

Information and communications technology (ICT) infrastructure will form the backbone of the 100 smart cities that the government is planning to build under its Smart Cities Mission. A robust ICT network will be instrumental in delivering smart solutions to citizens across segments such as energy, transportation and waste management. The heads of leading smart city projects in India (*C.Y. Bhatt, Deputy Municipal Commissioner, Surat Municipal Corporation; Rakesh Shankar, CEO, Ahmedabad Smart Cities Limited; Raj Cherubal, CEO, Chennai Smart City Limited*) talk about the communications requirements of smart cities, key smart applications and connectivity services, the role of emerging technologies such as cloud and internet of things (IoT), and opportunities for various stakeholders...

What are the key communication requirements of smart cities?

C.Y. Bhatt

One of the key communication requirements of sustainable “smart cities” is the development of ICT infrastructure to enhance the quality and performance of urban services, reduce costs and resource consumption, and engage more actively with the citizens. It is important to connect the various offices and facilities of civic bodies through ICT systems for the efficient delivery of services. It is also important to be connected through IoT in order to use data from these end-points to monitor and manage city operations. Smart cities can leverage the communication network established by telcos and at the same time, work to create their own network.

Rakesh Shankar

The key communication requirement of smart cities is high speed wireless communication, which includes GPS and Wi-Fi-based communication.

What are the key smart applications and connectivity services that will be a part of your smart city?

C.Y. Bhatt

Surat ranked fourth among the 20 smart cities selected in the first round. The smart city proposal of Surat includes several pan-city solutions and area-based development (ABD) initiatives, with a focus on both infrastructure and ICT advancements in strategic locations.

The smart applications that would be implemented include an intelligent transportation management system (ITMS), an integrated traffic control system (ITCS), an automatic fare collection system (AFCS), enterprise resource planning (ERP) solutions, integrated command and control centres (CCC), a citizen engagement portal and app, smart street lights, smart water meter systems, smart water management (SWM) systems and intelligent parking systems. Further, under the Connected Surat Project, the government is planning to develop a robust network infrastructure that supports digital applications and ensures network connectivity to Surat Municipal Corporation (SMC) offices including the head office, zonal offices, ward offices, bus rapid transit system (BRTS) stops, bus depots, health centres, civic centres, community halls, amusement locations and emergency response units.

The Connected Surat Project will be implemented in two parts. The first part entails the creation of an optic fibre cable (OFC) network for the BRTS corridor and other important SMC locations. This will be undertaken by SMC itself. This project will act as a backbone for other projects for the smart city such as ITMS, ITCS, AFCS, field sensors for air and water quality, digital boards and ERP systems. Under the second part, leased lines, multiprotocol label switching and dark fibre connectivity will be obtained for locations that are not connected with the OFC network.

Raj Cherubal

IT and ICT have become the backbone of sustainable, advanced and scalable projects. ICT solutions can increase the ease of doing business, provide better standard of living and improve service delivery of government programmes. The following are the ICT-enabled initiatives for smart cities across Tamil Nadu:

- **Smart class:** It is a flagship project undertaken by Chennai Smart City Limited (CSCL) and the Greater Chennai Corporation to integrate advanced teaching techniques with the state curriculum in the government schools of Chennai.

- CCCs: These will help in coordinating and synergising the vital functions in a smart city. With state-of-the-art technology and highly advanced software solutions, the CCC will streamline the functioning of smart cities.
- Traffic management: CSCL and GHC have jointly decided to explore an innovative and integrated solution to address the traffic and transportation challenges in Chennai.
- Smart grid: CSCL will set up a smart grid in the ABD region of T. Nagar to digitally integrate the power infrastructures.
- Smart poles: These combine the benefits of LED lighting and mobile connectivity.
- Intelligent solid waste management system: This will have cameras with edge analytics to monitor garbage bins at vulnerable locations.
- Smart cards: These will enable multi-modal integration by integrating payments across utilities.
- Namma Chennai: It is a public grievance redressal app, which will allow the authorities to track civic grievances voiced by residents.
- GIS LIDAR mapping: It will be used to map all the above-ground utilities and also prepare separate layers in the maps with mandatory and non-mandatory attributes.
- Parks with Wi-Fi and smart elements
- Radio-frequency identification tags: These will be deployed in over 100,000 auto rickshaws

and cabs to track vehicle movement and provide drivers' history to ensure passenger safety.

- 500 public buses will be fitted with emergency call boxes and GPS tracking devices for passengers to use in case of medical emergencies and security issues.

- Metro water filling points, automatic reading meters and electronic flow meters

Rakesh Shankar

The key smart applications for the Ahmedabad smart city include smart street lighting, smart parking, smart water management, GPS-based tracking for solid waste management vehicles, ITMS, AFCS, CCCs, multimodal transport, smart learning, skill development centres, and incubation centres.

What are the opportunities for various stakeholders in the ICT and telecom domain?

C.Y. Bhatt

Players in the ICT and telecom domain could be knowledge partners for smart cities as they are uniquely positioned to understand both the local city dynamics as well as the domestic and international best practices to provide highways (physical or wireless) for connected devices and user interfaces. The telecom sector will also play a crucial role in increasing the uptake of e-governance and smart governance services, which will be critical for the implementation of the Digital India initiative and the Smart Cities Mission.

Rakesh Shankar

The key opportunities for stakeholders in the ICT and telecom domain are in the areas of waste

management, rainwater buffering, smart street lighting, smart parking, vehicle tracking management, transport management, solid waste management and smart learning.

What are some of the ICT partnerships and collaborations that you are working on currently? What are your future plans?

C.Y. Bhatt

As part of the mission and other e-governance initiatives, SMC has collaborated, and is still in the process of collaborating, with various entities. It has not only engaged with private entities but also partnered with government bodies like the National Informatics Centre for the open data portal, the Ministry of Electronics and Information Technology, through the Centre for Development of Advanced Computing for SMS gateway and the national knowledge network for medical colleges.

Rakesh Shankar

The Ahmedabad smart city is working on various pan-city and ABD projects. For this, the Ahmedabad Municipal Corporation has partnered with PricewaterhouseCoopers for project management consultancy. Some of the key pan-city projects and partnerships are:

- **Common card payment system:** It is a common platform for payment. Citizens can pay for various services including city transport, municipal bills, parking bill, property taxes, gas bill, entertainment and amusement activities via a common card.
- **ITMS:** It is an end-to-end vehicle-to -infrastructure ecosystem designed to address the challenges of modern-day transportation and vehicle management. This project is easing public transit for 230 BRT buses, 158 BRT stations, 850 Ahmedabad Municipal Transport Service buses and 2,900 bus stations. AFCS aims to automate the fare collection process and technology within the transport ecosystem to enhance operational capability and citizen satisfaction by plugging leakages and increasing ease of operations. (n)Code and Sterlite Tech have been selected for the facilitation of these two pan-city initiatives.

- **Safe and Secure Ahmedabad (SASA) project:** It aims to improve the standard of living of the citizens by deploying cutting-edge technologies like IoT sensors (25 environment and 20 parking sensors), 126 smart LED display boards, 45 free Wi-Fi locations and over 6,500 surveillance cameras with a state-of-the-art CCC. Trimax has been selected as the implementation partner for this project.
- **Network for the BRTS:** It is a first-of-its-kind digital transformation initiative for transportation, under which OFC will be used to connect BRTS bus stations and AMC's zonal offices to data centres and disaster recovery sites. Smart City Ahmedabad Development Limited (SCADL) has partnered with Sterlite Tech for the implementation of the same.
- **SCADL has partnered with Bharat Sanchar Nigam Limited (BSNL) for a citywide network.** BSNL will provide network backbone connectivity to 1,576 locations under the SASA project across the city and to data centres and control rooms.

What will be the role of emerging technologies such as IoT, M2M, automation and big data analytics in the functioning of smart cities?

C.Y. Bhatt

Emerging technologies such as IoT, machine-to-machine (M2M) communication, automation and big data analytics will enable the city administration to take e-governance to the next level. The use of IoT will provide real-time information related to different services. Monitoring of these parameters from the CCC will help identify and resolve the issues. Given the amount of data that will be generated from different sensors and systems, the use of business intelligence and analytics will help generate meaningful information, establish correlation between events pertaining to two different domains, and analyse trends.

Rakesh Shankar

Emerging technologies such as IOT, M2M, and automation will significantly change the functioning of cities. Smart cities powered by these technologies will improve the citizens' quality of life through economic efficiency, sustainable environment, optimised transportation, good governance, high quality healthcare, improved security and generation of quick response during crises.

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