"Policy Assessment of SCM-Smart Cities Mission"

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Introduction

On June 25, 2015, the Indian government unveiled its flagship initiative, "Smart Cities," under the direction of Prime Minister Narendra Modi. The government has decided to create 100 Smart Cities by 2024 as part of the programme. It tries to address issues brought on by India's rapid economic development and widespread urbanisation in the next years. With the help of an area development plan, the 100 cities that will make up the Smart Cities Mission will be transformed into model regions that will influence the rest of the city as well as adjacent towns and cities.

Cities were chosen in accordance with the Smart Cities challenge, in which cities competed in a national competition to reap the rewards of this mission. Under the Smart Cities Mission, the selection of 100 smart cities was finished in June 2018. The task of carrying out the mission, in cooperation with the respective cities falls under the purview of the Union Ministry of Urban Development (MoUD). To choose the smart cities, the MoUD unveiled the Smart City Challenge programme, a multi-stage competition created to motivate and assist municipal leaders in creating smart city proposals to enhance the quality of life for citizens. To select their cities for the competition, each state followed the same set of guidelines. Each city created its own distinct "smart city" vision, mission, and plan.

According to the Ministry of Urban Development, the Smart City Mission marks a paradigm shift towards urban development in the country since it is based on 'bottom up' approach with the involvement of citizens in formulation of city vision and smart city plans, while the urban local bodies and state governments steers the mission with little say from the Ministry of Urban Development. It is a five-year program, where all of the Indian states and Union territories are participating, except West Bengal, by nominating at least one city for the Smart Cities challenge. Financial aid will be given by the central and state governments between 2017-2022 to the cities, and the mission is expected to show results from 2022 on-wards.

Sector and fund: Centrally Sponsored Scheme

Launched year: June 2015

Area: Urban Renewal and Retrofitting Programme

Ministry: Ministry of Urban Development

Figure 1. The 100 Cities Selected Under the Smart Cities Mission

Source: www.mapsofindia.com

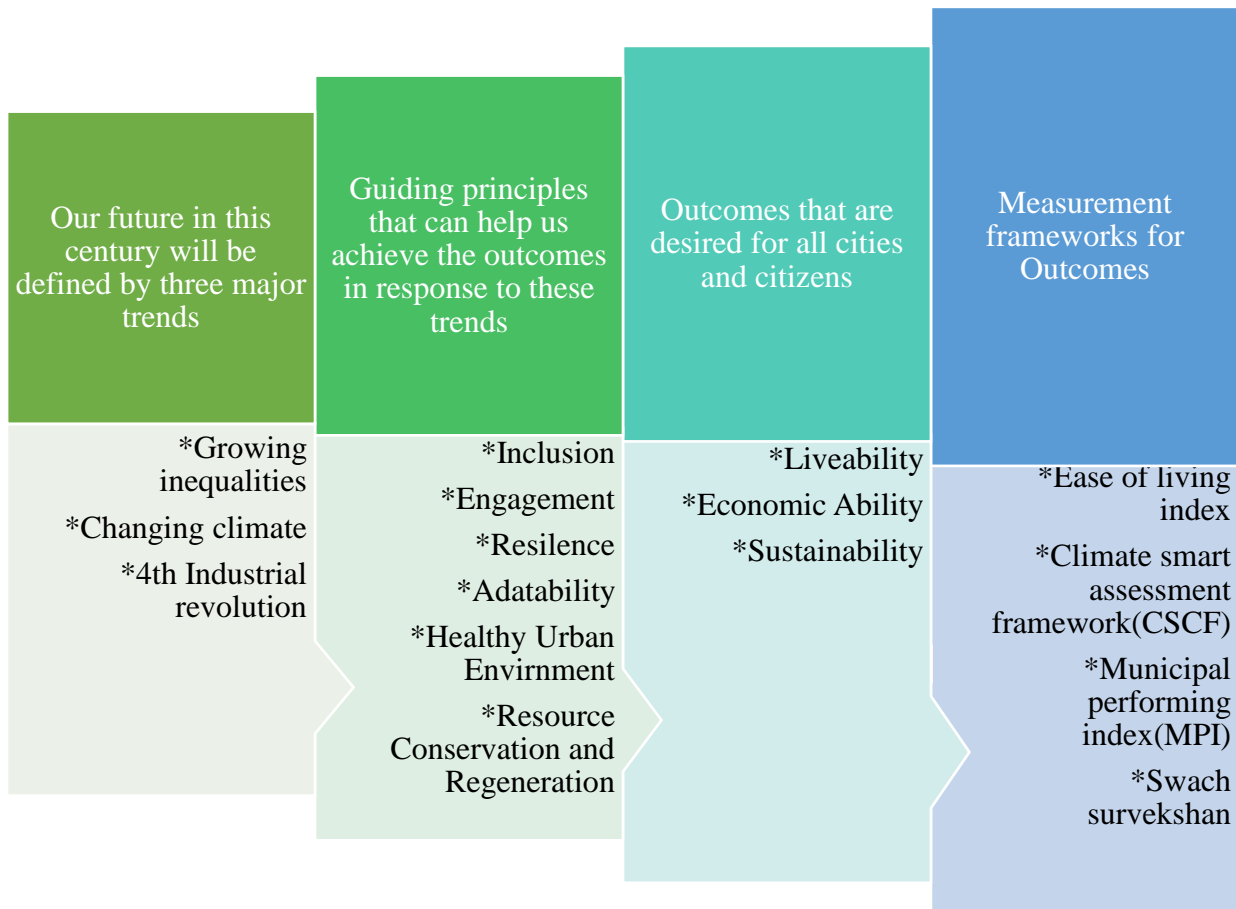## Smart Cities Mission Development Strategy

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. Given below are the details of the three models of Area-based Smart City Development:

City Improvement: (Retrofetting)	• It will implement planning in an existing built-up area in order to achieve Smart City objectives as well as other goals such as making the existing area more efficient and liveable.
City Renewal: (Redevelopmnet)	• It 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.
City Extension: (Greenfield Development)	• It will introduce most of the Smart Solutions in a previously vacant area using innovative planning, planned financing and plan implementation tools with provision for affordable housing, especially for the poor.
Pan City Development	• It envisages application of selected Smart Solutions to the existing citywide infrastructure. Application of Smart Solutions will involve the use of technology, information and data to make infrastructure and services better.

Why we need smart cities?

Being smart is no more a choice, it is a need. Cities are in a constant state of flux. Internal and external factors put tremendous strain on their systems. Cities also play an important role in achieving the national imperatives of economic growth and ease of living. Furthermore, their decisions have an impact on climate change and energy use not only for India, but for the entire world. With so much at stake, we cannot afford for our cities to operate as usual. Making our cities smart is thus a pressing and critical need. We also know that Smart Cities are and will continue to be torchbearers in realising the national aspiration for inclusive urbanisation.

While most national missions focus on a specific aspect of the multifaceted challenges that cities face, the Smart Cities Mission is focused on developing a model of integrated urban development that addresses cross-sector issues in an integrated manner. In some ways, Smart Cities serve as a testbed for implementing and scaling ideas. The most exciting aspect of being a Smart City is the ability to brainstorm and innovate while knowing that lessons learned in one city will inform actions in cities across the country.

Our future in this century will be defined by three major trends	Guiding principles that can help us achieve the outcomes in response to these trends	Outcomes that are desired for all cities and citizens	Measurement frameworks for Outcomes
*Growing inequalities *Changing climate *4th Industrial revolution	*Inclusion *Engagement *Resilence *Adatability *Healthy Urban Envirnment *Resource Conservation and Regeneration	*Liveability *Economic Ability *Sustainability	*Ease of living index *Climate smart assessment framework(CSCF) *Municipal performing index(MPI) *Swach survekshan

The mission will visit 100 cities, which will be distributed among the states and union territories (UT) based on equitable criteria. The formula gives equal weightage (50:50) to the State/urban UT's population and the number of statutory towns (a town with a municipality, corporation, cantonment board, or notified town area committee). According to this formula, each state/UT will have a certain number of potential Smart Cities, with each having at least one.

The core infrastructure elements in a Smart City

- 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

- Health and education

Objectives

- The objective is to look at confined regions and construct a repeatable model that would serve as a beacon for other aspirant cities, with the focus being on sustainable and equitable growth.
- The three strategic pillars of the Smart Cities Mission are city renewal (redevelopment), city expansion (greenfield development), and city improvement (retrofitting), in addition to a Pan-city project in which Smart Solutions are implemented throughout broader areas of the city.
- Area-based development will retrofit and remodel existing areas—including slums—into better planned human settlements, enhancing the liveability of the entire city. To support the rapidly growing population in metropolitan areas, well-planned and properly serviced new lands (greenfield) will be encouraged to be developed.
- Cities will be able to employ technology to enhance infrastructure and services by implementing smart solutions.
- Such comprehensive development would lead to inclusive cities by enhancing quality of life, generating jobs, and boosting incomes for everybody, particularly the underprivileged and the impoverished.

Theory of Change

Inputs

In response to rising urbanisation, the Indian government established the National Smart Cities Mission in 2015, with the goal of retrofitting 100 cities and making them sustainable by 2023. Citizen services, clean air, housing, safety, power, water, sanitation, and mobility were all on the table. And a focus on green areas, skill development, job creation, crime prevention, flooding prevention, and poverty alleviation. The mission had a five-year budget of INR 98,000 crores ($14 billion at the time), with equal contributions from the Central and State governments.

India is progressively moving toward developmental and sustainable goals, and this makes it evident that India need overhaul in planning of cities. Cities are epicentre of economic activities and hence it is required to be planned and organised.

The mission encompasses the joint efforts of several departments. The creation of a smart city entails several inputs such as, access to adequate electricity and water supply, waste management systems and sanitation, efficient urban mobility and public transport, affordable housing for the poor, IT connectivity and digitalisation, e governance, sustainable environment, focus on health and education, provision of a safe and secure environment for citizens, particularly women, children and the elderly

Although government was already working toward sustainable development goal of developing sustainable cities and communities but in India there was lack of infrastructural development to fulfil this objective and therefore to in tune all sustainable development goal an inclusive and dynamic policy such as smart city mission was required.

Interventions

*** Indian urban pandemic preparedness and responses (COVID-19):** Smart Cities Mission (SCM) also aids the rapid response in COVID 19 management. The Integrated Command and Control Centres (ICCC) set up under the mission in various Smart Cities including Bangalore, Pune, Agra, and Vadodara to name a few have been transformed into war rooms for real time monitoring and effective management of the pandemic using technology. The mission resulted in better practices across Smart Cities during the fight against COVID 19.

*** Capacity Building Frameworks on the National Urban Learning Platform (NULP):** The National Urban Learning Platform is a content neutral, scalable and multi-channel platform which can be used for producing and delivering capacity through a 360-degree approach. NULP is envisioned as a way to digitally consolidate key skills and knowledge required by urban stakeholders and make these available to all actors on the channel of their choice.

*** CITIIS (Cities Investments to Innovate Integrate and Sustain) Challenge**: CITIIS (Cities Investments to Innovate Integrate and Sustain) Challenge was launched in partnership with Agency Française de Development (AFD) and European Union, to extend a loan of EUR 100 million for implementation of up to 15 innovative projects selected through an All-India Challenge in four sectors- sustainable mobility, public open spaces, urban governance & ICT and social and organizational innovation in low-income settlements. The CITIIS program was set in motion on July 9, 2018.

*** India Smart Cities Fellowship (ISCF) Program:** launched on 9th July 2018. The objective was to select a cohort of promising young professionals who have the potential to contribute to the innovation ecosystem that is fast developing around the SCM.

*** The Nurturing Neighbourhoods Challenge**: launched in the first week of November 2020. It is a 3-year initiative hosted by the Smart Cities Mission, Mohua in collaboration with the Bernard van Leer Foundation and WRI India. The Challenge enables Indian cities to

adopt an early childhood lens in designing neighbourhood-level improvements that promote the health and well-being of young children and their caregivers.

* Smartnet: Smartnet was launched by the Ministry of Housing and Urban Affairs to support the development of cities across India and to build a resource-rich ecosystem of learning, sharing, and disseminating for city managers and primary stakeholders in the urban transformation of India. It is also expected to provide a horizontal learning and knowledge sharing platform for exchange between cities, practitioners, academia, researchers, and technologists while also evolving a comprehensive framework to visualise and articulate the government's urban sector missions such as smart cities, AMRUT, Housing for All, HRIDAY and Swachh Bharat.

Outcomes

* Liveability: Aspects of social well-being that enable a citizen to live a decent life in the city are included in liveability or quality of life. This outcome addresses issues such as access to clean water, safe streets and public spaces, public transportation, health and education facilities, recreational areas, and cultural and historical sites. By comparing a city's performance on these aspects to established benchmarks, a city can determine how well it is performing in improving the liveability of its residents and, as a result, which aspects of the city require additional investment. One such established benchmark is the 'Quality of Life' indicators in the Government of India's Ease of Living Index.

* Economic ability: Economic ability encompasses factors that influence a city's ability to be a good place to do business and provide access to a diverse range of jobs. People are drawn to cities primarily because of economic activity. Income growth requires sustained economic activity and investment. The city's role as an economic engine is critical to provide enough jobs and resources for continuous infrastructure improvement. When discussing economic ability, it is important to avoid broad generalisations. Economic growth is path dependent; for example, a city with a large agricultural hinterland may have a bright future as an agro-processing hub, whereas a city with a thriving car manufacturing industry may easily venture into or transition to building sophisticated machinery. The 'Economic ability indicators of the EOLI and City GDP Measurement Framework' are Government of India efforts to benchmark economic performances of cities.

* Sustainability: Sustainability is a state of dynamic equilibrium between natural and built ecosystems. This equilibrium has been severely threatened with rising temperatures, extreme weather events, deteriorating air quality, more frequent floods and droughts, and declining urban biodiversity. Sustainability is affected by such human activities and the state of the urban environment becomes an indicator of what has gone right or wrong in the city. The 'Sustainability' indicators under EOLI and the Climate Smart Cities Assessment Framework (CSCF) are tools formulated by the Government of India to understand a city's performance on different dimensions of sustainable development in the Indian context.

Impact

- Greater convenience for citizens through easy access to government services.
- Ease of work for field-level functionaries through digital tools and on-demand capacity building.
- Improved decision-making procedures to better manage cities.
- Improved access to information and improved communication with city departments to better serve citizens.
- Lowering the cost of innovation through open data and making it easier to design solution s that meet the demands of stakeholders.
- Enhanced ease of doing business through streamlined and time-bound application approval.
- Reduced barriers to participation in urban development for start-ups and MSMEs.
- Linking evidence to policy and practise to improve inclusive and sustainable urban development.
- Drive targeted reforms and accomplish State priorities.
  Improved financial management, allocation of funds, and budgeting.
- Better policy targeting through analysis of solid data on the country's urban sector.
- Encourage national collaboration and competition for better urban programme execution.

Theory of Change Visual:

INPUTS

*In response to rising urbanisation, the Indian government established the National Smart Cities Mission in 2015, with the goal of retrofitting 100 cities and making them sustainable by 2023.

*The Mission aims to drive economic growth and improve quality of life through comprehensive work on social, economic, physical, and institutional pillars of the city.

*The main objective of the Mission is to promote cities that provide core infrastructure, clean and sustainable environment and give a decent quality of life to their citizens through the application of 'smart solutions.

*The focus is on sustainable and inclusive development by creation of replicable models which act as lighthouses to other aspiring cities. 100 cities have been selected to be developed as Smart Cities through a two-stage competition.

INTERVENTIONS

Indian urban pandemic preparedness and responses (COVID-19): Smart Cities Mission (SCM) is actively providing support for rapid response in COVID 19 management.

Capacity Building Frameworks on the National Urban Learning Platform (NULP): The National Urban Learning Platform is a content neutral, scalable and multi-channel platform which can be used for producing and delivering capacity through a 360-degree approach.

• CITIIS (Cities Investments to Innovate Integrate and Sustain) Challenge: CITIIS (Cities Investments to Innovate Integrate and Sustain) Challenge was launched in partnership with Agency Française de Development (AFD) and European Union.

• India Smart Cities Fellowship (ISCF) Program: launched on 9th July 2018. The objective was to select a cohort of promising young professionals who have the potential to contribute to the innovation ecosystem that is fast developing around the SCM.

OUTPUTS:

*Community at the core of planning and implementation.

• *Ability to generate greater outcomes with the use of lesser resources.

• *Cities selected through competition; flexibility to implement projects.

• *Innovating methods; integrated and sustainable solutions.

OUTCOMES:

Liveability: This outcome addresses issues such as access to clean water, safe streets and public spaces, public transportation, health and education facilities, recreational areas, and cultural and historical sites.

Economic ability: Income growth requires sustained economic activity and investment. The city's role as an economic engine is critical to provide enough jobs and resources for continuous infrastructure improvement.

Sustainability: sustainability is a state of dynamic equilibrium between natural and built ecosystems. The 'Sustainability' indicators under EOLI and the Climate Smart Cities Assessment Framework (CSCF) are tools formulated by the Government of India to understand a city's performance

•IMPACTS:

•*Greater convenience for citizens through easy access to government services.

•*Ease of work for field-level functionaries through digital tools and on-demand capacity building.

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•*Enhanced ease of doing business through streamlined and time-bound application approval.

•*Reduced barriers to participation in urban development for start-ups and MSMEs.

Impact Pathways
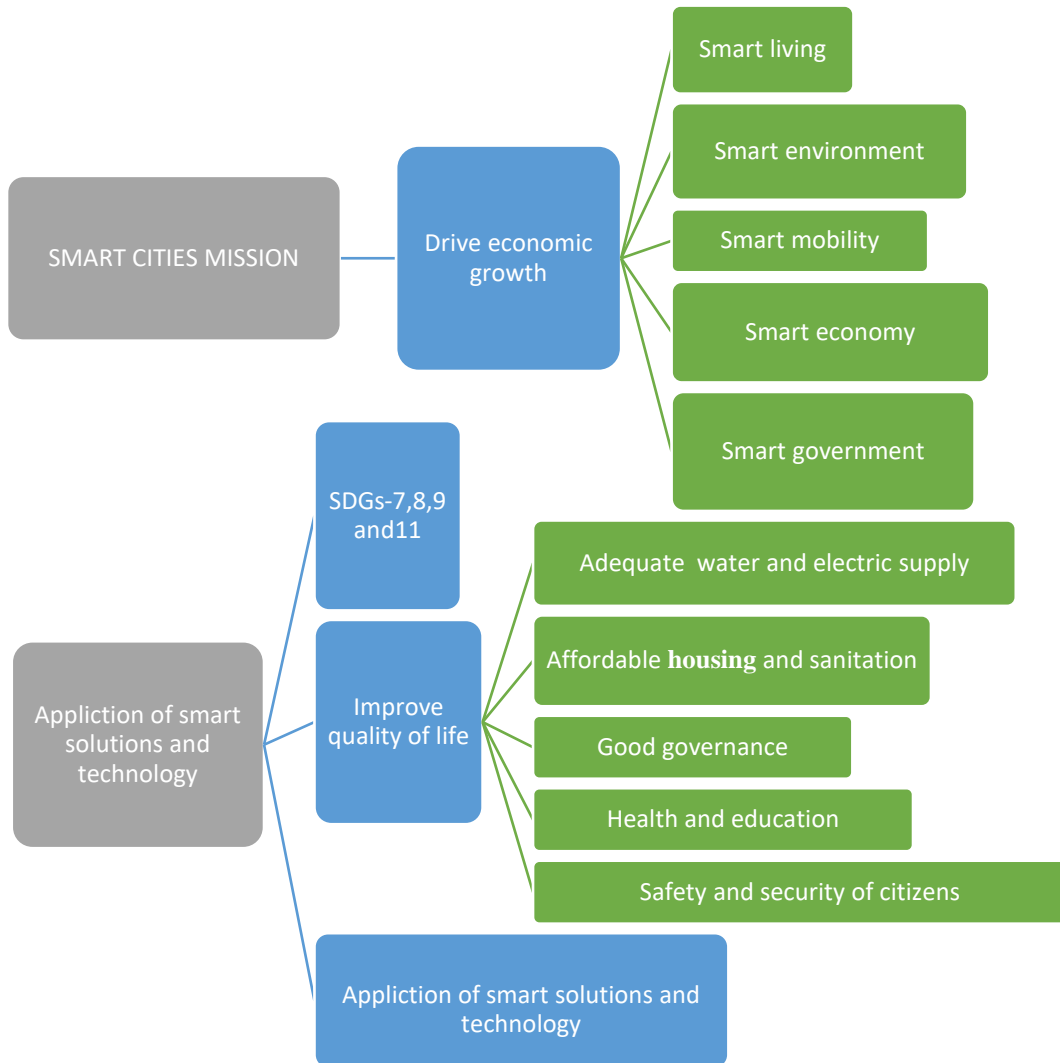
The Smart Cities Mission is an innovative, bold and fresh initiative by the government of India. The key objective of Smart Cities Mission is to create cities with all the core infrastructure, which will provide decent quality of life to the citizens along with a clean sustainable environment and enables the application of 'Smart Solutions'. The primary focus is on sustainable and inclusive development and to create a replicable model which will act like a lighthouse to other aspiring cities in various parts of the country. The core infrastructure elements in a Smart City would include - 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 digitalization,   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.

Budgetary Allocation

i. Union Budget Allocation
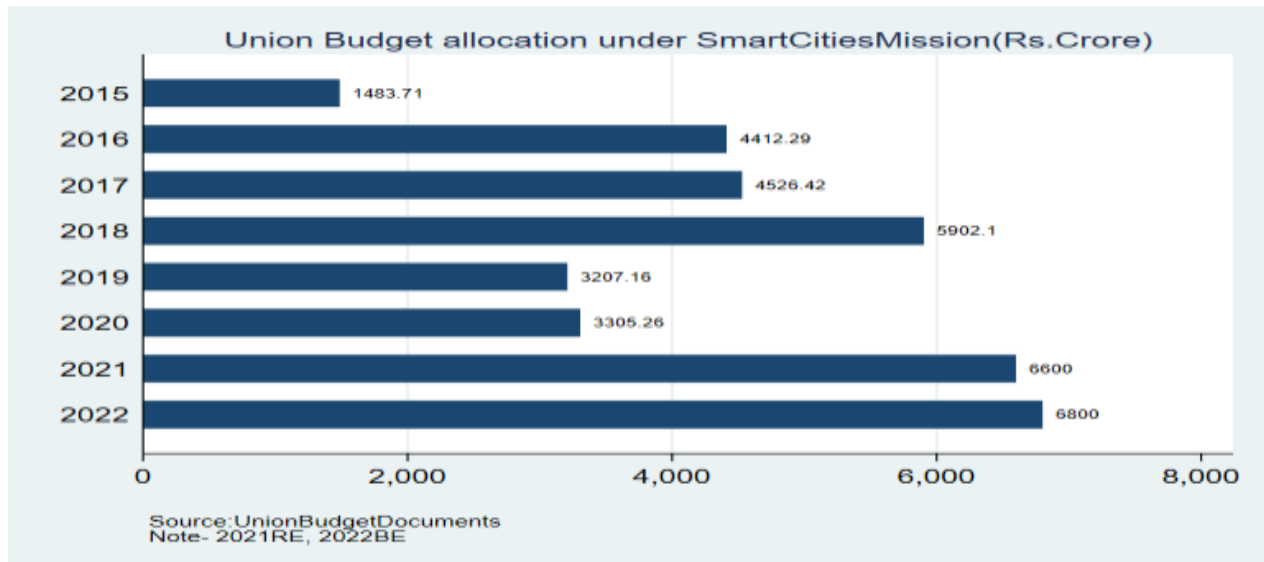
For the union government, the Ministry of Housing and Urban Affairs (MoHUA) undertakes the responsibility of the functioning and administration of the smart cities mission. The funding for this mission is mostly funded by gross budgetary support (GBS) of the union government. A part of funding comes from the City Investment to Innovate, Integrate and Sustain (CITIS).

Total estimated funds allocation for the mission during 2015-16 and 2022-23(BE) is Rs. 36,236 crores. The estimated shortfall in union government share of funds allocation for this mission stands at Rs. 12,000 crores. Total budget allocation for the smart cities mission by the union government witnessed a rising trend during 2015-16 and 2018-19, with an annual average growth of about 77 percent. During 2019-20 and 2020-21, the union budget allocation came down by less than 2 percent per annum. The union government tried to overcome shortfall by increasing the budget allocation by 2 times i.e., from Rs. 3305 crores in 2020-21 to Rs. 6600 crores in 2021-22(BE). In the current financial year i.e. 2022-23(BE), the budget allocation witnessed a small increment of Rs.200 crores from its previous year.

The smart cities mission is an ambitious program of the government to deal with the structural issues in million plus cities looking at their growth in size of demography. According to World Bank estimate, about 16.2 percent of India's population live in million plus cities. This is about half of the estimated total urban population in the country. According to Census 2011, the 2001-2011 decade witnessed a higher growth of urban agglomeration. Number of million plus cities increased to 53 with about 43 percent of concentration of urban population in this decade.

ii. State Budget allocation

As said above, half of the total budget allocation for the smart cities mission is funded by both the state governments and ULBs, some of the state governments allocate a certain amount of funds from their budget for this purpose. However, this allocation is not in proportionate to the concentration of urban agglomeration in the state.

In 2020-21, total budget allocation for the smart cities mission in Uttar Pradesh was Rs. 2000 crores followed by Rs. 823 crores in Karnataka. As per the Census 2011, about 39 percent of total population in Karnataka stays in urban areas compared to 20 percent in Uttar Pradesh. However, Karnataka has raised the budget allocation in subsequent years i.e. Rs. 1111 crores in 2021-22 (RE) and Rs.1000 crores in 2022-23(BE). This is an annual average rise of over 100 percent since 2020-21. Among the two other major states who contributed higher allocation for smart cities mission are Andhra Pradesh Rs.1000 crore and, Madhya Pradesh Rs. 1259 crore in 2022-23 (BE). The north-eastern and hilly territory states took some major initiatives under this mission for development of cities. Total budget allocation for the mission in Nagaland was Rs. 300 crores followed by Rs. 192 crore by Tripura, Rs. 189 crore by Mizoram and Rs.169 crores by Manipur in 2022-23(BE). Both Jammu & Kashmir and Himachal Pradesh allocated about Rs. 200 crores each in 2022-23(Be) under smart cities mission.

iii. Foreign Funding

Leading economies around the world have expressed interest in India's smart city mission and are eager to participate in the development of smart cities. Spain, the United States, Germany, Japan, France, Singapore, and Sweden are among them. Italy is interested in the smart city concept and has decided to invest US$ 1.2 trillion over the next 20 years in a variety of initiatives. The Italian firms will contribute in terms of design and technology for smart cities, with services ranging from consulting to actual infrastructure construction. France has decided to support three Indian cities—Chandigarh, Lucknow and Puducherry—and announced an investment of US$ 1.5 billion (EUR 1.3 billion).

Analysis

The Ministry of Housing and Urban Affairs (MoHUA) and all states and union territory (UT) governments collaborated to launch the Smart Cities Mission (SCM) on June 25, 2015. Its original completion date of 2019–20 has since been extended. More than one-third of India's population resides in the 100 cities and towns chosen for the SCM, which are spread across various states and UTs. A project wise approach has been undertaken for the mission. Cities taking part in the SCM have proposed a total of 5,151 projects. Of these, 4,178 projects have been tendered out, accounting for 81% of the total projects worth Rs.1, 49,519 crores (73% of the total project cost).

Cities taking part in the mission have completed 25% of the total number of projects planned. Work orders have been issued for 81% of the projects that were tendered. Infrastructure

projects aimed at improving the quality of life in cities are in various stages of implementation, according to data presented by the Ministry of Housing and Urban Development. These projects are carried out by bringing together resources from the Centre, states, and local governing bodies, as well as externally funded schemes and projects.

I. Current Status of the Smart Cities Mission:

As we see in figure.1, less than half of the estimated project cost will be covered by government funding. The remaining funds must be raised from both internal and external sources, including the private sector, state and local governments, financial intermediaries, other central government programmes, and innovative mechanisms (like municipal bonds and pooled financing).

Figure 1. Financing for the Smart Cities Mission (2015-16 to 2019-20)

Financial Items	Amount (in INR billion)
Total fund requirement (project costs)	2,050.18
Financial support by central government	480.00
Matching contribution by state/local government	480.00
Total funds to be mobilised by central, state/local government	960.00 i.e., 47% of 2,050.18
Funds to be mobilised by central, state/local government for each city per years (approx. INR 1,000 billion)	2.00
Balance funds to be mobilised from other sources	1,090.18

Source: *Ministry of Housing and Urban Affairs (Based on data up to 28 July 2021)*

II. Status of tender Issued:

National level: As mentioned in below (figure.2), Tenders have been issued for 6,130 projects worth INR 1,814.91 billion. Of these, 2,898 (47 percent) projects worth INR 504.22 billion have been completed.

About 23% of the total sum for which bids have been issued has already been released, with the centre and state/local governments each receiving 13% and 10% of that total.

Approximately 94 percent of the total monies released by the federal government have been transferred to the SPVs. Up to 71 percent of the total federal and state/local government monies issued have been used; the shares used by the central and state governments are 48 and 23 percent, respectively.

State level: We clearly see in (figure .2) that more tenders have been issued by large states. Karnataka ranks first with 821 project tenders issued, while Manipur ranks last with only seven tenders. In general, fewer than 100 project tenders have been issued by smaller states, northeastern states, and UTs.

Figure 2. Physical and Financial Progress of All Smart Cities Mission Projects
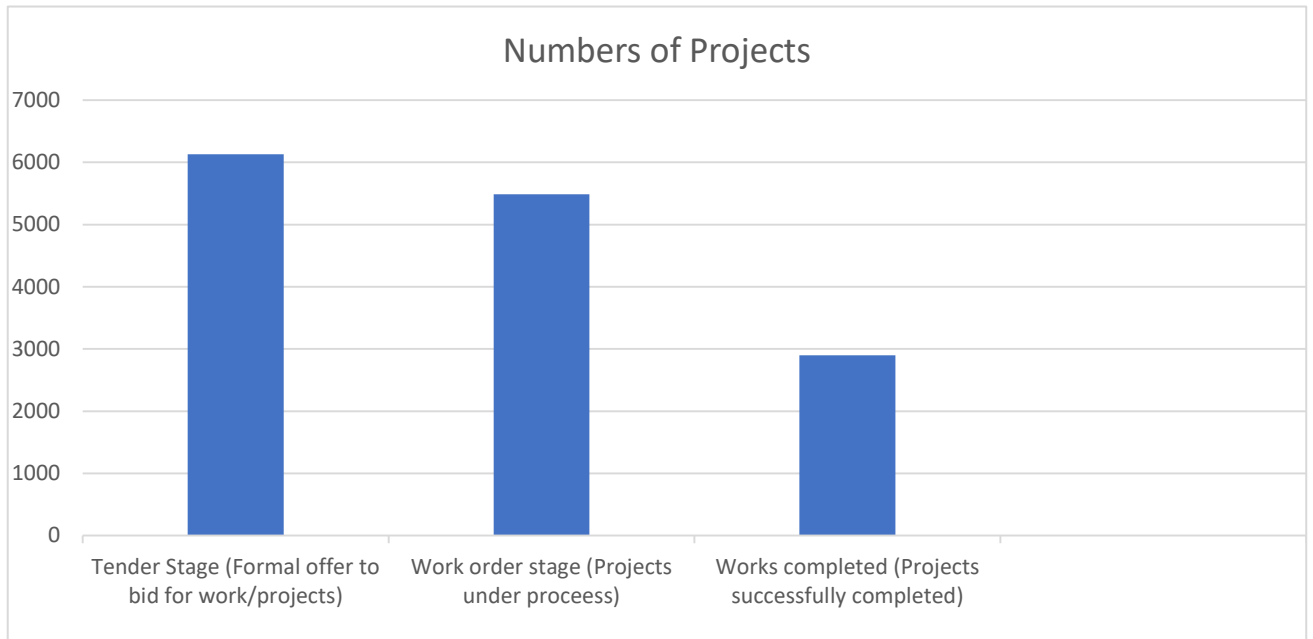
Source: Ministry of Housing and Urban Affairs (Based on data up to 28 July 2021)
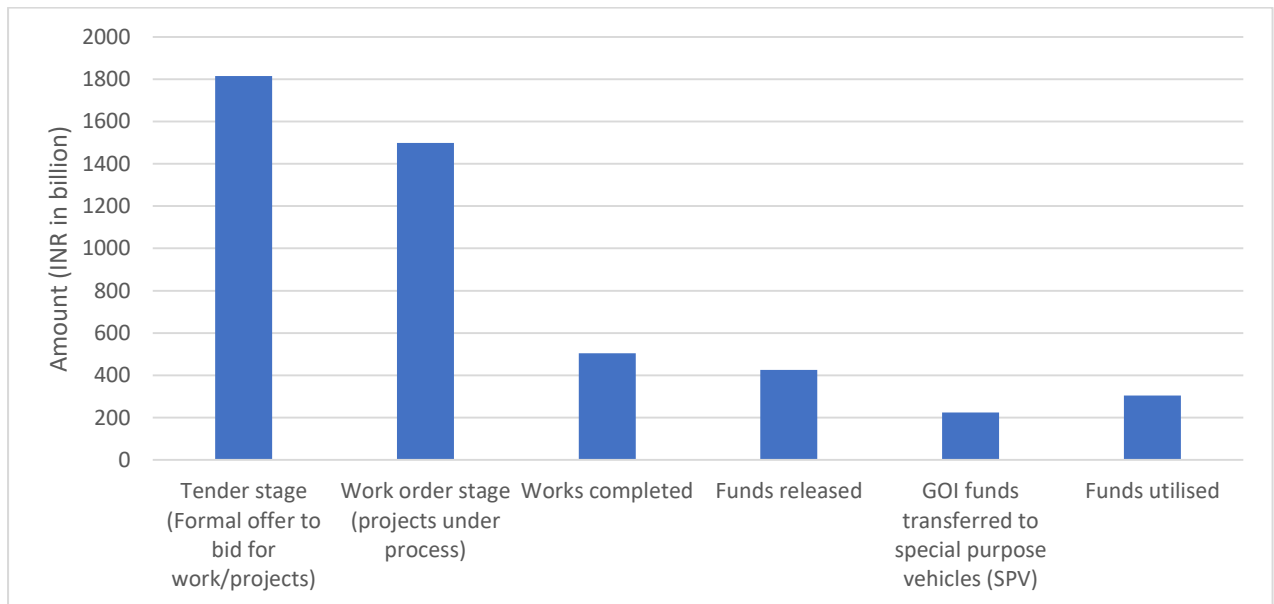
Source: Ministry of Housing and Urban Affairs (Based on data up to 28 July 2021)

## III. Status of Projects Completed:

As observed in figure.3, Over 80 percent of the projects have been completed in New Delhi, Chennai, and Indore. All the projects are pending in Amaravati, Bhagalpur, Muzaffarpur and Shillong. Cities in Dadra and Nagar Haveli, Puducherry, Bihar, and Meghalaya are trailing. In 61 cities, project completion is below 40 percent.

Dharamshala has received more than 87 percent of the central government funds that have been disbursed relative to the entire amount offered. Itanagar, Pasig hat, Namche, and Panaji are next in line. This percentage is less than 50% in the remaining cities. It is less than 5% in Bareilly, Bihar Sharif, Thane, and Bilaspur.

Aizawl, Amritsar, and Jalandhar have had the least amount (below 50%) of federal government cash released. The percentage of raising the correspondence financing for the project from the state government of all the 100 cities is below the 45%.

The biggest percentages, between 40 and 45 percent, were distributed by the state governments to Faridabad and Chennai. The three cities with the lowest percentage are Gangtok, Kavaratti, and Srinagar. The best performing states in terms of progress of the mission are Tamil Nadu, Madhya Pradesh, and Gujarat. Chennai and Coimbatore in Tamil Nadu, Indore, Bhopal and Ujjain in Madhya Pradesh, and Surat and Rajkot in Gujarat, figure repeatedly among the best performers on different criteria. Other states/UTs that have showcased good performance are Delhi, Haryana, Chhattisgarh, Dadra and Nagar Haveli, and West Bengal. (See figure 3)

Figure 3. Projects Completed in Cities
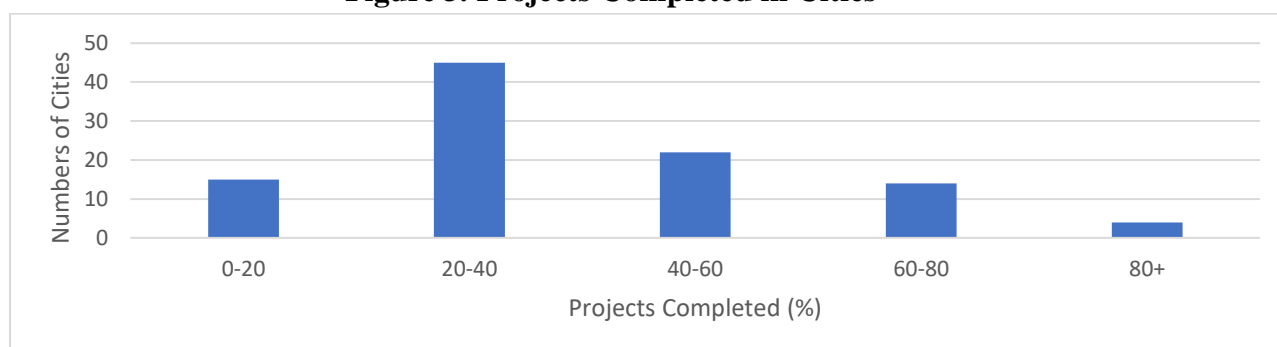
Source: Ministry of Housing and Urban Affairs (Based on data up to 28 July 2021)

IV. Physical and Financial Status of Smart Cities:

It is noted in (figure.4), that the progress of the Mission has been best in the states of Tamil Nadu, Madhya Pradesh, and Gujarat. Chennai and Coimbatore in Tamil Nadu, Indore, Bhopal and Ujjain in Madhya Pradesh, and Surat and Rajkot in Gujarat, figure repeatedly among the best performers on different criteria. Other states/UTs that have done well are Delhi, Haryana, Chhattisgarh, Dadra and Nagar Haveli, and West Bengal.

Figure 4. Physical and Financial status of Top Five Cities

Rank	Highest number of projects and tenders issued	Highest percentage of projects completed	Received highest percentage of allocated central funds	Transferred 100 percent of central funds to Special purpose	Received highest percentage of matching funds from respective	Highest utilisation of funds by percentage

				vehicles (SPV)	state government	
1	Indore	New Delhi	Dharmshala		Faridabad	Rajkot
2	Belagavi	Chennai	Itanagar		Chennai	Indore
3	Raipur	Indore	Pasighat	64 cities	Atal Nagar	Ujjain
4	Tumakura	Surat	Namchi		Coimbatore	Bhopal
5	Ajmer	Coimbatore	Panaji		Silvassa	NT Kolkata

Source: Ministry of Housing and Urban Affairs (Based on data up to 28 July 2021)

From (figure.5), we note that States/UTs that have a long way to go before reaching its targets include Bihar, Punjab, Telangana, Puducherry, Meghalaya, Goa, Mizoram, Jammu and Kashmir, Sikkim, Assam, Lakshadweep, Dadra and Nagar Haveli, Daman, and Diu. Bhagalpur, Muzaffarpur and Bihar Sharif in Bihar, Amritsar and Jalandhar in Punjab, and Karimnagar and Warangal in Telangana figure prominently among the bottom five cities on different criteria.

Figure 5. Physical and Financial Status of Bottom Five Cities

Rank	Lowest number of projects and tenders issued	Lowest percentage of projects completed	Lowest percentage released of allocated central funds	Lowest transfer of funds to SPVs (40-60 percent)	Received lowest percentage of matching funds from respective state government	Lowest percentage of funds utilised
96	Bhagalpur	Puducherry	Nagpur	Panaji	Srinagar	Saharanpur
97	Nagpur	Amaravati	Bareilly	Satna	Kavaratti	Guwahati
98	Guwahati	Bhagalpur	Bihar sharif	Aizawl	Gangtok	Puducherry
99	Itanagar	Muzaffarpur	Thane	Amritsar	Karimnagar	Bhagalpur
100	Imphal	Shillong	Bilaspur	Jalandhar	Warangal	Diu

Source: Ministry of Housing and Urban Affairs (Based on data up to 28 July 2021)

COVID-19 and Smart Cities Responses

Smart cities in India have used a variety of technological solutions to combat Covid-19 and manage the situation on the ground. Slowing the spread of Covid-19 will necessitate a heavy reliance on India's data infrastructures, which will provide real-time data readings for critical decision making, as well as its Smart Cities Mission. Smart cities responded quickly to the crisis and leveraged the existing smart infrastructure like the integrated command and control centres. According to the ministry, these centres were eventually converted into Covid-19 war rooms and became the epicentre of coordinated action while dealing with the pandemic.

75 integrated command and control centres were operationalized across the country and played a critical role in mitigating the spread of the pandemic as well as providing Covid care to the needy, according to the report. ICCCs serve as city managers' 24/7 nerve centres, providing situational awareness and real-time coordination of emergency response services.

Cities must deploy ICCC infrastructure creatively - control rooms, web portals, sensors, drones, public address systems, surveillance cameras - to coordinate activities related to information, awareness, collaboration, management, predictive analysis, and lockdown implementation.

Srinagar established a COVID-19 contact centre and released six mobile applications. To give information about hotspots and containment zones, medical and testing institutions.

Thane developed a digital platform called Digi Thane. COVID-19 control is managed by the Tumakuru Integrated Command and Control Centre (ICCC).

The MIDC Savlaram sports complex was transformed by Kalyan-Dombivali into a 185-bed acute care centre.

Jammu activated a COVID-19 control room as well as an e-pass system for emergency mobility during the lockdown.

Dehradun has established a section for COVID-19 treatment under the SCM in response, as well as a 400-bed hospital at Doon Medical College.

Implementation of the Project: Achievements, Diverse and Contradictory Results:

 Four micro skill development centres have been established in **Agra** to provide instruction in traditional trades, zardosi (gold embroidery), and stone inlay. 104 women's self-help groups (SHGs) are being connected to the skill centres to strengthen their capacity and implement additional livelihood initiatives. Additionally, it is improving areas where low-income people live and creating zones for street vendors.

 * **Coimbatore** is restoring eight lakes, developing the lakefront, providing open air recreation, food kiosks, open plazas, cycle tracks, fountains, and building an amphitheatre. It is also using robotic machines (called Bandicoot V 2.0) to clean and unclog manholes and septic tanks, thus doing away with manual scavenging.

 ***Tirupati** is nurturing local arts and crafts through digital training. It has created a digital platform which allows artists to share designs with crafts persons.

* Three intelligent anganwadis with updated activity spaces, refurbished structures, and CCTV surveillance have been established in Thiruvananthapuram.

 * **Prayagraj** has installed a plastic-to-diesel conversion plant of capacity 2 MT. It can convert 100 kg of plastic/polythene into 40-60 litres of diesel, the operation producing natural gas as well.

 ***Madurai** is improving accessibility to 14 heritage sites near the Meenakshi Temple, laying a three km long stone pathway, an arrival plaza, and a heritage bazaar.

The Tumakuru police have developed a mobile app called Lockdown House Monitoring to improve security in the city, which citizens can download and seek police help.

 * **Mangaluru** has started six roof-top solar power projects on government buildings with an installed capacity of 393 KW. So too in Salem, solar roof top panels with total capacity of 872 KW have been installed atop 86 corporation-owned buildings, which is expected to bring down electricity costs by INR 6 million annually over the next 25 years.

 * **Surat** is also providing amenities such as better roads, footpaths, utility crossings, median parking, hawking zones, art galleries, children's play areas under the Mission and increasing its green cover along a canal. Solapur is redeveloping a sports stadium.

 *Greater Warangal is creating cycling and walking facilities along 40 km of road. Newtown, Kolkata too has laid a graded barrier-free three km cycle track. Surat has begun a chartered bicycle project, setting up 42 bike stations with 1,160 bicycles.

Critical Analysis

I. Variation in city budgets and funding cuts in subsequent years:

Due to the vast differences in size and scope of the mission, the budgets for the top 99 cities range from over INR 500 crore (Kavaratti, Lakshadweep) to over 6000 crores (Chandigarh). The total budget for the 99 cities is INR 2051 crore. As we see in a below figure no.6, a cursory examination of budget trends reveals that budgets are being reduced across successive rounds. Following round one, most budgets became more conservative, with the greatest decrease seen in cities with budgets exceeding INR 4000 crores.

Figure 6: No of cities as per Smart Cities Mission Budgets
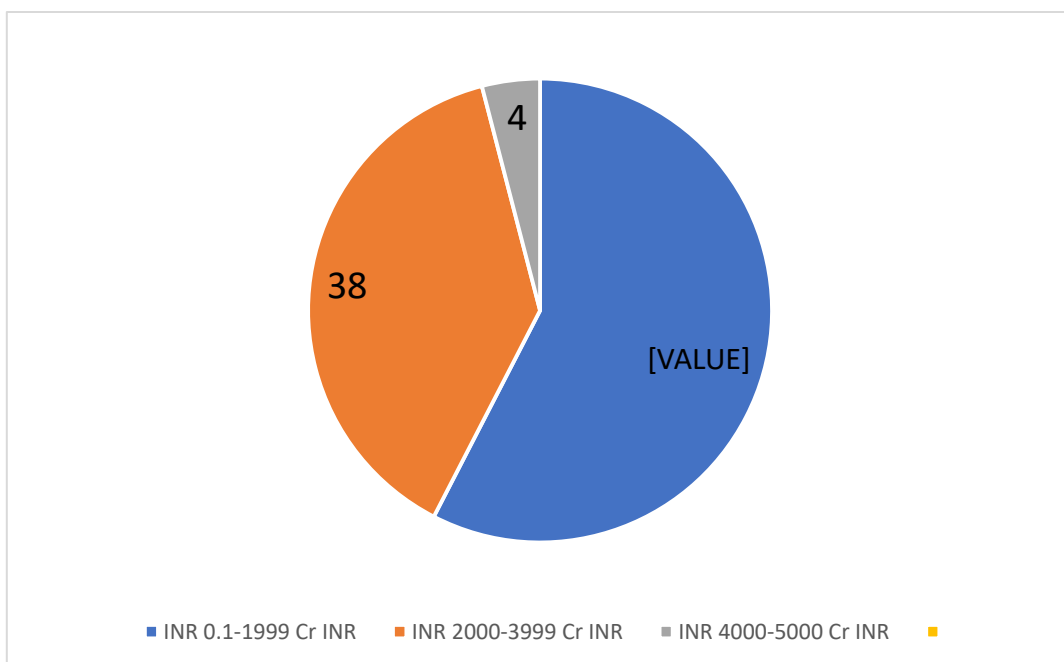
II. Uncertainty about the source of funding:

Most funds (70%) will come from public sources, followed by corporate and CSR funds. However, as the mission progresses, there is more uncertainty about the sources. The source of funding for each project is unclear - there is a lack of specific information about the source of funding for individual projects. Only 17 of the top 60 cities identified sources of finance at the project level. Bhubaneswar, for example, topped the SCM list but did not provide specific information about the source of funding for their projects.

III. Inequality linked to area-based development:

According to the study, over 80% of the SCM budget is allocated to area-based development projects that cover only about 7% of the area of the 99 smart cities. As a result, 90% of the city has access to only 20% of the city's SCM budget. Furthermore, it is argued that the majority of ABD projects are chosen in areas that are already well developed and well served, thereby exacerbating the city's existing inequalities.

IV. Disproportionate emphasis on financial returns:

Unlike previous schemes such as JNNURM, which focused on the social welfare of the city, projects under SCM aim to primarily build a financial corpus for the city. Thus, parameters such as real estate development, parking facilities, water metering, and so on are mentioned.

For example, over 80% of the SCM budget is dedicated to transportation and energy. Water, sanitation, and energy are all important considerations. New budget categories such as IT governance, culture, and heritage receive a meagre 15% allocation.

V. Power re-centralization:

Under the Companies Act 2013, SCM provided for the establishment of a special public vehicle to manage and oversee the scheme's implementation. However, the precise relationship and hierarchy between SPV Anand local bodies is unknown, which may impede collaboration between the two organisations. Furthermore, SPV members are mostly state government bureaucrats with little political representation. Thus, it appears that the 74th amendment has eroded the decentralisation achieved by entrusting powers to bureaucrats.

VI. Discourse of citizen participation:

Though citizen engagement is an important component of the mission, there is a lack of precise data on the scale of citizen interaction. There was no tangible data on the number of citizen meetings or consultations held by over 65 cities.

Digital literacy is a critical issue when it comes to implementing digital feedback and outreach. Given the inequity in access to technological means, digital outreach may result in the ignorance of certain sections of society's opinions. There is a lack of clarity regarding what constitutes participation. Whether or not Twitter likes and shares are counted, no substantive analysis is performed to account for what is being shared and its relevance. (see figure.6)

Figure 7: Participation in top 60 cities

No.	Category	Numbers of cities	Percentage of cities	Percentage of population
1	Non-digital outreach	40	66.7	20
2	Non -digital feedback	24	48.3	18.16
3	Social media outreach	22	36.7	NA
4	Social media feedback	39	65	NA
5	No feedback	10	16.7	NA

Source: CPR smart city database,2018

Challenges in Developing and Implementing Smart Cities

* ***Sources of funding are not clear-*** Only 17 of the top 60 cities were able to identify the sources of funding at the project level, even though the top 60 cities have reported all of their projects and the costs of the majority of projects are stated in the project proposals (94%).

* ***Availability of master plan or city development plan:*** Most of our cities lack master plans or city development plans, which are critical to smart city planning and implementation because they encapsulate everything a city needs to improve and provide better opportunities to its citizens. Unfortunately, 70% to 80% of Indian cities do not have one.

* ***Smart retrofitting of existing legacy city infrastructure:*** When reviewing a smart city strategy, there are several underlying issues to consider. The most important thing is to identify the existing city's weak points that require special attention, such as 100% distribution of water supply and sanitation. It can be difficult to integrate previously isolated legacy systems in order to achieve citywide efficiencies.

* ***Inadequate private participation -*** Smart City Mission had intended for private funding to account for 21% of the mission's overall costs. Only 15% of the projects currently in development are operating in the public-private partnership (PPP) mode.

* ***Growing inequality*** - The Area Based Development (ABD) model, which indirectly encourages cities to concentrate most of their funding on a small portion of the city, has been the focus of the mission. Thus, it is discovered that the ABD projects for 99 cities only account for 7% of the total area and 80% of the total budget. Such a strategy fosters inequality within and between cities.

* ***Focusing more on a smaller number of Smart City areas-*** For instance, the SCM budget is made up of almost 80% of the five development categories of transportation, energy and ecology, water and sanitization, housing, and economy. Only 15% of the funding is allocated to other categories like IT, governance, culture and heritage, health, and education.

* ***Recentralization of Power-***Effective horizontal and vertical coordination between various institutions providing various municipal amenities, as well as effective coordination between central government (MoUD), state government, and local government agencies on various issues related to financing and sharing of best practises and service delivery processes, is required for the successful implementation of smart city solutions.

* ***Capacity building programme:*** Building capacity for 100 smart cities is a difficult task, and most ambitious projects are delayed due to a lack of qualified personnel at both the federal and state levels. Only about 5% of the central budget may be allocated to capacity building programmes that focus on training, contextual research, knowledge exchange, and a rich database.

Way Forward:

In the 100 cities and towns selected for the Smart Cities Mission, there has in fact been progress on a wide range of smart projects. In particular, the marginalised populations of these cities are benefiting socially and economically from the completed projects. But the study also reveals that some cities are behind in terms of project execution. The COVID-19 pandemic has undoubtedly slowed down progress, but there are also numerous administrative and financial factors to consider. The SPVs established in some cities to carry out the Mission are not operating effectively because of insufficient managerial, technical, and financial capabilities. Data handling, analysis, digitalization levels, fund mobilisation, release, and utilisation deficiencies were noted.

* As more and more services are incorporated, the effectiveness of Smart City Centres will increase. Convergence with other city initiatives and breaking down departmental silos should be the goals of the mission.

* To further enhance the urban environment, an enabling environment that considers governance frameworks, policy protocols, the capabilities of urban local bodies, and the nature of citizen-government engagement must be created.

* The focus of any smart city in the world is on the dependability of utility services, whether they are electricity, water, telephone, or broadband services. The current supply and distribution system does not allow for 24-hour universal access to electricity in smart cities. To reduce the need for electricity, cities must shift to renewable energy sources and focus on green buildings and green transportation.

* Convergence of other Central and State Government Programs/Schemes with the Smart Cities Mission can yield significant benefits. Cities must seek convergence in the SCP with AMRUT, Swachh Bharat Mission (SBM), National Heritage City Development and Augmentation Yojana (HRIDAY), Digital India, Skill development, Housing for All, Museum construction funded by the Culture Department, and other programmes related to social infrastructure such as Health, Education, and Culture at the planning stage.

* A smart city would necessitate a smart economy, smart people, smart organisation, smart communication, smart engineering, smart transit, a clean environment, and a clean way of life. Nonetheless, with mass migration causing basic issues such as water shortages and overcrowding, the rate at which these cities are developed will be critical. The Government of India is leading several initiatives to transform 100 cities into smart cities. The government is focusing on encouraging Public-Private Partnership (PPP) for the successful implementation of India's smart city project.

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Annexure

- List of smart cities

State/ UTs	Name of cities
Andhra Pradesh	• Vati *Visakhapatnam • Kakinada * Tirupati
Gujarat	▪ Gandhinagar *Surat ▪ Vadodara *Rajkot ▪ Ahmedabad *Dahod
Madhya Pradesh	▪ Bhopal *Indore ▪ Jabalpur *Gwalior ▪ Satna *Ujjain ▪ Sagar
Tamil Nadu	▪ Chennai * Coimbatore

	▪ Dindigul *Erode ▪ Madurai *Salem ▪ Thanjavur *Thoothukudi ▪ Tiruchirappalli *Tirunelveli ▪ Tiruppur *Vellore
Karnataka	▪ Bengaluru *Mangaluru ▪ Belagavi *Shivamogga ▪ Hubbali-Dharwad *Tumakuru ▪ Davanagere
Kerala	▪ Thiruvananthapuram ▪ Kochi
Telangana	▪ Warangal Karimnagar *Thane ▪ Kalyan-Dombivali *Nashik ▪ Amravati *Solapur ▪ Nagpur *Pune ▪ Aurangabad
Uttar Pradesh	▪ Lucknow *Kanpur ▪ Prayagraj *Varanasi ▪ Gorakhpur *Raebareli ▪ Jhansi *Aligarh ▪ Saharanpur *Bareilly ▪ Agra *Rampur ▪ Moradabad *Meerut
Rajasthan	▪ Jaipur *Udaipur ▪ Ajmer *Kota
Punjab	▪ Ludhiana *Jalandhar *Amritsar
Bihar	▪ Patna *Muzaffarpur ▪ Bhagalpur *Biharsharif
Haryana	▪ Karnal *Faridabad
Assam	▪ Guwahati
Odisha	▪ Bhubaneshwar *Rourkela
Himachal Pradesh	▪ Dharamshala

Uttarakhand	▪ Dehradun
Jharkhand	▪ Ranchi
Sikkim	▪ Namchi
Manipur	▪ Imphal
Andaman and Nicobar Island	▪ Port Blair
Arunachal Pradesh	▪ Pasighat
Chandigarh	▪ Chandigarh
Chattisgarh	▪ Raipur ▪ Bilaspur ▪ Naya Raipur
Dadra and Nagar Haveli	▪ Silvassa
Daman and Diu	▪ Diu
Delhi	▪ New Delhi
Goa	▪ Panaji
Lakhshadweep	▪ Kavaratti
Meghalaya	▪ Shillong
Mizoram	▪ Aizawl
Nagaland	▪ Kohima
Puducherry	▪ Oulgaret
Tripura	▪ Agartala
Jammu and Kashmir	▪ Jammu ▪ Srinagar

Abbreviations:

ABD- Area-based Development

AI- Artificial Intelligence

GDP -Gross Domestic Product GHG Greenhouse Gases GIS Geographic Information System

GoI- Government of India HRIDAY Heritage City Development and Augmentation Yojana

IT -Information Technology

KWh- Kilowatt Hour

ULB- Urban Local Body

UN-United Nations

 USD-United States Dollar

SCM-Smart Cities Mission

 SDG- Sustainable Development Goals

SOP-Standard Operating Procedure

SPV- Special purpose vehicle

SaaS- Software as a Service

SBM (U) -Swachh Bharat Mission (Urban)

MoHUA-Ministry of Housing and Urban Affairs