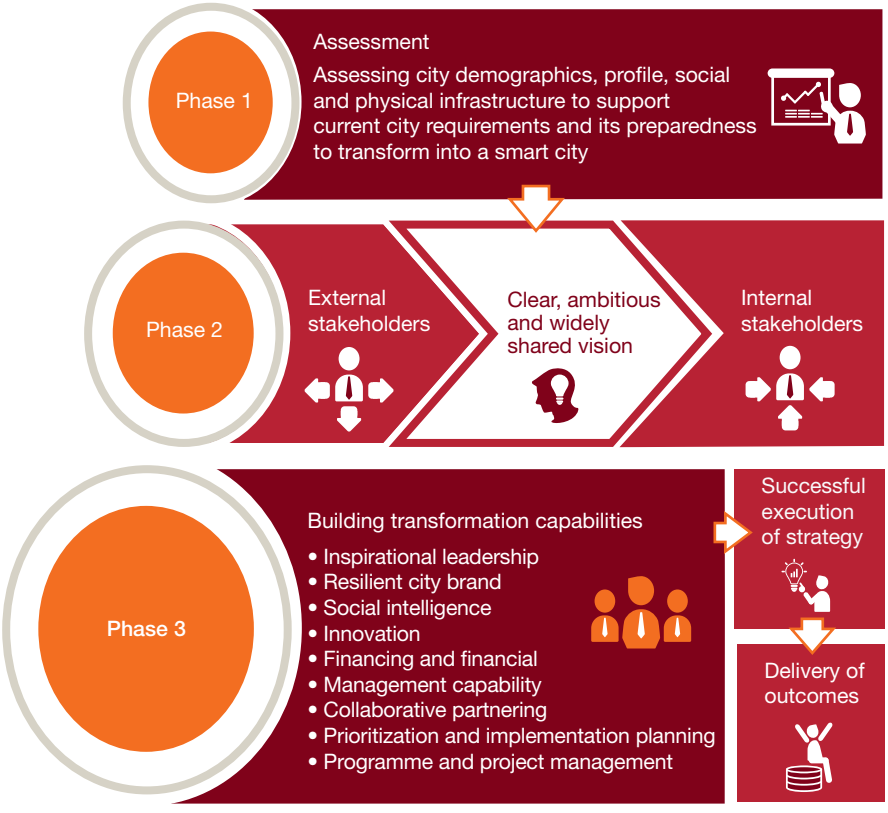
Making it happen: The transformation strategy

The city government and administrators need to develop an implementable transformation strategy around ways to achieve the future development of a sustainable and competitive city that can address social, environmental and economic issues in a holistic manner, whilst making the most of future opportunities.

The starting point for a city is clear assessment of its current situation, immediate pain areas, stakeholder expectations and its preparedness to take the next leap towards the transformation. Subsequently, city administrators need to formulate a clear vision which captures its strategic ambition. In order to channel all resources towards accomplishing the vision, the city's management and its administrators need to develop multiple internal capabilities--an inspirational leadership, a resilient city brand and the ability to learn from other cities through social intelligence.

City administrators need to manage its finances effectively and with the capability to manage the city's key programmes and projects, its performance risks and assets including

the human capital employed in performing its functions. All of this must also be done in a way that is sustainable and through collaboration and partnering with citizens, the private sector, academia and NGOs.



The overall strategy needs to also ensure smooth functioning, inter-department cohesiveness and seamless coordination. Moreover, KPIs and SLAs need to be created for timely reporting, monitoring and completion of tasks and deliverables. In addition, dependencies and reporting structures need to be clearly defined and documented in order to assure transparency and minimise downtime as well as unnecessary delays.

Objective of the report

Our prime objective is to assess the current situation of the city by analysing various social, economic and urban components and metrics in order to develop a comprehensive stock of the city.

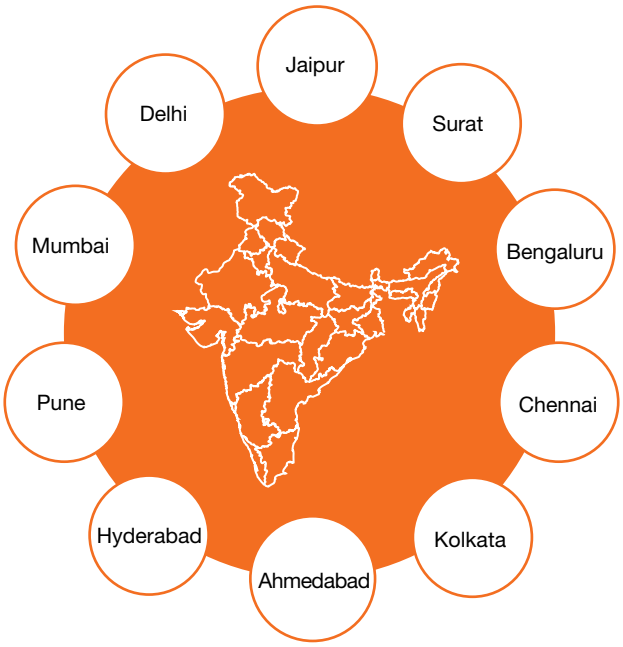
One of the main objectives of this assessment is to reveal a clear picture of current state of the respective identified cities in terms of the selected metrics. This assessment will help as a tool for policymakers and city administrators to understand current and emerging needs of the city and assist in developing strategies to make it more attractive, prosperous and sustainable while advancing towards the wellbeing of its citizens and communities.

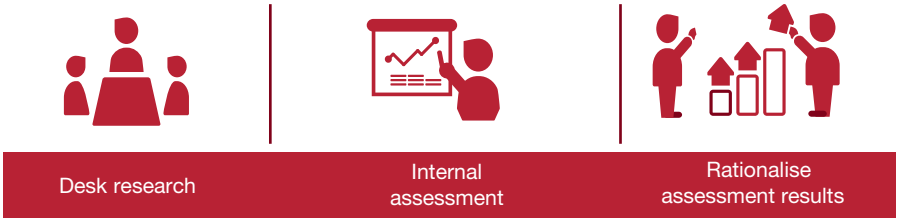
Assessment is a key phase and the most critical for successful execution of any smart city transformation strategy. Thorough assessment will lay a strong foundation to design the strategy for smart cities and help the city administrators analyse current state and performance through various lenses, while also taking into consideration the readiness of the city for the transformation.

Approach adopted

We adopted a structured approach that involved the detailed assessment of fundamental and critical data vectors for smart city transformation and to take cognisance of city readiness to achieve the smart city vision.

In order to develop a comprehensive picture of each individual city, every city has been assessed on the basis of social, economic and urban characteristics and several data vectors as defined in subsequent sections of this report, have been explored.





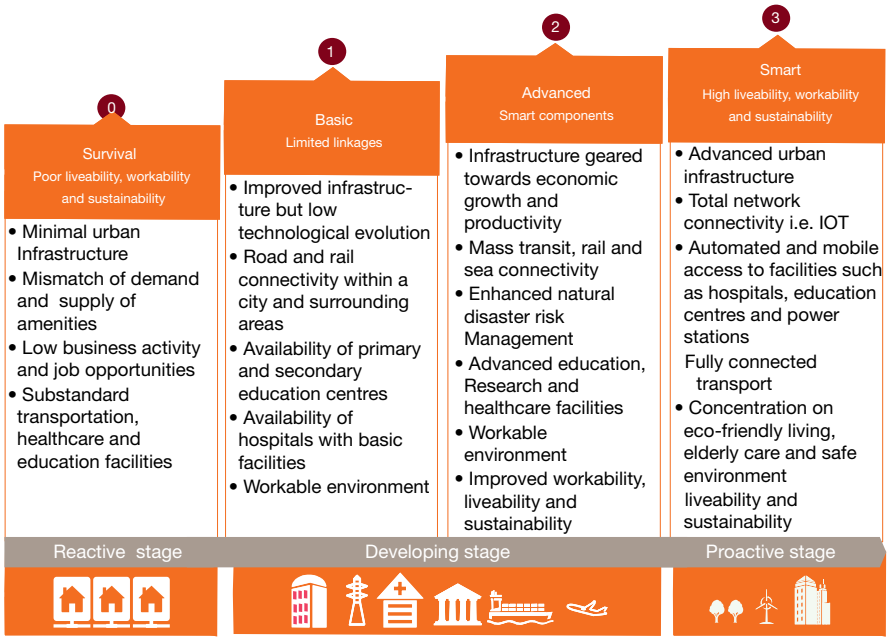
The research methodology included three core activities to build and validate various parameters and findings as a part of the study.

Desk research

Our research team started by identifying the research goals, information areas, boundaries, information reliability and validation procedures. City components that are critical in smart city transformation were identified and emphasis was laid on assessment and investigation around them. These components were then mapped with the city departments and agencies responsible for their operations and management. A mapping exercise was conducted to develop a clear scope boundary and to focus efforts around the right areas only.

The team relied on information and literature from the following sources:

- Various Indian government information portals
- City-specific government websites
- City-specific department websites
- Research papers available publically
- Public reports and statistics; surveys done by various analyst organisations



Component vis-a-vis city department mapping

Components/ city department	Mumbai	Delhi	Bengaluru	Hyderabad	Ahmedabad
Power	Mahadiscom; BEST;	BSES-Rajdhani BSES - Yamuna NDPL NDMC	BESCOM	Andhra Pradesh Southern Power Distribution Company Limited	Torrent Power Limited
Water	BMC MCGM NMMC	Delhi Jal Board	Bengaluru Water Supply and Sewerage Board	Hyderabad Metropolitan Water Supply and Sewerage Board	Gujarat Water Supply and Sewerage Board and Ahmedabad Municipal Corp
Municipal	BMC MCGM NMMC	NDMC SDMC EDMC DCB New Delhi Municipal Corporation	Bruhat Bengaluru Mahanagara Palike	Greater Hyderabad Municipal Corporation	Ahmedabad Municipal Corporation
Disaster	BMC MCGM NMMC	Delhi Disaster Management Authority	Karnataka State Natural Disaster Monitoring Centre	Revenue Disaster Management Department	Gujarat State Disaster Management Authority
Fire	Mumbai Fire Brigade Department	Delhi Fire Services	Karnataka Fire and Emergency Services	AP Fire Service Department	Ahmedabad Fire and Emergency Services Department
Revenue	Revenue Department, Mumbai	Revenue Department, Delhi	Revenue Department Office	Revenue Department, Hyderabad	Ahmedabad District Collectorate Revenue Department
Education	Directorate of Technical Education, Maharashtra	Directorate of Education	Karnataka Education Department	Department of Technical Education, Government of Andhra Pradesh	Gujarat Education Department
Health	Maharashtra Public Health Department Directorate of Health Services	Department of Health and Family Welfare	Department of Health and Family Welfare	Directorate of Public Health and Family Welfare	Ahmedabad Municipal Corporation
Transport	MSRTC, BEST	DTC	Bengaluru Metropolitan Transport Corporation KSRTC RTO	GoAP Transport Department Telangana Transport Department	Ahmedabad Municipal Transport Services
Development authority	Maharashtra Housing and Area Development Authority & MMRDA	Delhi Development Authority	Bengaluru Development Authority	Hyderabad Metropolitan Development Authority	Ahmedabad Urban Development Authority
Police	Mumbai Police	Delhi Police	Bengaluru Police	Hyderabad Police	Ahmedabad Police

Chennai	Kolkata	Surat	Pune	Jaipur
Tamil Nadu Electricity Board Tamil Nadu Generation and Distribution Corporation Limited	Calcutta Electric Supply Corporation	Torrent Power DGVCL	Mahadiscom	Jaipur Vidyut Vitran Nigam
Chennai Metro Water	Kolkata Metropolitan Water and Sanitary Authority	Gujarat water Supply and Sewerage Board and Ahmedabad Municipal Corp	Pune Municipal Corporation	Water Resources Department, Rajasthan
Corporation of Chennai	Kolkata Municipal Corporation	Surat Municipal Corporation	Pune Municipal Corporation	Jaipur Municipal Corporation
Revenue Administration, Disaster Management and Mitigation Department	Department of Disaster Management, Government of West Bengal	Gujarat State Disaster Management Authority	Disaster Management Cell of Pune Municipal Corporation	Disaster Management and Relief Department
Tamil Nadu Fire and Rescue Services	West Bengal Fire Services	Fire and Emergency Services Surat Municipal Corporation	Maharashtra Industrial Development Corporation	Jaipur Fire Brigade Department
Corporation of Chennai Zone Revenue Department	Land and Land Revenue Department	Surat Collectorate - Revenue Department	Revenue Department Pune	Revenue Department Jaipur
Tamil Nadu School Education Department	Department of School Education	Gujarat Education Department	Directorate of Technical Education, Maharashtra	Department of College Education
Public Health Department, Chennai	Department of Health and Family Welfare, West Bengal	Health Department Surat Municipal Corporation	Health Department, PMC	Department of Medical, Health and Family Welfare
State Transport Authority - Tamil Nadu Tamil Nadu State Transport Corporation	Calcutta State Transport Corporation	Gujarat State Road Transport Corporation	Pune Mahanagar Parivahan Mahamandal Limited	RSRTC – Rajasthan State Road Transport Corporation
Chennai Metropolitan Development Authority	Kolkata Metropolitan Development Authority	Surat Urban Development Authority	Pune Metropolitan Region Development Authority	Jaipur Development Authority
Tamil Nadu Police	Kolkata Police	Surat Police	Pune Police	Jaipur Police

**Above department websites were referred during desk research for information*

Internal assessment

Smart city transformation entails the integrated development of various sectors that contribute to city operations and the delivery of competent services to city inhabitants. These sectors are also interconnected. Improvement in one enables improvement in others and vice versa. We looked at the journey of the global cities that have embarked on a similar transformation and the sectors that played a vital role in this transformation. We rationalised our findings with the Indian city administration set-up and finalised the following key sectors as a part of the social, economic and urban review of each of the cities in reference.

Social	Urban	Economic
• Health	• Power	• Municipal corporation
• Education	• Water	• Sustainability
• Safety	• Transport	
• Disaster management	• Sewerage and sanitation	
	• Solid waste management	
	• Storm water drainage	

Detailed sectoral analysis was conducted and across each identified sector, metrics were developed of smart city benchmarks and target operating values. A city's current performance level and service delivery mechanism was then given a score on the basis of its compliance to and deviation from these benchmark and target values. We identified 63 benchmarks which have been assessed and rated across three data vectors:

- Current status
- Technology intervention
- Contribution to smart cities

Out of these 63 benchmarks, 57% depicts an urban overview, 25% a social overview and the remaining provides an economic overview of the city. During the assessment, care has been taken to use the most recent data available.

- **Current status:** Defines the current level of city performance and service delivery across each of the benchmark and is assessed
- **Technology intervention:** Defines the use and state of technology solutions for city operations and the delivery of various city services
- **Contribution to smart city:** Defines the vitality index and the contribution made by individual benchmarks in city operations

These data vectors are assessed on a scale of three to one, three being the highest rating and one the lowest. Weights have been assigned to these data vectors on the basis of their significance and contribution to help assess the preparedness of the cities in reference.

Data vector / rating	Rating 3	Rating 2	Rating 1
Current status	High service delivery	Medium service delivery	Low service delivery
Technology intervention	High technology involvement (for city monitoring and control points)	Medium technology involvement (limited to city monitoring only)	Low technology involvement
Contribution to smart city	Essential to a smart city, fundamental requirement	Significant to a smart city	Least significant for a smart city

The final score has been derived as per the following formula:

Final score =	(Current status* 0.3) + (technology intervention*0.3) + (contribution to smart city*0.4)

High weightage is assigned to 'contribution to smart city' to give a clear view of critical components that need immediate attention and efforts. Further, we have provided a list of key parameters that are required to be assessed by the policy makers and city administrators before embarking upon the smart city transformation journey.

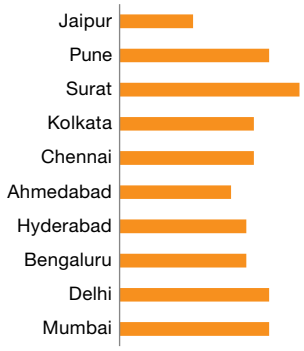
Rationalise assessment results

We rationalised our assessment findings by carrying out a micro-level analysis of the initiatives taken by cities in the respective sectors by individual departments across all identified benchmarks. To substantiate our findings and ratings against the benchmarks, we examined in detail the kind of ground-level initiatives and mechanisms being currently utilised. We have developed a toolkit that has helped us standardise the data vectors across all identified cities and benchmarks. It has developed consolidated scores on a scale of one to 10 for each benchmark. This has helped us gain clear insights of the entire city-wise operations till the last level.

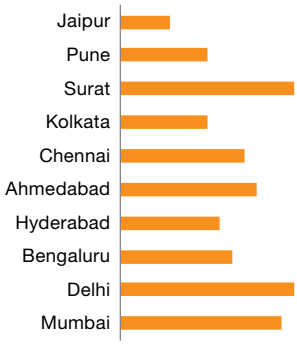
Assessment summary

Assessment summary of various city sectors on identified benchmarks and data vectors

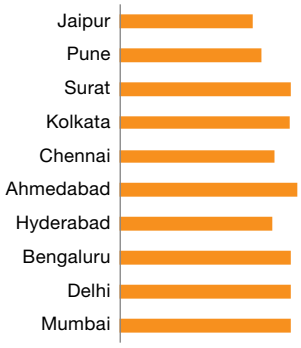
Power



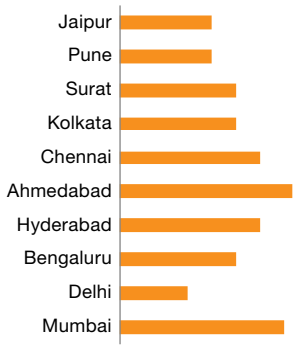
Water



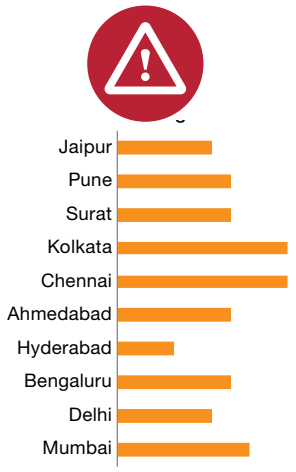
Municipal corporation



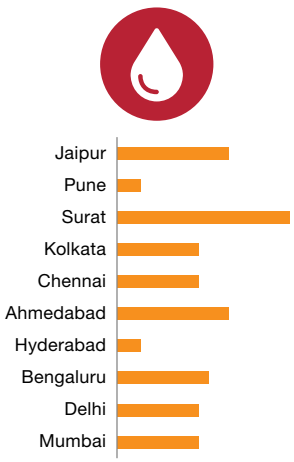
Safety



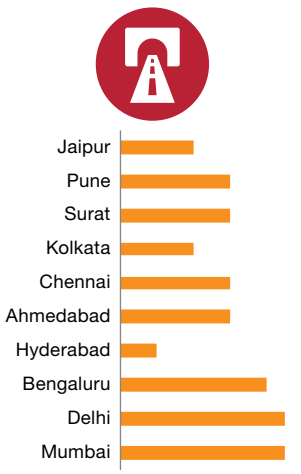
Disaster management



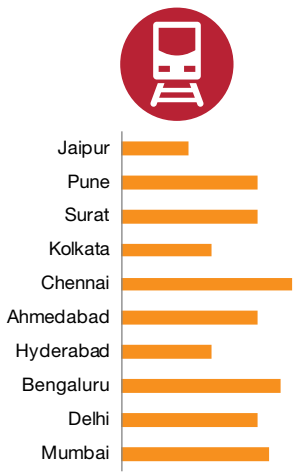
Storm water management drainage



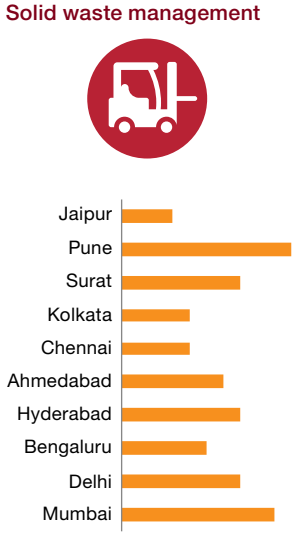
Sewerage and sanitation



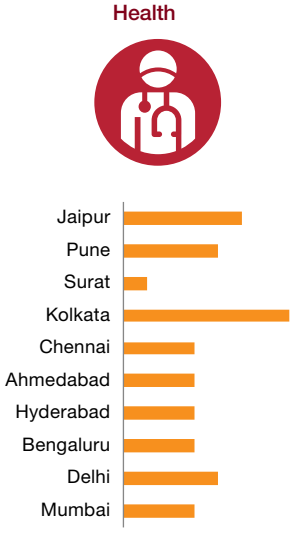
Transport



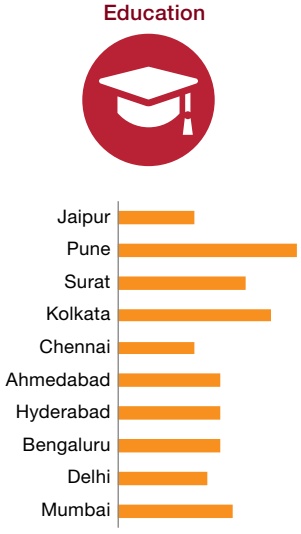
Solid waste management



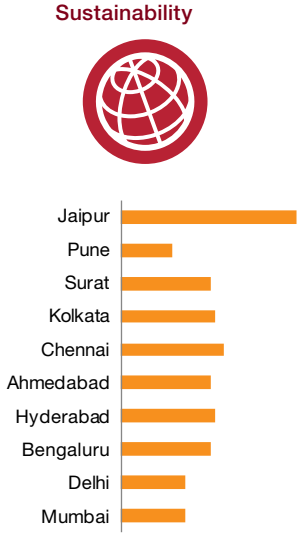
Health



Education



Sustainability



Cities' preparedness for smart city transformation

Mumbai	Master plan
Delhi	Approved in 2006
Bangalore	Approved in 2006
Hyderabad	Approved in 2006 and revised 2012
Ahmedabad	Approved in 2006
Chennai	Approved in 2006
Kolkata	Approved in 2006
Surat	Approved in 2006
Pune	Approved in 2006
Jaipur	Approved in 2006

Our assessment indicates that most cities have robust infrastructure mechanisms in place to deliver fundamental services. However significant transformation is still required to take experience and quality of life to the next level. Power, a basic necessity in smart cities, scores relatively well in our assessment as compared to the other parameters. Several cities have round-the-clock-power supply and efficient metering systems with facilities for online bill payment. Surat leads the race in power, with a consolidated score of 8.67; owing to various progressive initiatives and reforms undertaken by city authorities. Delhi and Mumbai are not too far behind.

Water, another significant component, has immense scope for improvement across most cities assessed. Delhi and Surat hold top spots in this area, while Jaipur, Kolkata and Pune need to re-assess and set up suitable mechanisms for ensuring adequate availability, metering and other services.

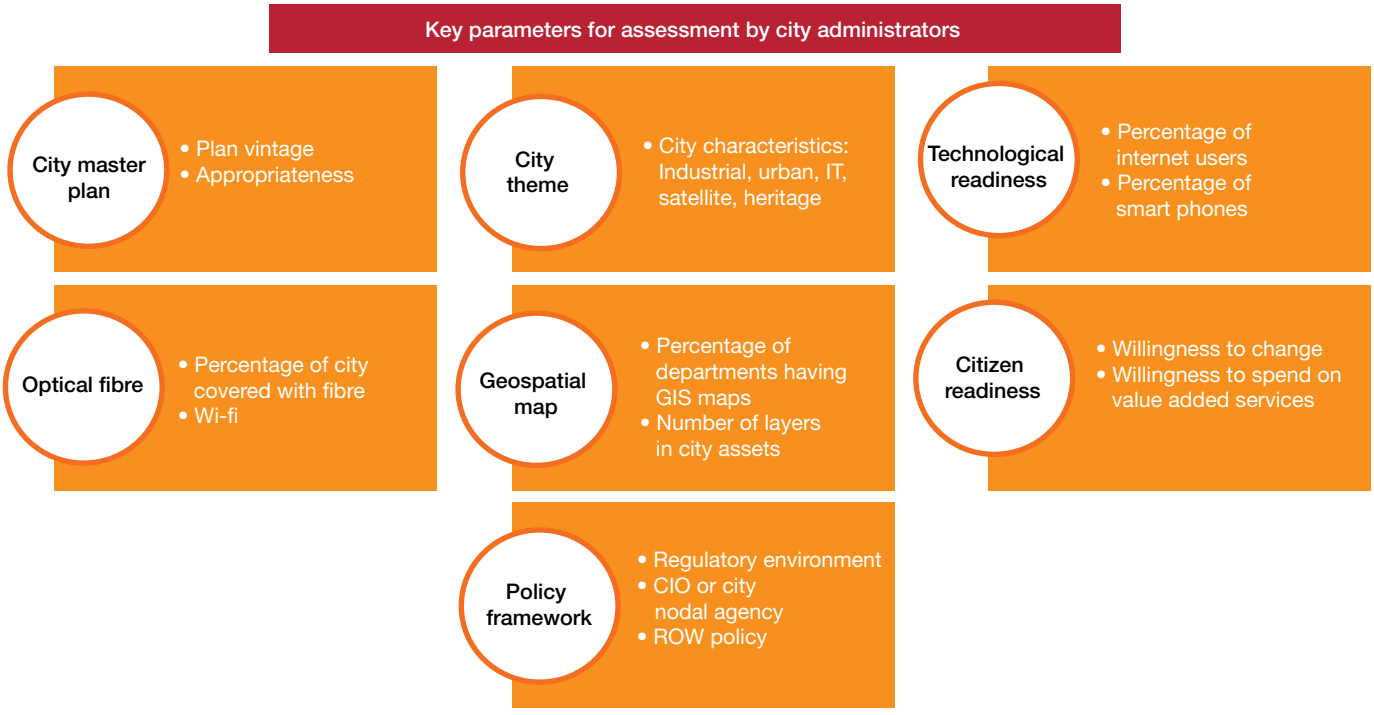
Taking cognisance of municipal corporation services for citizens and businesses, such as online certificate registrations, licence issuance and online approval of building plans, these services are fairly effective in many regions, with Ahmedabad and Surat in the lead. However, cities such as Jaipur and Pune need an overhaul in their service delivery mechanisms to ensure better comfort and convenience for citizens.

In the transport domain, city administrators need to take corrective measures for increasing multi-modal transport as well as ensuring seamless interconnectivity. Moreover, traffic congestion is a major concern across the globe, emphasising that an effective traffic management system is the need of the hour.

Disaster management is a critical component and here, Chennai and Kolkata are frontrunners. Most cities lag behind in disaster management and city authorities must make this one of their top priorities. With regards to other urban infrastructure, most cities also lag behind in waste management as well as sewerage and sanitation. The government has undertaken a nation-wide cleanliness campaign, Swachh Bharat, in order to propagate the culture of cleanliness among citizens. Also, several regulatory measures are being taken to have effective waste management mechanisms in place.

As far as social infrastructure is concerned, providing a sense of security to citizens is a key element of the smart city initiative and surveillance technology infrastructure augmentation needs to be made a top priority across all cities assessed in this report. Additionally, several cities need to catch up on the health and safety fronts. While Kolkata leads in health, Ahmedabad is the leader in safety. In education, emphasis must be laid on increasing the number of government schools and institutions with a channelled focus on building schools for the specially-abled children.

On completion of the benchmark assessment, city administrators and policymakers need to carefully examine their city's readiness to take the next leap of transformation and accordingly articulate the policy and regulations.



Detailed city assessments

Mumbai

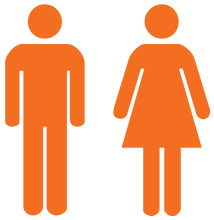
Mumbai
Snapshot

Total city area 603 km²

Total population and sex ratio

1.2 crore

53% 47%



Economy

State domestic product: 13,240 billion INR

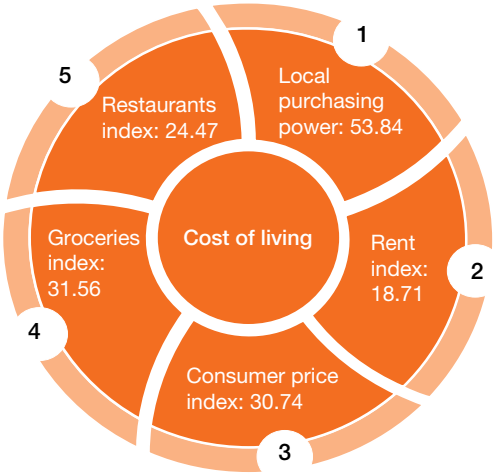
City demographics

Per capita income: 4.23 lpa

Literacy rate: 90.80%

Crime index: 49.50

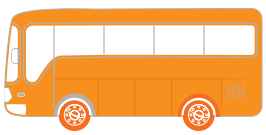
Cost of living



Urban transport

Mumbai local

Auto rickshaw



Bus

Taxi

Pollution

Pollution index: 92.72

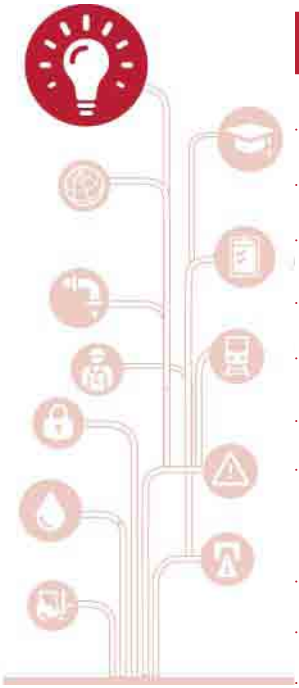
Social infrastructure

Hospitals: One per 92,592 (primary healthcare facilities)

Parks: 0.03 acres of open space per 1,000 persons

Components scoring

Legends	High score: 3	Moderate score: 2	Limited score: 1

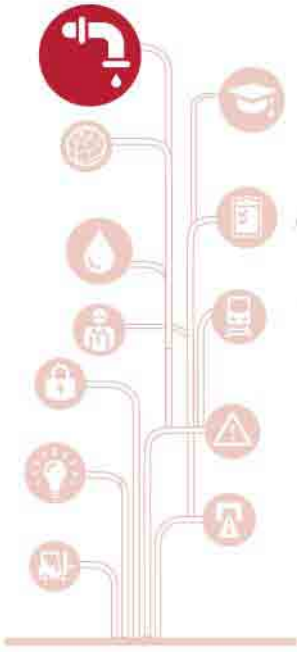


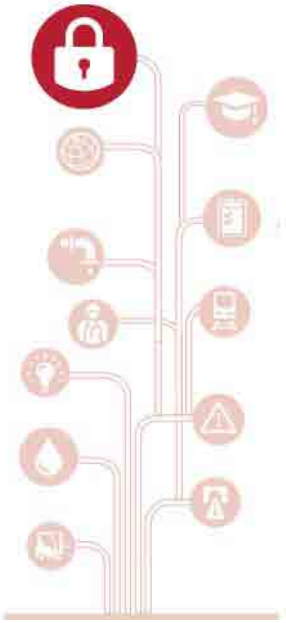
Power

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
24x7 electricity supply	3	3	3	3
Quality	2	3	2	2.3
Distribution losses	3	3	3	3
Energy consumption details	3	2	3	2.7
Online payment facility	3	3	3	3
Grievance redressal or CRM for citizens	3	3	3	3
Metering	3	2	3	2.7
Energy efficiency initiatives: Street, renewable, subsidy and green buildings	2	1	2	1.7
Billing efficiency	2	2	2	2
Revenue realisation	2	2	2	2

Water

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
24x7 water supply	2	2	3	2.4
Metering of water connections	1	2	2	1.7
Billing efficiency	1	2	2	1.7
Online payment facility	3	2	3	2.7
Water losses	2	1	3	2.1
Revenue realisation	2	3	2	2.3



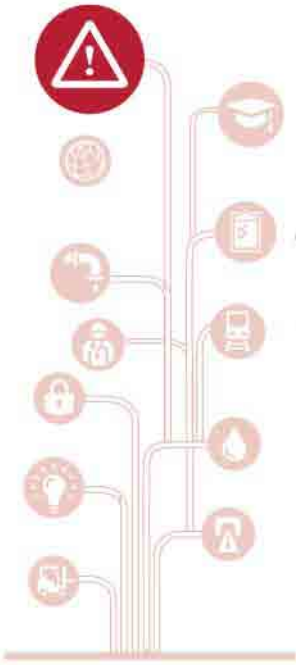


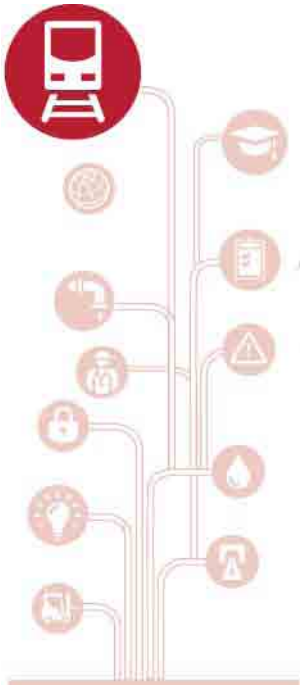
Public safety

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
City surveillance	2	2	3	2.4
Online FIR, complaints registration	3	3	2	2.6
Verification, validations or clearance	2	2	2	2
Complaint response time	2	2	2	2

Disaster management

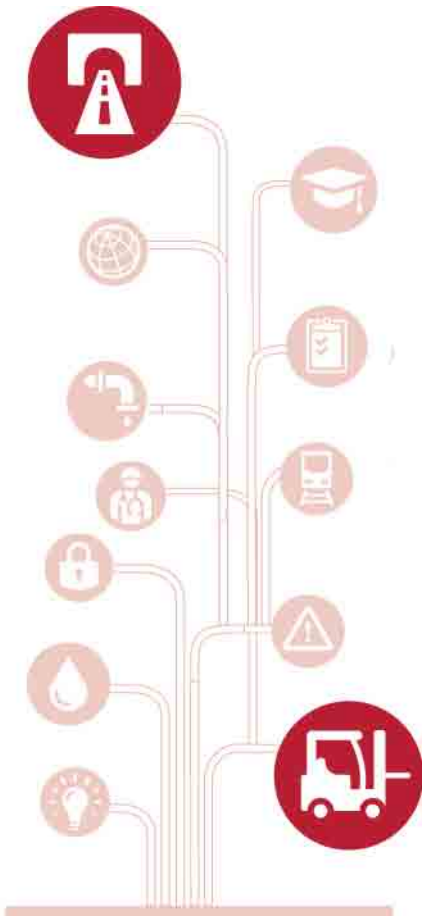
Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Disaster prediction system, early warning system	1	2	3	2.1
Disaster alarm and response system	1	1	3	1.8
Efficient firefighting systems	2	2	3	2.4
Fire stations basis population density	3	1	3	2.4
Fire stations with special devices and materials for firefighting	2	2	3	2.4





Transport

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Transport surveillance: Traffic violation detection, speed violation detection, traffic signal violation detection	1	2	2	1.7
Challan management	2	2	2	2
Traffic management system	2	2	3	2.4
Parking management	1	1	2	1.4
Access to para-transit	2	2	2	2
Availability and frequency of mass transport	3	2	2	2.3
Availability of bicycle tracks	1	1	2	1.4
Unobstructed footpaths of minimum 2m width on either side of all streets	1	1	2	1.4
Adherence to building and parking standards	1	1	2	1.4



Sewerage and sanitation

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Households connected to the waste water or sewerage network	3	2	3	2.7
Waste water treatment	2	2	2	2
Treated water usage	2	2	1	1.6

Solid waste management

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Population with regular solid waste collection (residential)	3	2	2	2.3
Collection of municipal solid waste	3	2	2	2.3
Recycling of solid waste	1	1	2	1.4
Solid waste that is disposed of in a sanitary landfill, open dump or burnt	2	1	1	1.3
Hazardous waste recycling	1	1	2	1.4

Storm water drainage

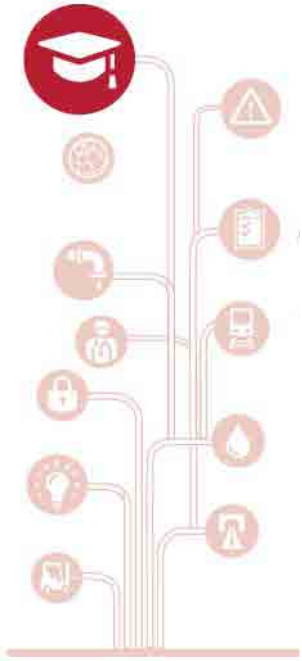
Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Availability of required drainage in identified hotspots	2	1	2	1.7
Rainwater harvesting	1	1	1	1
Evacuation of water	2	1	2	1.7

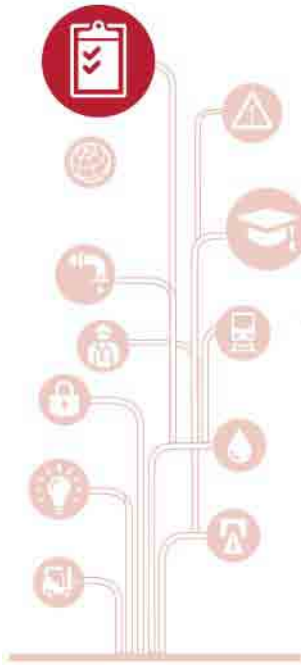
Health

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Hospitals against population density	1	1	3	1.8
Healthcare facilities	2	2	3	2.4
Emergency response facilities (ambulances, emergency wards, etc)	1	2	3	2.1

Education

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Total number of schools	2	1	3	2.1
School for the specially abled	1	1	2	1.4
Colleges against population density	2	2	2	2
Professional colleges against population density	2	2	2	2



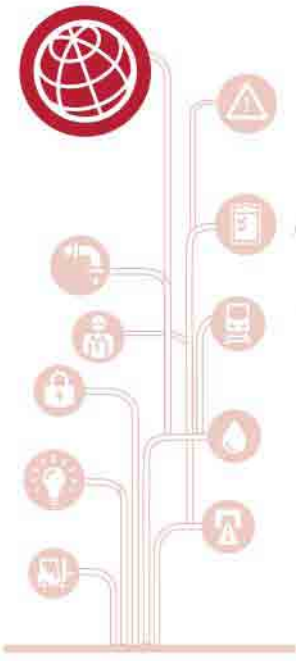


Municipal corporation

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Property tax payment	3	3	2	2.6
Online license issue	3	3	2	2.6
Complaint registration	3	2	2	2.3
Licenses issuance TAT	3	2	2	2.3
RTI TAT	3	2	1	1.9
Birth and death registration	3	2	2	2.3
Online building plan sanction	1	2	2	1.7

Sustainability

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Noise pollution	1	1	2	1.4
Air pollution	1	1	2	1.4
Adherence to green building norms	2	1	3	2.1
Water pollution	1	1	2	1.4



Overall assessment

Mumbai, the financial capital of India, has an area of nearly 603 km^2 and a population of 1.27 crore. The consolidated score for power, which is a significant component in terms of liveability and sustainability from the citizen as well as the industrial perspective, is 8.47/9. In terms of municipal corporation services, Mumbai has a consolidated score of 7.48/9, which positions the city at a higher level than others.

In terms of disaster preparedness and disaster recovery mechanisms, the city has a consolidated score of 7.40/9. This score can be attributed to the presence of an adequate number of fire stations and advanced fire-fighting equipment. However, the city lags behind on the disaster prediction and management front and needs to urgently catch up.

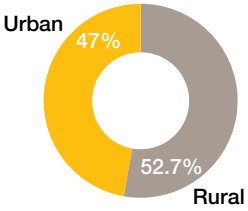
Mumbai is often in the news for incessant rains, waterlogged roads and flooding in the monsoon, which is also reflected in the city's consolidated score of 4.89/9 in storm water drainage. This is an area of concern and Mumbai needs to have robust mechanisms in place for minimising such incidents.

Safety is another critical parameter to assess smart city readiness and here, Mumbai has a consolidated score of 7.50/9. The city has shown a positive graph in the utilisation of technology for city surveillance and has various projects in the pipeline. However, the city administration needs to align its current project objectives with the smart city vision to further enhance public safety. In terms of water supply, the city has a consolidated score of 7.17/9. It needs to improve billing efficiency, metering of water connections, revenue realisation and mitigate water loss. On other parameters such as transport, solid waste management and health, Mumbai has consolidated scores of 5.93, 5.80 and 7.00 respectively. In terms of overall sustainability that includes air, water and noise pollution as well as adherence to green building norms, the city has a consolidated score of 5.25/9, highlighting an immediate need for attention by the city administration.

Delhi

Delhi
Snapshot

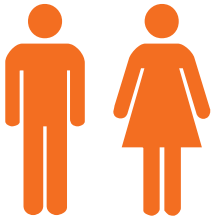
Total city area: 1,484 km²
Districts: 11



Total population and sex ratio

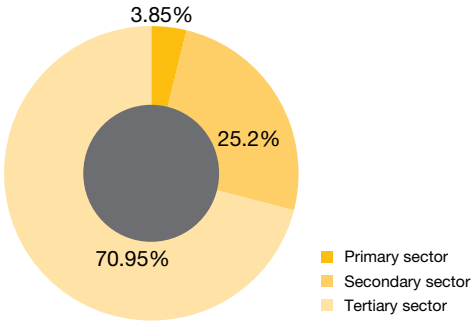
1.1 crore

57% 43%



Economy

State domestic product: 1,578 billion INR



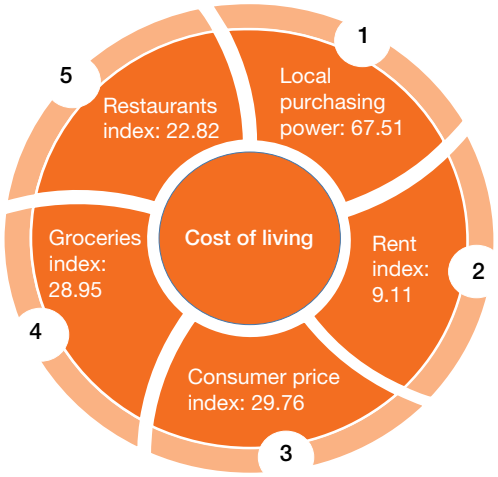
City demographics

Per capita income: 2.1 lpa

Literacy rate: 86.34%

Crime index: 58.37

Cost of living

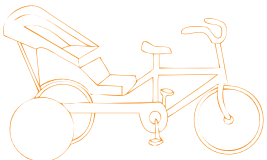


Urban transport

Delhi metro

Bus

Auto rickshaw



Cycle rickshaw

Green cover

Forest cover is 20.20%

Pollution index: 86.97

Social infrastructure

Hospitals: 131

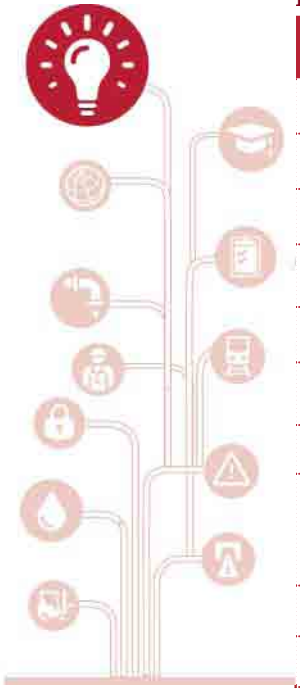
Schools: 2,666

Colleges: 160

Parks: 18,000

Components scoring

Legends	High score: 3	Moderate score: 2	Limited score: 1

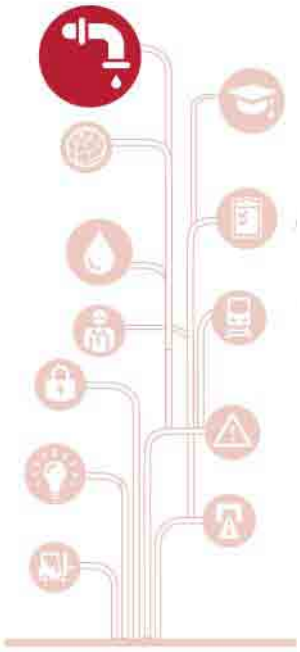


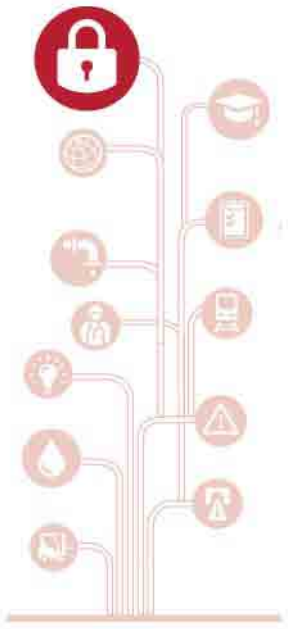
Power

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
24x7 electricity supply	3	3	3	3
Quality	1	3	2	2
Distribution losses	2	3	3	2.7
Energy consumption details	3	2	3	2.7
Online payment facility	3	3	3	3
Grievance redressal or CRM for citizens	3	2	3	2.7
Metering	3	2	3	2.7
Energy efficiency initiatives: Street, renewable, subsidy and green buildings	2	2	2	2
Billing efficiency	2	3	2	2.3
Revenue realisation	2	3	2	2.3

Water

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
24x7 water supply	2	2	3	2.4
Metering of water connections	1	2	2	1.7
Billing efficiency	1	2	2	1.7
Online payment facility	3	3	3	3
Water losses	1	2	3	2.1
Revenue realisation	2	3	2	2.3



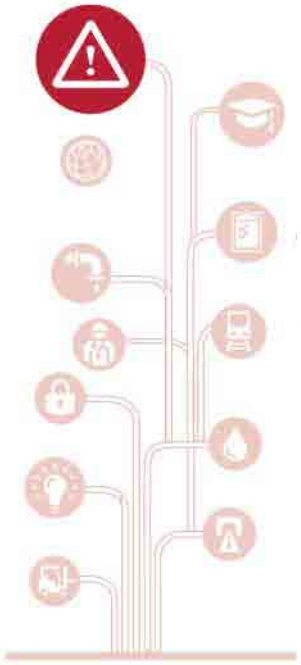


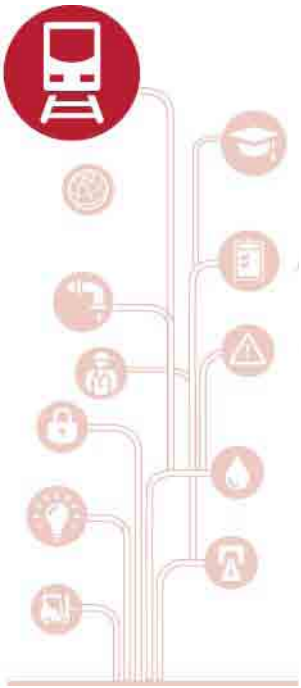
Public safety

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
City surveillance	1	1	3	1.8
Online FIR, complaints registration	2	2	2	2
Verification, validations or clearance	2	2	2	2
Complaint response time	2	2	2	2

Disaster management

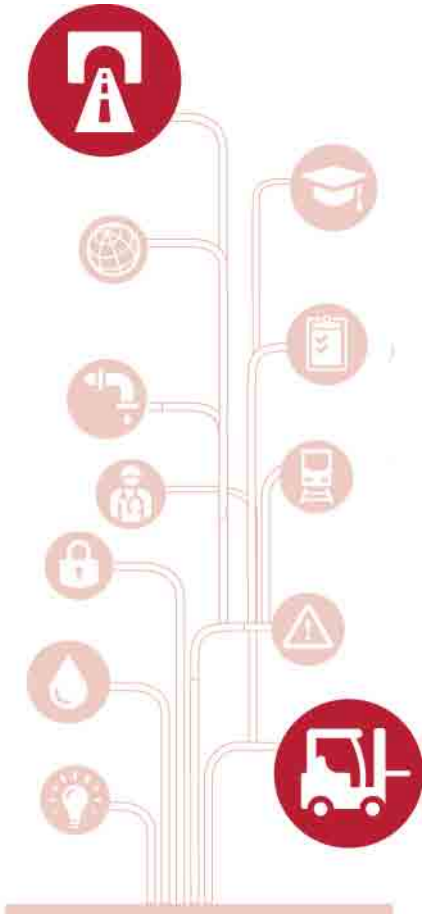
Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Disaster prediction system, early warning system	1	2	3	2.1
Disaster alarm and response system	1	1	3	1.8
Efficient firefighting systems	2	2	3	2.4
Fire stations basis population density	1	1	3	1.8
Fire stations with special devices and materials for firefighting	2	2	3	2.4





Transport

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Transport surveillance: Traffic violation detection, speed violation detection, traffic signal violation detection	1	2	2	1.7
Challan management	2	2	2	2
Traffic management system	2	2	3	2.4
Parking management	1	2	2	1.7
Access to para-transit	2	1	2	1.7
Availability and frequency of mass transport	2	2	2	2
Availability of bicycle tracks	1	1	2	1.4
Unobstructed footpaths of minimum 2m width on either side of all streets	1	1	2	1.4
Adherence to building and parking standards	1	1	2	1.4



Sewerage and sanitation

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Households connected to the waste water or sewerage network	3	2	3	2.7
Waste water treatment	2	2	2	2
Treated water usage	2	2	1	1.6

Solid waste management

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Population with regular solid waste collection (residential)	3	1	2	2
Collection of municipal solid waste	3	1	2	2
Recycling of solid waste	1	1	2	1.4
Solid waste that is disposed of in a sanitary landfill, open dump or burnt	2	1	1	1.3
Hazardous waste recycling	1	1	2	1.4

Storm water drainage

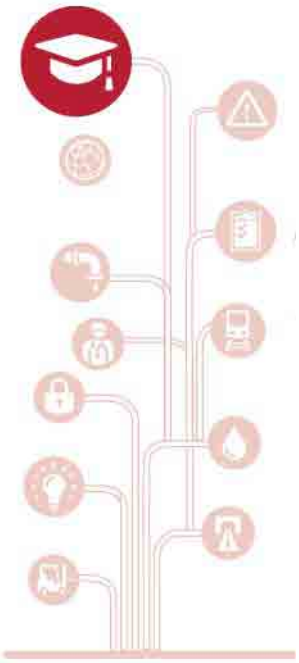
Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Availability of required drainage in identified hotspots	2	1	2	1.7
Rainwater harvesting	1	1	1	1
Evacuation of water	2	1	2	1.7

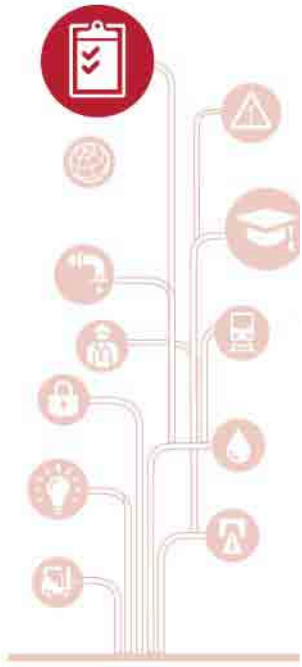
Health

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Hospitals against population density	1	1	3	1.8
Healthcare facilities	2	2	3	2.4
Emergency response facilities (ambulances, emergency wards, etc)	2	2	3	2.4

Education

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Total number of schools	1	2	3	2.1
School for the specially abled	1	1	2	1.4
Colleges against population density	1	2	2	1.7
Professional colleges against population density	1	2	2	1.7



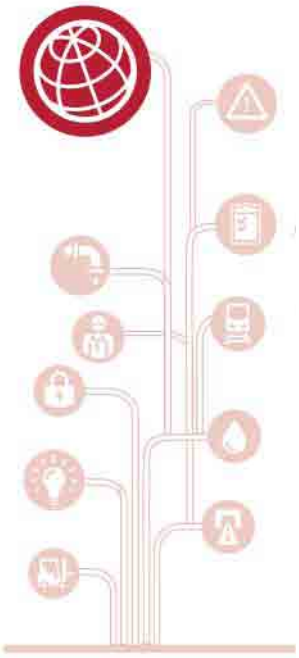


Municipal corporation

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Property tax payment	3	3	2	2.6
Online license issue	3	3	2	2.6
Complaint registration	2	2	2	2
Licenses issuance TAT	3	2	2	2.3
RTI TAT	3	2	1	1.9
Birth and death registration	3	2	2	2.3
Online building plan sanction	2	2	2	2

Sustainability

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Noise pollution	2	1	2	1.7
Air pollution	1	1	2	1.4
Adherence to green building norms	1	1	3	1.8
Water pollution	1	1	2	1.4



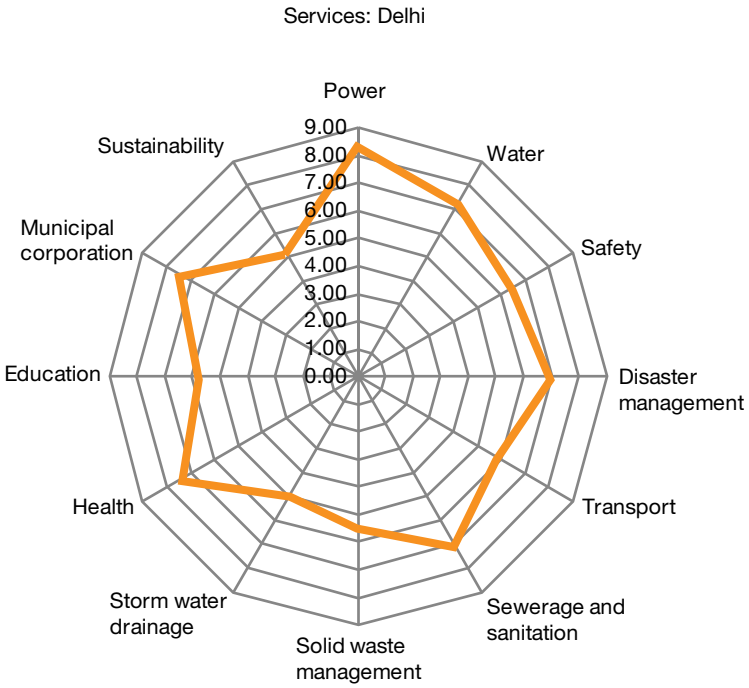
Overall assessment

Delhi, the capital city of India, spans across an area of 1484 km^2 and has a population of 1.1 crore. It has an overall score of 8.47/9 in power, which is a positive indication. The city has effective systems in place for ensuring 24X7 power supply, online payment facilities as well as visibility of energy consumption details.

Water, another significant contributor to the smart city framework, has a consolidated score of 7.33/9 in Delhi. The capital needs to improve on its water billing efficiency, metering of water connections, mitigation of water losses and round-the-clock water supply. In public safety, Delhi has a consolidated score of 6.50/9. Surveillance, utilisation of technology, online FIR registration facilities, and complaint response time require substantial improvement.

On the disaster management front, Delhi has a consolidated score of 7/9. Technology intervention in disaster management is a core concern. Moreover, factors such as the availability of adequate fire stations basis the population density, specialised equipment, efficient disaster alert and response systems, as well as prediction and warning systems require significant enhancement.

With consolidated scores of 5.40 and 4.89 in solid waste management and storm water drainage respectively, Delhi clearly needs an upgrade. Presently, technological intervention is substantially low in areas such as waste collection and recycling, as well as rainwater harvesting and drainage systems. In terms of municipal corporation services, Delhi has a consolidated score of 7.48/9. The city has fairly efficient mechanisms in place for online licence issuance, property tax payment, online building plan and birth registration certificates. However, there is scope for better technological interventions in these domains. In terms of sustainability, Delhi has a consolidated score of 5.25/9.



Hyderabad

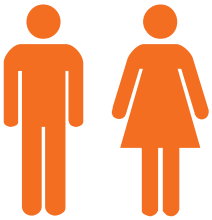
Hyderabad
Snapshot

Total city area: 650 km²

Total population and sex ratio

68.09 lakh

52% 48%



Economy

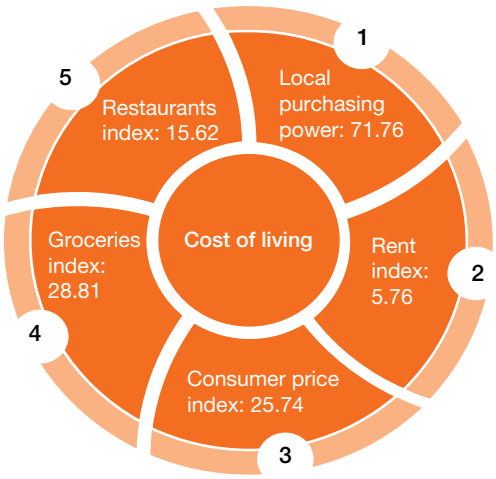
State domestic product: 70 billion INR (2011)

City demographics

Per capita income: 44,300

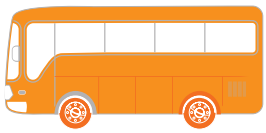
Literacy rate: 82.96%

Cost of living



Urban transport

Train



Bus

Auto rickshaw

Green cover

Forest cover is 25% (2014)

Pollution index

Air pollution: 81.94

Water pollution: 59.17

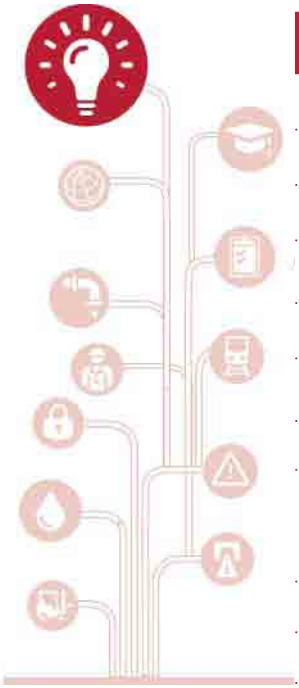
Social infrastructure

Hospitals: 50

Schools: 181

Components scoring

Legends	High score: 3	Moderate score: 2	Limited score: 1

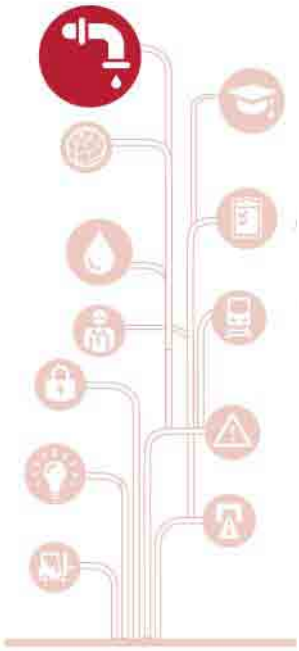


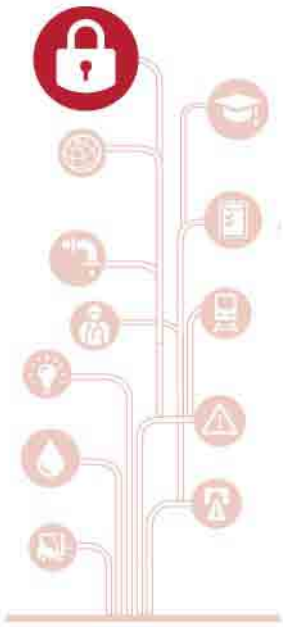
Power

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
24x7 electricity supply	1	3	2	2
Quality	3	3	3	3
Distribution losses	3	1	3	2.4
Energy consumption details	3	3	3	3
Online payment facility	3	2	3	2.7
Grievance redressal or CRM for citizens	3	2	3	2.7
Metering	3	2	3	2.7
Energy efficiency initiatives: Street, renewable, subsidy and green buildings	2	2	2	2
Billing efficiency	2	3	2	2.3
Revenue realisation	2	2	2	2

Water

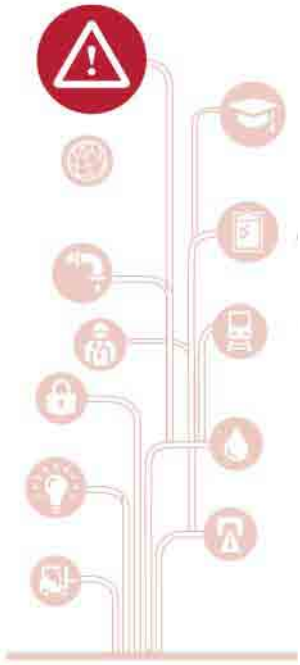
Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
24x7 water supply	1	1	3	1.8
Metering of water connections	1	1	2	1.4
Billing efficiency	2	1	2	1.7
Online payment facility	2	3	3	2.7
Water losses	3	1	3	2.4
Revenue realisation	1	1	2	1.4





Public safety

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
City surveillance	2	1	3	2.1
Online FIR, complaints registration	3	3	2	2.6
Verification, validations or clearance	2	3	2	2.3
Complaint response time	2	1	2	1.7

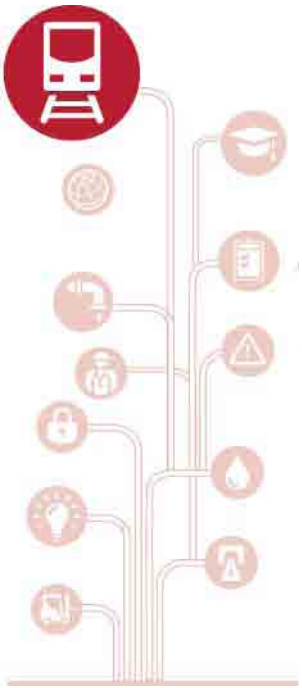


Disaster management

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Disaster prediction system, early warning system	2	1	3	2.1
Disaster alarm and response system	2	1	3	2.1
Efficient firefighting systems	2	1	3	2.1
Fire stations based on population density	1	1	3	1.8
Fire stations with special devices and materials for firefighting	1	1	3	1.8

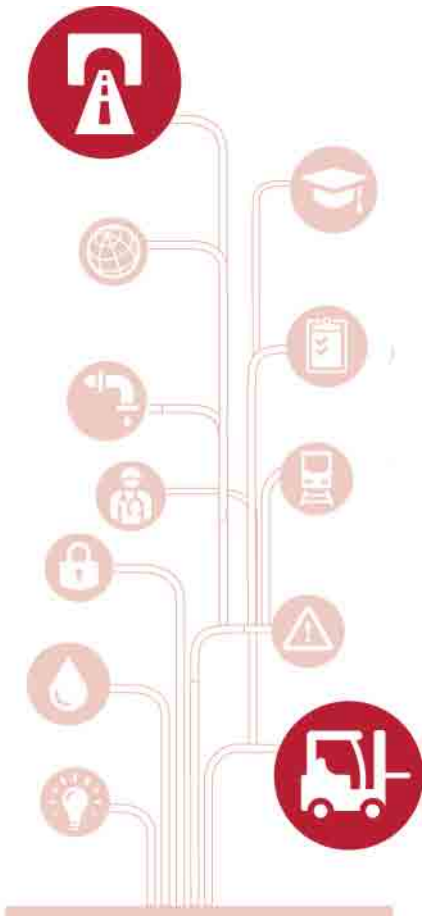
Transport

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Transport surveillance: Traffic violation detection, speed violation detection, traffic signal violation detection	2	2	2	2
Challan management	2	1	2	1.7
Traffic management system	2	2	3	2.4
Parking management	1	1	2	1.4
Access to para-transit	1	1	2	1.4
Availability and frequency of mass transport	1	1	2	1.4
Availability of bicycle tracks	1	1	2	1.4
Unobstructed footpaths of minimum 2m width on either side of all streets	1	1	2	1.4
Adherence to building and parking standards	1	1	2	1.4



Sewerage and sanitation

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Households connected to the waste water or sewerage network	1	1	3	1.8
Waste water treatment	1	1	2	1.4
Treated water usage	1	1	1	1



Solid waste management

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Population with regular solid waste collection (residential)	2	1	2	1.7
Collection of municipal solid waste	2	1	2	1.7
Recycling of solid waste	2	1	2	1.7
Solid waste that is disposed of in a sanitary landfill, open dump or burnt	2	1	1	1.3
Hazardous waste recycling	2	1	2	1.7

Storm water drainage

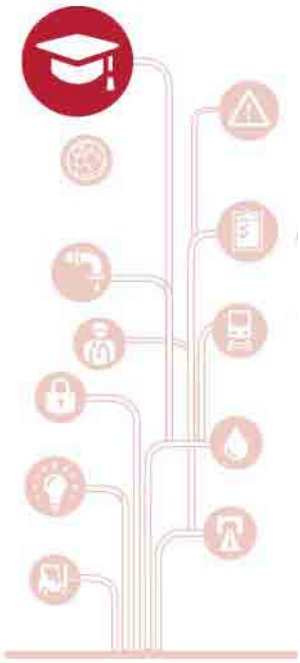
Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Availability of required drainage in identified hotspots	1	1	2	1.4
Rainwater harvesting	1	1	1	1
Evacuation of water	1	1	2	1.4

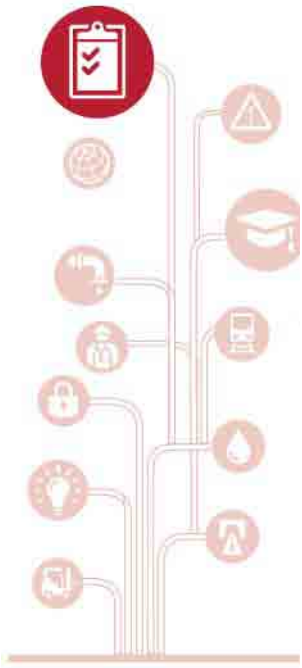
Health

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Hospitals against population density	1	1	3	1.8
Healthcare facilities	1	2	3	2.1
Emergency response facilities (ambulances, emergency wards, etc)	2	2	3	2.4

Education

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Total number of schools	1	1	3	1.8
School for the specially abled	2	1	2	1.7
Colleges against population density	2	1	2	1.7
Professional colleges against population density	2	2	2	2



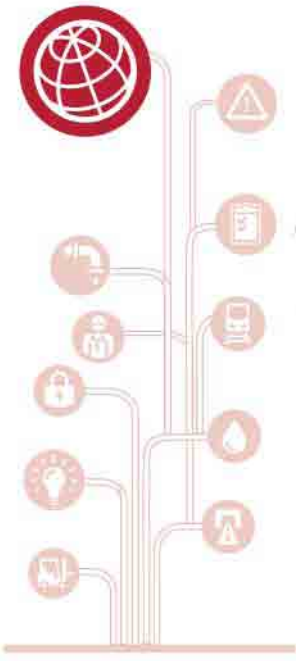


Municipal corporation

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Property tax payment	3	2	2	2.3
Online licence issue	2	2	2	2
Complaint registration	3	3	2	2.6
Licences issuance TAT	1	1	2	1.4
RTI TAT	2	1	1	1.3
Birth and death registration	3	1	3	2.4
Online building plan sanction	2	2	2	2

Sustainability

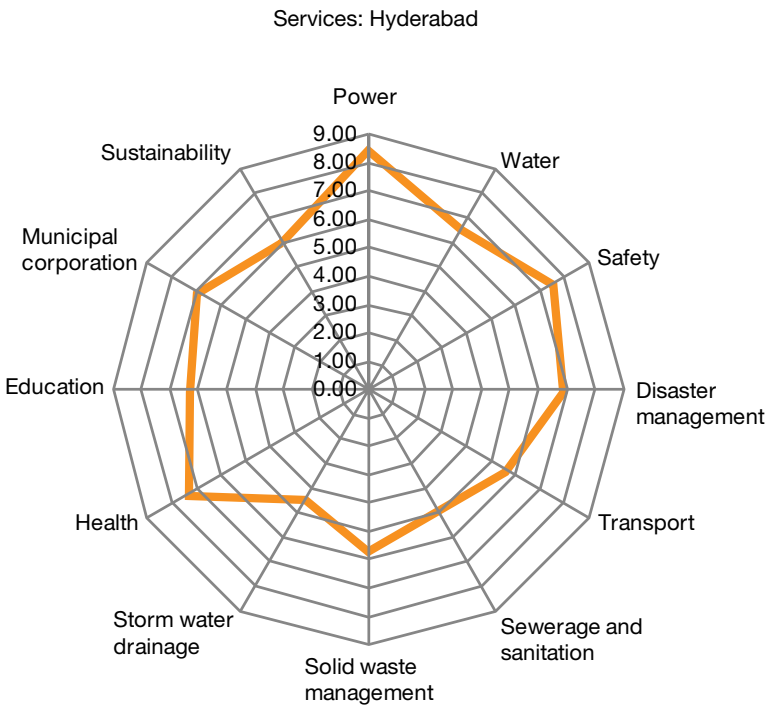
Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Noise pollution	1	1	2	1.4
Air pollution	1	2	2	1.7
Adherence to green building norms	2	1	3	2.1
Water pollution	1	1	3	1.8



Overall assessment

Hyderabad covers an area of 326.5 km^2 and has a population of 68.09 lakh. In the power domain, the city has a consolidated score of 8.17/9. With technological intervention, Hyderabad has fairly efficient systems in place for electricity grid operations and management, online bill payment, mitigation of distribution losses, metering and grievance redressal. Uninterrupted power supply, however, continues to remain a concern in certain parts.

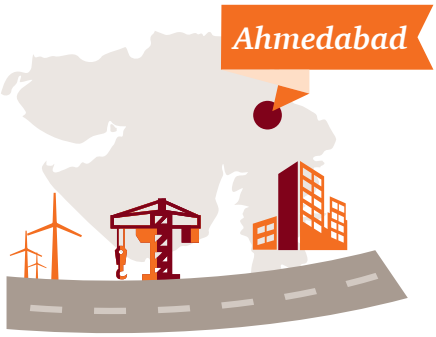
In the water, municipal corporation, education and disaster management domains, Hyderabad has consolidated scores of 6.33, 6.67, 6.00 and 6.60 respectively. Sewerage and sanitation, a critical component for embarking on the smart city journey, has a consolidated score of 4.67/9. The city requires considerable technological intervention in areas of waste water treatment, usage of treated water, as well as the connectivity of households to the waste and sewerage network. The city also needs to improve in terms of overall sustainability and storm water drainage.



Ahmedabad

Ahmedabad
Snapshot

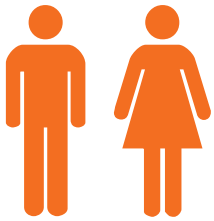
Total city area: 464 km²



Total population and sex ratio

0.63 crore

897 women per 1,000 men



Economy

State domestic product: 4,032 billion INR

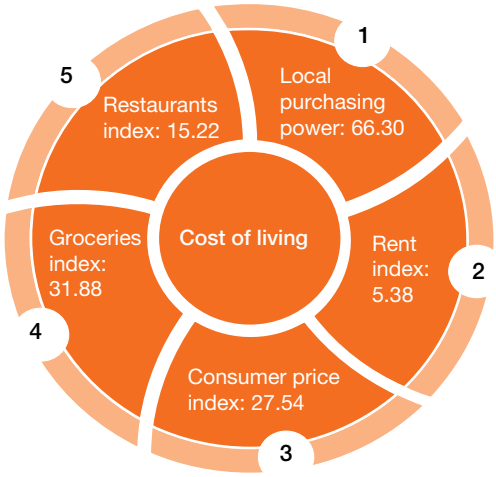
City demographics

Per capita income: 3.28 lpa

Literacy rate: 89.62 %

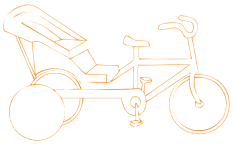
Crime index: 22.01

Cost of living

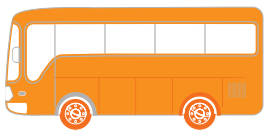


Urban transport

Auto rickshaw



Cycle rickshaw



Bus

Green cover

Forest cover is 4.5%

Pollution index: 70.35

Social infrastructure

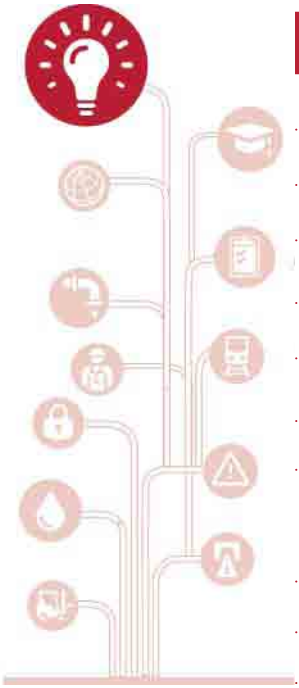
Hospitals: 26

Schools: 1,870

Colleges: 34

Components scoring

Legends	High score: 3	Moderate score: 2	Limited score: 1

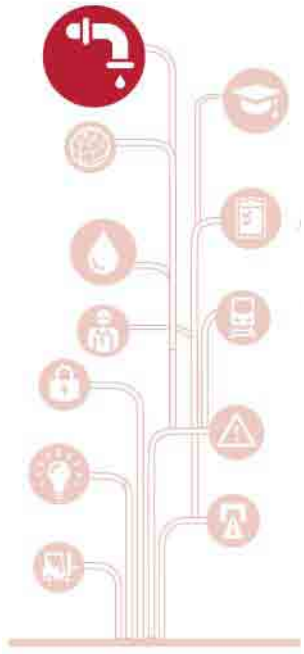


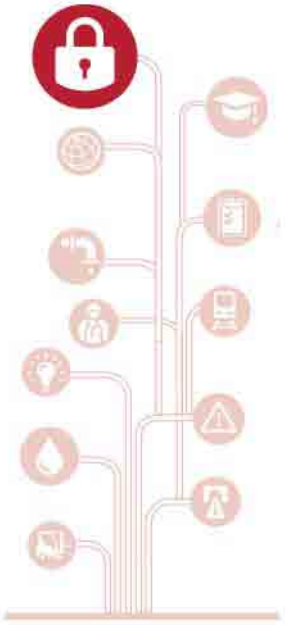
Power

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
24x7 electricity supply	3	2	3	2.7
Quality	3	2	2	2.3
Distribution losses	2	2	3	2.4
Energy consumption details	2	1	3	2.1
Online payment facility	3	3	3	3
Grievance redressal or CRM for citizens	3	2	3	2.7
Metering	3	1	3	2.4
Energy efficiency initiatives: Street, renewable, subsidy and green buildings	2	2	2	2
Billing efficiency	3	2	2	2.3
Revenue realisation	2	2	2	2

Water

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
24x7 water supply	2	1	3	2.1
Metering of water connections	2	1	2	1.7
Billing efficiency	2	1	2	1.7
Online payment facility	3	2	3	2.7
Water losses	2	1	3	2.1
Revenue realisation	2	2	2	2



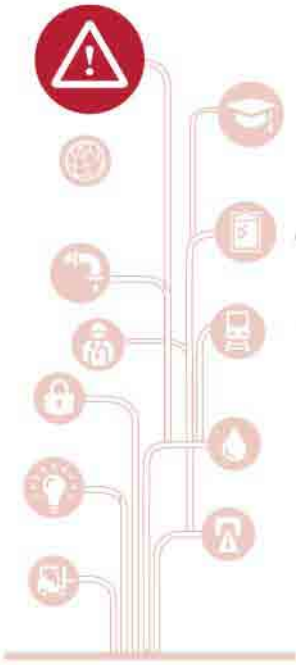


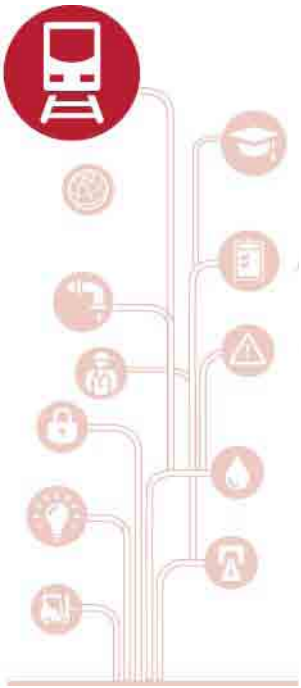
Public safety

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
City surveillance	3	2	3	2.7
Online FIR, complaints registration	3	2	3	2.7
Verification, validations or clearance	2	2	2	2
Complaint response time	2	1	2	1.7

Disaster management

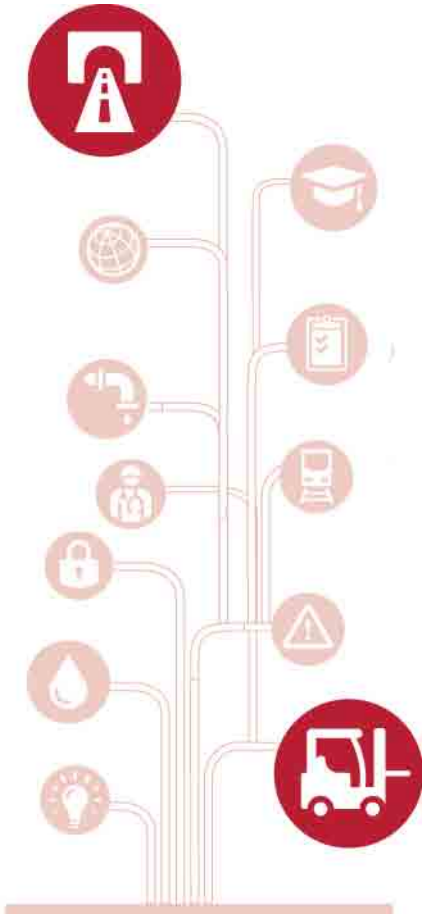
Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Disaster prediction system, early warning system	2	1	3	2.1
Disaster alarm and response system	2	1	3	2.1
Efficient firefighting systems	2	2	3	2.4
Fire stations based on population density	2	2	3	2.4
Fire stations with special devices and materials for firefighting	1	1	3	1.8





Transport

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Transport surveillance: Traffic violation detection, speed violation detection, traffic signal violation detection	2	2	2	2
Challan management	2	2	2	2
Traffic management system	2	2	3	2.4
Parking management	2	1	2	1.7
Access to para-transit	2	1	2	1.7
Availability and frequency of mass transport	2	1	2	1.7
Availability of bicycle tracks	1	1	2	1.4
Unobstructed footpaths of minimum 2m width on either side of all streets	1	1	2	1.4
Adherence to building and parking standards	1	1	2	1.4



Sewerage and sanitation

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Households connected to the waste water or sewerage network	3	1	3	2.4
Waste water treatment	2	2	2	2
Treated water usage	1	1	1	1

Solid waste management

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Population with regular solid waste collection (residential)	2	1	2	1.7
Collection of municipal solid waste	1	1	2	1.4
Recycling of solid waste	2	1	2	1.7
Solid waste that is disposed of in a sanitary landfill, open dump or burnt	2	1	1	1.3
Hazardous waste recycling	2	1	2	1.7

Storm water drainage

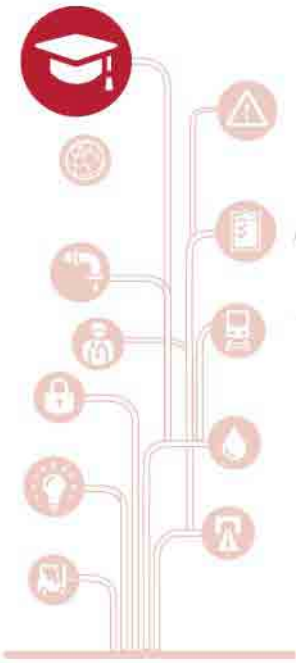
Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Availability of required drainage in identified hotspots	2	1	2	1.7
Rainwater harvesting	2	1	1	1.3
Evacuation of water	2	1	2	1.7

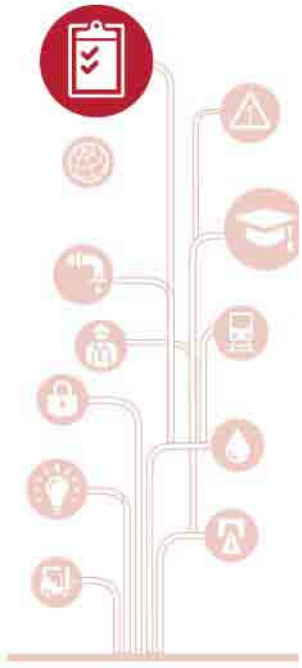
Health

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Hospitals against population density	2	1	3	2.1
Healthcare facilities	2	1	3	2.1
Emergency response facilities (ambulances, emergency wards, etc)	2	1	3	2.1

Education

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Total number of schools	2	1	3	2.1
School for the specially abled	2	1	2	1.7
Colleges against population density	2	1	2	1.7
Professional colleges against population density	2	1	2	1.7



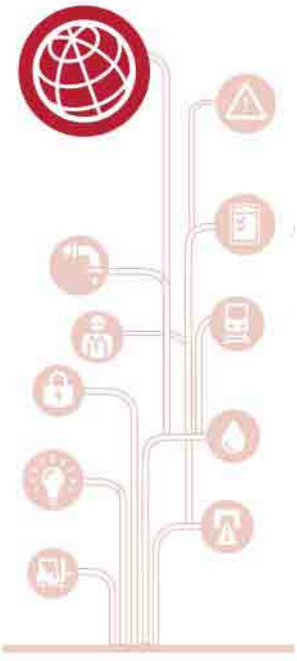


Municipal corporation

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Property tax payment	3	3	2	2.6
Online licence issue	3	2	2	2.3
Complaint registration	3	2	2	2.3
Licences issuance TAT	3	2	2	2.3
RTI TAT	3	2	1	1.9
Birth and death registration	3	3	2	2.6
Online building plan sanction	3	2	2	2.3

Sustainability

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Noise pollution	2	1	2	1.7
Air pollution	2	1	2	1.7
Adherence to green building norms	1	1	3	1.8
Water pollution	2	1	2	1.7

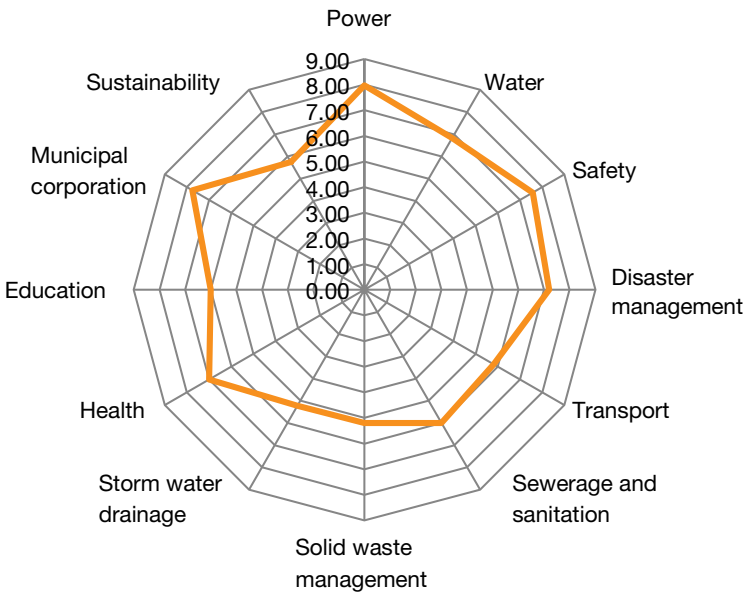


Overall assessment

Ahmedabad, which spans an area of 464 km^2, has a population of 63 lakh. In the power domain, the city has a consolidated score of 7.97, and ranks high on parameters of power quality, 24X7 power supply, billing efficiency, metering and online payment facility. However, there is scope for improvement in terms of technology intervention in areas of metering and energy efficiency. In the water domain, the city has a consolidated score of 6.83, with a need to improve its water loss mitigation mechanism, billing efficiency, round-the-clock availability of water and metering of water connections. Further, there is scope for substantial improvement in technology interventions for these areas.

In the area of municipal corporation, the city has a consolidated score of 7.76. Ahmedabad scores fairly well in facilities such as online licence issuance, complaint registration, property tax payment, birth and death registration and online sanction of building plans. With scores of 5.20 and 5.22 in solid waste management and storm water drainage, respectively, there is considerable scope for improvement in these domains. In addition, the city needs to work on its facilities in the areas of transport and overall sustainability, accounting for scores of 5.81 and 5.75, respectively.

Services: Ahmedabad



Kolkata

Kolkata
Snapshot

Total city area: 185 km²

Total population and sex ratio

44.86 lakh

55% 45%

Economy

State domestic product: 9,000 billion INR (2011)

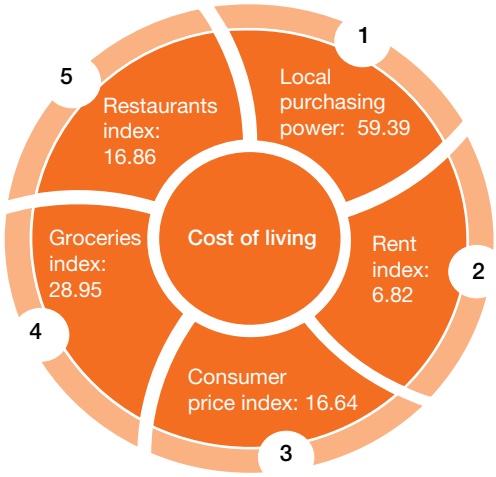
City demographics

Per capita income: 41,469 lpa

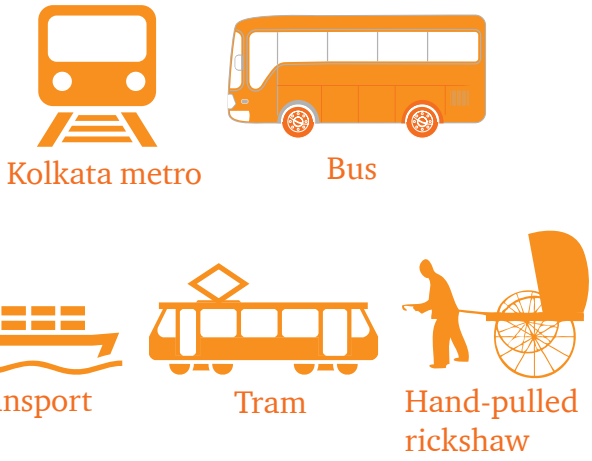
Literacy rate: 87.14%

Crime index: 50.90

Cost of living



Urban transport



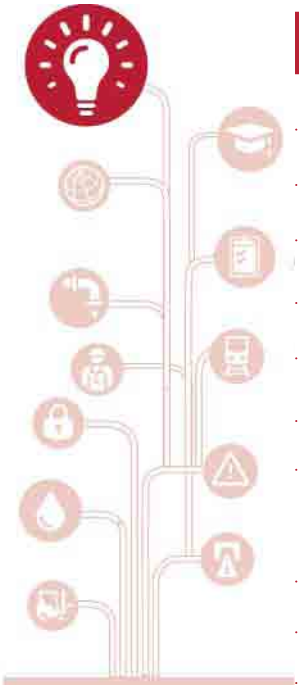
Pollution index

Air pollution: 78.68
Water pollution: 68.52
Noise pollution: 48.15

Social infrastructure

Components scoring

Legends	High score: 3	Moderate score: 2	Limited score: 1

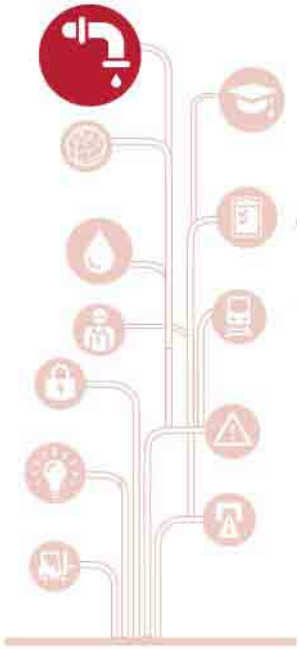


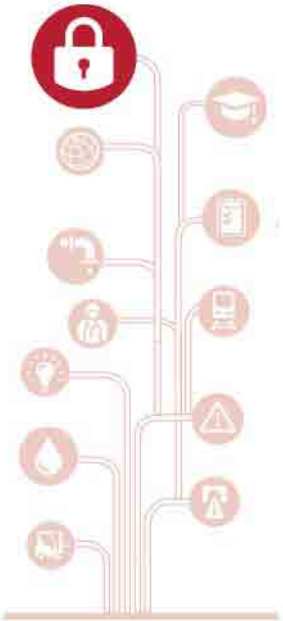
Power

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
24x7 electricity supply	2	3	3	2.7
Quality	3	2	2	2.3
Distribution losses	3	2	3	2.7
Energy consumption details	3	1	3	2.4
Online payment facility	3	3	3	3
Grievance redressal or CRM for citizens	3	3	3	3
Metering	3	1	3	2.4
Energy efficiency initiatives: Street, renewable, subsidy and green buildings	2	1	2	1.7
Billing efficiency	2	3	2	2.3
Revenue realisation	2	3	2	2.3

Water

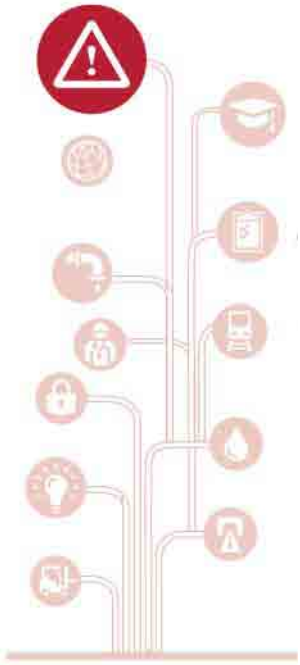
Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
24x7 water supply	1	1	3	1.8
Metering of water connections	2	1	2	1.7
Billing efficiency	1	1	2	1.4
Online payment facility	3	3	3	3
Water losses	1	1	3	1.8
Revenue realisation	1	1	2	1.4





Public safety

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
City surveillance	2	1	3	2.1
Online FIR, complaints registration	3	3	2	2.6
Verification, validations or clearance	2	1	2	1.7
Complaint response time	2	2	2	2

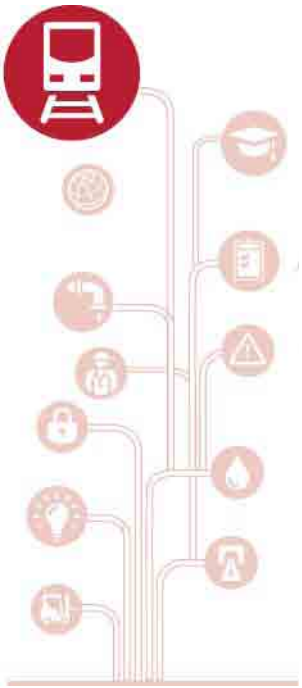


Disaster management

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Disaster prediction system, early warning system	2	1	3	2.1
Disaster alarm and response system	2	1	3	2.1
Efficient firefighting systems	2	2	3	2.4
Fire stations basis population density	3	1	3	2.4
Fire stations with special devices and materials for firefighting	3	2	3	2.7

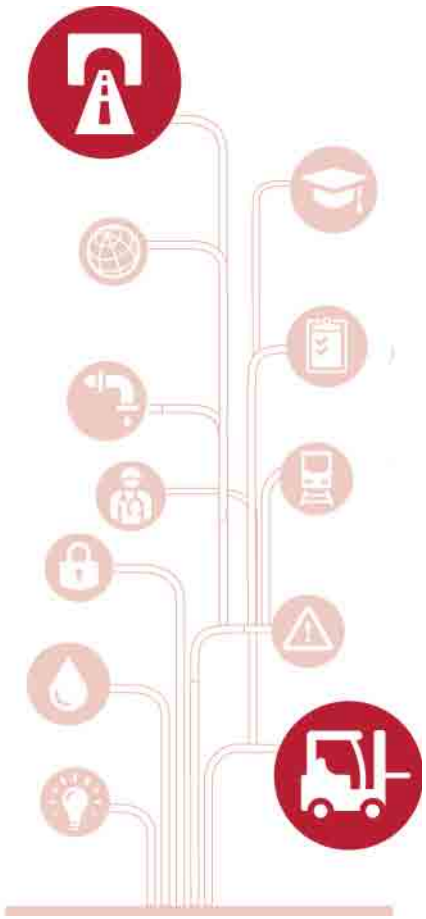
Transport

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Transport surveillance: Traffic violation detection, speed violation detection, traffic signal violation detection	2	1	2	1.7
Challan management	2	1	2	1.7
Traffic management system	2	1	3	2.1
Parking management	2	1	2	1.7
Access to para-transit	1	1	2	1.4
Availability and frequency of mass transport	2	1	2	1.7
Availability of bicycle tracks	1	1	2	1.4
Unobstructed footpaths of minimum 2m width on either side of all streets	1	1	2	1.4
Adherence to building and parking standards	1	1	2	1.4



Sewerage and sanitation

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Households connected to the waste water or sewerage network	3	1	3	2.4
Waste water treatment	1	1	2	1.4
Treated water usage	1	1	1	1



Solid waste management

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Population with regular solid waste collection (residential)	1	1	2	1.4
Collection of municipal solid waste	2	1	2	1.7
Recycling of solid waste	1	1	2	1.4
Solid waste that is disposed of in a sanitary landfill, open dump or burnt	2	1	1	1.3
Hazardous waste recycling	1	1	2	1.4

Storm water drainage

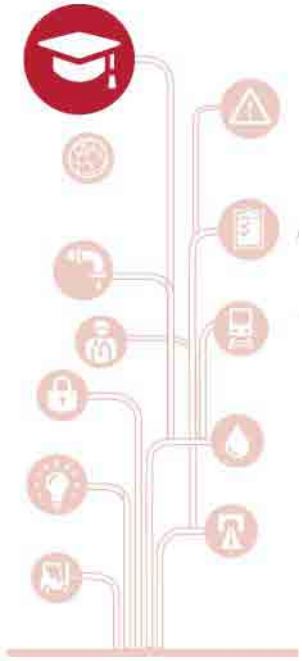
Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Availability of required drainage in identified hotspots	2	1	2	1.7
Rainwater harvesting	1	1	1	1
Evacuation of water	2	1	2	1.7

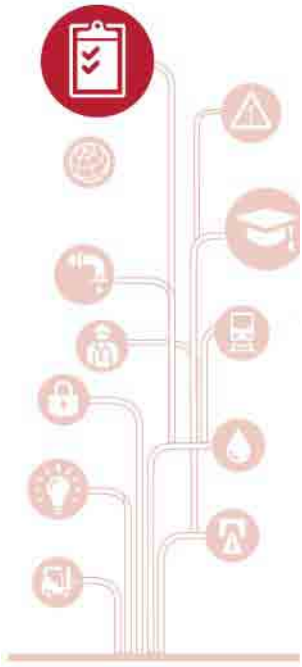
Health

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Hospitals against population density	1	2	3	2.1
Healthcare facilities	3	3	3	3
Emergency response facilities (ambulances, emergency wards, etc)	2	2	3	2.4

Education

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Total number of schools	1	2	3	2.1
School for the specially abled	1	1	2	2
Colleges against population density	3	2	2	2.3
Professional colleges against population density	2	1	2	2



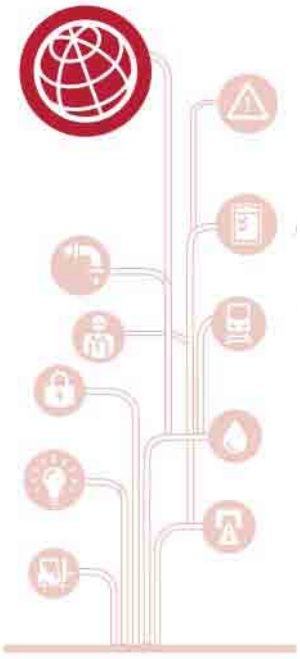


Municipal corporation

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Property tax payment	2	2	2	2
Online licence issue	3	3	2	2.6
Complaint registration	3	2	2	2.3
Licences issuance TAT	3	2	2	2.3
RTI TAT	1	1	1	1
Birth and death registration	3	3	3	3
Online building plan sanction	2	2	3	2.4

Sustainability

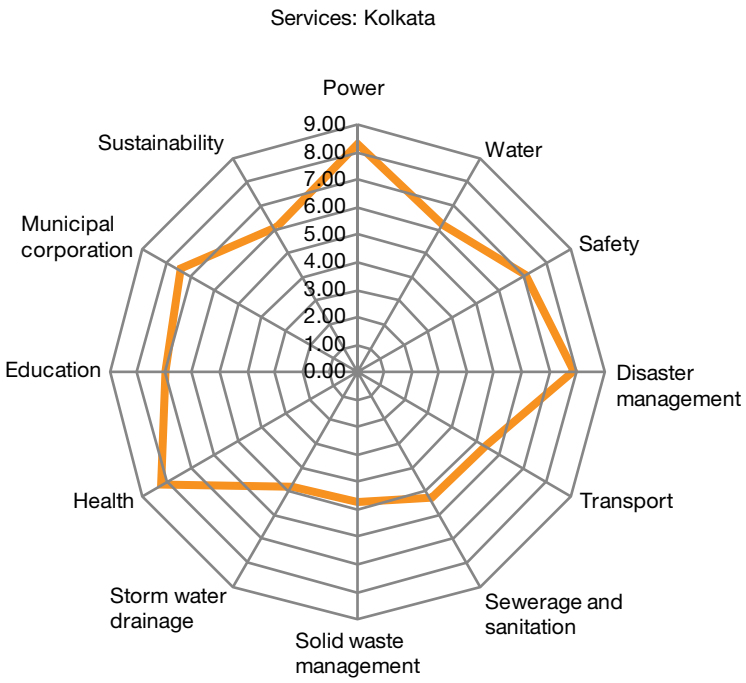
Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Noise pollution	3	1	2	2
Air pollution	1	1	2	1.4
Adherence to green building norms	2	1	2	1.7
Water pollution	2	1	3	2.1

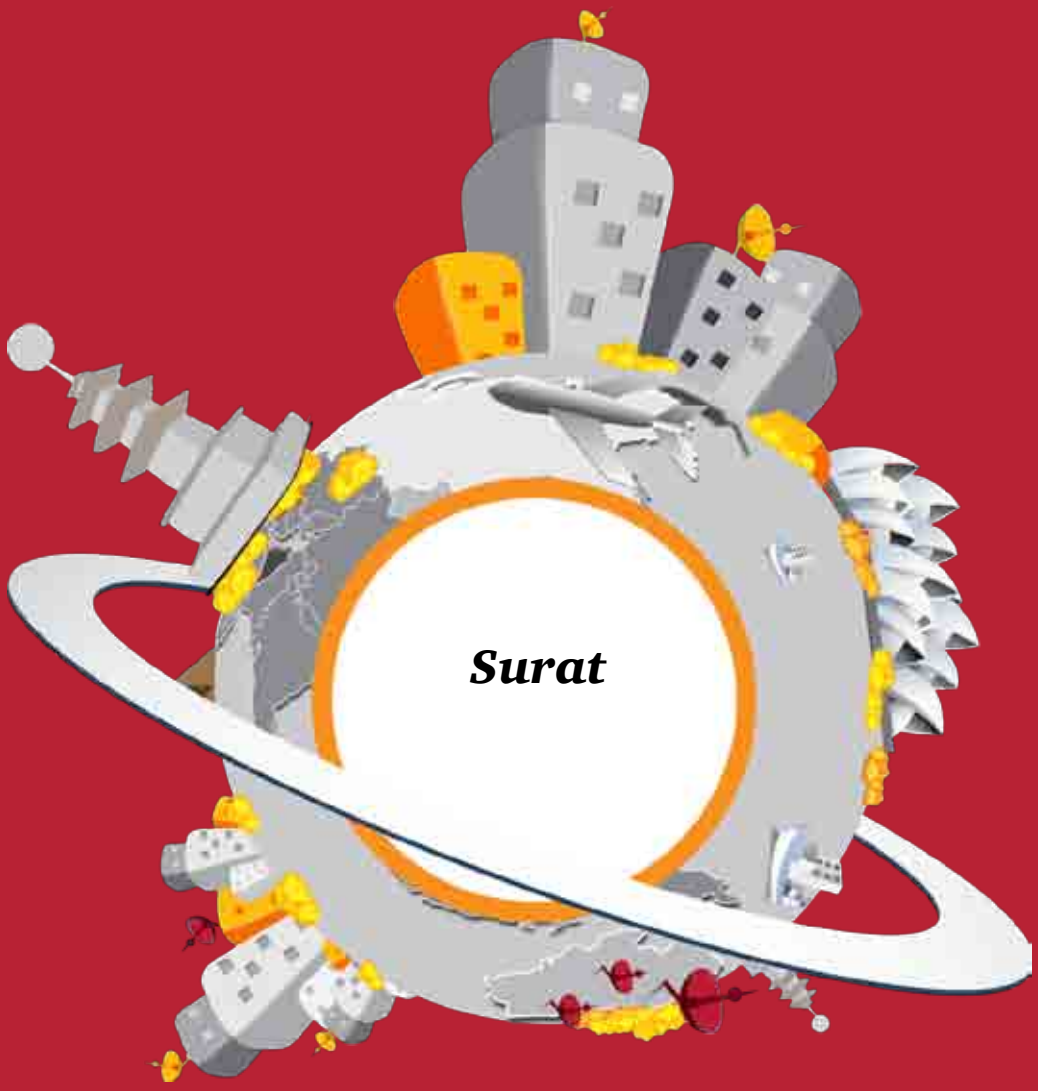


Overall assessment

Kolkata, the cultural capital of the country, spans an area of approximately 185 km^2 and has a population of 44.86 lakh. In power, the city has an overall consolidated score of 8.27 and scores well in terms of the quality of power supply, mitigation of distribution losses, and grievance redressal and CRM for citizens. However, the city needs to improve its technology intervention in metering, energy-efficient initiatives and providing energy consumption details.

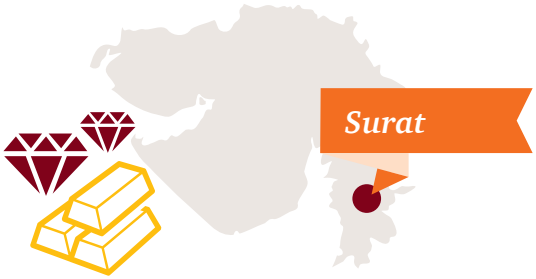
On water and safety, two other important features for transitioning to smart cities, Kolkata has consolidated scores of 6.17 and 7, respectively. In disaster management, the city is doing fairly well with a consolidated score of 7.80. However, the city needs to considerably improve its technology intervention in the areas of disaster prediction, disaster alarm and response system and availability of fire stations with special equipment for firefighting. In transport, sewerage and sanitation, and solid waste management, Kolkata has consolidated scores of 5.37, 5.33 and 4.80, respectively, indicating a need to for a significant overhaul.




Surat

Surat
Snapshot

Total city area: 326.5 km²



Total population and sex ratio

0.44 crore

53% 47%

Economy

State domestic product: 2,520 billion INR

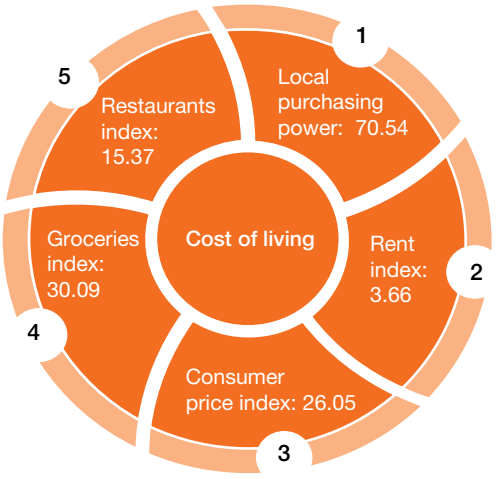
City demographics

Per capita income: 4.8 lpa

Literacy rate: 86.65 %

Crime index: 26.46

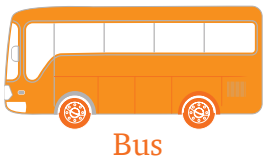
Cost of living



Urban transport

Taxi

Auto rickshaw



Bus

Green cover

Forest cover is 3%

Pollution index 67.07

Social infrastructure

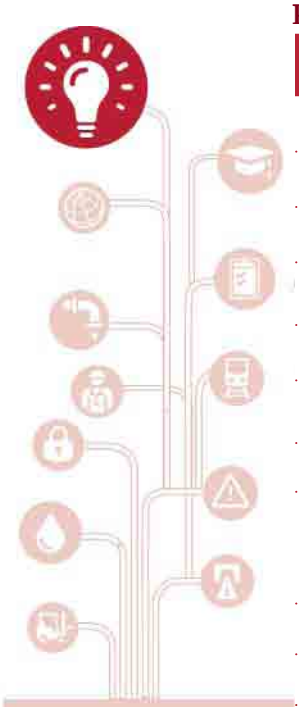
Hospitals: 25

Schools: 735

Colleges: 30

Components scoring

Legends	High score: 3	Moderate score: 2	Limited score: 1

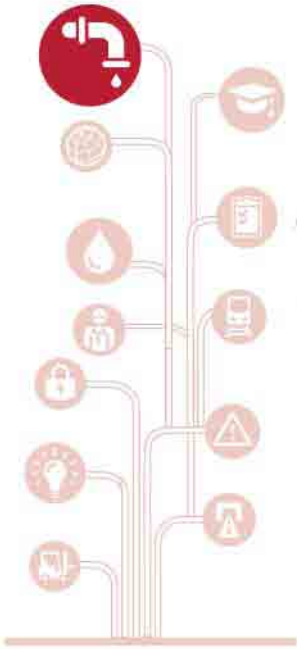


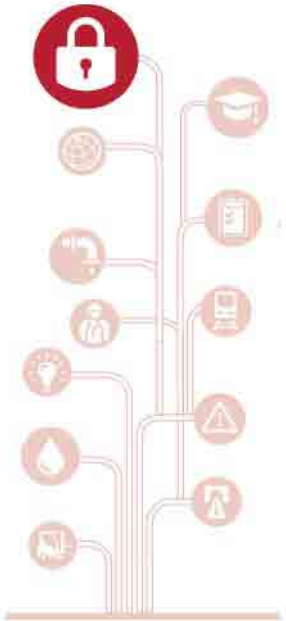
Power

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
24x7 electricity supply	3	3	3	3
Quality	2	3	2	2.3
Distribution losses	3	3	3	3
Energy consumption details	3	2	3	2.7
Online payment facility	3	3	3	3
Grievance redressal or CRM for citizens	3	3	3	3
Metering	3	3	3	3
Energy efficiency initiatives: Street, renewable, subsidy and green buildings	2	2	2	2
Billing efficiency	2	3	2	2.3
Revenue realisation	2	3	2	2.3

Water

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
24x7 water supply	2	2	3	2.4
Metering of water connections	1	2	2	1.7
Billing efficiency	2	2	2	2
Online payment facility	2	2	3	2.4
Water losses	2	3	3	2.7
Revenue realisation	2	2	2	2



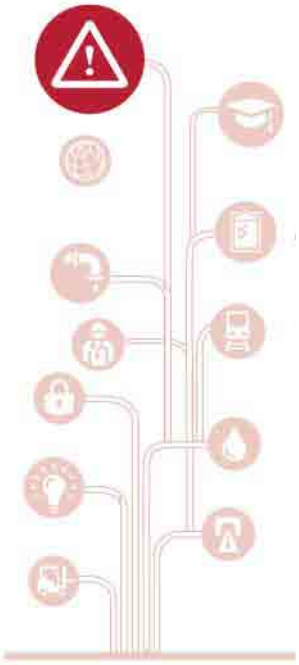


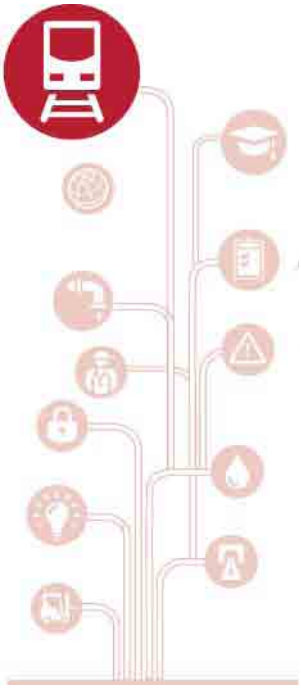
Public safety

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
City surveillance	2	2	3	2.4
Online FIR, complaints registration	2	2	2	2
Verification, validations or clearance	2	2	2	2
Complaint response time	2	2	2	2

Disaster management

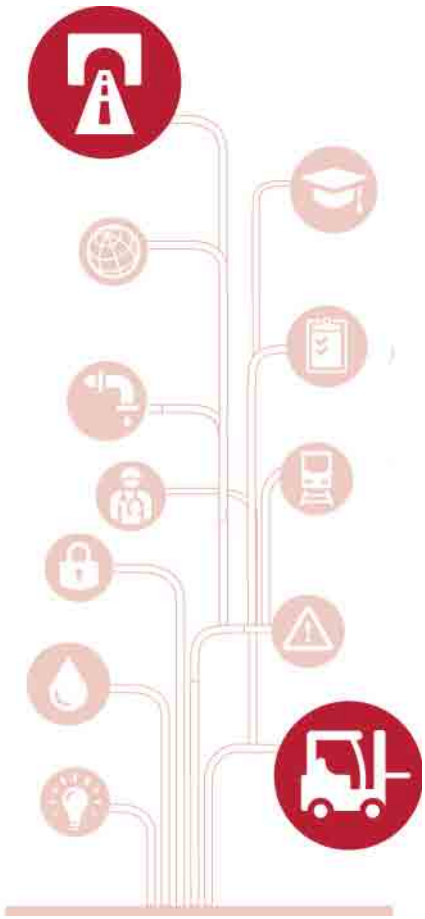
Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Disaster prediction system, early warning system	1	1	3	1.8
Disaster alarm and response system	2	1	3	2.1
Efficient firefighting systems	2	2	3	2.4
Fire stations basis population density	2	2	3	2.4
Fire stations with special devices and materials for firefighting	1	2	3	2.1





Transport

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Transport surveillance: Traffic violation detection, speed violation detection, traffic signal violation detection	2	2	2	2
Challan management	1	2	2	1.7
Traffic management system	2	2	3	2.4
Parking management	1	2	2	1.7
Access to para-transit	2	1	2	1.7
Availability and frequency of mass transport	2	2	2	2
Availability of bicycle tracks	1	1	2	1.4
Unobstructed footpaths of minimum 2m width on either side of all streets	1	1	2	1.4
Adherence to building and parking standards	1	1	2	1.4



Sewerage and sanitation

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Households connected to the waste water or sewerage network	2	1	3	2.1
Waste water treatment	2	2	2	2
Treated water usage	2	1	1	1.3

Solid waste management

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Population with regular solid waste collection (residential)	3	1	2	2
Collection of municipal solid waste	3	1	2	2
Recycling of solid waste	1	1	2	1.4
Solid waste that is disposed of in a sanitary landfill, open dump or burnt	2	1	1	1.3
Hazardous waste recycling	1	1	2	1.4

Storm water drainage

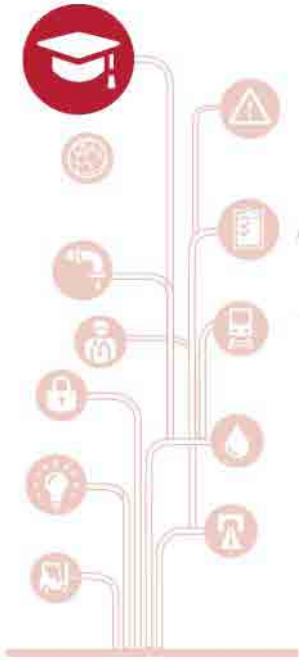
Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Availability of required drainage in identified hotspots	2	2	2	2
Rainwater harvesting	2	1	1	1.3
Evacuation of water	2	2	2	2

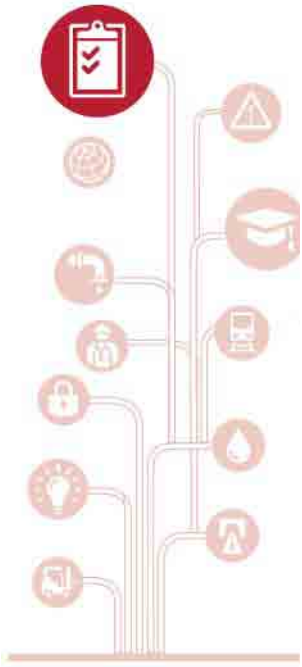
Health

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Hospitals against population density	1	2	3	2.1
Healthcare facilities	1	1	3	1.8
Emergency response facilities (ambulances, emergency wards, etc)	1	1	3	1.8

Education

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Total number of schools	1	1	3	1.8
School for the specially abled	2	2	2	2
Colleges against population density	2	2	2	2
Professional colleges against population density	2	2	2	2



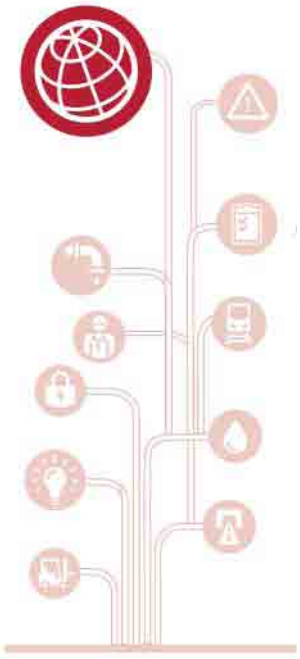


Municipal corporation

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Property tax payment	3	3	2	2.6
Online licence issue	1	2	2	1.7
Complaint registration	3	3	2	2.6
Licences issuance TAT	3	2	2	2.3
RTI TAT	3	2	1	1.9
Birth and death registration	3	2	2	2.3
Online building plan sanction	3	2	2	2.3

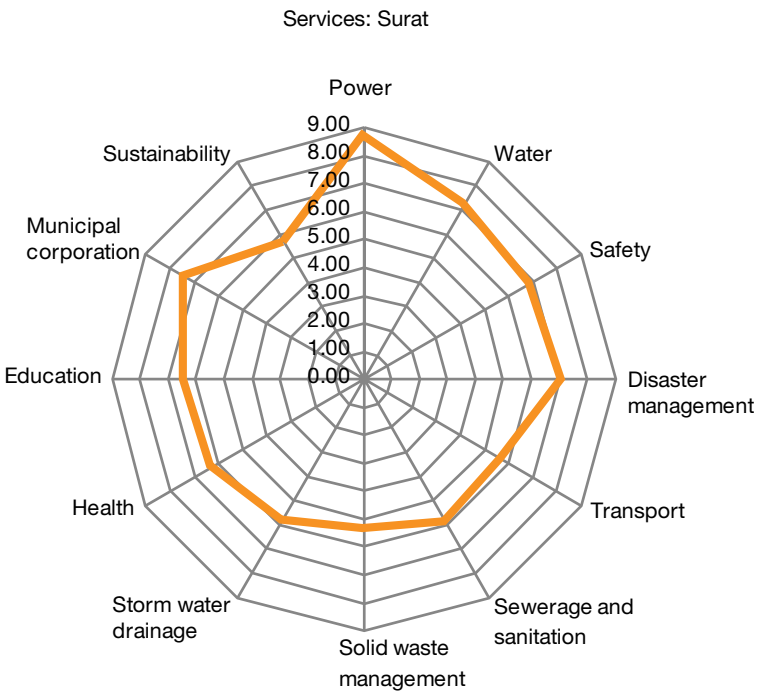
Sustainability

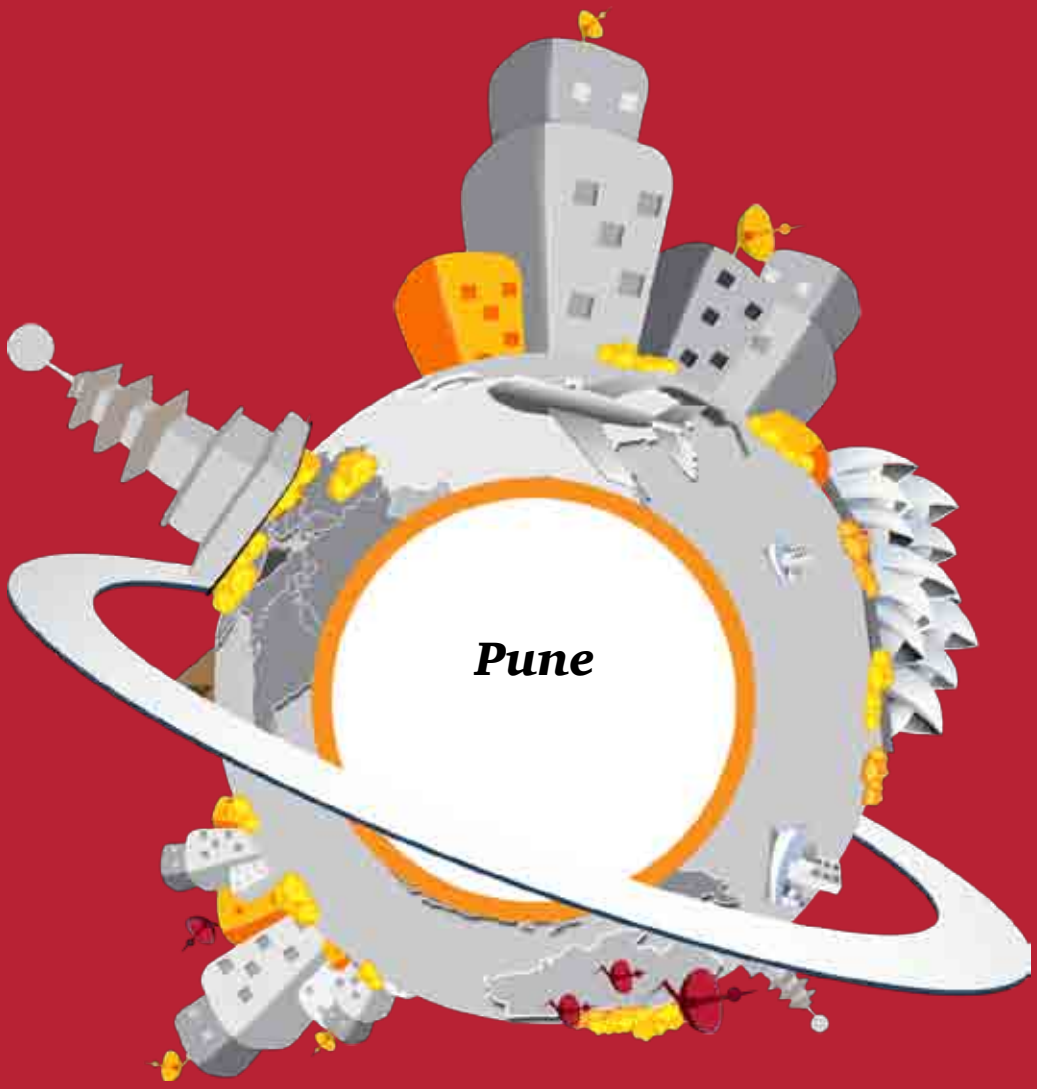
Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Noise pollution	2	1	2	1.7
Air pollution	1	1	2	1.4
Adherence to green building norms	1	1	3	1.8
Water pollution	2	2	2	2



Overall assessment

Surat, which spans an area of 326.5 km^2, has a population of 44 lakh. With a score of 8.87, the city scores fairly well in the power sector. This is attributable to its robust electricity grid operations and management that is complemented by its efficiencies in metering, billing and collection. In areas such as water, transport and solid waste management, Surat has consolidated scores of 7.33, 5.81 and 5.40, respectively. The city needs to significantly improve its technology intervention in all areas of solid waste management. In addition, there is scope for more technology intervention in education, health and storm water drainage.




Pune

Pune
Snapshot

Total city area: 710 km²

Total population and sex ratio

0.94 crore

940 females per 1,000 males

Economy

State domestic product: 3,024 billion INR

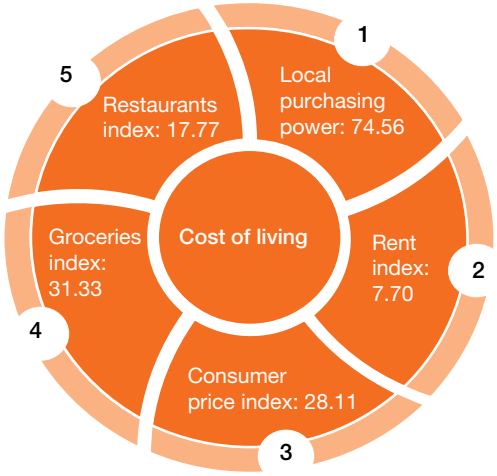
City demographics

Per capita income: 1.27 lpa

Literacy rate: 88.15%

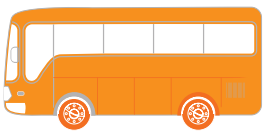
Crime index: 46.99

Cost of living



Urban transport

Auto rickshaw



Bus

Green cover

Forest cover is 13%

Pollution index: 81.16

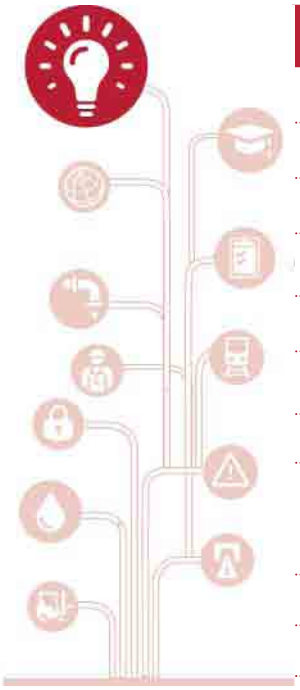
Social infrastructure

Schools: 161

Components scoring

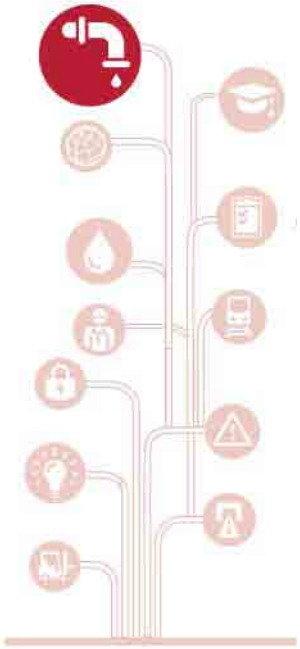
Legends	High score: 3	Moderate score: 2	Limited score: 1

Power

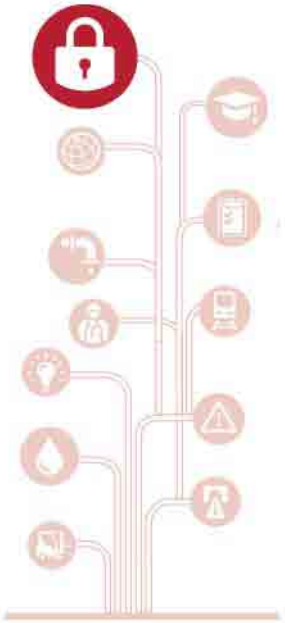


Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
24x7 electricity supply	3	3	3	3
Quality	2	3	2	2.3
Distribution losses	3	3	3	3
Energy consumption details	3	2	3	2.7
Online payment facility	3	3	3	3
Grievance redressal or CRM for citizens	3	3	3	3
Metering	3	2	3	2.7
Energy efficiency initiatives: Street, renewable, subsidy and green buildings	2	1	2	1.7
Billing efficiency	2	2	2	2
Revenue realisation	2	2	2	2

Water



Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
24x7 water supply	2	2	3	2.4
Metering of water connections	1	2	2	1.7
Billing efficiency	1	1	2	1.4
Online payment facility	1	2	3	2.1
Water losses	1	1	3	1.8
Revenue realisation	1	2	2	1.7

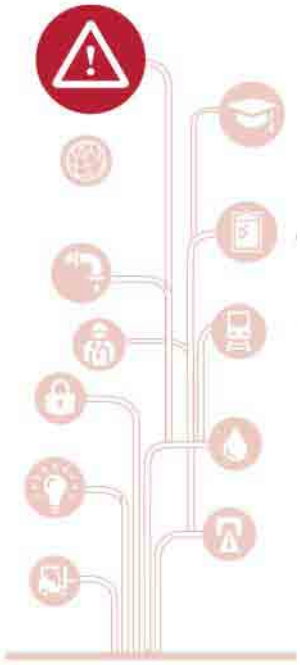


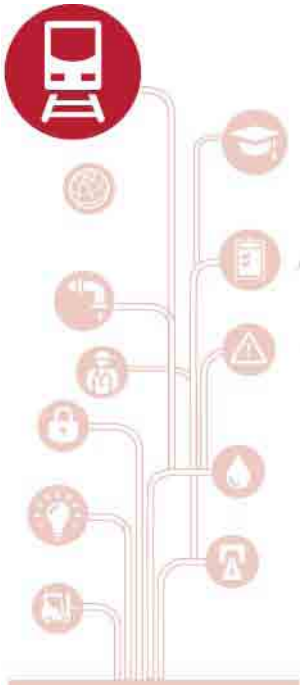
Public safety

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
City surveillance	2	2	3	2.4
Online FIR, complaints registration	2	2	2	2
Verification, validations or clearance	2	1	2	1.7
Complaint response time	2	2	2	2

Disaster management

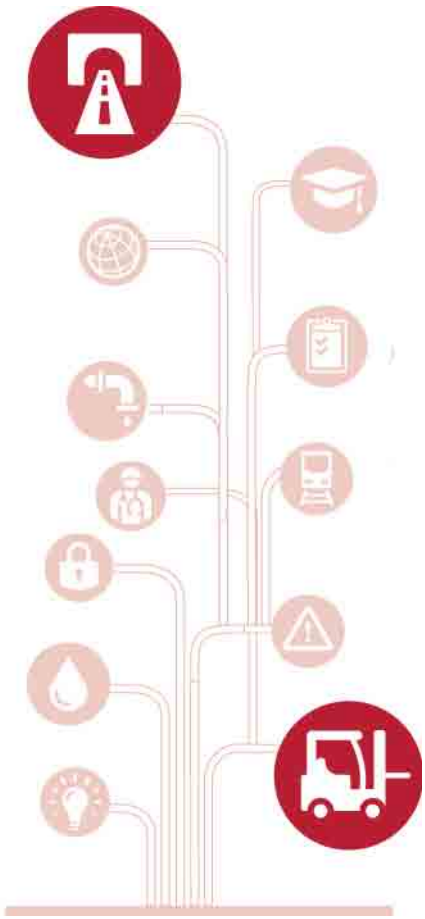
Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Disaster prediction system, early warning system	1	2	3	2.1
Disaster alarm and response system	1	1	3	1.8
Efficient firefighting systems	2	2	3	2.4
Fire stations basis population density	2	1	3	2.1
Fire stations with special devices and materials for firefighting	2	2	3	2.4





Transport

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Transport surveillance: Traffic violation detection, speed violation detection, traffic signal violation detection	1	1	2	1.4
Challan management	1	1	2	1.4
Traffic management system	1	1	3	1.8
Parking management	1	1	2	1.4
Access to para-transit	2	1	2	1.7
Availability and frequency of mass transport	2	1	2	1.7
Availability of bicycle tracks	1	1	2	1.4
Unobstructed footpaths of minimum 2m width on either side of all streets	1	1	2	1.4
Adherence to building and parking standards	1	1	2	1.4



Sewerage and sanitation

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Households connected to the waste water or sewerage network	3	1	3	2.4
Waste water treatment	2	2	2	2
Treated water usage	1	1	1	1

Solid waste management

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Population with regular solid waste collection (residential)	3	2	2	2.3
Collection of municipal solid waste	3	2	2	2.3
Recycling of solid waste	1	2	2	1.7
Solid waste that is disposed of in a sanitary landfill, open dump or burnt	2	1	1	1.3
Hazardous waste recycling	1	1	2	1.4

Storm water drainage

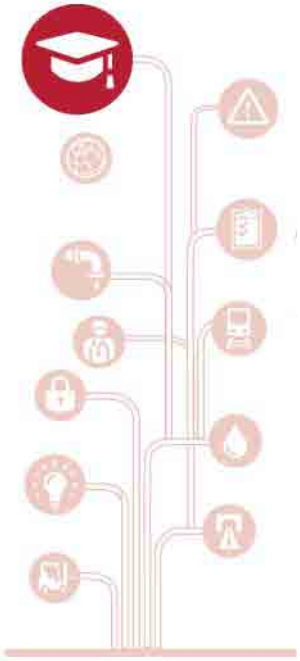
Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Availability of required drainage in identified hotspots	1	1	2	1.4
Rainwater harvesting	1	1	1	1
Evacuation of water	1	1	2	1.4

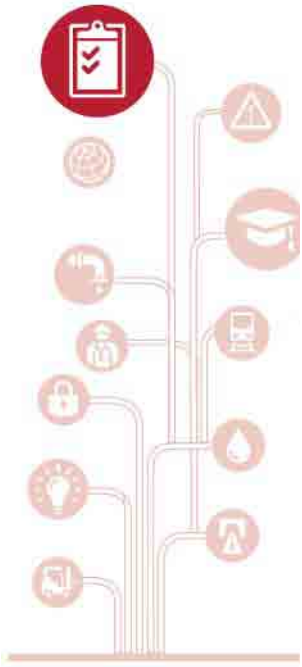
Health

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Hospitals against population density	1	1	3	1.8
Healthcare facilities	2	2	3	2.4
Emergency response facilities (ambulances, emergency wards, etc)	2	2	3	2.4

Education

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Total number of schools	3	2	3	2.7
School for the specially abled	2	1	2	1.7
Colleges against population density	3	2	2	2.3
Professional colleges against population density	3	2	2	2.3



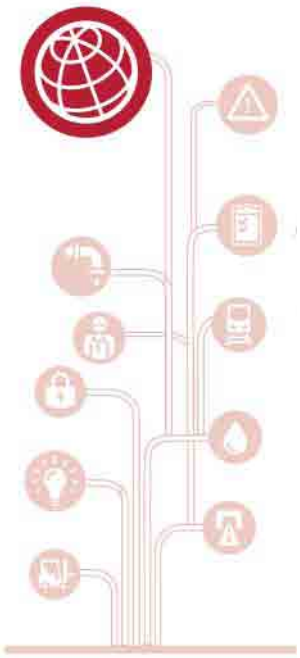


Municipal corporation

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Property tax payment	3	3	2	2.6
Online license issue	1	1	2	1.4
Complaint registration	3	2	2	2.3
Licenses issuance TAT	2	1	2	1.7
RTI TAT	2	1	1	1.3
Birth and death registration	2	1	2	1.7
Online building plan sanction	2	2	2	2

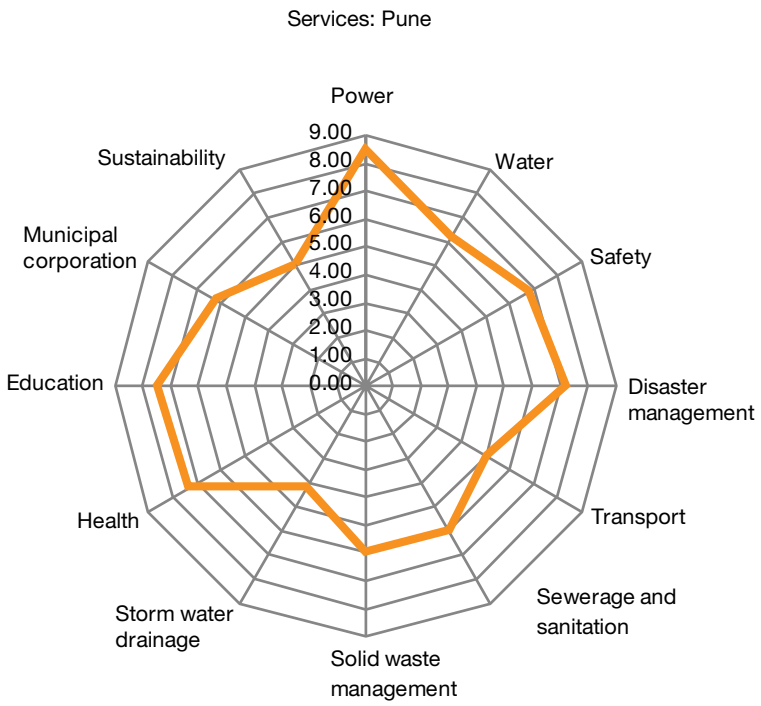
Sustainability

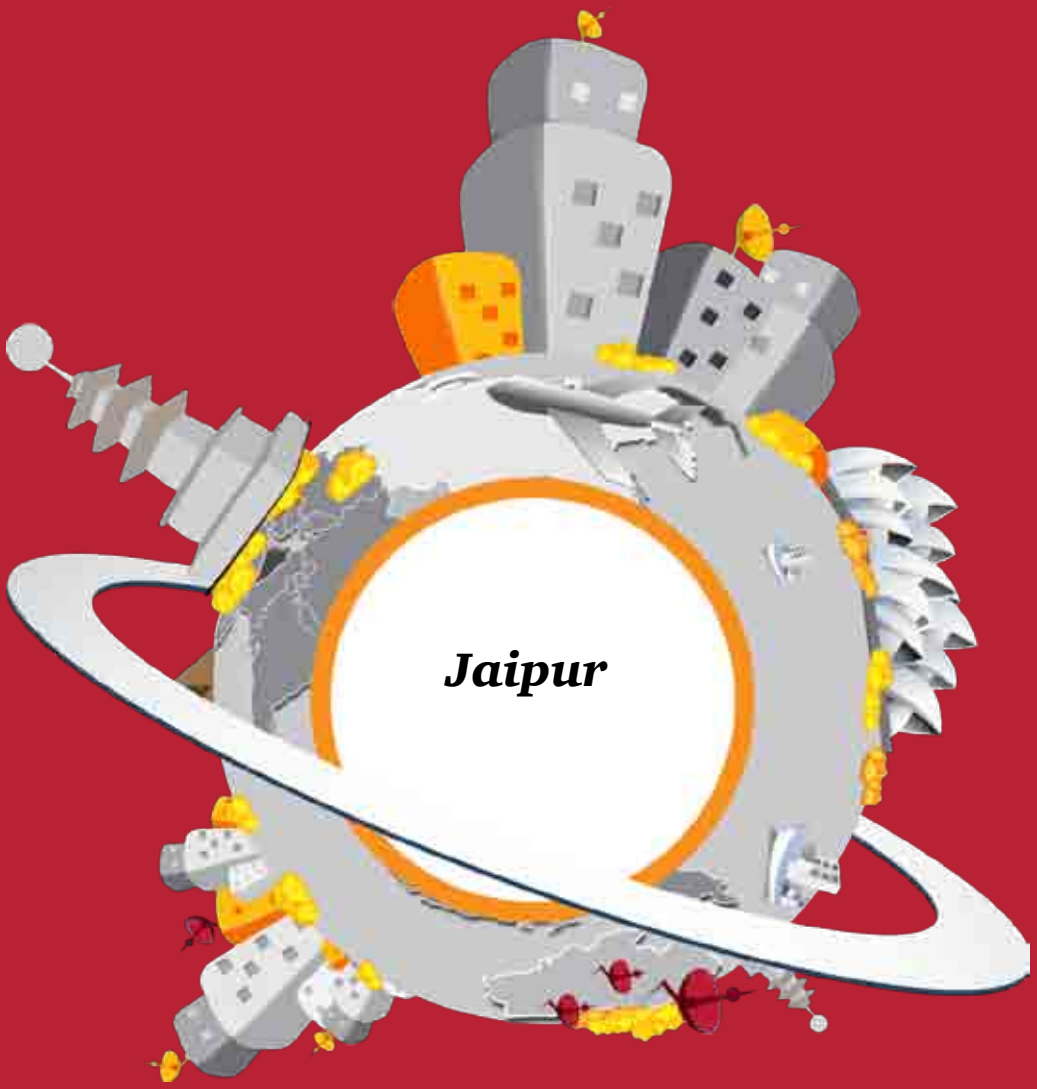
Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Noise pollution	1	1	2	1.4
Air pollution	1	1	2	1.4
Adherence to green building norms	1	1	3	1.8
Water pollution	1	1	2	1.4



Overall assessment

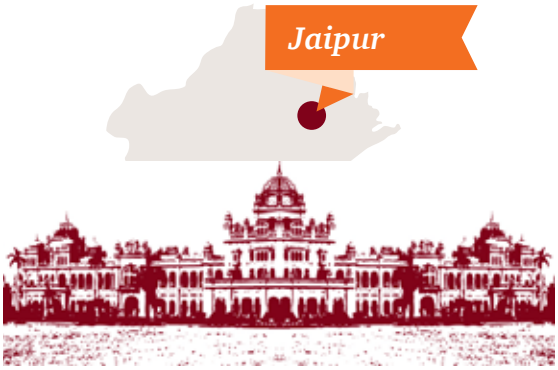
Pune, with a population of 94 lakh, spans an area of approximately 710 km^2. The city has a consolidated score of 8.47 in power. In the areas of water, safety and disaster management, Pune has consolidated scores of 6.17, 6.75 and 7.20, respectively. The city is required to improve its technology intervention in these areas in order to further improve its service delivery to citizens. Pune has consolidated scores of six each in areas of solid waste management as well as sewerage and sanitation. With a score of five in sustainability, the city requires to considerably improve in the sustainability domains of air and noise pollution.




Jaipur

Jaipur
Snapshot

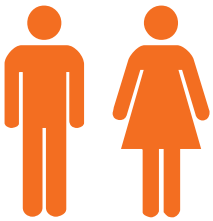
Total city area: 111.8 km²



Total population and sex ratio

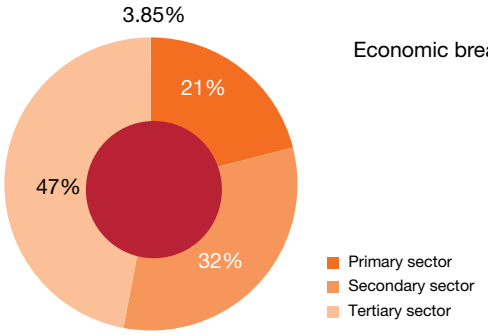
30.73 lakh

54% 46%



Economy

State domestic product: 1,440 billion INR (2011)

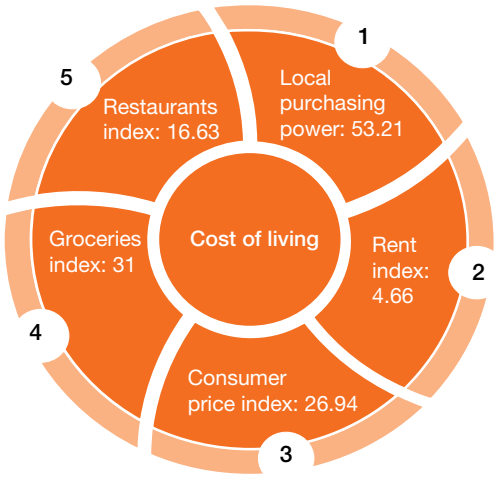


City demographics

Per capita income: 47,605

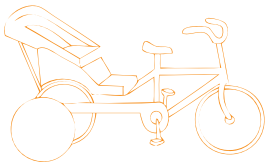
Literacy rate: 67.06

Cost of living



Urban transport

Bus



Rickshaw

Green cover

Forest cover is 11.3%

Pollution index
Air pollution: 82.14
Water pollution: 41.67

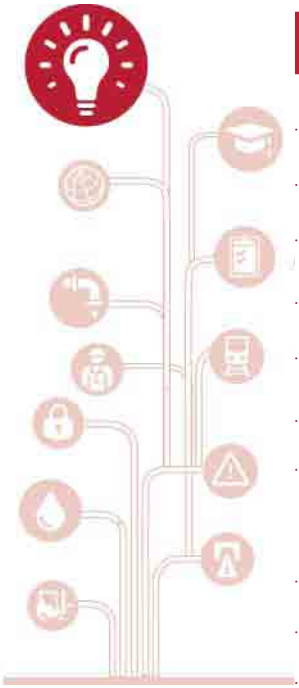
Social infrastructure

Hospitals: 30

Schools: 80

Components scoring

Legends	High score: 3	Moderate score: 2	Limited score: 1

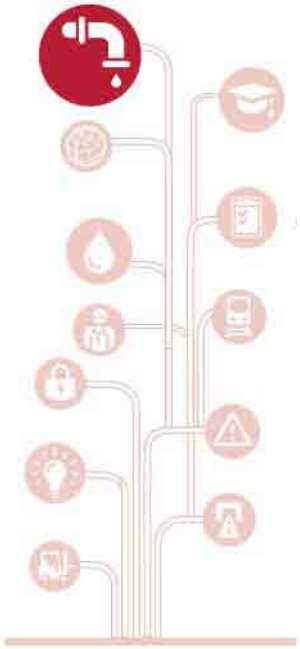


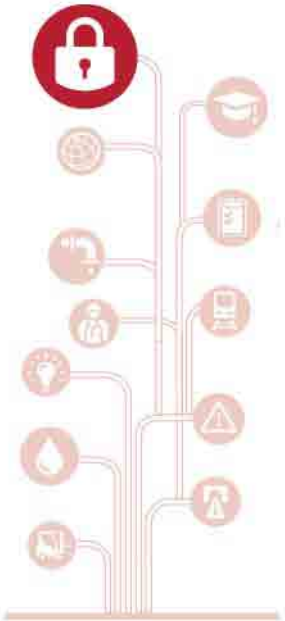
Power

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
24x7 electricity supply	2	2	3	2.4
Quality	2	2	2	2
Distribution losses	2	2	3	2.4
Energy consumption details	3	1	3	2.4
Online payment facility	2	2	3	2.4
Grievance redressal or CRM for citizens	2	2	3	2.4
Metering	3	1	3	2.4
Energy efficiency initiatives: Street, renewable, subsidy and green buildings	1	1	2	1.4
Billing efficiency	3	3	2	2.6
Revenue realisation	2	2	2	2

Water

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
24x7 water supply	1	1	3	1.8
Metering of water connections	1	1	2	1.4
Billing efficiency	2	2	2	2
Online payment facility	1	1	3	1.8
Water losses	1	1	3	1.8
Revenue realisation	1	1	2	1.4



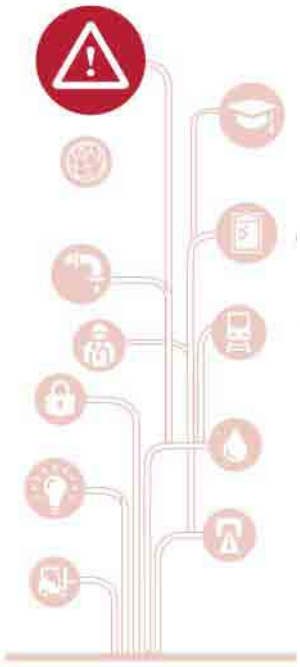


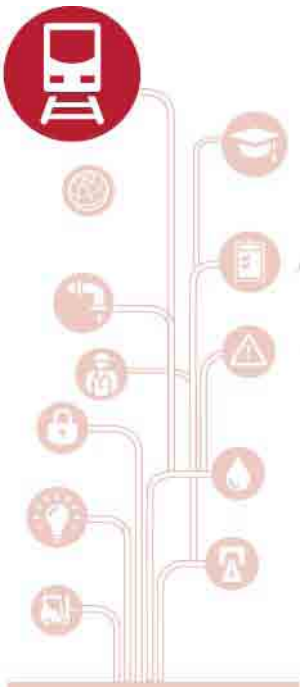
Public safety

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
City surveillance	2	2	3	2.4
Online FIR, complaints registration	2	2	2	2
Verification, validations or clearance	2	2	2	2
Complaint response time	2	1	2	1.7

Disaster management

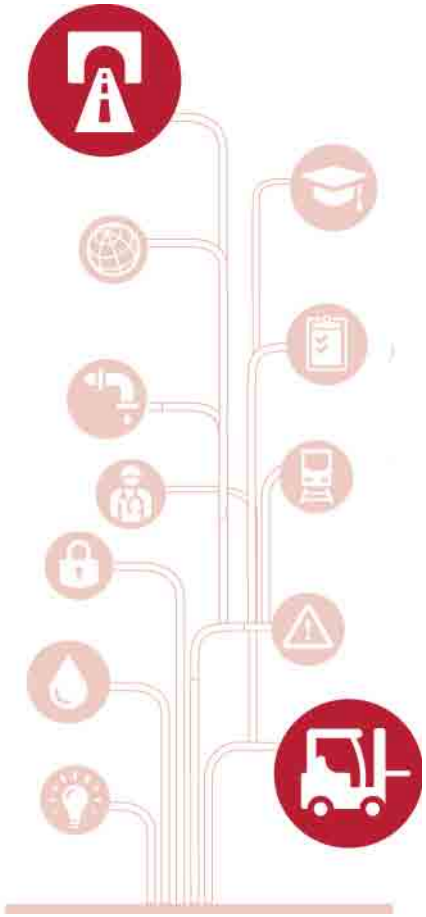
Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Disaster prediction system, early warning system	2	1	3	2.1
Disaster alarm and response system	2	1	3	2.1
Efficient firefighting systems	2	1	3	2.1
Fire stations based on population density	2	1	3	2.1
Fire stations with special devices and materials for firefighting	2	1	3	2.1





Transport

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Transport surveillance: Traffic violation detection, speed violation detection, traffic signal violation detection	1	1	2	1.4
Challan management	2	1	2	1.7
Traffic management system	2	1	3	2.1
Parking management	2	1	2	1.7
Access to para-transit	1	1	2	1.4
Availability and frequency of mass transport	1	1	2	1.4
Availability of bicycle tracks	1	1	2	1.4
Unobstructed footpaths of minimum 2m width on either side of all streets	1	1	2	1.4
Adherence to building and parking standards	1	1	2	1.4



Sewerage and sanitation

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Households connected to the waste water or sewerage network	2	1	3	2.1
Waste water treatment	2	1	2	1.7
Treated water usage	1	1	1	1

Solid waste management

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Population with regular solid waste collection (residential)	1	1	2	1.4
Collection of municipal solid waste	1	1	2	1.4
Recycling of solid waste	2	1	2	1.7
Solid waste that is disposed of in a sanitary landfill, open dump or burnt	1	1	1	1
Hazardous waste recycling	1	1	2	1.4

Storm water drainage

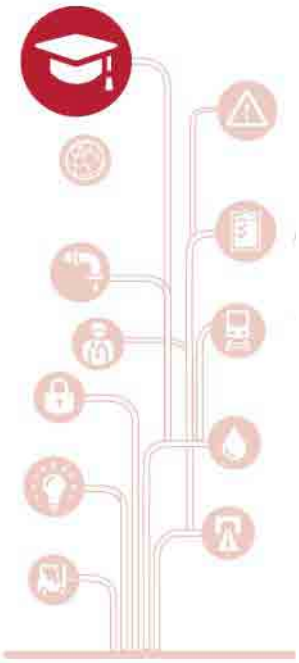
Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Availability of required drainage in identified hotspots	2	1	2	1.7
Rainwater harvesting	2	1	1	1.3
Evacuation of water	2	1	2	1.7

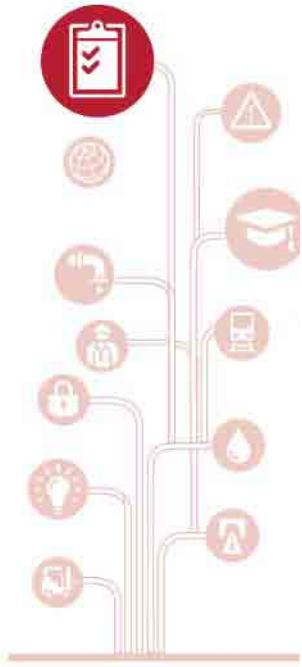
Health

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Hospitals against population density	1	2	3	2.1
Healthcare facilities	2	2	3	2.4
Emergency response facilities (ambulances, emergency wards, etc)	2	2	3	2.4

Education

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Total number of schools	2	1	3	2.1
School for the specially abled	1	1	2	1.4
Colleges against population density	2	1	2	1.7
Professional colleges against population density	1	1	2	1.4



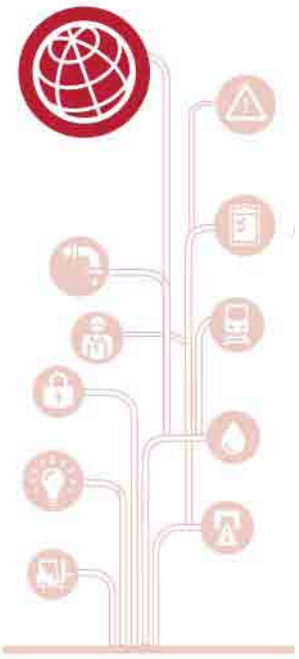


Municipal corporation

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Property tax payment	2	1	2	1.7
Online licence issue	1	1	2	1.4
Complaint registration	3	3	2	2.6
Licences issuance TAT	1	1	2	1.4
RTI TAT	2	1	1	1.3
Birth and death registration	2	2	3	2.4
Online building plan sanction	1	1	2	1.4

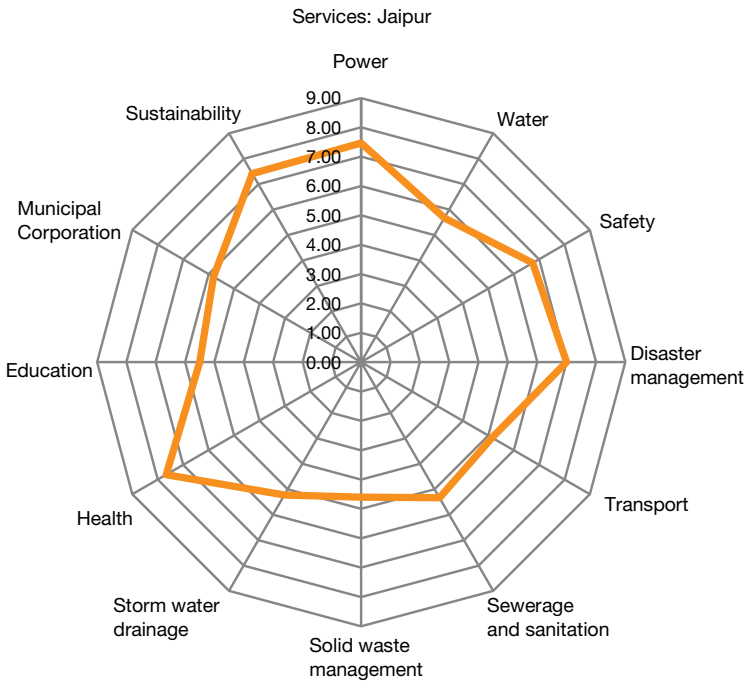
Sustainability

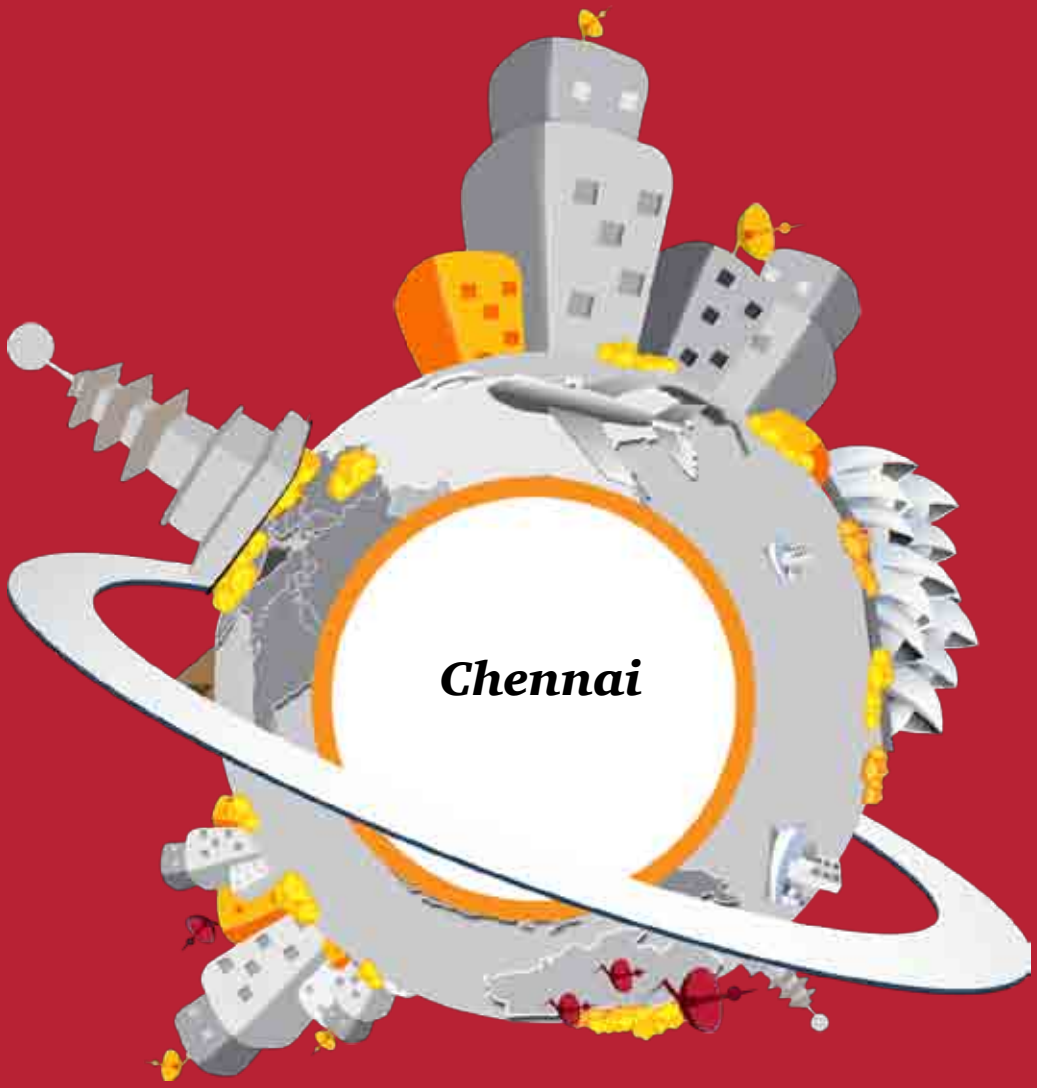
Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Noise pollution	3	1	2	2
Air pollution	1	2	3	2.1
Adherence to green building norms	2	1	3	2.1
Water pollution	3	2	3	2.7



Overall assessment

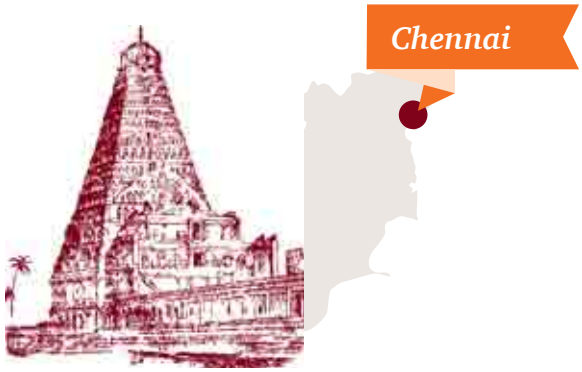
Jaipur, popularly known as the Pink City, spans an area of 326.5 km^2 and has a population of 30.73 lakh. In the area of power, it has a consolidated score of 7.47. The city needs to improve its consumer metering, billing and collection efficiency and also take up progressive steps in the utilisation of renewable energy sources. In the areas of water, safety and disaster management, the city has consolidated scores of 5.67, 6.75 and 7, respectively. Jaipur needs to considerably improve its technology intervention in water and disaster management in order to enhance its service delivery. In the areas of transport, sewerage and sanitation as well as solid waste management, the city has consolidated scores of 5.15, 5.33 and 4.60, respectively.




Chennai

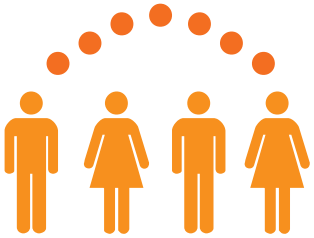
Chennai Snapshot

Total city area: 426 km²

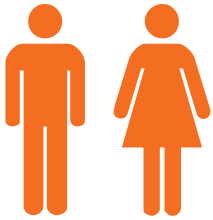


Total population and sex ratio

46.81 lakh



51% 49%



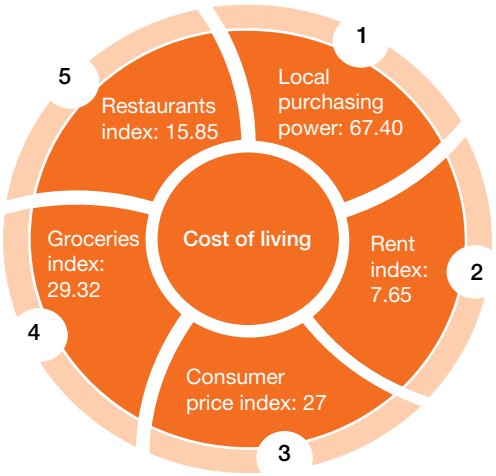
Economy

State domestic product: 3,960 billion INR (2011)

City demographics

Literacy rate: 90.33

Cost of living



Urban transport

Auto rickshaw

Bus

Train

Green cover

Forest cover is 9.5%

Pollution index

Air pollution: 69.08

Water pollution: 56.03

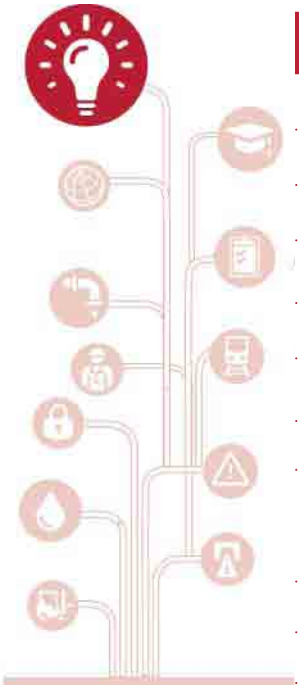
Social infrastructure

Hospitals: 43

Schools: 27

Components scoring

Legends	High score: 3	Moderate score: 2	Limited score: 1

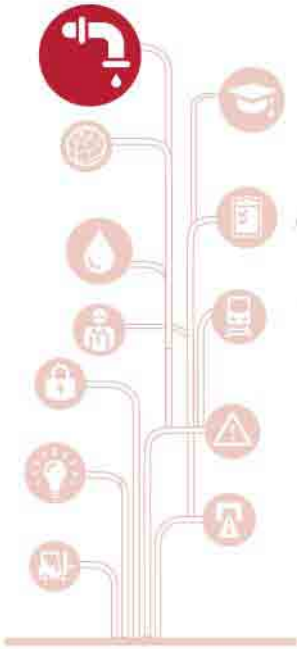


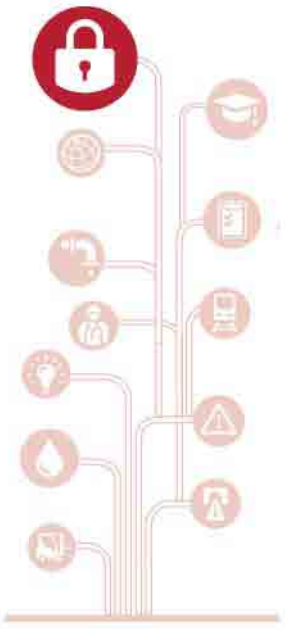
Power

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
24x7 electricity supply	2	3	3	2.7
Quality	2	2	2	2
Distribution losses	2	3	3	2.7
Energy consumption details	3	3	3	3
Online payment facility	3	3	3	3
Grievance redressal or CRM for citizens	3	3	3	3
Metering	3	2	3	2.7
Energy efficiency initiatives: Street, renewable, subsidy and green buildings	2	1	2	1.7
Billing efficiency	2	2	2	2
Revenue realisation	2	2	2	2

Water

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
24x7 water supply	2	1	3	2.1
Metering of water connections	2	1	2	1.7
Billing efficiency	2	2	2	2
Online payment facility	2	2	3	2.4
Water losses	1	1	3	1.8
Revenue realisation	2	2	2	2



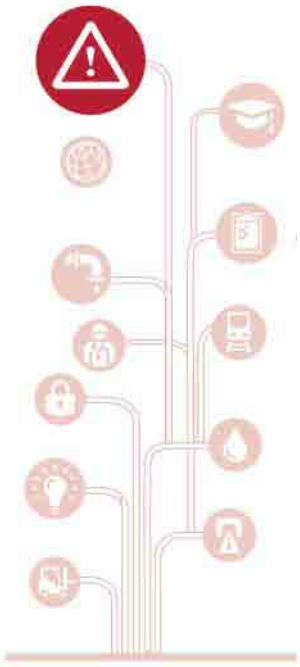


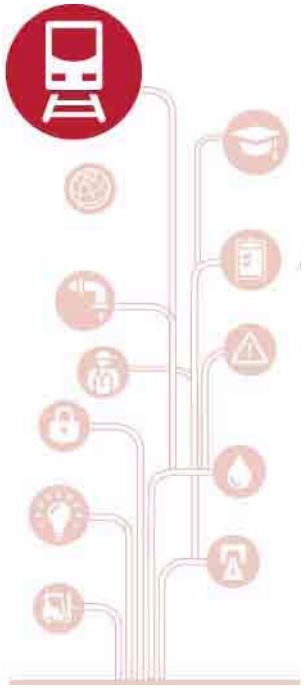
Public safety

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
City surveillance	2	1	3	2.1
Online FIR, complaints registration	3	3	2	2.6
Verification, validations or clearance	3	1	2	2
Complaint response time	2	2	2	2

Disaster management

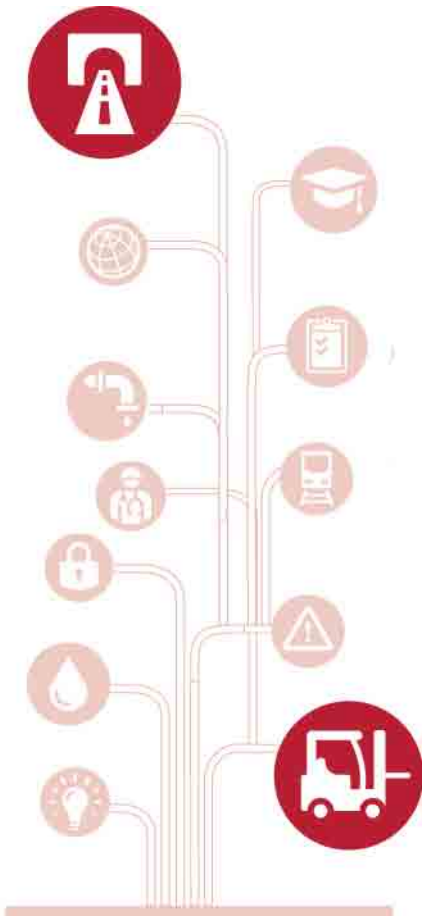
Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Disaster prediction system, early warning system	2	2	3	2.4
Disaster alarm and response system	2	1	3	2.1
Efficient firefighting systems	2	1	3	2.1
Fire stations based on population density	3	2	3	2.7
Fire stations with special devices and materials for firefighting	2	2	3	2.4





Transport

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Transport surveillance: Traffic violation detection, speed violation detection, traffic signal violation detection	2	1	2	1.7
Challan management	3	3	2	2.6
Traffic management system	2	2	3	2.4
Parking management	2	1	2	1.7
Access to para-transit	1	1	2	1.4
Availability and frequency of mass transport	3	2	2	2.3
Availability of bicycle tracks	1	1	2	1.4
Unobstructed footpaths of minimum 2m width on either side of all streets	1	1	2	1.4
Adherence to building and parking standards	2	1	2	1.7



Sewerage and sanitation

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Households connected to the waste water or sewerage network	3	1	3	2.4
Waste water treatment	2	2	2	2
Treated water usage	1	1	1	1

Solid waste management

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Population with regular solid waste collection (residential)	1	1	2	1.4
Collection of municipal solid waste	1	1	2	1.4
Recycling of solid waste	2	1	2	1.7
Solid waste that is disposed of in a sanitary landfill, open dump or burnt	2	1	1	1.3
Hazardous waste recycling	1	1	2	1.4

Storm water drainage

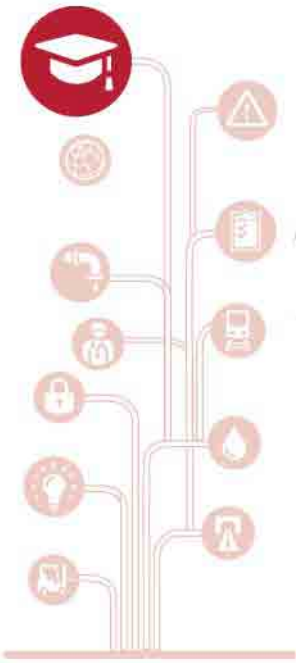
Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Availability of required drainage in identified hotspots	2	1	2	1.7
Rainwater harvesting	2	1	1	1.3
Evacuation of water	1	1	2	1.4

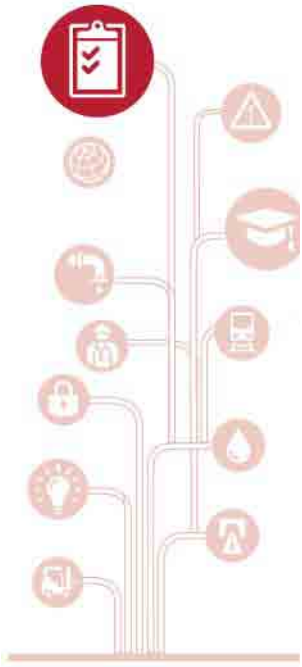
Health

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Hospitals against population density	1	1	3	1.8
Healthcare facilities	2	1	3	2.1
Emergency response facilities (ambulances, emergency wards, etc)	2	2	3	2.4

Education

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Total number of schools	1	1	3	1.8
School for the specially abled	1	1	2	1.4
Colleges against population density	1	2	2	1.7
Professional colleges against population density	1	2	2	1.7



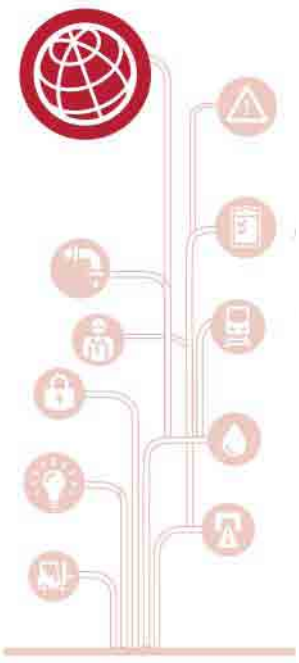


Municipal corporation

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Property tax payment	3	3	2	2.6
Online licence issue	1	1	2	1.4
Complaint registration	3	2	2	2.3
Licences issuance TAT	2	1	2	1.7
RTI TAT	2	1	1	1.3
Birth and death registration	3	3	2	2.6
Online building plan sanction	3	2	2	2.3

Sustainability

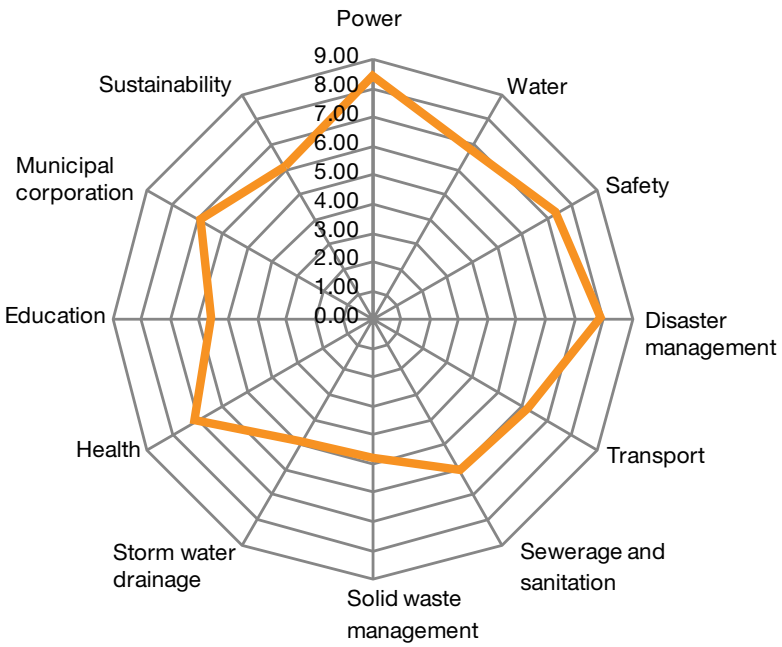
Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Noise pollution	2	1	2	1.7
Air pollution	2	1	2	1.7
Adherence to green building norms	1	1	3	1.8
Water pollution	3	1	2	2

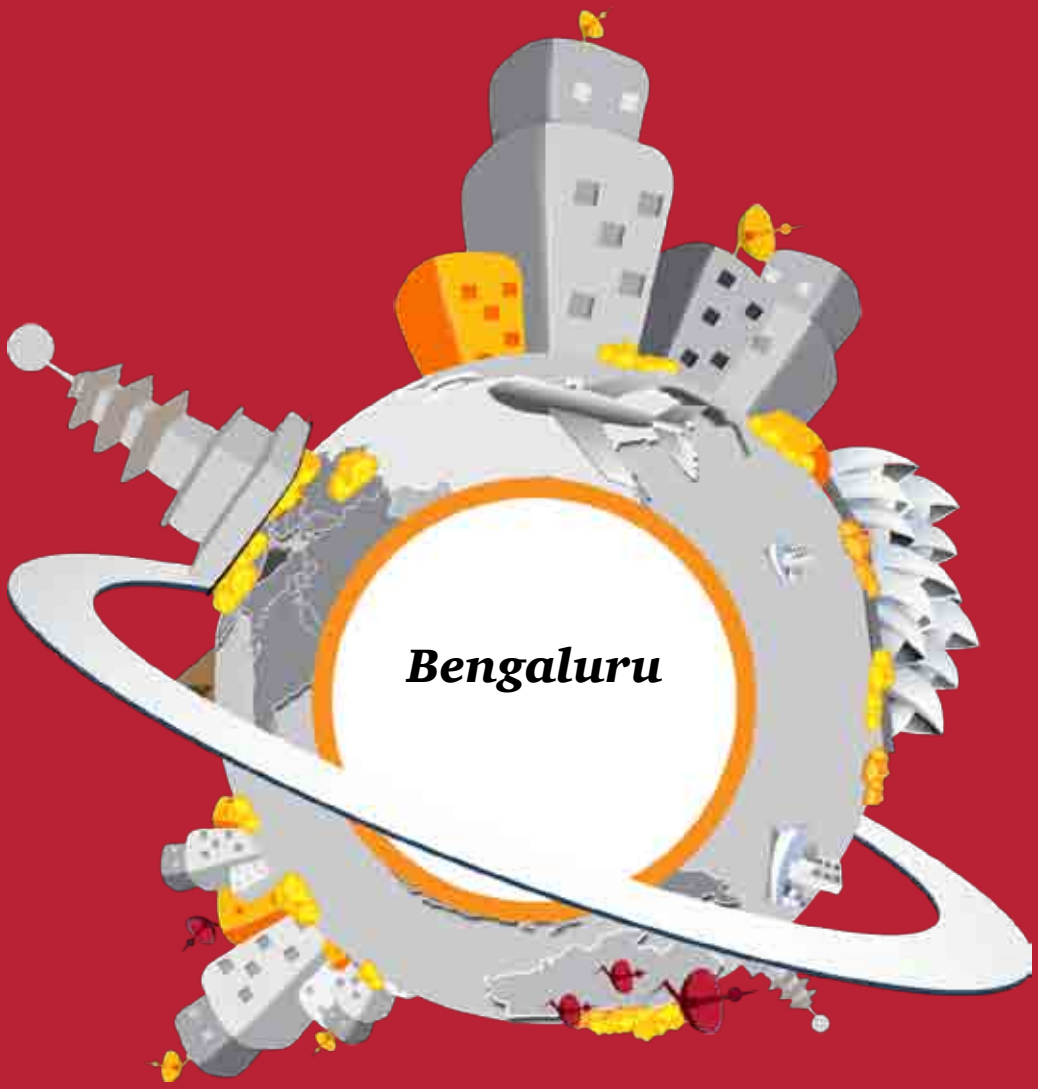


Overall assessment

Chennai, the capital of Tamil Nadu, spans an area of 426 km^2 and has a population cover of 46.81 lakh. In power, the city has a consolidated score of 8.27, which is relatively low in comparison to other states. Chennai needs to implement appropriate mechanisms in order to ensure round-the-clock power supply. In areas of water, disaster management and safety, the city has consolidated scores of 6.67, 7.80 and 7.25 respectively. In the areas of municipal corporation and sustainability, the city has scores of 6.76 and six respectively.

Services: Chennai




Bengaluru

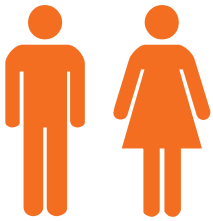
Bengaluru
Snapshot

Total city area: 741 km²

Total population and sex ratio

84.81 lakh

54% 46%



Economy

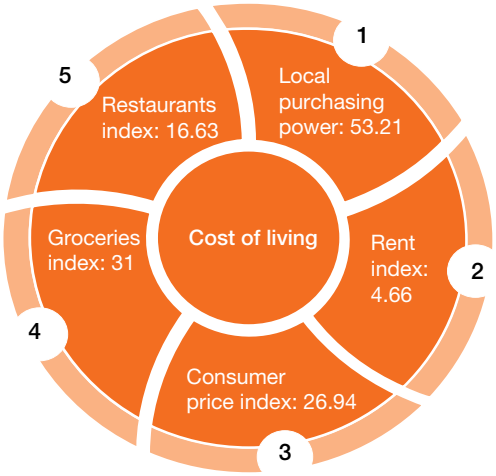
State domestic product: 4,980 billion INR (2011)

City demographics

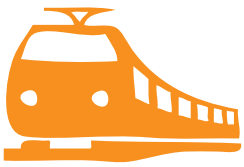
Per capita income: 47,605

Literacy rate: 88.62%

Cost of living



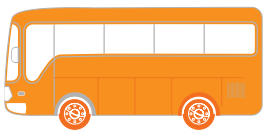
Urban transport



Local train

Metro

Auto rickshaw



Bus

Green cover

Forest cover is 6.80%

Pollution index
Air pollution: 66.79
Water pollution: 74.17

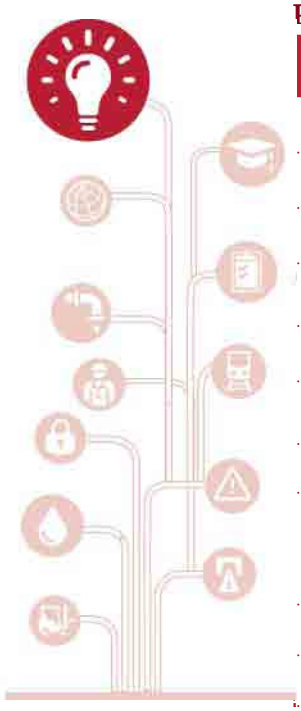
Social infrastructure

Hospitals: 22

Colleges: 27

Components scoring

Legends	High score: 3	Moderate score: 2	Limited score: 1

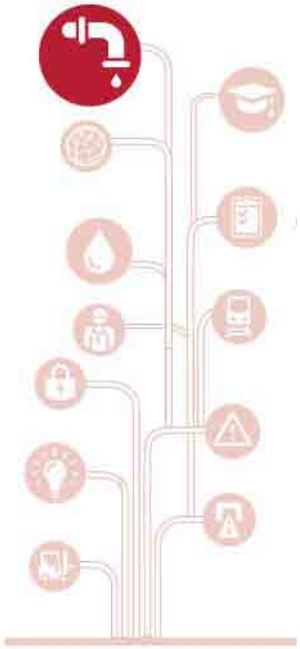


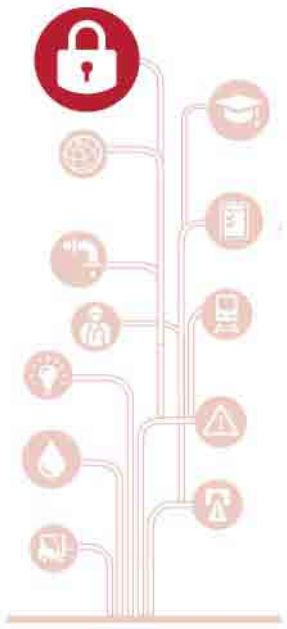
Power

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
24x7 electricity supply	2	2	3	2.4
Quality	2	2	2	2
Distribution losses	1	3	3	2.4
Energy consumption details	3	2	3	2.7
Online payment facility	3	3	3	3
Grievance redressal or CRM for citizens	3	3	3	3
Metering	3	1	3	2.4
Energy efficiency initiatives: Street, renewable, subsidy and green buildings	2	2	2	2
Billing efficiency	2	3	2	2.3
Revenue realisation	2	3	2	2.3

Water

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
24x7 water supply	2	1	3	2.1
Metering of water connections	2	1	2	1.7
Billing efficiency	2	2	2	2
Online payment facility	2	2	3	2.4
Water losses	1	1	3	1.8
Revenue realisation	1	2	2	1.7



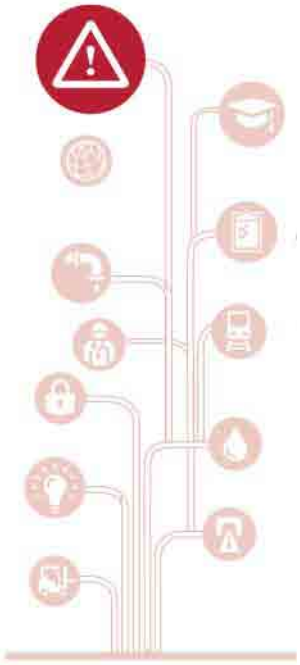


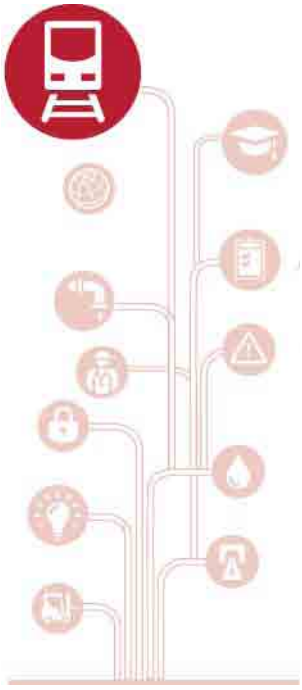
Public safety

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
City surveillance	2	2	3	2.4
Online FIR, complaints registration	2	2	2	2
Verification, validations or clearance	2	2	2	2
Complaint response time	2	2	2	2

Disaster management

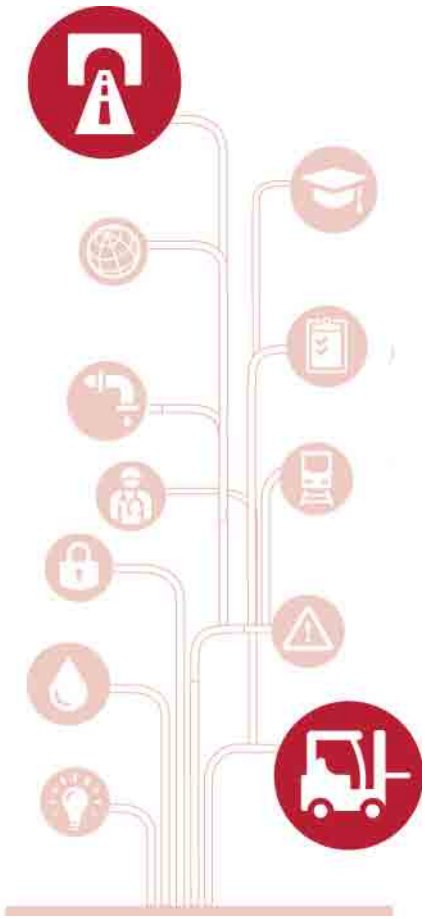
Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Disaster prediction system, early warning system	1	1	3	1.8
Disaster alarm and response system	2	1	3	2.1
Efficient firefighting systems	2	2	3	2.4
Fire stations based on population density	2	2	3	2.4
Fire stations with special devices and materials for firefighting	1	2	3	2.1





Transport

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Transport surveillance: Traffic violation detection, speed violation detection, traffic signal violation detection	3	3	2	2.6
Challan management	1	2	2	1.7
Traffic management system	2	2	3	2.4
Parking management	2	1	2	1.7
Access to para-transit	2	1	2	1.7
Availability and frequency of mass transport	2	2	2	2
Availability of bicycle tracks	1	1	2	1.4
Unobstructed footpaths of minimum 2m width on either side of all streets	1	1	2	1.4
Adherence to building and parking standards	1	1	2	1.4



Sewerage and sanitation

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Households connected to the waste water or sewerage network	3	3	3	3
Waste water treatment	2	2	2	2
Treated water usage	1	1	1	1

Solid waste management

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Population with regular solid waste collection (residential)	1	1	2	1.4
Collection of municipal solid waste	1	1	2	1.4
Recycling of solid waste	2	1	2	1.7
Solid waste that is disposed of in a sanitary landfill, open dump or burnt	2	1	1	1.3
Hazardous waste recycling	2	1	2	1.7

Storm water drainage

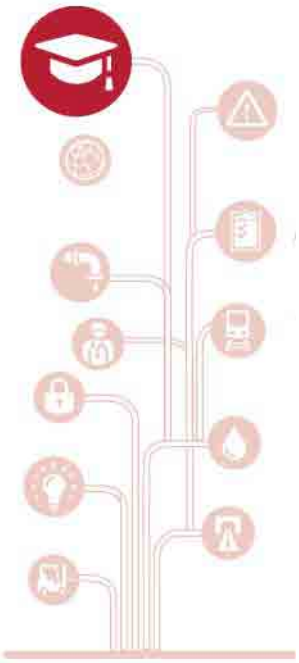
Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Availability of required drainage in identified hotspots	2	1	2	1.7
Rainwater harvesting	2	1	1	1.3
Evacuation of water	2	1	2	1.7

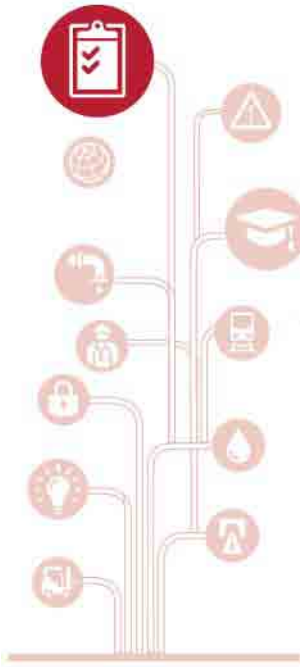
Health

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Hospitals against population density	1	2	3	2.1
Healthcare facilities	2	1	3	2.1
Emergency response facilities (ambulances, emergency wards, etc)	2	1	3	2.1

Education

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Total number of schools	2	2	3	2.4
School for the specially abled	1	1	2	1.4
Colleges against population density	1	1	2	1.4
Professional colleges against population density	2	2	2	2



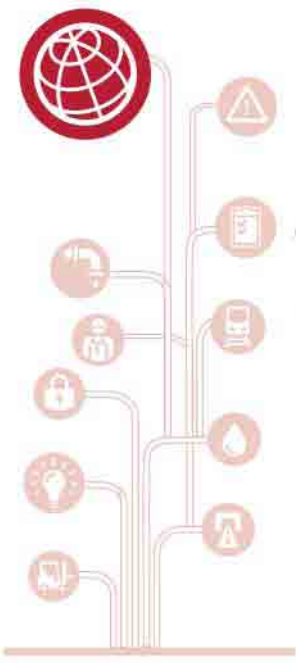


Municipal corporation

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Property tax payment	3	3	2	2.6
Online licence issue	3	2	2	2.3
Complaint registration	3	1	2	2
Licences issuance TAT	3	2	2	2.3
RTI TAT	3	1	1	1.6
Birth and death registration	3	3	2	2.6
Online building plan sanction	3	2	2	2.3

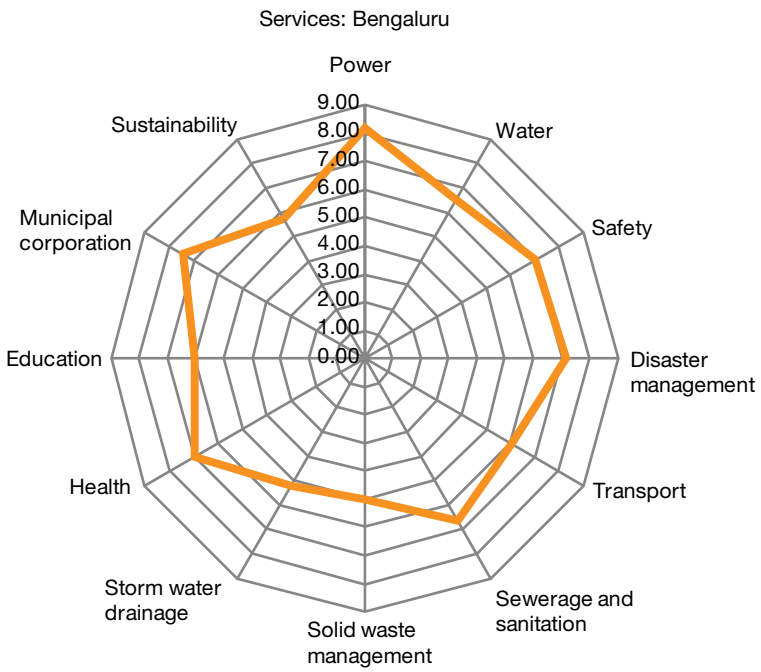
Sustainability

Sub-components	Current state	Technology intervention	Contribution towards smart city	Score (considering weights)
Noise pollution	2	1	2	1.7
Air pollution	1	1	2	1.4
Adherence to green building norms	1	1	3	1.8
Water pollution	2	2	2	2



Overall assessment

Bengaluru, the city of electronics, has a consolidated score of 8.17 in power. In transport, the city has a consolidated score of 6.04, while in water the city has a score of 6.50. In the areas of safety, disaster management as well as sewerage and sanitation, the city has scores of 6.58, 7.20 and 6.67 respectively. Bengaluru needs to considerably improve its technology intervention in solid waste management and storm water drainage. In overall sustainability, the city has a score of 5.75.



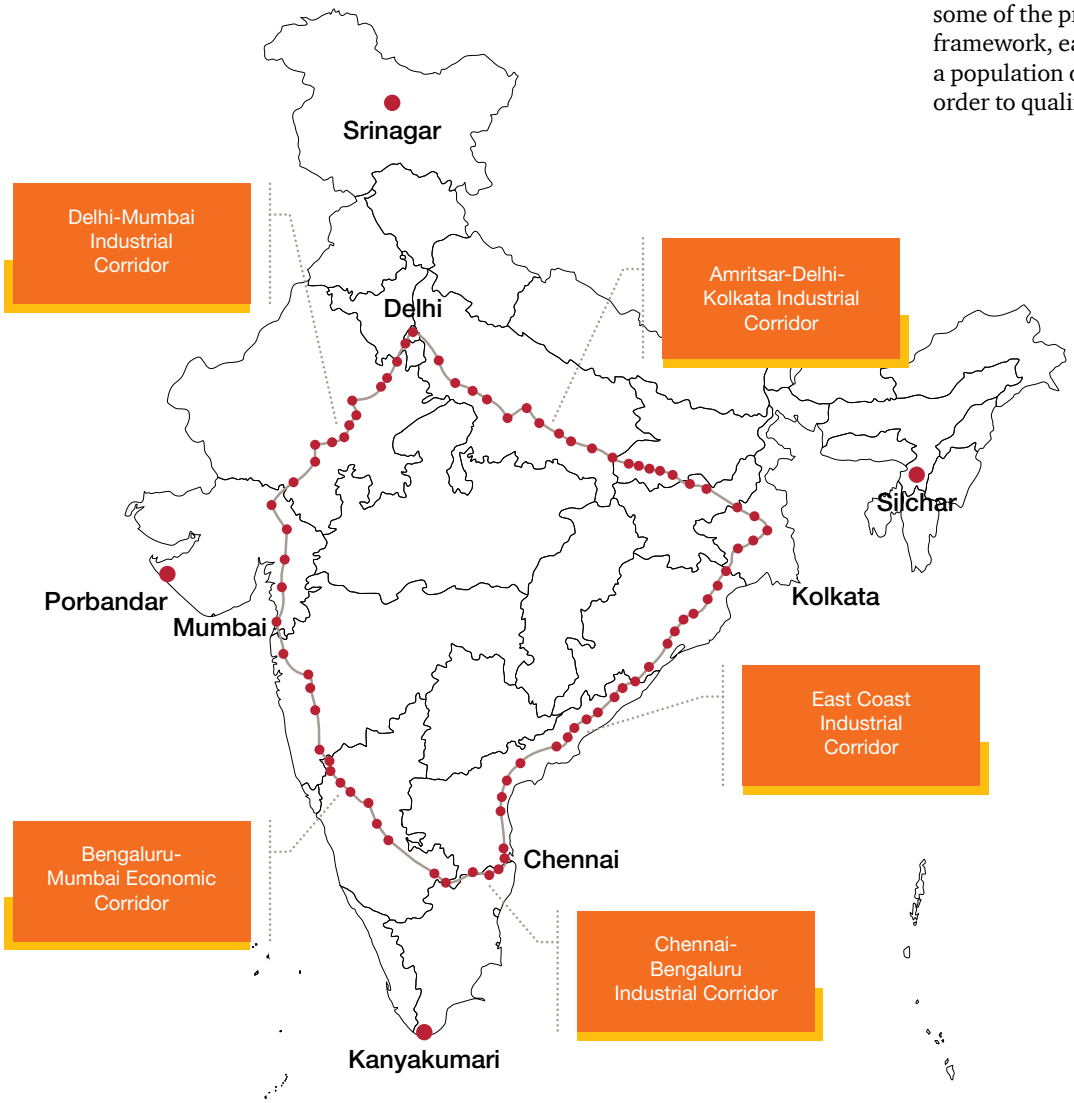
Taking stock

Corridors of opportunities

For promoting economic activity in India, five new industrial corridors are being planned--Delhi-Mumbai Industrial Corridor, Amritsar-Delhi-Kolkata Industrial Corridor, Bengaluru-Mumbai Economic Corridor, East Coast Industrial Corridor and Chennai-Bengaluru Industrial Corridor. Each will have several key nodes developed on smart city principles.

The Delhi-Mumbai Industrial Corridor (DMIC) is India's most ambitious infrastructure programme aiming to develop new industrial cities as 'smart cities' and converging next-generation technologies across the infrastructure sector. The objective is to expand India's manufacturing and services base and develop DMIC as a 'global manufacturing and trading hub'. The programme will provide a major impetus to planned urbanisation in India with manufacturing as the key driver. In addition to new industrial cities, the programme envisages development of infrastructure linkages such as power plants, assured water supply, high capacity transportation and logistics facilities as well as softer interventions such as skill development programme for employment of the local populace. In the first phase, seven new industrial cities are being developed. The programme has been conceptualised in collaboration with the government of Japan*.

The government of India has announced seven new smart cities under the DMIC project. However, the projects vary in size and scale and are being partially developed on PPP. A corridor in the north-east region is also likely to include some of the proposed smart cities. For the framework, each city is likely to include a population of 1 million to 4 million in order to qualify as a smart city.



Source: DMIC website

Naya Raipur

The state of Chhattisgarh (CG) was created in 2000 with Raipur as its capital. The latter with its growing importance as an important node in the trade network and a host of industries, has immense potential. However, the present city is constrained by the unavailability of land, space and basic infrastructure. Considering the growth potential of the city and with a view to decongest it, a new city is being developed as 'Naya Raipur', the greenfield capital city, at a distance of about 17 kms from the existing Raipur. Its core area admeasures 8,013 ha. The planning area of Naya Raipur has been notified as a 'special area' under the CG Nagar Tatha Gram Nivesh Adhiniyam, 1973.

The Naya Raipur Development Authority (NRDA) constituted under the CG Nagar Tatha Gram Nivesh Adhiniyam, 1973 Act has been entrusted with the development, operation and maintenance of infrastructure of the new city.

The new city was selected on the basis of following criteria:

• Connected to NH-6 and NH-43	• Maximum government land	• Minimum forest cover and wild life
• Railway link to Vizag, Mumbai	• Land unsuitable for agriculture, mining and quarrying	• Water availability and easy drainage
• Close proximity to airport and major urban centres	• Land having least number of existing human settlements	• Soil having good bearing capacity for economic construction

The city was planned with the following objectives:

Financial centre of the region

Servicing hub not only in manufacturing but also in IT and biotechnology

Efficient engine of growth and prosperity

Agent of economic change and social transformation in the state

Hub of trade and hospitality sectors

Hub of cultural services which will supplement local economy

Hub of affordable and high-quality medical services

Hub of quality educational facilities and a knowledge base

A significant percentage of the national population lives in cities and the demand for urbanisation has increased manifold in the current scenario. Today, cities around the world are seen as the engines for sustainable social and economic growth. In order to achieve this growth, it is critical for city administrators to build cities responsive to the demands of their citizens and businesses.

The NRDA envisages Naya Raipur as a city that will be modern in the use of technology, uphold worthy traditions and core values, and conserve the prevailing man-nature symbiotic culture as well as the abundant natural and cultural assets in the region. Citizens will be offered a wide range of living options with equity and dignity. The three key metrics that constitute the design of the ICT master plan for a smart city are as follows:

Stakeholders	Value added
Government	Optimise resources
Residents	Improved livability
Businesses	Ease of doing business

This can be achieved by establishing an integrated system for collecting, measuring, collating and broadcasting city data and for making it easily accessible to stakeholders for efficient and effective development, governance and management of Naya Raipur. It will maximise the services to its citizens and businesses for social, economic and environmental benefits.

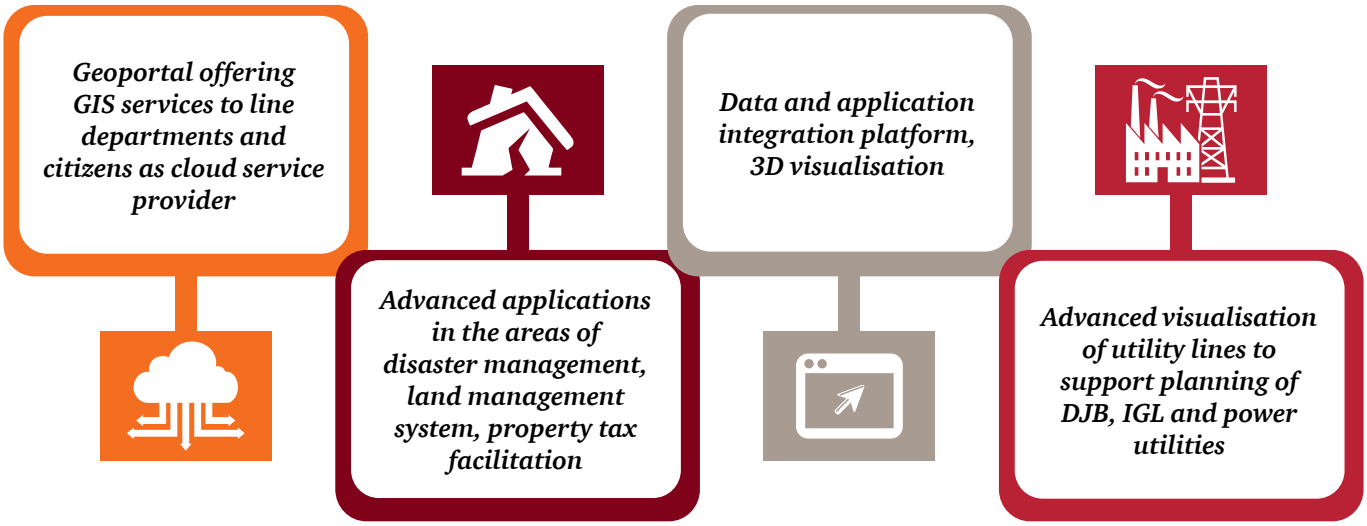
Establish a smart city that is responsive and integrated.

Delhi smart city

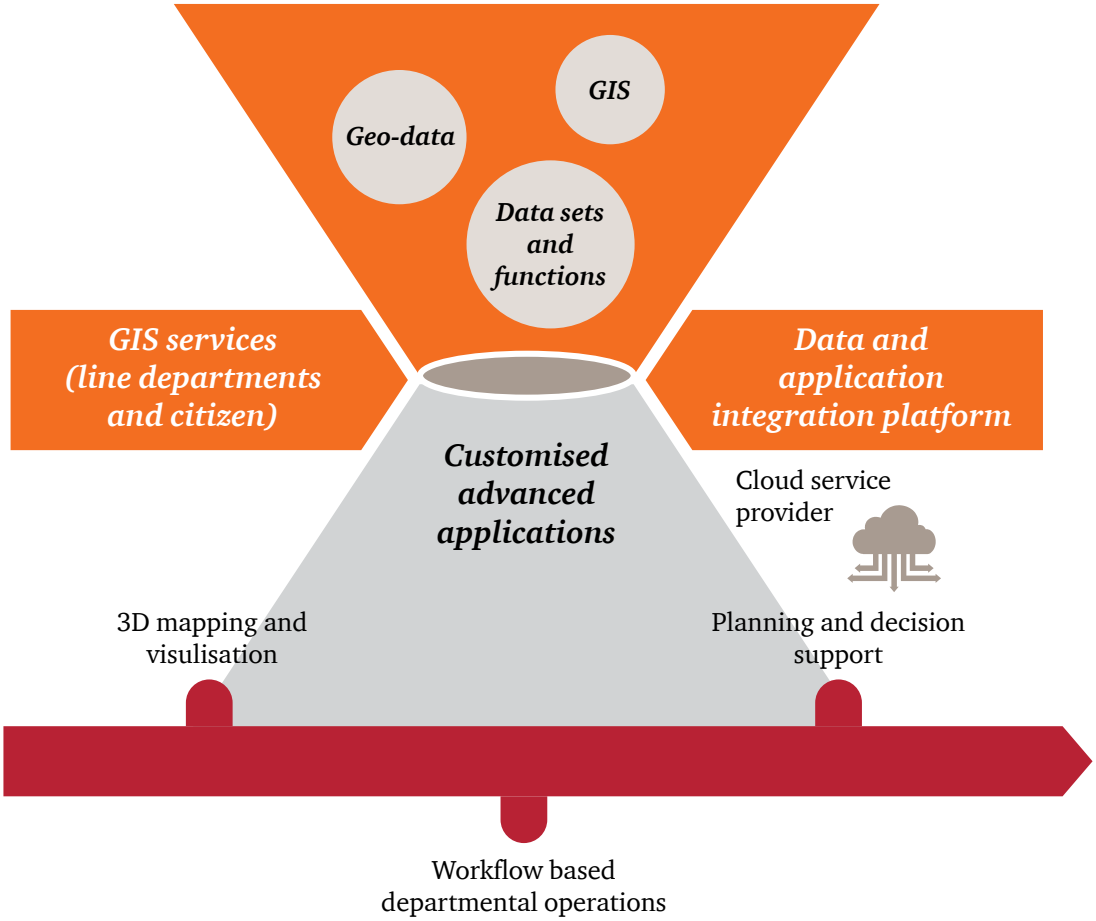
Geospatial Delhi Limited (GSDL) has embarked on an initiative to revamp their existing spatial data infrastructure created in 2008 on DSSDI data sets. This is to develop the capacity to support the infusion of GIS in e-Governance projects of GNCTD and process reforms for departments to effectively use GIS.

GSDL plans to develop cloud-based GIS systems for all line departments to assist them in operations. The GIS system will be an integrated solution wherein cross-department layer access will be possible for better information-sharing and analysis. Under this initiative, GSDL also plans to develop a process-driven robust technological solution for continuous and seamless data updation by line departments.

The following key objectives are envisaged under the current transformation:



To do so, GSDL is in the process of understanding the individual requirements of line departments, the review of existing databases and data gap analysis as per the requirements of line departments for infrastructure upgrade in order to support the development and deployment of citizen-facing services and that of Delhi as a smart city using DSSDI data sets.



Heritage city development

India has several heritage sites that are the bedrocks of its culture and heritage. These cities play a vital role in passing on the legacy and value of Indian culture to future generations.

However, today, these cities are poised with the challenges of sustaining accelerating urbanisation and are overcrowded with inadequate basic services and infrastructure, such as water supply, sanitation, roads, etc. Basic amenities such as toilets, signages, street lights are missing.

Challenges of heritage cities	
Physical infrastructure	• Lack of focus on the preservation and conservation of heritage buildings • Lack of public toilets and other civic amenities in most tourist destinations • Absence of organised mode of travel connecting different tourist sites within the city and in its surroundings • Lack of water supply and acute waterlogging problems during heavy rainfall • Absence of solid waste treatment plant in the city • Large number of illegal electricity connections in the city • Significant infrastructure deficiencies in water supply, sewerage and drainage and traffic and internal transport particular in the inner city
Social infrastructure	• Lack of adequate socio-cultural facilities in the city • Limited medical facilities • Lack of university level educational institutes • Lack of vocational institutes
Economic infrastructure	• Unavailability of investors in developing tourism businesses
Institutional infrastructure	• Lack of technical and administrative manpower to implement the plan

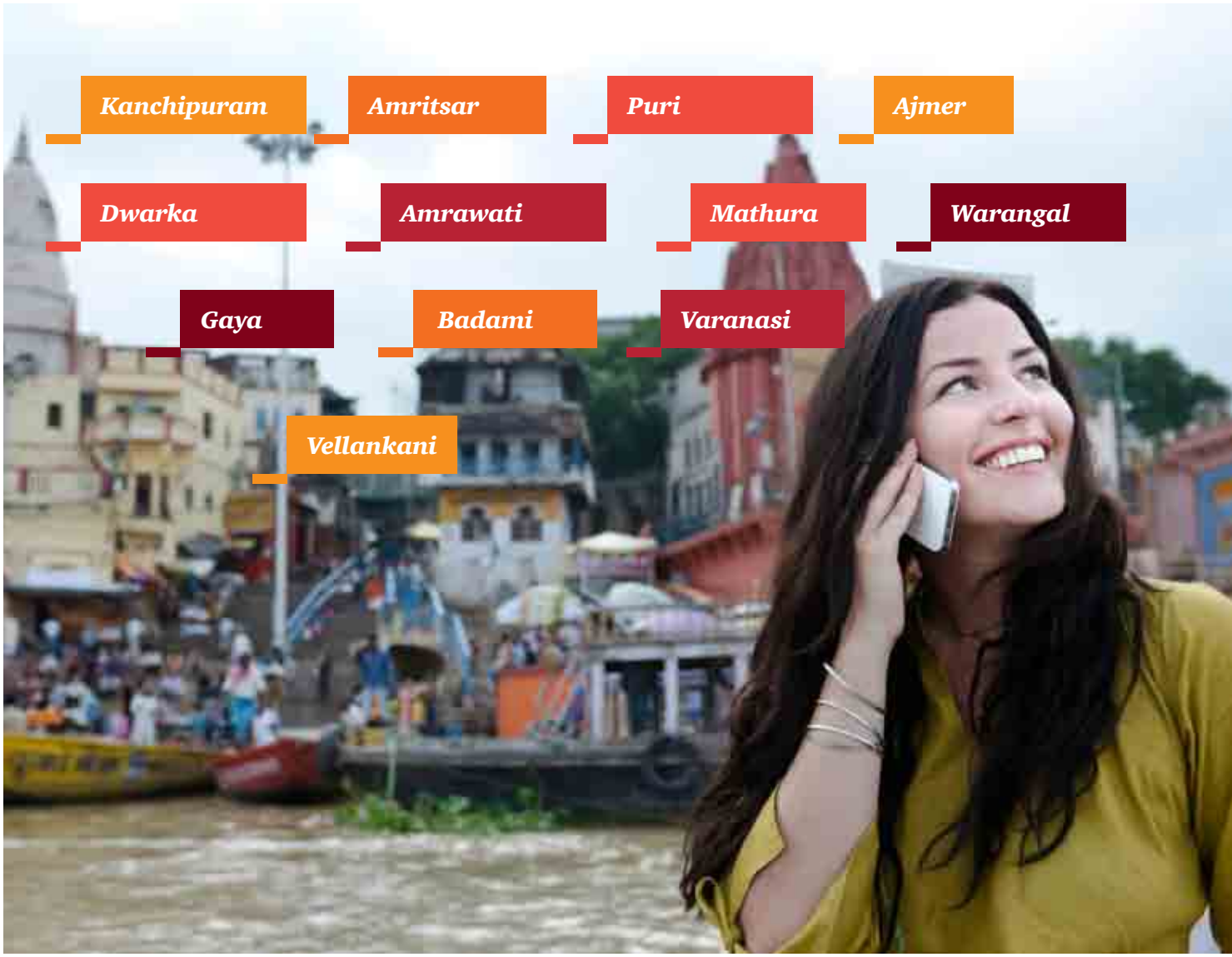
It is important to take steps toward mitigating the challenges faced by these cities and develop transformation strategies and schemes in order to conserve our cultural heritage to explore the full potential of the heritage cities of India.

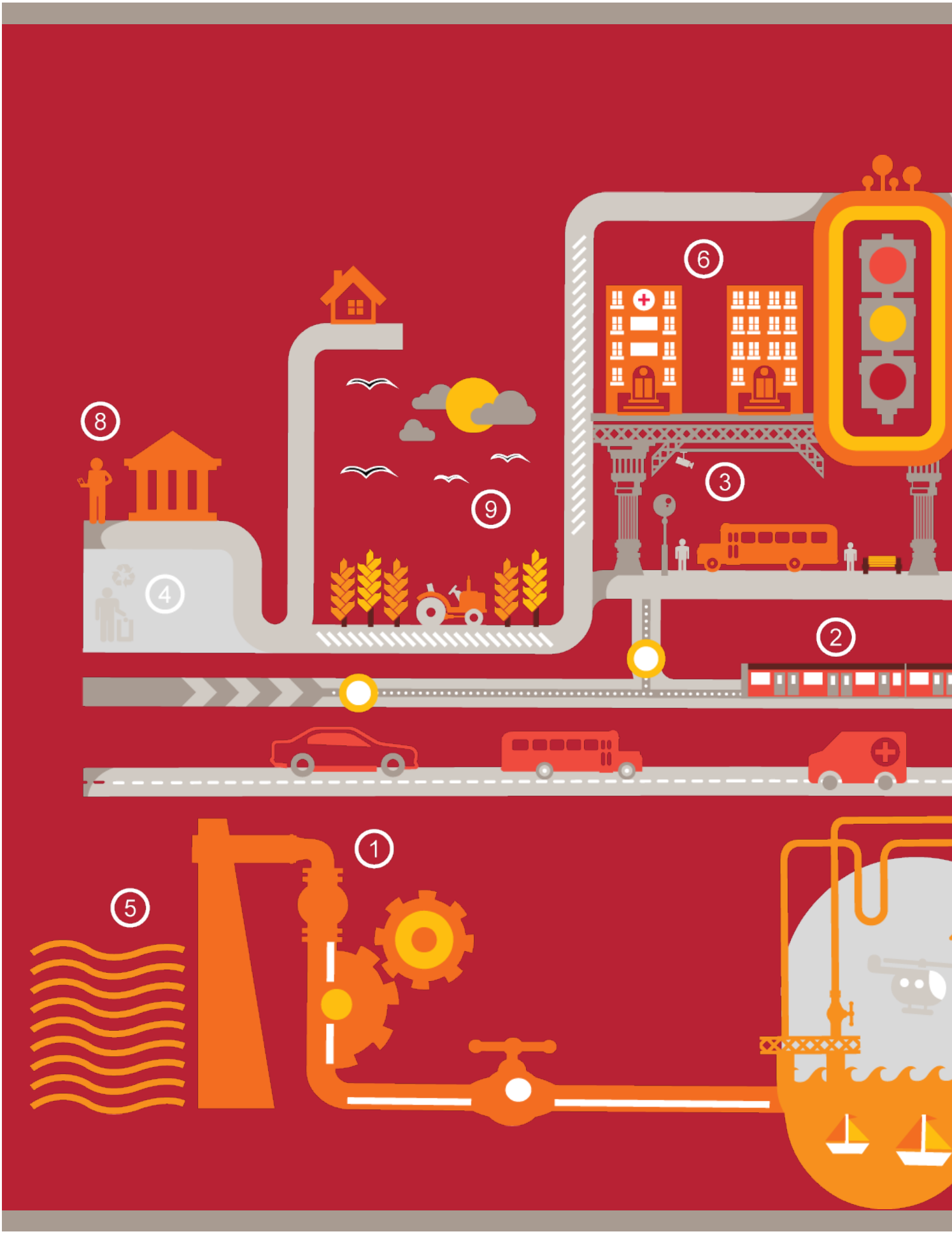
The Ministry of Urban Development has proposed a draft scheme called HRIDAY that offers opportunity towards integrated, inclusive and sustainable development of the heritage cities India. HRIDAY focusses on promoting local economic development by tapping the potential of revenue generation from tourism activities while conserving city heritage in an inclusive and integrated manner with focus on livelihoods, skills, cleanliness, security, accessibility and service delivery.

Scheme strategy

- Central sector scheme: 100% funding will be provided by the government of India.
- Cities and towns will be required to prepare a heritage management plan (HMP) for the city and develop DPRs for identified projects for availing assistance under the scheme.
- The project duration is four years from December 2014.
- NIUA is designated as the National Project Management Unit for HRIDAY and will function as a secretariat for the National Mission Directorate.
- The city PMU will be procured by the National Mission Directorate and will function as secretariat to the City Mission Directorate.

Cities under the scheme

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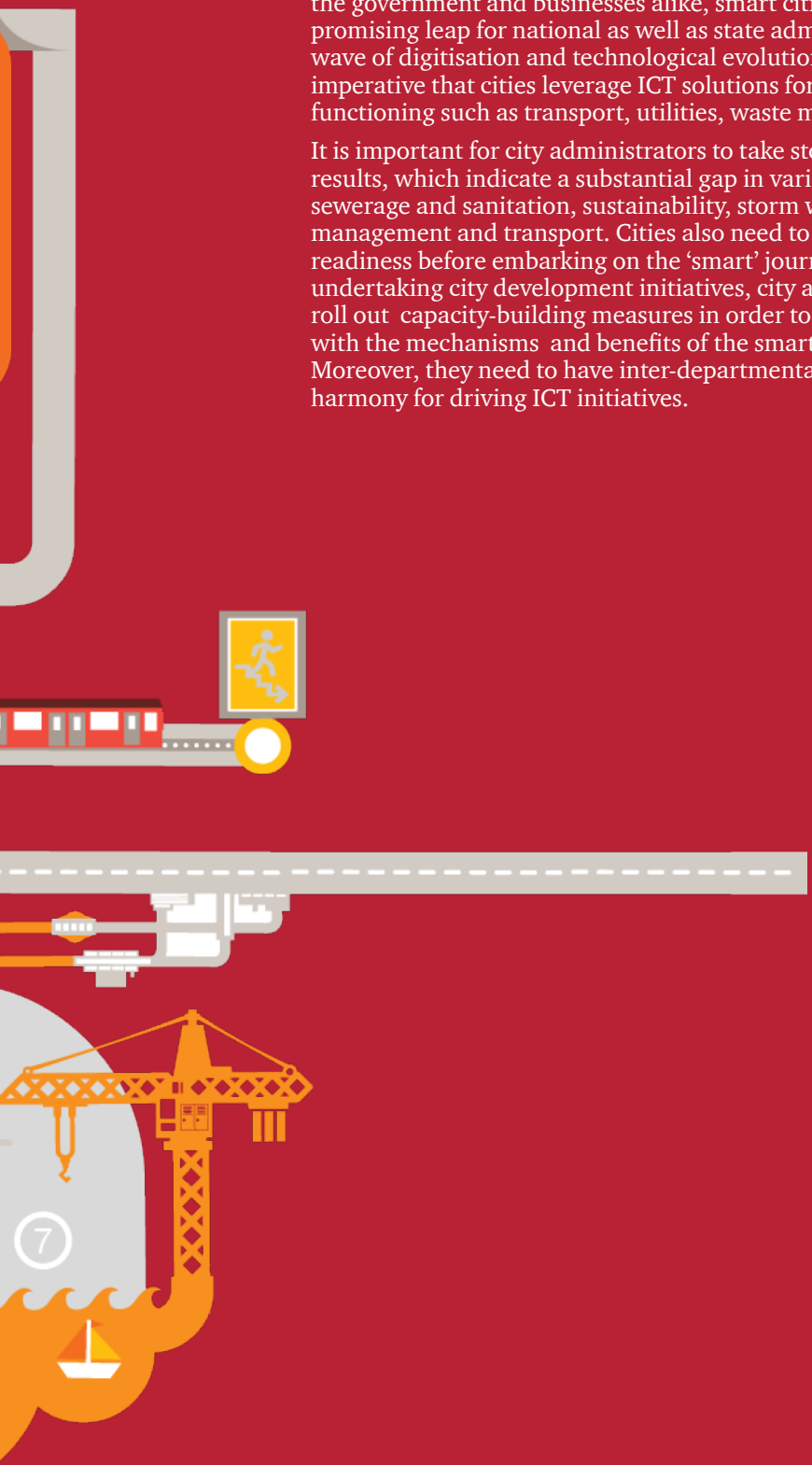
Conclusion

The new government at the centre has embarked on an ambitious trail to transform the landscape of India with the announcement to set-up several smart cities across the country. With the promise of benefits for citizens, the government and businesses alike, smart cities seem to be the next promising leap for national as well as state administrations. With a strong wave of digitisation and technological evolution across the globe, it is only imperative that cities leverage ICT solutions for simplifying city activities and functioning such as transport, utilities, waste management and education.

It is important for city administrators to take stock of the report's assessment results, which indicate a substantial gap in various areas including, safety, sewerage and sanitation, sustainability, storm water drainage, solid waste management and transport. Cities also need to take cognisance of their readiness before embarking on the 'smart' journey. In addition, while undertaking city development initiatives, city administrators need to also roll out capacity-building measures in order to acquaint the general public with the mechanisms and benefits of the smart solutions at their disposal. Moreover, they need to have inter-departmental cohesiveness as well as harmony for driving ICT initiatives.



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The Express Group is one of India's largest media conglomerates with a wide selection of publications and a network of offices spread across India. Today, with 32 national editions, 13 publication centers and four language dailies that reach over 19 million people daily, the Express Group stands tall among the country's media houses. The Express Group of publications has stood for excellence in journalism for over 80 years. Express Group publications include The Indian Express, The Financial Express, Loksatta, Lokprabha, Screen, Jansatta.

Established in 1990, the Business Publications Division (BPD) of the group manages B2B publications such as Express Computer, Express Pharma, Express Healthcare, Express TravelWorld, Food and Hospitality World and events across varied sectors, including information technology.

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Organised twice a year, for the last eight years, by the Indian Express Group, the Express Technology Sabha, since its inception as India's premier eGovernance Forum, has been setting new benchmarks in eGovernance seminars through leadership dialogues, exciting case studies and best practices, peer-to-peer networking opportunities and technology showcases. The Sabha aims to gather key practitioners of ICT within the government to hold deliberations on ideas that can lead to development of more transparent and efficient governance mechanism.

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Express Computer is one of India's most respected IT media brands and has been in publication for 24 years. The magazine covers enterprise technology in all its flavours, including processors, storage, networking, wireless, business applications, cloud computing, analytics, green initiatives and anything that can help companies make the most of their ICT investments. The magazine is also on the forefront of reporting on eGovernance in India.

The goal of the magazine is to bring to its primary readers—the CIOs/CTOs and senior IT decision-makers and implementers across various industries & government departments—the most comprehensive, topical, incisive and unbiased coverage through a carefully chosen mix of news, views, analysis and in-depth feature articles.

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Contacts

Neel Ratan
Leader
Government and Public Sector
neel.ratan@in.pwc.com

Rakesh Kaul
Partner
Government and Public Sector
rakesh.kaul@in.pwc.com

NSN Murty
Associate Director
Government and Public Sector
nsn.murty@in.pwc.com

Acknowledgements

Biju Kadapurath
Government and Public Sector
biju.kadapurath@in.pwc.com

Gaurav Gupta
Government and Public Sector
Gaurav.p.gupta@in.pwc.com

Charu Singla
Government and Public Sector
Charu.singla@in.pwc.com

Ambika Bahadur
Government and Public Sector
ambika.bahadur@in.pwc.com

Gagandeep Singh
Government and Public Sector
gagandeep.singh@in.pwc.com

Monica Bhatia
Government and Public Sector
monica.bhatia@in.pwc.com

Design

Pallavi Dhingra
Abhishek Kakar
Deepika Jain

Media

Nandini Chatterjee
nandini.chatterjee@in.pwc.com

www.pwc.in

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