

Smart City in India and Urban Planning – An Assessment

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ABSTRACT

The rapid urbanisation in India has resulted in un-ubiquitous regional development and multilateral difficulties at diverse levels starting from city to regional levels, which clearly demonstrated the lopsided urban planning and unregulated governance of the urban ecosystem unfavourably. Indian cities are facing the problems of traffic congestion, reduction of green cover, haphazard peri-urban settlements, an increased traffic, affecting the cities and surrounding areas' environment adversely. The present problems will worsen over the coming decades with phenomenal urban population that requires an urgent attention to urban planning with reference to smart city mission project.

The article evaluates the significance of smart city missions in comprehensive planning which could deliver an improved urban milieu and help achieve the goal of resilient Urban India.

Keywords: *Urbanization, Urban Planning, Smart City Mission, Sustainable Development, Urban Environment*

Today the world is getting urbanised and so do our characteristics and habits are getting urban. The leap of western urbanisation is greater and steeper than the Indian urbanisation, although its growth has gained the momentum after Rao Singh model which includes liberalisation, privatisation and globalisation (1991). Urban population is estimated to surge by 600 million by the year 2031.¹ However, almost 50 per cent of the total population will reside in urban areas; the high-powered expert committee set up by Government of India (GoI) to analyse urban infrastructure and services by the Indian government, stated that urban share would rise 75 per cent by the year 2050.² The number of Million Plus cities is expected to surge to 87 by 2031; Urban areas are critical for the economic growth and that would require a massive refitting to

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accommodate the future urban population. The Government of India started the Smart City mission in 2015,³ “*which will provide ambient, livable conditions for increasing urban population in the future, suitable environment for future investments, creation of smart jobs and livelihoods, building of green and trustworthy community substructure, provision of social services to the person who is in last line of accessibility with affordable housing, efficient and consistent energy and most importantly sustainable use of resources for an ecological quality of life*”.

The Urban Chaos: The world is getting more urban and where in re-classification and de-classification are the major factors for the increase in urban population as a whole. Urbanisation is a significant trend of 21st century, where proportion of urban population has increased exponentially and is expected to increase to 50 per cent in next few decades. Urban population grew by 91 million to 377 million between 2001 to 2011 and by 2030 it is anticipated that it will surge by more than 200 million (NUHM-NHSRC).

The cities in general and metropolitan cities specifically have become a magnet for poor and vulnerable population. At the same time, the cities and metropolitan areas are being subjected to determined collective challenges namely: water, sanitation, vicious cycle of unemployment and crime, energy usage increase and energy efficiency are becoming urgent problems, increasing population puts higher pressure on the urban infrastructure like electricity, water, sanitation and public transport and Municipal and public authorities need to do more to curb the menace of urbanisation.

Evolution of Smart Cities – The concept of smart city is different from “one city to another city” and “one country to another country”. The progress of a smart city is dependent on a country’s stage of development, political and financial willingness to change and reform the urban system.⁴

The urban planners preferably aim at developing the urban ecosystem, which is characterised by institutional, physical, social and economic infrastructure called as the four pillars of comprehensive development. Whereas the long-term goal of the smart cities is to develop comprehensive infrastructure with addition of layers of ‘smartness’ which fulfills the aspirations and needs of the citizens.

Smart Cities Mission⁵ objectives are to promote cities that offer fundamental structure and a decent quality of life to its citizens, which includes a clean and sustainable milieu embedded with application of ‘Smart’ Solutions.⁶ The focus is on inclusive and sustainable development

and the idea is to look at compact areas, create a replicable model which will act like a light house to other aspiring cities.

The ruling National Democratic Alliance government implemented the smart cities mission to fulfill its pre-election manifesto; which started with the primary idea to build state-of-the-art technology 100 new cities.⁷ In August 2014, the National government asked the state governments to select three existing cities in each state and a national consultation on modalities of smart city mission started.

In September 2014, National Conclave on Building Smart Cities organised by Government of India⁸ to deliberate on following three key aspects for smart cities:

- (i) Competitive (attracts investors and residents)
- (ii) Sustainable (social, financial and environmental)
- (iii) Capital Rich (human and social).

On June 25, 2015 “Mission Statement Cities and Mission Guidelines” released by the Ministry of the Urban Development (MoUD)⁹ to provide clarity on smart city and its related aspects and on the Mission itself. Strategic components of the Mission include:

- (a) Retrofitting
- (b) Redevelopment
- (c) Green Field development
- (d) Pan-city development.

However, the primary objective of the Smart Cities Mission is to amalgamate economic growth with improvement of the people’s quality of life by empowering local area development and connecting technologies, especially by linking technology with smart outcomes. “Area-based development will transform existing areas (retrofit and redevelop)”, including comprehensive planned slum development to improving livability index and condition of the whole City.¹⁰ New areas (Greenfield) have to be developed in the periphery of cities to house the growing population of urban areas, to enable the application of smart solutions via technology creation and fusion, creation of information highway and data for evidence creation to expand infrastructure and services for residents and communities of smart city which in turn improve quality of life, create employment opportunities’, improved income structure for all, especially for the poor and the vulnerable sections leading to creations of inclusive cities to cater to the present and future needs of cities.¹¹

Need for the Smart City: Indian urbanisation needs a total retrofitting to accommodate growing urban population which is going to be half of Indian population by the next two decades. To accommodate the rapid urbanisation and a range of the socio-economic and technological developments across the globe, the Government and policymakers decided to implement smart city mission. To support government initiatives and opportunities, the startups would agglomerate to seize emergent prospects in the “Smart city mission”¹².

Scope of Smart City: While launching Digital India, a plan to build 100 smart cities across the country, PM Modi in his speech said, “Cities in the past were built on riverbanks. They are now built along highways but in the future, they will be built based on availability of optical fiber networks and next-generation infrastructure.”¹³ Following are the features of Smart Cities:

- *Promotes development* – Smart cities augment the developmental activities such as creation of school building, Government and private organisations offices and shopping malls. These activities benefit chain of developmental activities including citizens, businesses, government and environment.
- *Housing for All* – Today in urban areas, housing is a major issue. The smart city mission will work on provision of “housing for all”. With the 70 per cent of the Indian population living in cities by 2050 complete overhaul of urban planning is needed to provide a better standard of living. A paradigm shift in planning is needed which will provide green and sustainable model of housing for poor and vulnerable population.
- *Provides employment* – A smart city creates agglomeration economics which provides a conducive environment, opportunities and advantages for its residents to get gainful employment. While India is expanding rapidly, the smart city has the potential to provide employment for present and future residents, as the structure of a smart city necessitates a lot of human resources.
- *Smart Health*¹⁴ “the concept of smart health means innovative, simple and low-cost smartphone technologies for a larger, less expensive healthcare workforce which can provide state-of-the-art electronic clinical decision support systems for Evidence-based, quality-controlled, affordable healthcare for all”. “SMART” Health is an exceptional low-cost, high-quality healthcare delivery system for all residents which provides state-of-the-art healthcare for diseases at a nominal price.
- *Smart Infrastructure*¹⁵ “Smart infrastructure is the need of Indian

cities. This includes roads with cycle tracks, 24x7 water and power, ICT enabled infrastructure, domestic waste collection, recycling of water, rainwater harvesting, waste to energy processing and more” . The “Smart Infrastructure” is not just a theoretical premise today but the smart city mission will work to make them a reality.

The Government of India started a bold, new initiative of Smart Cities Mission in 2015 to create smart cities that can be imitated inside and outside the geographical coverage of Smart City, which catalyzes the creation of smart cities in different regions and parts of the country.

The core infrastructure elements in a smart city: Situational and Gap analysis

All urban researchers must work together for the creation of the smart city and overall provision of best basic needs to the people and the community as a whole.

SMART- S- Sustainable, M-Modern, A-Ambitious, R-Renewable, T-Technology Friendly

Adequate water supply – World Bank report suggests that more than 90 per cent of urban India has access to drinking water and more than 60 per cent has access to sanitation (World Bank, 2011)¹⁶, after the onset of Swachh Bharat Abhiyaan, the accessibility has improved. However, urban India still lacks in providing reliable, sustainable and affordable water supply. No Indian city gets water on 24 x 7 basis and piped water is never distributed for more than few hours a day. This few hours of piped water at home is available to only 50 per cent of the total population of the cities.¹⁷ The non-revenue water meaning water that is lost due to pilferage, leakage, unauthorised connections, collection lacunae and billing inefficiency is accumulated to 40 to 70 per cent of the total water supply of the government. Due to high non-revenue water in cities, most of the water supply does not provide value for return and in turn is totally dependent on large operating subsidies and capital grants by the Central and state government. Today, the urban India is at the bottom of the international performance and smart city project may deliver the goods for the urban India. The smart city project has been assigned about 18861.1 crore and around 71 per cent of the planned projects are meant for area based projects with focus on sewerage, solid waste management and allied projects.¹⁸

A Smart city must not only focus simply upon creating the water supply infrastructure but also on the distribution procedure as well because non-management of the services does not lead to desired levels of sustainable services. The true challenge of a smart city project is not

to increase the infrastructure but to increase reliable, sustainable and affordable services.¹⁹

- **Assured electricity supply** – Growth of urban India will soar to about 814 million by 2050 then the demand of the electricity will be twice of what is prevailing now.²⁰ The demand for electricity in 2047 would be 1500 million tonne.²¹ (In the terms of electricity, it's the coal comparison being done, as to what quantum of coal would be needed to produce such quantum of energy)

Cities use more than 70 per cent of the global energy and produce 40-50 per cent of the global greenhouse gas emissions worldwide. With the threat of climate change looming large on world, the usage of energy and its creation needs a hard thought so what can be done to make energy sustainable and uninterrupted.

So, what smart cities are going to do with the energy sector and how it's going to bring positive change in it? Smart city project looks for creation of Modern district energy systems which consists of Combined Heat and Power (CHP), thermal storage, heat pumps and development of non-central production and supply of energy. Modern district energy systems if implemented, will reduce CO₂ emission by 58 per cent.²² Currently smart city necessitates creating Special Purpose Vehicle (SPV) which will manage the implementation of the projects and all the rights and obligations of the Municipality will be transferred to Special Purpose Vehicle (SPV). Currently 59 out of 60 cities under the smart city mission have created the Special Purpose Vehicle (SPV).²³

- **Sanitation, including solid waste management** – the major feature of urbanisation in India is that it grows without much planning and when we look for cities with the planned infrastructure we realise that this unplanned growth in urban India led to shortfalls of urban facilities like water, sanitation, energy usage, etc. According to Water Aid Report of 2016, around 157 million people living in urban India do not have the toilet facilities. Smart city in collaboration with Swachh Bharat Mission have gained some good grounds and many parts of India are now open defecation free and improvised toilets have been made for the usage of the public.

The smart city project will look for sanitation programme on the basis of economic viability, socially acceptable, technologically viable, and institutionally appropriate and protection of environment and natural resources.

With rapid urbanisation, solid waste management is a major challenge, with 377 million people living in 7935 urban cities creating

62 MT of solid waste out of which only 11.9 MT is treated and 31 MT are dumped in landfills like Ghazipur and Badli in Delhi. Solid waste management is one of the primary duties and obligations of any Municipality but from collection to disposal everything is done haphazardly. Smart city uses waste as a resource and after segregation of the waste it will be used for fertilizers and for electricity generation projects. The real time information, to monitor waste collection and improve street sanitation in a smart city, is the hallmark of smart city mission.²⁴

Smart city mission would use the geo-tagging street sweepers and waste collection fleets to gather and dispose waste. The garbage trucks having the provision of location-tracking devices and cameras will provide and collect real-time information. The sanitation workers will be equipped with GPS-enabled watches to provide information to the smart monitoring centres for seamless integration.

Efficient urban mobility and public transport— Transport is a major sector for any urban area or city, it increases the exchange of the public movement from one place to another and reduces the burden on urban resources. The smart city plan has proposed budget of Rs 32,600 crore (INR 326 billion), which is around 25 per cent for the top 60 cities of India. 71 per cent of the financial resources will be spent on area based projects and around 29 per cent would be spent on improvised traffic system and in creation of information system for public transit.²⁵ Around 40 per cent of the money has been assigned for creation of roads and parking lots, 20 per cent for public transportation and only two per cent had been assigned for the efficient buses. Around 38 per cent would be used for creation of bus rapid transit system, creation of hard infrastructure namely bridges, flyovers and eco-friendly roads. Smart cities also glance at the non-motorized transport creation.²⁶ Smart city project is to enhance the sustainability of the urban resources and its utilization but on the contrary it will also be beneficial for the private transportation. Roads, public transit and parking have been given prime importance and the economic returns of above three are higher.

- *Affordable housing, especially for the poor*— Housing is the basic human need and in Urban India it is a major challenge for the municipalities. “Around 63.67 million urban and rural households do not have adequate housing” (Arjun Kumar, 2014).²⁷ Adequate housing means adequate privacy, adequate space, adequate security, adequate lighting and ventilation, adequate basic infrastructure and adequate location, with regards to work and basic facilities at reasonable cost (Global strategy for shelter to the year 2000). Technical group on housing shortage in the country for

2012-2017 reported 18.78 million are living with inadequate housing conditions leading to housing poverty.²⁸

The housing sector under smart city mission has been earmarked with a budget of 16381.2 crore, out of which 99.4 are for area based projects for housing. Whereas, the IT component is just 0.2 per cent; nearly half of the projects are devoted to real estate and other half is related to mixed or lower income housing projects. In budgetary terms, the housing sector is unevenly distributed for major 60 cities with five cities accounting for 65 per cent of the all housing projects.

- ***Robust IT connectivity and digitalisation***– With onset of Digital India, the IT connectivity has become the priority of Central government. Digital India scheme launched to make available the services under the different government schemes digital by means of improved online infrastructure and increasing internet connectivity to every part of India. E-health, startups and infrastructural support are the major initiatives under the Government of India digitisation project. Digital India platform and emerging development are the visionary steps and the synergy between services and providers will bring paramount change in urban development scenario in India. The digital India will provide on-demand services and digital empowerment of the individuals and community leading to successful implementation of the smart cities mission.²⁹

Around 98,000 crore were sanctioned for the transformation of 100 cities of the country with the heavy dependence on “*information and communication technology*”, which in turn will enhance the efficiency of the services and effective management of the resources without any wastage. Comprehensive management of transportation, housing, water supply etc will enable to reduce wastage and offer better services to the citizens.³⁰ The central concept is centred around improvement of lifestyle by means of efficient and optimum resource management without any wastage. Whereas the role of digital technology is critical for wastage reduction and this transformation offers the finest thinkable answer to screen the wide array of urban amenities related to city living and amenities, which will seamlessly connect citizen centric policy-making and governance.

Utilisation of digital platforms for regulatory mechanism, Municipal financing, and administration of Urban India, by retrofitting planning and smart services would provide a people centric governance in smart cities with Smart urban India. Digital technology will be a key to increase real time monitoring and evaluation of public life in smart cities, which in turn will boost safety and decrease crime for citizens and Netizens.

The current landscape for the digital platforms is not supportive and it is non-smart leading to weak security and increasing cyber-crimes and will bring vulnerability to the citizens.³¹

- ***Good governance, especially e-Governance and citizen participation***— The major problem of Indian system of governance is implementation part and governance and e-governance are the major steps by the government to improve governance. With the implementation of digital platforms and digital India, the governance systems will improve the accessibility of the services.

The e-governance and internet-based solutions based on smart city mission will create citizen-centric development and eco-friendly construction that would promote sustainable development and paves the path of ecological balance.³²

- ***Sustainable environment***— The concept of smart city empowers and enhances citizens' quality of life, strengthens and diversifies the urban economy with prioritisation of urban environment sustainability through adoption of smart solutions.³³ Sustainable smart cities means creation of green building, eco-friendly and sustainable township, which recycles garbage to compost, creates sewer methane gas to power and harnesses wind and solar energy to provide power requirements. It calls for sustainable usage of rain water by means of rain water harvesting to sewage treatment facilities to make water useful again. Smart city mission will address the issues like matchless civic and infrastructure with attention on technology determined method of urban planning, urban governance, implementation, monitoring and upkeep of the project.

- ***Safety and security of citizens, particularly women, children and the elderly***— With a good chunk of population in urban India, the safety is a major issue. Today and in future the safety and security issues will always remain a challenge and today India ranks 54 in crime index. The city can be smart only if it is safe first. Safer cities are the ones which have multiple layers of intelligence system to gather public safety information effectively, respond efficiently alongside creating a database of forecasting and averting suspicious unlawful activities.

As the women and elderly are most vulnerable sections of the society, smart city will create a centralised surveillance and management system for monitoring and controlling the security and traffic condition alongside assets, population protection and reduction of urban crime and improvement of urban safety. Additionally, the smart city mission will gather information for Gunshot detection, social media intelligence, GIS mapping for advanced intelligence and situational analysis.³⁴ Surat

is the only city under the smart city project that has implemented the concept due to which crime rate dipped by 27 per cent. The new initiatives like HIMMAT app, mapping of streets and reduction of dark areas and mapping of vulnerable locations are few leading examples of measures taken for the safety of elderly and women.

Health and education are the major benchmarks for the smart city mission and improvement of health and education service can not only improve citizens' quality of life but also improve the smart city initiative.³⁵ Poor educational qualification and poor health are the major factors for urban poverty. According to latest CBS report, the exorbitant cost of health care pushed 39 million people back to poverty.³⁶

Evaluation of Smart City Project: The Smart Cities Mission in India introduced at a time when India was in transition of becoming more urban. *Since the launch of the smart cities mission in India, 5,151 projects identified by the cities worth more than Rs two lakh crore are in various stages of implementation in 100 cities and 534 projects worth Rs 10,116 crore have been completed*, according to a Ministry of Housing and Urban Poverty Alleviation statement. Around 536 kms of metro networks are now operational in 10 major cities across India. SCM made very good progress and the Development projects appear to be directing in the right direction as envisioned. There are challenges in meeting timelines due to large existing infrastructure which gets overlapped with newer initiatives. However, due to magnitude of the Programme the challenges are only routine problems that can be removed in the longer run of implementation. So far, only 10 per cent of the planned projects have been completed till 2018. The deadline for completion of these projects was set between 2019 and 2023, which is going to be an uphill task for the implementers.

The smart city solutions are deployed to serve its citizens better and if we are not able to provide central role to consumer than the impact of smart city can't be measured. The entire concept of smart cities revolves around enhancing citizen standard of living, ICT, Data Analytics and e-governance, which in turn decide how the Smart technology will improve the areas of a consumer's life.

CONCLUSION

This paper concludes that the Smart Cities Mission in India is an urban regeneration retrofitting programme with a strong focus on physical and cyber infrastructure. In terms of its planning, the smart city mission is an area-based planning with strong forward and backward linkages with creation and return of investment and finances, inspiring

Indian cities to move towards market-based funding so that it can create healthy competition for growth and development of smart cities. The 'smart city' must make available meticulous information for formulation of financial capacities of the city and elaborate the finance requirement for empowering the seven sectors of smart cities, and the sources of funding, which are a major challenge for the smart city mission. Smart Cities: mission in India has proposed the blueprint of different phases of smart city development but not provided the data for each project breakup city wise. The leanings in the finances from corner to corner rounds indicates a move towards more conservative budgets and greater reliance on public sources of funding with a view that private players will invest in coming years. The Smart Cities mission empowers the state governments for their planning, creation and maintenance. The mission has already started rating the existing projects under five parameters – planning, technology, governance, services and finance, along with climate sensitive action and ease of living sensitive action but it missed the community participation, community planning and individual say in the Programme. All the major sectors under the SCM namely adequate water supply, assured electricity supply, sanitation, including solid waste management, efficient urban mobility and public transport, affordable housing, especially for the poor, robust IT connectivity and digitalisation, good governance, especially e-governance and citizen participation, sustainable environment, safety and security of citizens, particularly women, children and the elderly, and health and education needs an overhaul if we expect commitment for building sustainable cities that will last centuries.

Finally, this paper finds that the citizen engagement is not documented in spite of the extensive rhetoric of communal participation.

Overall, the Smart City Mission is a great thought and can only be achieved if planning is properly implemented on ground with special references to finances, timelines and accountability of the implementers.

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