

MODERN URBANIZATION

CHALLENGES IN SETTING UP SMART CITIES

A Cushman & Wakefield Research Report



JANUARY 2015



INTRODUCTION

UNDERSTANDING SMART CITIES AND THEIR IMPORTANCE IN THE CONTEXT OF URBANIZATION

With increasing urbanization, India's urban population is expected to increase from 377 million in 2011 to 600 million people by the year 2031. Almost 50% percent of the total population will live in urban areas. According to a recent report on Indian urban infrastructure and services by a high-powered expert committee set by the Indian government, the urban share of the GDP is expected to rise to 75% in the year 2030 from around 62-63 percent in the year 2009-2010. The number of cities is projected to increase to 87 in the year 2031 from 50 in 2011. Urban areas will be critical to the economic growth of the country and they will require a massive overhaul to accommodate the future population.

To cater to this increasing urban population in the future, cities need to plan and provide a suitable environment for future investments, create new jobs and livelihoods, build reliable public infrastructure, provide social services with ample access to affordable housing and most importantly support efficient use of resources for a sustainable quality of life.

Smart City Components

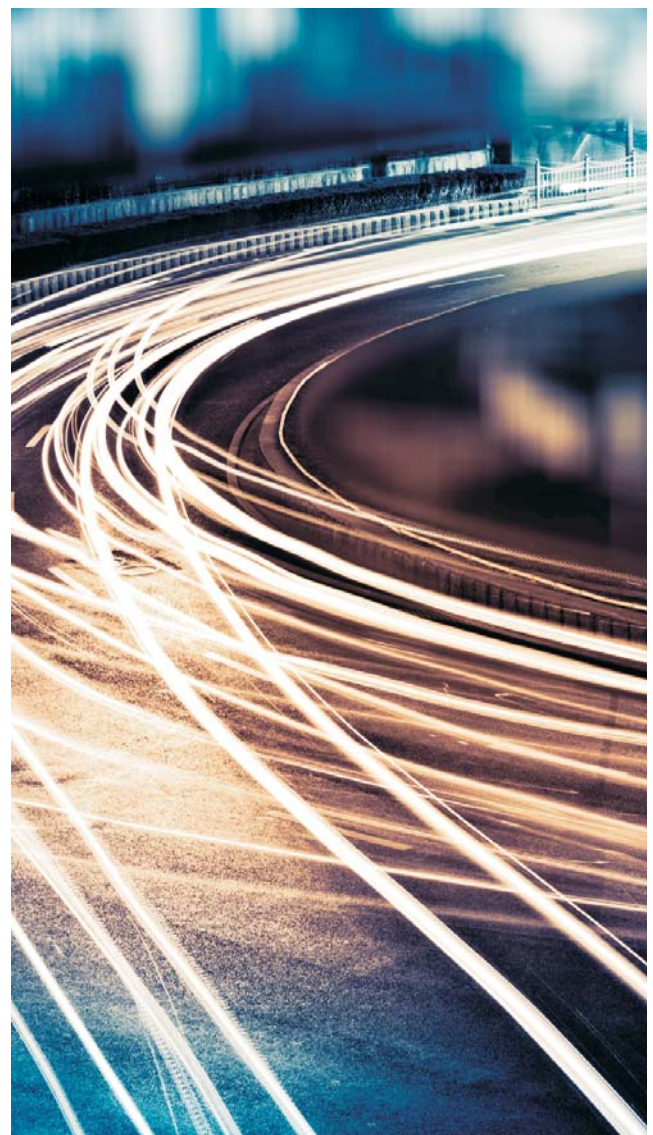
- Integrated transport and increased connectivity
- 100% coverage of utilities: solid waste management, storm water drainage, telecommunication, electricity, water
- Integration of Information and Communication Technology (ICT) with transportation and utilities to allow real time monitoring
- Energy Efficiency and the use of renewable resources
- Sustainable building practices
- Access to jobs, education and healthcare

A 'SMART' SOLUTION TO MITIGATE THE PROBLEMS OF URBANIZATION

Smart cities introduce a new paradigm in the way cities are envisioned. There is no singular definition for a 'Smart' city; however, it can be identified by certain characteristics. A smart

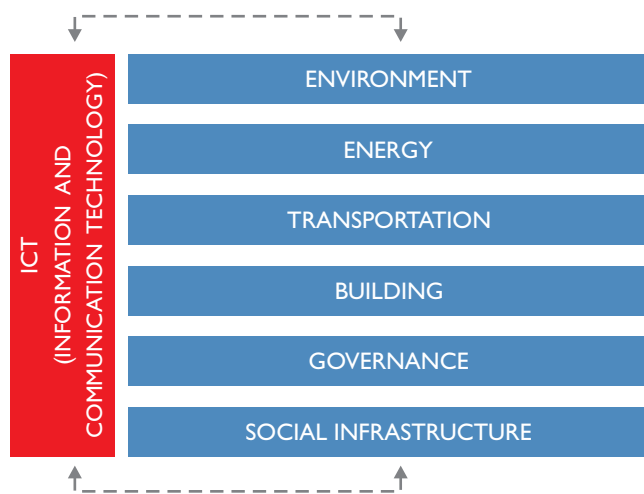
city should ideally offer swift seamless mobility, round the clock accessibility to urban services, access to quality healthcare, education, jobs and affordable housing.

Smart cities aim to reduce anticipated complexities and expenses that accompany future urbanization. Hence, integration of Information and Communication Technology (ICT), energy efficiency and sustainability form the backbone of these cities. For enabling and supporting these initiatives, the smart cities also require accountable, empowered urban local bodies. Overall, smart cities promise to provide a quality of life that can support future generations sustainably.



WHAT MAKES A CITY SMART?

Based on the stage of ICT integration in project life-cycle smart cities can be broadly classified into three types: (1) new cities, (2) retrofitting existing cities with smart technologies, and (3) purpose-driven cities. New cities integrate ICT in all aspects to attract citizens and businesses by providing quality services. Retrofitting existing cities into smart cities is a step-by-step intervention to integrate new processes into the older systems to achieve the overall objective of creating a smart city. Purpose driven cities could be industry centric, built around science towns or other core activities. The scale of each of these type of cities could greatly vary. However, all the smart cities broadly consist of ICT integrated projects in various sectors viz.; Environment, Energy, Transportation, Smart Buildings, Governance and Social Infrastructure



INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)

ICT forms the fundamental support system for smart cities and it is integrated across different sectors to achieve transparency and efficiency in processes. It can be used to improve power use and distribution, ensure 24/7 water supply, improve efficiency in mobility through intelligent transportation and traffic management, enhance automated surveillance and security systems and enable Wi-Fi powered open spaces and houses for businesses. It can also be implemented for efficient use of scarce resources and real-time tracking of available services. It has the potential to provide quick response in emergencies as well. The scope of integrating ICT is unlimited and it is largely dependent on availability of funds and the set goals and objectives for different cities.

ENVIRONMENT

Smart cities take measures to plan for future generations while protecting the natural environment and resources to reduce the overall carbon footprint. Some of the major agendas can include:

- a) Use of Renewable Resources: Smart urban environments require renewable sources of power to reduce dependency on coal for energy generation.
- b) Promoting mixed-use developments and encouraging walkability: Smart cities include walkable communities where major trips could be completed within a short distance through walking, cycling or public transportation with reduced trip transfers. For this, work spaces and living spaces are located in close proximity to each another.
- c) Reduction in wastage of resources: Through the use of ICT, smart cities focus on reducing wastage of resources such as water, electricity, etc. by identifying and isolating the source of leakages, controlling peak and non-peak hour usage, identifying equipment needing repairs and/or replacement, etc. They also implement efficient technologies for recycling waste water and solid wastes.

ENERGY

Efficient energy management is crucial to a smart city due to its large dependence on power. Smart metering and wireless connected sensors are some of the technologies that have been adopted for energy management. Smart meters allow two-way monitoring from both the utility provider as well as the end-user to monitor consumption, peak hour loads, etc. These systems provide necessary information to the citizens to help manage their tariffs.

Additionally, smart cities also use 'smart grids,' which are power grids that are integrated with controls, automation and new technologies to allow efficient transmission of power, quicker restoration of power outages, reduce overall operation and management costs and integrate renewable energy systems. In addition to this, they give financial incentives to the consumers to shift the electrical demand during off-peak hours. Overall, smart grids offer opportunities to save energy while reducing dependency on fossil fuels.

TRANSPORTATION

Smart cities provide seamless integrated public transportation networks across multiple modes including rail, metro, bus and non-motorized transportation (walking and cycling). Ideally, ICT is integrated with the transport networks to allow real time

tracking and increase citizens' access to information on transportation. Guided parking and volume-based traffic control systems aid in addressing traffic challenges and improving mobility. Other measures to provide smart transportation solutions may include smart cards, asset and fleet management, toll and parking management. Smart cities also promote the use of low polluting vehicles and electric vehicles.

Land-use planning is integrated with transportation planning to reduce trip distances and increase walkability. Enhanced urban design of the streets support high pedestrian activity and engagement of people with the surrounding spaces and activities.

BUILDINGS

Smart cities include buildings that are sustainable in terms of the materials used and construction techniques employed, to reduce the overall carbon footprint. Intelligent systems, which include sensors and control systems, can optimize the overall building energy usage, along with the efficient use and management of utilities. Smart building technologies can help reduce maintenance costs and enhance occupiers' comfort, health and safety.

GOVERNANCE

Governance becomes a crucial part of the implementation and sustenance of a smart city. Smart cities include an integrated governance system that employs technology for ease of movement of information and efficiency in all of its processes across several departments. E-services, social media, applications and other platforms allow interaction between the government and its citizens whilst keeping the latter engaged and updated about the latest developments.

SOCIAL INFRASTRUCTURE: HEALTH AND EDUCATION

Access to quality social infrastructure (primarily health and education), is crucial for every city. Smart cities provide these services with the integration of technology to reduce expenses, where possible, and provide timely support. Moreover, a highly skilled environment that is created through a smart city, requires skilled human capital necessary to support and sustain the cities for the future.



WHAT DO WE NEED TO MAKE SMART CITIES?

POWER

According to the Planning Commission of India's Twelfth Plan energy projections, only about two-thirds of our total energy needs will be produced domestically by the year 2021-22. Dependency on imports will be essential to bridge the energy demand and supply gap. Energy intensive smart cities will only spike up the already heavy dependence on fossil fuels for energy production, unless renewable fuel alternatives are available. Currently, only 2 percent of India's energy generation can be attributed to renewable sources. There is an immediate need to develop technologies to increase dependence on alternative energy sources to make smart cities financially and ecologically viable. Coal-based energy supply cannot be a long term solution for an initiative that aims to be sustainable in its approach.

INFRASTRUCTURE

According to the report by the high-powered expert committee mentioned earlier, a total investment of about INR 39.2 lakh crores will be required over the next 20 years to meet the infrastructure deficits and service delivery shortcomings. Urban services like water supply, sewerage, solid waste management, storm water drains etc., would require at least 20% of the total anticipated investment. Construction, operation and maintenance of new and existing infrastructure will also be critical. However, given the current rates of investment in urban infrastructure, there is likely to be a huge shortfall in meeting anticipated demand.

In addition to the physical infrastructure, the new cities will need heavy investment in social infrastructure (which includes housing, education, healthcare and entertainment among others). Securing funding to implement such large-scale infrastructure developments will be crucial and a challenging task.

FUNDS

The government has suggested a few mechanisms to financially support the smart cities. Internally, the city governments need to mobilize funds from various resources while not limiting themselves to urban development schemes. Land value-based taxation reform needs to be brought in. User charges for utilities need to be adjusted to reflect costs. Increasing the development density through revised Floor Space Index (FSI)/ Floor Area Ratio

(FAR) will not only help to bring down the overall real estate prices but it will also improve the overall financial viability of the physical infrastructure projects (like roads, metros, rails, etc.). Other financial sources suggested include Pooled Municipal Debt Obligation (PMDO) Facility, Real Estate Investment Trusts (REITs) and Infrastructure Debt Funds (IDFs).

Funds need to be leveraged from prospective domestic and international private investors as well. Currently, the total private investment in infrastructure is very little and most of this was implemented through Public Private Partnership (PPP) model. So far, the policies for foreign direct investment (FDI) have not been in favor of the investors, owing to a poor structure of the PPP schemes. Another fault was identified with the tendering process. Typically, the operation and maintenance component is not incorporated for Engineering, Procurement and Construction (EPC) contracts. Performance-based maintenance contracts (PBMC) need to be adopted more widely.

The Union Budget 2014-15 has introduced a few provisions to support the expansion of capital markets in the long term financing of infrastructure projects and commercial real estate projects through Infrastructure Investment Trusts (InvITs) and Real Estate Investment Trusts (REITs) respectively. Further, FDI in real estate has been relaxed in terms of built-up area and capital requirements, this might further encourage smaller investors to participate. Additionally, banks have been now permitted to raise long term funds for lending infrastructure sector. This was further supported with concessions on the mandatory bond holdings and cash reserve requirements.

TECHNOLOGY

Smart cities are defined by extensive use of technology to make the cities sustainable and improve the overall quality of life. Such technology dependent initiatives require platforms that allows constant innovation and improvement of existing technologies to increase the overall performance in all sectors including digital technology, automobiles, energy, healthcare and transport systems.

SKILLED HUMAN CAPITAL

Smart cities require 'smart' citizens to run and maintain the cities as well. The working population needs to be prepared for the employment opportunities that the cities will provide. In addition to this, they need to embrace the innovations, adapt and engage. Access to quality education and training, and other necessary support and guidance will be critical. Capacity building to improve the skills of personnel in relevant government agencies

is also required for quick absorption of various new technological interventions in the government processes. The future cities need to simultaneously and continuously provide the right

environment for innovation and productivity enhancement, thereby providing employment opportunities for the new population.



CASE STUDIES OF SMART CITIES

This section summarizes some of the smart cities projects initiated globally and in India.

BARCELONA¹

Barcelona has a population of 1.6 million and the core industries are tourism followed by knowledge and information systems, media and fashion. The city has implemented several projects under the smart cities initiative. Moreover, it has established **22@Barcelona**, which is a unique platform for small and medium enterprises to experiment and develop innovations in technology.

Key Initiatives

ICT

- New Telecommunications network: Integration of different fiber optic networks including Wi-fi network available at 193 municipal facilities, 276 street sites making it a total of 461 access points. Wi-fi would also be introduced in public spaces, municipal gardens, parks, city bus network and metro.
- Apps4bcn: An application to help the residents and tourists experience and enjoy the city. The app evolves on a daily basis and is accessible by the end-user as well as the developer.

Environment

- Smart Rubbish collection: Promoting recycling of garbage at household level.
- Remote irrigation control for City's green spaces.

Energy

- The city deployed 19,500 smart meters in Olympic villa.

Transportation

- Orthogonal Bus lines: Well-planned, well-connected, faster and intuitive bus network, which allows commute to any point in the city in a single transfer.
- Smart Parking: Network of sensors and displays to indicate available parking spaces.
- Bicing: Shared bicycle use plan which enables the citizens to travel short distances and undertake everyday journeys easily.

¹ Source: BCN Smart City (<http://smartcity.bcn.cat/en>); BIS research paper no. 135: Global Innovators: International Case Studies on Smart Cities (https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/249397/bis-13-1216-global-innovators-international-smart-cities.pdf)

6,000 bikes are available in the city and they can be accessed through a card which can be obtained through an online registration. The bicing website together with the app allows real-time tracking of the availability of the bicycles.

- Electric charging stations, electric vehicles and car rentals: 500 hybrid taxis, 294 public electric vehicles, 262 recharging points, 130 electric motorbikes and an estimated 400 private electric vehicles are visible on the streets in the city.

Buildings

- District heating and cooling: Two networks provide hot water in 64 buildings spanning 21 kms.

Governance

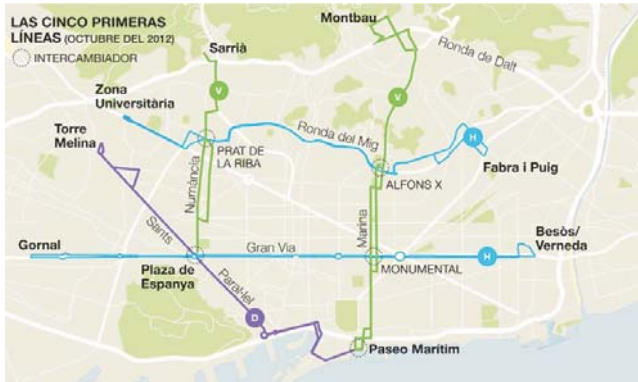
- Launch of open data portal and kiosks to create transparency and increase collaboration with the citizens. Citizens have an opportunity to participate by submitting their proposals on the government portal.
- The Barcelona Open Government app allows citizens to communicate with the government representatives, share opinions and be involved in different processes.

Other

- Smart traffic lights emit sound to assist blind people in crossing the road, in addition to providing easy movement for Fire Brigade and other emergency vehicles.



Bicing: Shared Bicycle Facility



Orthogonal Bus Line Network²: Phase I- 5 Lines

The city of Barcelona has developed projects through collaboration between other cities across the world, academia and industry. The city entered a PPP with Abertis Telecom to manage the municipal networks and enhance access to information through mobile phones. For the smart grid, the city partnered with Endesa (the largest utility company in Spain) for expanding the electricity distribution network, expanding the network of heating and cooling in the city and rehabilitating buildings using energy efficiency. Barcelona has also collaborated with research centers for promoting innovation for smart cities.

To support the implementation of the smart cities initiative, the city created an Urban Habitats group that brought together isolated departments like water, energy, human services and environment housing. Additionally, it created a Smart City PMO (Personal Management Office) to coordinate all projects under the smart city tag.

SEOUL³

Seoul Metropolitan City supports a population of over 10 million. The city launched the smart cities project in June 2011 to promote Seoul's position as a global leader in ICT by enhancing its sustainability and competitiveness through the use of smart technologies. South Korea had previously launched a u-City technology project in all of its cities to increase their competitiveness. Smart Seoul 2015 was launched to improve on the u-Seoul project for enhanced service delivery.

² Source: <http://bcnecologia.net/en/projects/orthogonal-bus-network-barcelona>

³ Source: Smart Cities Seoul: a case study by ITU-T Technology Watch Report <http://www.itu.int/dms_pub/itu-t/oth/0b/15/T0B150000153301PDFE.pdf> ; Smart Seoul 2015 <http://english.seoul.go.kr/wp-content/uploads/2014/02/SMART_SEOUL_2015_41.pdf>

Key Initiatives

ICT

- Open-source app-development models.
- High-speed broadband, optical wire and wireless networks: Accessible Wi-Fi network in parks, squares and other public places.
- “e-Seoul Net”: An administrative optical network, which was an extension of “U-Seoul Net”. U-Seoul net was first used for administrative data exchange between public offices. e-Seoul Net allows wi-fi services and access to public websites for all its citizens.
- Mobile Seoul (m.Seoul): Public information access through mobile web.
- Smart device accessibility to vulnerable and low income groups: Distribution of second-hand smart devices to low-income community members to increase their access to information through technology.
- NFC (Near Field Communication) based mobile payment system: A service that allows payment through a credit card or mobile card by touching smart devices to a specialized reader that obtains essential information to allow transaction. This service can be used through a smart device or a mobile card.

Energy

- Smart Metering Project: This initiative encourages the use of smart meters to reduce the overall energy usage by 10%. In 2012, Seoul installed smart meters in 1,000 households as part of the pilot initiative.
- Mandatory use of new renewable energy sources by 2015. Seoul targets to reduce carbon dioxide emissions by 2% and energy consumption by 10%.

Transportation

- Traffic Operation Information Service (TOPIS): Provides smart traffic information in real time, in addition to information on emergencies, road conditions, road repairs and detours. The information is displayed in various mediums such as a TOPIS home page, mobile web, DMB, TBS, and VMS (Variable Message Sign).
- Integrated public transit service linking subways, buses and taxis and the traffic signal system to favour public transportation.

- u-Shelter: ICT incorporated at bus stops. The services include bus route guide, digital map, destination search, traffic broadcasting station and weather forecast.

Buildings

- Smart Work Centre: An attempt to reduce the travel between work and home for the government employees. They can work from any of the 10 offices established across the city instead of working from the main city office.

Governance

- “Community Mapping”: Using Geographic Information Systems (GIS) as a participatory tool for engaging citizens in the administration of the city. The tools allows citizens to raise issues of biggest concern and report them to the government.
- Open Governance 2.0: Increasing citizen access to administrative documents and other public data, thereby increasing transparency in the government processes.
- WeGO (World e-Governments Organization of Cities and Local Governments): This was launched in September 2010 together with 49 member cities from around the world to promote international collaborations in e-government. Also signed Memorandum of Understanding (MoU) with the United Nations Public Administration Network and the World Bank for undertaking e-government collaborations with developing countries.

Social Infrastructure

- Education courses in smart ICTs though public and private mediums.

- U-Seoul Safety Service: Location based services and CCTV technologies to notify authorities and family members in case of an emergency where a child, elderly or a disabled individual is involved.
- School Newsletter Application: An online school board, devised by the citizens to alert or notify parents about any updates related to their children's educational institution.
- U Health Care: Health check-ups and medical consultation through remote controlled cutting-edge medical equipment and smart devices, especially for the vulnerable individuals or those with restricted mobility.
- Installing CCTVs to maintain public safety.

Seoul has adopted different strategies to implement its projects. The Wi-fi network installation has been implemented through a PPP. Private investment have been attracted for providing Wi-fi on subways, trains and buses. Smart device donators receive tax incentives per smart device donated. In addition to this, the creation of WeGo has expanded collaborative efforts with other cities across the globe to help expand the initiatives and enable knowledge sharing.

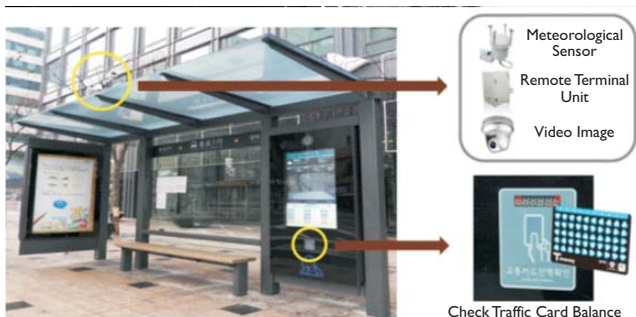
STOCKHOLM⁵

Stockholm covers an area of 381 square kilometers and supports a population of 910,000. The city has invested substantially in e-government services. Kista Science City has been developed as a test bed for innovations and is recognized as an economic development center for smart city technologies. Additionally, the city has funded a large fibre-optic broadband network through a collaboration with Stokab, a city-owned company.

Key Initiatives

ICT

- World leading ICT cluster: Kista Science Center is the home to Ericsson, IBM and 1,000 other ICT companies, making it one of the largest ICT clusters.
- 100% broadband coverage both fixed and mobile.
- Fiber optic infrastructure coverage by Stokab to meet the future communication needs, promote diversity, offer freedom of choice and minimize the need for excavating. In addition to providing access to fibre-optic telecoms, they created an environment that enabled IT development.
- Open Data: Increasing public access to information and services.



U-Shelter: Seoul ⁴

⁴ Source: Seoul Metropolitan Government

⁵ Source: BIS research paper no. 135: Global Innovators:

International Case Studies on Smart Cities

(https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/249397/bis-13-1216-global-innovators-international-smart-cities.pdf)

Buildings

- **Royal Seaport:** A mixed-use development planned to house 12,000 new dwellings and 35,000 new office spaces from the port and its associated trade, media and finance companies. Smart grids and ICT is incorporated to provide high quality sustainable living.

Stockholm has invested about 70 million euros since 2007 for providing high quality accessible e-government services. The surplus funds available with the city helped leverage the initial projects. Another surplus of 208 million euros was available in 2012, a part of which was allocated for infrastructure development and for future IT-investment. The city also makes funds available for projects that can add value for the city and its citizens.

Stockholm constantly engages in a dialogue with the citizens and private companies to identify the services that are required by them. Another implementation strategy the city has adopted is creating 'demonstrators,' the Royal Seaport is an example. It allows other investors and stakeholders to observe, understand the impact of the project, and scale it up further through other projects. The city has also created platforms to support innovations by engaging with the industry, universities and other partners. Monitoring and evaluation is an integral part of all processes.

PILOT 'SMART CITIES' INITIATIVES IN INDIA

Over the next 20 years, the government has proposed to develop a 100 smart cities across India, for which an initial allocation of INR 7,060 crores was provided in the 2014-2015 budget. These cities will include the construction of satellite towns near existing mega cities, upgradation of existing mid-sized cities and construction of settlements along industrial corridors in addition to the construction of a few new cities altogether. Typically, these smaller self-sustainable units would support about a population of 1 million each.

a) New Delhi

New Delhi has been proposed as the country's first smart city in order to decongest the national capital. Delhi's smart cities initiative is inspired from the city of Barcelona, which has successfully amalgamated and preserved the old architecture with the new. The proposal will cover an area of 20-24 hectares carved out of Dwarka, Rohini and Narela and it will be equipped with the latest technologies. This area is proposed to consist of world-class infrastructure, green technology and latest water conservation techniques, global educational and health institutes and entertainment facilities.

b) Gujarat International Finance Tech City (GIFT)

GIFT is an under construction smart cities project spanning over 550 acres located at Gandhinagar near Ahmedabad, in the state of Gujarat. It is planned to be built as a financial business district to be equipped with high quality infrastructure in order to create a platform for finance and tech firms. The project is a public-private collaboration between the Gujarat Urban Development Co. Ltd. (GUDC) and Infrastructure Leasing & Financial Services Ltd. (IL&FS). The project will include the following initiatives:

Key Initiatives

ICT

- Broadband FTTP, WiFi/ WiMAX, global connectivity
- Financial extranets
- IPTV internet gateway

Environment

- Water management
- Automated solid waste management
- District cooling system
- Integrated utility trench alignment

Energy

- Uninterrupted & highly reliable power supply
- Domestic gas distribution
- Emergency power generation
- Green power

Transportation

- Intelligent transport system
- Metro Rail Transport System (MRTS)
- Extension of Bus Rapid Transit System (BRTS) to GIFT
- Personal Rapid Transport (PRT): Dedicated guide-way network, 24X7.
- Multi-modal transport hub
- Real time travel response
- Interactive road maps
- Transit node management
- Automatic vehicle location and tracking
- Vehicle emission monitoring

The total cost of the project is estimated at INR 70,270 crores, of which 18% is from the GIFTR Unit Fund, 49% is from the developers, 8% from investors and the remainder 25% is debt. The project is currently in its first phase of implementation and the design development for the core infrastructure is completed. Since the launch of the 100 cities project, GIFT has been recognized as a smart city and is anticipated to receive financial as well as policy support from the center for the implementation of the project.

c) Smart City Kochi

Smart City Kochi is a private initiative of TECOM, Dubai in partnership with the Government of Kerala, to build a 246 acres IT township through an investment of INR 3,000 crores. TECOM is developing the project similar to its Dubai Internet City and Dubai Knowledge City concepts. Smart City Kochi is anticipated to generate 90,000 jobs. The first phase of construction of the project commenced in October 2011. It is due to complete its infrastructure development by mid-2015. Upon completion, the city will have ready to operate modern, fully-serviced commercial spaces for a range of companies, residential units for the employees and support infrastructure in the form of retail, hospitality, educational facilities. The companies in this smart city will also benefit from SEZ incentives as the entire project also been designated as a SEZ.

Key Initiatives

ICT

- Access to metro ethernet network - high bandwidth and secure remote connection
- High speed internet for all homes and businesses

Environment

- Preserving natural terrain and flora
- Walk to work development to reduce motorized conveyance
- Rain water harvesting through storm water management system
- Propriety network distribution center and fully digital telecommunications network with high-capacity fibre optic cables

Energy

- Solar powered lighting for landscape
- Natural ventilation and passive cooling in buildings
- SCK 01 will be the first LEED Platinum building in the city



CONCLUSION

CHALLENGES FOR SMART CITIES IN INDIA

India is currently lagging seriously behind on sustainability of its urban areas for a variety of reasons that range from overcrowding and congestion to poor quality and grossly inadequate infrastructure resulting in polluted and decaying living environs. Consequently there are a number of challenges in retrofitting and even developing new smart cities. The most prominent ones are:

Poor Governance Structures

Urban local governments in India have limited financial autonomy and the capacity to raise resources. The municipal governments are dependent on fiscal transfers. Several studies have identified fragmented institutional set-ups and overlapping jurisdictional responsibilities as a hindrance in smooth implementation of projects and their service delivery to citizens. Additionally, the poor operation and maintenance of the existing assets has resulted in further problems. The governance structures need massive restructuring to undertake a major project such as the implementation of smart cities. There needs to be a shift away from state-centric planning to a more decentralized but regionally inclusive approach. The urban local bodies need to be strengthened to be financially sustainable to undertake large-scale projects that provide effective local level solutions. There is a need to develop a shared design vision between different government bodies to support efficient implementation. Finally, there is also a strong need to ensure that those in government are suitably trained and geared up for:

- a) speedy responses to the real-time problems, and
- b) flexibility and imaginativeness to evolving demands of citizens.

Thus the government needs to constantly evolve to adapt to the changing needs and respond to its citizens, thereby making them accountable and transparent at the same time.

Complex Social Structures

Urban India hosts dense and highly populated microcosms of different population groups classified on the basis of religion, caste, community, social status, occupations, origins, beliefs, etc. On top of that, most large cities have half or more of their population dwelling in slums. Smart cities need to be able to cater to these diverse client groups whilst ensuring that their privacy and security are not compromised on. Further, all services and infrastructure have to be affordable for all sections of the

population and these cities should not become gated communities meant for a privileged lot.

OPPORTUNITIES FOR SMART CITIES IN INDIA

Given the fact that the Indian economy is being increasingly driven by highly skilled services such as Information Technology (IT), telecom, engineering and knowledge services, there is tremendous potential to utilize and develop the available human capital and skills for incubating future innovations in ICT integration. In addition to this, the political will and commitment of the central government promises to bring in large-scale reforms to support the smart cities initiative.

ICT is the basic infrastructure for all the smart cities. There is no limitation on the collaborations and innovations that can be adopted across various departments and with multiple stakeholders. ICT enables the city and the governance to bring in participation from the citizens and integrate their inputs in the processes. By extending community participation, it not only empowers the citizens, but it also allows them to develop a sense of ownership of their cities. Thus, the smart cities initiative would result in sustainable and thriving Indian cities – new and old, if implemented properly with active involvement of all stakeholders.

About Cushman & Wakefield

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