Smart City Mission: Challenges and Opportunities- A Case of Surat City (Gujarat)

I Believe that IT + IT= IT. That means Indian talent and Information technology is equivalent to India tomorrow. It is my firm belief that our talent will built the future of India with the help of IT.

- Prime Minister Narendra Modi

Abstract-

Smart cities Mission from a government's perspective. Before highlighting the government policy. The paper provides a brief overview of the challenges that the cities of India face due to increasing levels of urbanization in the country. These Challengers include housing Shortage and Slums, Water supply, Drainage and Sanitation, Solid Waste Management, Transportation. The Paper underlines the Importance of ease of doing Business and role of technology in Governance for making the Indian Cities.

Key words- Smart city Mission, Urbanization, Government Policy, Emerging issue of the City.

1.0 Introduction

Presently half of the world's population lives in urban settlements. As per United Nations forecast, the proportion of human population is expected to grow to nearly 60% by 2030 and to almost 70% by 2050 with almost 6.3 billion urban population living in cities and towns out of the total population of 9.55 billion(United Nation,2014).

Rapid urbanization and growth of our cities and towns is irreversible and is gaining momentum. As per census, 2011 there are 7,933 cities and towns and by 2051, half the population of India would reside in urban settlements and it is estimated that the number of metropolitan cities would be more than 100 and total number of the urban centers would be more than 10,000.Further, in future the contribution of urban settlement to the GDP may be around 75% to 80% and they would play a key role in the overall national development. Till early 1990's India's urban centers were to a large extent on the back burner and could not find place in the goverence agenda and investment plans.

They have been contributing over 50% of the country's GDP and always been the generators of economics momentum. In the 2000's, it was realized that cities and towns equire massive investments for infrastructure up gradation and renewal, and under the JnNURM, the flagship programme of Ministry of urban development (2006-2014),

2.0 Challenges for Ensuring Access to Urban Infrastructure

In this typical development scenario, the urban population in the country has to continuously struggle with the access to urban infrastructure such as water supply, Drainage, sewerage, scientific solid waste disposal, housing and urban Transport. Further cities also have to face the Problems of Inequities in distribution of Infrastructure among different income groups of population.

Infrastructure inadequacies and inequitable distribution are accompanied by the absence of efficient and effective management, which has led to ineffective linkages and losses and the deficiencies in services in urban areas. These are largely absorbed by the low Income and poor sections of the Population. The present condition of Indian cities in terms of access to urban

infrastructure provides ample opportunity for planned development and the challenges are manifold. The sector wise problems and challengers are discussed in the following section.

2.1 Housing Shortage and Slums

Owing to rapid industrialization in and around the city, a large influx of migrants has been observed, which has resulted in the formation of slums. The city presents a wide range of activities in various industrial and commercial sectors. Growth in such activities, possibilities of absorption in industrial, allied as well as service sectors, scope of employment in trade and business activities, hawking, retailing, carting and other such possibilities have attracted rural poor to the city.

The housing sector needs to be catered for meeting the existing backlog as well as to meet the future demands of the expansion happening in the city. The present deficiency of housing is computed as below, assuming an optimum household size of 5 for the city, over the Census 2001 population data and future housing projections. The table below shows the total shortfall in number of Houses required for the population as per zones in the Surat city:

Table 1: Housing Shortfall existing In the Year census 2001

Zones	2001			
	Population	Total Houses	Average Household	Shortfall
North Zone	416,370	63,929	6.5	19,345
East Zone	711,516	117,548	6.1	24,755
West Zone	287,144	49,318	5.8	8,111
South Zone	407,980	70,417	5.8	11,179
South west	242,466	40,406	6.0	8,087
South east zone	397,257	66,403	6.0	13,048
Central Zone	413,641	69,487	6.0	13,241
TOTAL	2,876,374	477,508	6.0	97,767

Sources- Surat city Development plan (2006-12).

There are a total of 312 slums in the city of Surat in which 19.24 percent of the total population the city lives. This figure was 27.5 percent of the city's population during 1992. Growth of the slum population has also decreased considerably from an annual average of 14.6 percent in 1992 to an annual average of 1.46 percent in 2001. This achievement on the part of SMC is due to the effective implementation of various slum re-location and development programmes after the havoc of the plague in 1994.

During 1995-98, five slums were relocated and in 1999, those settlements, which were not considered earlier as slums, were also added along with new slums that developed. The total number of slums thus stands at 312 at present. Development of new slums could not be avoided by the SMC due to the easy access to open spaces in the south and southeastern areas of the city.

2.2 Water Supply, Drainage and Sanitation

the areas outside the municipal corporation (SUDA area), there is no systemic water supply system. The drinking water is fetched from open wells or from various water supply scheme implemented by GWSSB (Gujarat Water Supply and Sewerage Board). SUDA is also planning water supply schemes in the Pal and Vesu areas.

Emerging Issue for Water supply.

System (transmission and distribution) losses and unaccounted for water

The gross average supply in the city is 195 lpcd. The population coverage is approximately 95 percent with about 2.91 lakhs water supply connections. It is estimated that transmission and distribution losses account for 30 percent of the total supply. Studies are required to check these figures and also amount of water unaccounted for.

Pollution of river water behind the weir by adjacent villages

The villages like Amroli, Chaprabhata, Mota Varachha, Korad etc. located upstream of weir, discharge their untreated affluent directly into the river thereby affecting the quality of water drawn from the surface watersources. This situation requires action from other government agencies as they are outside the jurisdiction of SMC,

Leakage and contamination of water at household connections

Although rehabilitation of old pipelines has been taken up during the past five years, the problem of low pressure in water supply persists due to the existence of an aged network especially in central zone. Increasing population has also added to the already existing woes. Apart from these, the use of GI pipes for household connections leads to leakage and contamination of water in several areas of the corporation, further increasing the maintenance cost. A separate leak detection cell with latest leak detection equipments and sufficient trained staff will be set up shortly.

Mixing of Sewer and storm water drains

With a very small number of sewerage connections in the city, large amounts of sewage are let out illegally into the storm water drains. The closed drains of the city amount to only 20.3 percent of the total length of surfaced roads. Solid waste is also dumped into the natural drains of the city in many areas near the slums. Due to this, the city witnesses frequent flooding of roads during the monsoon.

Silting of khadis and open storm water drains.

The city has the advantage of a good natural drainage pattern, which is not, unfortunately, exploited properly. Silting and constriction due to uncontrolled solid waste dumping and encroachments by the poor on the banks have interrupted the flow of wastewater and storm waters, thus, causing them to spill into neighbouring areas. Never has there been an attempt to desilt and clean the natural drains of the city. The open storm water drains are in a similar condition, with sewerage waters getting mixed with them at places.

2.3 Solid Waste Management

Solid waste management is one among the basic essential services provided by urban local bodies in the country to keep these areas clean. However, it is among the most poorly rendered services in the basket- the systems applied are unscientific, outdated and inefficient, and population coverage is also low. Waste is littered all over leading to insanitary living conditions.

With rapid urbanization, the situation is becoming a critical urban issue. Urbanization directly contributes to waste generation, and unscientific waste handling causes health hazards and urban environment degradation. Solid waste management, which is already a mammoth task in Indian city, is going to be more complicated with the increase in urbanization, changing lifestyles, and increasing consumerism.

Every day, Surat generates 400gms per capita per day of waste amounting to roughly 1000 metric tons. This is collected by SMC, private contractors and the rag pickers.

About 70 percent of the waste generated every day is contributed by households, shops and other commercial establishments. Just over 30 percent of the total waste generated is recyclable. This comprises of paper, plastic, metal, brick stone and glass primarily. Combustible waste accounts for 22.75 percent of the total and organic waste is nearly 42 percent.

Doorstep bins are roadside cradle types and are 314 in number. The total number of waste collection bins is 1170. These are mainly 4.5 cu.m in size with a capacity of 1.5 tonnes (4.5 cu. m)/dustbin and cover the entire population of the city. The spacing between waste storage depots is about 100 m.

For door-to-door collection 3000 bins would be installed by 3 private agencies. The cradle type would be designed in such a way that revenue generation through advertisement is possible.There are also initiatives for segregation of waste at source including awareness generation through pamphlets. For this to create awareness pamphlets are distributed.

At present there are 4503 sweepers engaged in the collection of waste across the seven zones of the city. Of the total waste collected, the corporation manages 98 percent i.e., 980 tons/day while the rest is collected by rag pickers.

Emerging Issue for Solid Waste management.

Lack of effective technology for scientific disposal of solid as well as bio-medical waste.
Bhatar waste disposal site is at present the only serving site and this site has reached the end of its life span now. Moreover, the location of the site right within the city limits has exposed the entire process to the open air and life threatening parasites.

2.4 Transportation and Traffic

Public transportation is a key component of a sustainable transportation system that improves mobility without placing economic and environmental burden of increased auto ownership on the travelling population. Due to lack of public transport facilities, significant growth in personalized vehicle population and considerable reduction in city bus transportation is observed.

Most of the metropolitan cities lack proper accessibility to public transport. Transport and land use planning have a significant role in promoting accessibility, and at the same time accessibility is becoming increasingly important in making sound and sustainable land use and transport decisions. Therefore, t is important to develop models that are able to measure accessibility to public transport networks.

Emerging Issues for Transportation.

- Improper connectivity in peripheral areas.
- Major operation and maintenance costs on roads.

- Discontinuity in Ring Road and Major Roads.
- Encroachments and informal activities on major corridors of the city.
- No consideration for future growth patterns in planning for roads outside SMC.

Emerging Issues for Traffic.

- Rapid growth of private vehicles.
- Inadequate parking facilities.
- Lack of Traffic Segregation.
- Lack of pedestrian facilities
- Inefficient and poorly maintained public transport.
- High operation and maintenance costs on street lighting.

3.0 Options for Technological Interventions for smart city Components

Sr.No	Key Components	Specifics
1	**Energy**	• **Building Energy Management system** where occupants can automate the energy consuming system in building. Building sensors and controls allow for better use of building, or prediction of faults. • **Smart Energy Metering** allow automated meter reading enables utility and occupants to access information digitally and strategies. • **Power Quality Monitoring** • **Renewable Energy Sources in Smart city.** • **Energy conservation Monitoring.**
2	**Transport**	• **Smart Transport Cards-** Ideally smart cards link multiple forms of transport and make it more convenient to use, and for transport authorities to understand mobility pattern**.** • **Electric Bus**- Bus is more efficient and ideally run on renewable power. • **Real Time Transport Information**- Provides the basis for mobile applications for journey planning. • **Parking Management Technology Using GIS**- Consolidated parking management technology using GIS and remote sensing. • Safety and security, accident monitoring • Infrastructure integration.
3	**Waste**	• **Smart Waste Management:** Waste process optimization and pick up. City benefit from more efficient use of vehicles for waste pick up and resource saving. • **Mobile Web for Waste Social Networking:** These tools allow sharing of goods and more optimal recycling and re-use. Citizen and city benefit with option for citizen to recycle.

4	**Water**	• **Smart Water Metering**: Monitoring and helps water managers reduce waste in the system.
5	**ICT**	• **Smart Governance operating Framework:** An Administration that applies and integrated information, communication, operational technologies to planning, management and operational to generate sustainable public value. Integration of operations new services faster response to citizen.

4.0 Ministry of Urban Development Initiatives: Smart City Mission

Emerging Issue highlighted in the preceding sections, the Ministry of Urban Development has been deliberating on the issue of Smart cities since May 2014. Honorable Prime Minister inaugurated the Smart City mission on 25 July, 2015. In his address he stated that a city which is two steps ahead of its citizen's needs: is a smart city.

4.1 Objectives of Smart cities Mission

- basic infrastructure
  - Assured water & electricity supply,
  - Sanitation & Solid Waste Management,
  - Efficient urban mobility & public transport,
  - Affordable Housing,
  - Robust IT connectivity,
  - e-governance & citizen participation,
  - Safety & security of citizens,
  - Health & Education and
  - Economic Activities & Livelihood Opportunities.
- uses 'smart' solutions to make infrastructure and services better, and
- Relies on Area based development.

4.2 Salient Features of the Smart Cities

Some Typical features of Comprehensive development in Smart Cities are described below.

- **Promoting Mixed land use in area- based development**, Planning for "Unplanned area" containing a range of compatible activities and land uses close to one another in order to make land use more efficient. The states will enable some flexible in land use and building byelaws to adapt to change:
- **Housing and inclusiveness**, expand housing opportunities for all.
- **Creating walkable localities**, reduce congestion, air pollution and resource depletion, boost local economy, promote interaction and ensure security. The road network is created or refurbished not only for vehicles and public transport, but also for pedestrians and cyclists, and necessary administrative services are offered within walking or cycling distance.
- **Preserving and developing open spaces** - parks, playgrounds, and recreational spaces in order to enhance the quality of life of citizens, reduce the urban heat effects in Areas and generally promote eco-balance;
- **Promoting a variety of transport options** - Transit Oriented Development (TOD), public transport and last mile para-transport connectivity;
- **Making governance citizen-friendly and cost effective** - increasingly rely on online services to bring about accountability and transparency, especially using mobiles to

reduce cost of services and providing services without having to go to municipal offices. Forming e-groups to listen to people and obtain feedback and use online monitoring of programs and activities with the aid of cyber tour of worksites;

- **Giving an identity to the city** - based on its main economic activity, such as local cuisine, health, education, arts and craft, culture, sports goods, furniture, hosiery, textile, dairy, etc;
- **Applying Smart Solutions to infrastructure and services** in area-based development in order to make them better. For example, making Areas less vulnerable to disasters, using fewer resources, and providing cheaper services.

4.3 City Challenge Competition (Stage-I and Stage- II Competition)

For the first Time in the History of Implementating urban development programs- an element of competitiveness has been introduced. The selection process for smart cities has been envisaged in two stages.

Stage I is essentially intra-state competition whereby each states shall shortlist certain number of smart city aspirants based on the criteria given I the guidelines(Form-2). The Stage II will be an all India competition and cities will prepare smart city proposals for further evaluation for receiving central assistance. Each city has to develop its own ideas of a smart city, vision, and submit a smart city proposal during the all india competitions.

Table 2: List of Smart cities recommended for Second Stage of Competitions of Gujarat State.

Sr. No.	Name of State	No. Of Cities allotted	Name of the City
1	Gujarat	6	Gandhinagar
			Ahmadabad
			Surat
			Vadodra
			Rajkot
			Dahod

Sources- Surat city Development plan (2006-12).

4.4 Smart City Proposal (SCP)

Under the Smart Cities Mission, all the Selected cities will have to prepare the smart city proposals(SCPs), which will be evaluated in the second stage of competition based on a broad set of criteria to pick up the top scoring 20 cities for funding during 2015-16.

Cities will prepare SCPs using the principles of strategic planning process and the proposal will contain area-based development plans and Pan-city initiatives. The SCP is collaborative because the objectives and funds of all government departments, parastatals, private agencies and the citizens are dovetailed during the process of preparing the SCP. It is realized that the task of preparing the SCPs is quite challenging and States/ULBs will require assistance of experts.

Development of Smart cities is a challenging tast and states and urban local bodies have to rise to this challenge. The Mission guidelines have suggested measures to empower them to meet the challenge through substantially enhanced central assistance and decentralized decision making beside assisting in capacity building of urban local bodies. The Ministry of Urban development would provide about 1,00,000crore under this new initiative.

4.5 Smart City Strategy

The strategic components of Area-based development in the Smart Cities Mission are city improvement (retrofitting), city renewal (redevelopment) and city extension (Greenfield development) plus a Pan-city initiative in which Smart Solutions are applied covering larger parts of the city. Below are given the descriptions of the three models of Area-based Smart City Development:

- **Retrofitting** will introduce planning in an existing built-up area to achieve Smart City objectives, along with other objectives, to make the existing area more efficient and livable.
- **Redevelopment** will effect a replacement of the existing built-up environment and enable co-creation of a new layout with enhanced infrastructure using mixed land use and increased density.
- **Greenfield** development will introduce most of the Smart Solutions in a previously vacant area (more than 250 acres) using innovative planning, plan financing and plan implementation tools (e.g. land pooling/ land reconstitution) with provision for affordable housing, especially for the poor.
- **Pan-city** development envisages application of selected Smart Solutions to the existing city-wide infrastructure. Application of Smart Solutions will involve the use of technology, information and data to make infrastructure and services better.

  E- Governance and Citizen Services
  - Public Information
  - Electronic Services Delivery
  - Citizen Engagement
  - Citizen- City's Eyes and Ears
  - Video Crime Monitoring

  Waste Management'
  - Waste to Energy & Fuel
  - Waste to Compost
  - Waste water to be Treated

  Water Management
  - Smart Meter & Management
  - Water Quality Monitoring

  Energy Management
  - Smart Meter & Management
  - Renewable Sources of Energy
  - Energy Efficient & Green Building

  Urban Mobility
  - Smart Parking
  - Intelligent Traffic Management
  - Integrated Multi model Transport

5.0 Ensuring Good Practices by the Urban Local Bodies.

Planning under limited and uncertain resource futures

- Understand
- Resources and constraints

- Regional context and externalities
- Informed planning by geo-physical conditions

Understand & leverage granularity in Ecosystem, Economy & Social systems

- Empower communities and delegate roles
- Closing the loops- Enabling On-site Recycling and Reuse systems
- Colony level water/energy supply to reduce workloads

Focus on monitoring & management

- Real-time flood forecasts/disease surveillance systems
- Ground and surface water management

Holistic transdisciplinary planning options

Enabling environment

- Land use rules for local waste treatment
- Rain water harvesting & Conservation of natural drainage
- Open spaces management

Institutions

- Resident welfare associations strengthened to take up roles
- Frequent multi-stakeholder engagement to address issues

Conclusion

Smart city is not another typology of cities. Smart city is an approch to urban transformation through spatial strategies like retrofitting, redevelopment, and greenfields development as well as pan city intiative. Although it covers spatial strategies, the use of ICT is the mainstay of this approch. Smart city approch can be applied to any city new or existing and Large or small. Depending upon the need and the existing characteristics, this approach is applicable to even different pockets of city.

Refernces

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