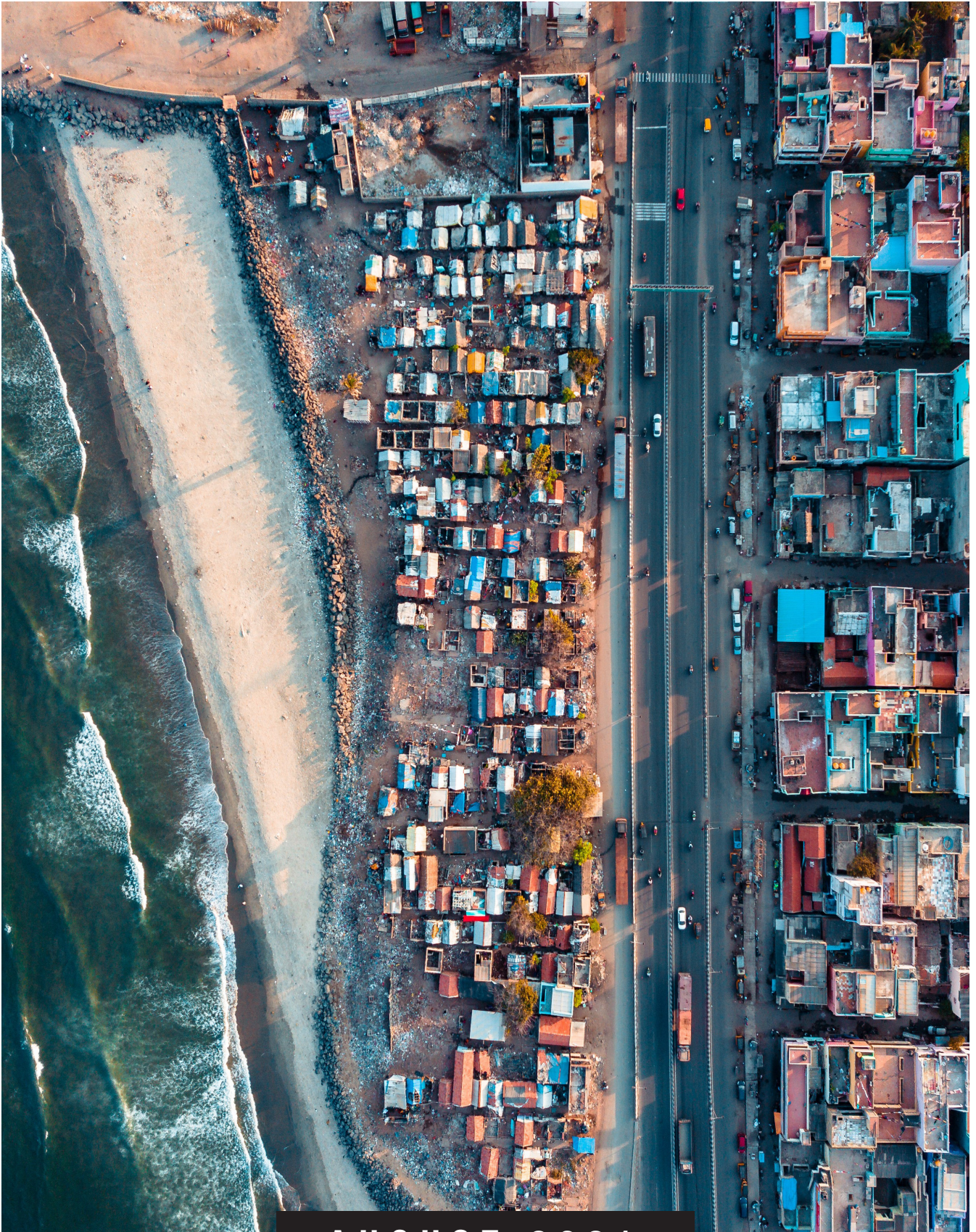


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India's Smart Cities Mission, 2015-2021: A Stocktaking

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Abstract

The Smart Cities Mission (SCM), launched in 2015, seeks to improve the quality of life in 100 cities and towns of India. Overall, its progress has been uneven, with many cities yet to achieve the desired levels of transformation.

This report evaluates the first five years of the Mission, and draws lessons from its successes and failures. It discusses the physical and financial status of the projects taken up so far, and identifies the most crucial challenges—administrative, financial, and technology-related—that impede progress.

Attribution: Rumi Aijaz, “India’s Smart Cities Mission, 2015-2021: A Stocktaking,” *ORF Special Report No. 155*, August 2021, Observer Research Foundation.

Introduction

The Smart Cities Mission (SCM), launched on 25 June 2015, is a joint effort of the Ministry of Housing and Urban Affairs (MoHUA), and all state and union territory (UT) governments. It initially aimed to be completed by 2019-20, but has since been extended.^a One hundred cities and towns in different states and UTs of India have been selected under the SCM—they are home to more than one-third of the country’s population (see Figure 1). The Mission aims “to drive economic growth and improve the quality of life of people by enabling local area development and harnessing technology, especially technology that leads to smart outcomes,”¹ and ensure that these cities are “liveable, inclusive, sustainable, (and) have thriving economies that offer multiple opportunities to people to pursue their diverse interests.”² In other words, according to MoHUA, “smart cities are cities that work for the people.”

The selection process began by identifying a large number of cities on the basis of the urban population of the state/UT, as well as the number of statutory towns in them. A two-stage competition was organised, first among cities in each state, and subsequently for the winners in each round, at the national level. Finally chosen were those which scored the highest on existing service levels, institutional capacities, self-financing, past track record and reforms, as well as on the quality of the smart city proposal they presented.

In the first round of the competition in January 2016, 20 cities were chosen; this was followed by another 13 in a fast-track round in May 2016. In September 2016, during the second round, 27 more cities were selected; in the third, in June 2017, another 30; in the fourth in January 2018, another nine. Meghalaya’s capital, Shillong, was included as the 100th city in June 2018.

^a No end-date has been specified by the government.

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



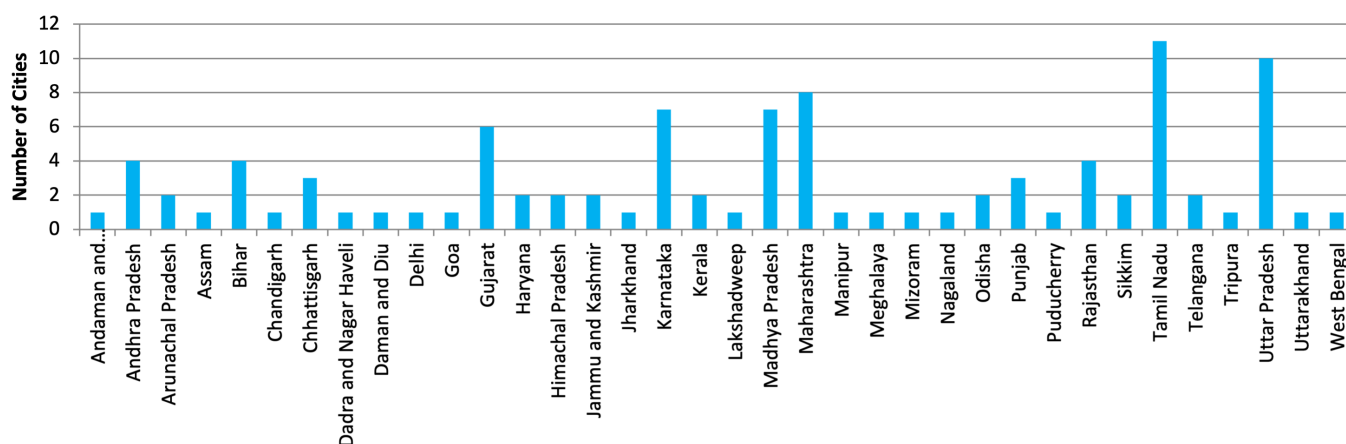
Source: Maps of India.³

Note: In the map, Shillong and Prayagraj have been added by the author.

The geographical distribution shows that a large number of chosen cities are from the following large states – Tamil Nadu, Uttar Pradesh, Maharashtra, Karnataka, Madhya Pradesh and Gujarat (see Figure 2). A fewer number (three or four) are from Punjab, Andhra Pradesh, Bihar and Rajasthan, while the remaining large states – Jharkhand, Haryana, Kerala, Odisha, and Telangana – have one or two.

The only other big state, West Bengal, has one such city – New Town, an extension of Kolkata. Its state government had initially withdrawn from the Mission, claiming it promotes inequitable development.⁴ In Maharashtra too, the opposition parties which run the municipal corporations of Mumbai and Navi Mumbai have opposed some of the conditions for the scheme, particularly the one related to constitution of Special Purpose Vehicles (SPVs), and turned down participation. They maintain the SPVs will dilute the municipal corporation’s powers.⁵

Figure 2:
Number of Cities Selected from Indian States/UTs



Source: Ministry of Housing and Urban Affairs.⁶

Only one or two cities have been selected from each of the hilly regions, the north-eastern states, and the UTs. The populations of the selected cities vary from as little as 11,201 (Kavaratti in the UT of Lakshadweep) to a maximum of 12.4 million (Delhi). The total population of the 100 chosen cities/towns, as per Census 2011, is about 130 million. Thus, approximately 35 percent of India’s urban population live in the selected cities.

The SCM will improve infrastructure and services (i.e. housing, water supply, sanitation, electricity supply, health, education, mobility, safety and security, IT connectivity and digitalisation), while maintaining a clean and sustainable environment, and strengthening urban governance. The development and application of ‘smart’ solutions to overcome various urban problems is the main feature that distinguishes the SCM from previous urban-reform initiatives.

Solutions are possible in many areas, such as making localities more pedestrian-friendly, which would reduce vehicle congestion, air pollution, or in preserving and developing open spaces—in turn reducing heat effects and promoting ecological balance. They can be used to promote transit-oriented development (TOD) where housing, jobs, and services are closely integrated with mass transit systems; they can make areas less vulnerable to disasters by providing early warnings; and they can support mixed land use, making such use more efficient. Smart solutions can also be used to expand housing opportunities, employ solar power for energy needs, ensure efficient street lighting, build energy-efficient green buildings, and make governance citizen-friendly, accountable, transparent, and cost effective.

Two kinds of development are proposed in the selected cities (see Figure 3).

Figure 3:
Smart Cities Mission Development Strategy



Source: Ministry of Housing and Urban Affairs.⁷

- a. *Area-based development*: This involves selecting areas of specified size for redevelopment, retrofitting, and greenfield development. The entire city is not selected. For example, the National Capital Territory (NCT) of Delhi has a total area of 1,483 sq km, of which only 2.2 sq km, which is administered by the New Delhi Municipal Council (NDMC) has been selected. In Chennai, the area of T. Nagar, spread over nearly seven sq km, has been chosen.

Redevelopment implies razing an existing built-up area and creating a new layout. Examples of this form of development are the Bhendi Bazaar redevelopment project in Mumbai, and the East Kidwai Nagar project in Delhi. Retrofitting, on the other hand, provides for upgrading an existing built-up area. In this model, existing structures remain intact.

For greenfield development, innovative planning, plan financing, and implementation tools are used to develop vacant areas around cities.

- b. *Pan-city development*: Here, smart solutions are applied over larger areas of the city to improve liveability. These could include setting up an intelligent traffic management system, which would reduce average commuting time as well as travel costs, or wastewater recycling and smart metering for better water management.

Both kinds of development call for planning, implementation, monitoring, and financing.

Planning: Cities and state governments were encouraged by MoHUA to submit ‘smart city’ proposals. It shortlisted leading consulting firms and handholding agencies (both foreign and domestic) which could provide them technical and financial advice. The city authorities took inputs from citizens and other stakeholders to prepare their proposals. Some foreign governments, including those of France, Germany, Japan, and the US, also gave technical advice.

Each smart city proposal submitted offers a city profile, and describes the city’s vision and goals, the model chosen for development and the plan to implement the proposal. It sets out proposed projects (such as providing electric vehicle charging facilities), the resources required, the implementing agencies, and likely completion date of the projects, along with a detailed financial plan.

Implementation: To implement their ‘smart city’ proposals, cities had to constitute a special purpose vehicle (SPV), headed by a full-time chief executive officer, and have nominees of the central, state and local governments on its board. The SPV can acquire the assistance of consulting firms, and appoint project management consultants (PMCs).

Monitoring: The Mission guidelines⁸ provide for the creation of a monitoring mechanism, and spell out the organisational responsibilities for monitoring:

- At the national level, an apex committee (AC) approves proposals, reviews activities, recommends mid-course corrections, and releases funds. A national mission director is the overall in-charge.
- In the states, a high powered steering committee (HPSC), headed by a state mission director, handles the Mission. It provides guidance and a platform for exchange of ideas.

- In the cities, in addition to the SPV, smart city advisory forums (SCAF) have been established to advise and enable collaboration among stakeholders. The forum is convened by the CEO of the SPV.

Financing: The central government and state/urban local governments share equal responsibility for mobilising funds. A total of INR 1,000 billion has been allocated for the 100 cities over the five-year period for which the Mission was initially planned. This works out to about INR 2 billion per city per year (see Table 1).

**Table 1:
Financing for the Smart Cities Mission
(2015-16 to 2019-20)**

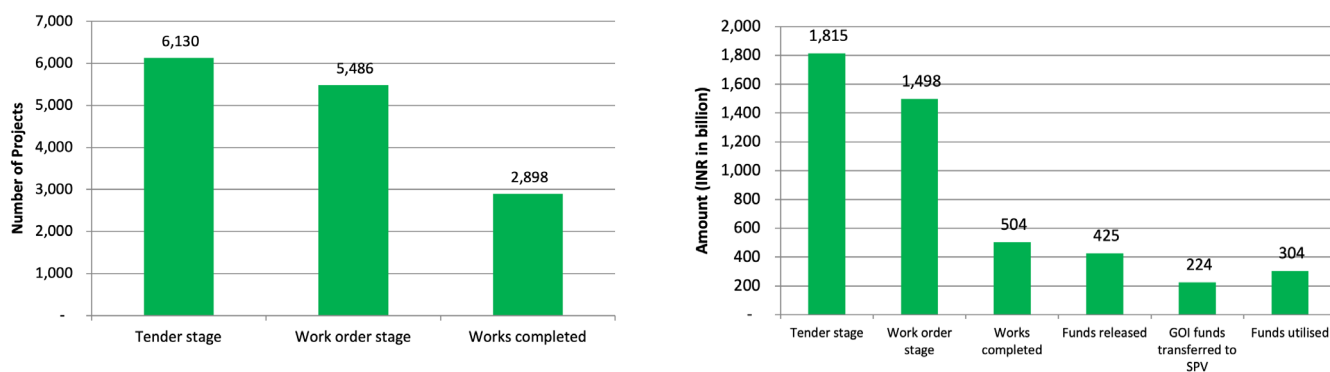
| Financial Item | Amount (in INR billion) |
|---|--------------------------|
| Total fund requirement (project costs) | 2,050.18 |
| Financial support by central government | 480.00 |
| Matching contribution by state/local government | 480.00 |
| Total funds to be mobilised by central and state/local government | 960.00 (47% of 2,050.18) |
| Funds to be mobilised by central and state/local government for each city per year (approx. INR 1,000 billion ÷ 100 cities ÷ 5 years) | 2.00 |
| Balance funds to be mobilised from other sources | 1,090.18 |

Source: Ministry of Housing and Urban Affairs.⁹

Current Status of the Mission

National level: 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 (see Figure 4).

Figure 4:
Physical and Financial Progress of All SCM Projects

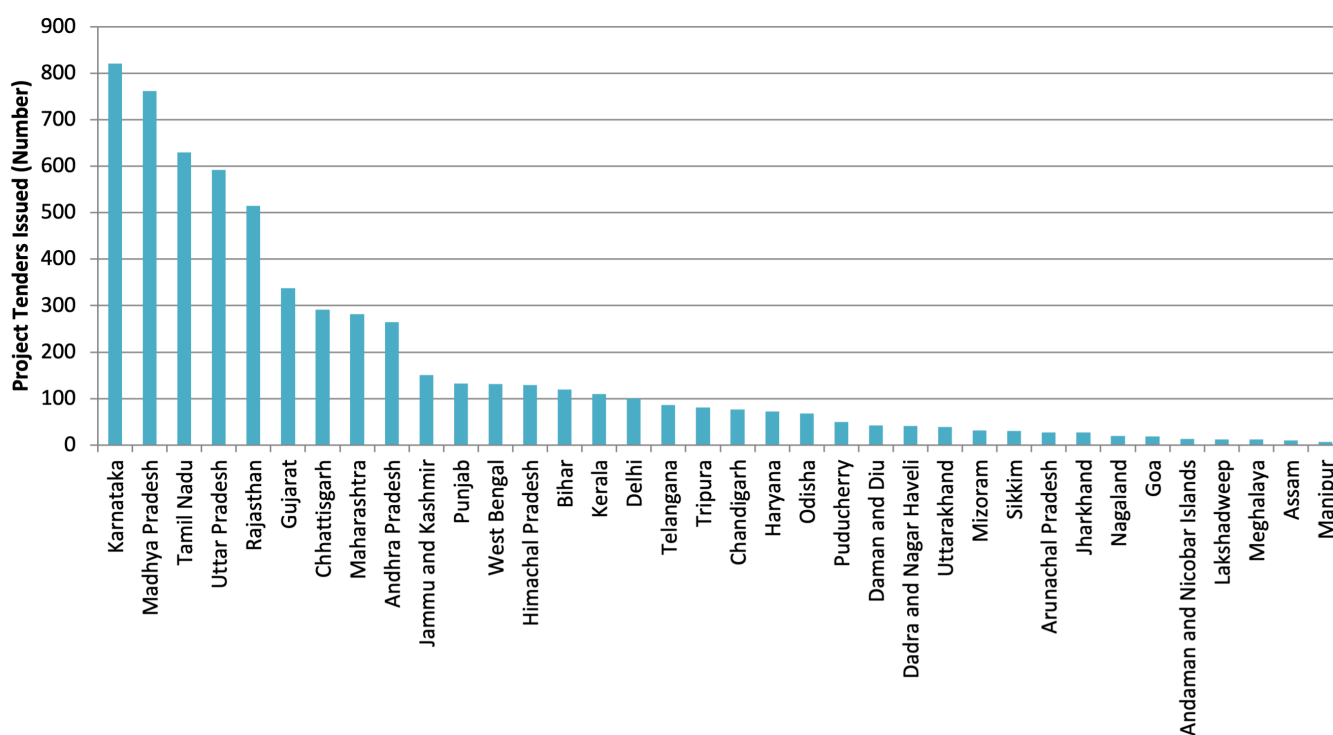


Source: Ministry of Housing and Urban Affairs.¹⁰
Note: Based on data up to 28 July 2021.

Of the total amount for which tenders have been issued, about 23 percent of funds have been released, the share of the centre and state/local governments being 13 and 10 percent, respectively. This is fairly low and needs to be increased. Of the total central government funds released, about 94 percent has been transferred to the SPVs. Of the total central and state/local government funds released, up to 71 percent has been utilised; the centre and state utilisation share being 48 percent and 23 percent, respectively.

State level: Large states have issued more tenders. Karnataka is at the top with a total of 821 project tenders issued, while Manipur, with just seven tenders, is at the bottom. Generally, the smaller states, northeastern states, and the UTs have issued fewer than 100 project tenders (see Figure 5).

Figure 5:
Projects under Tender

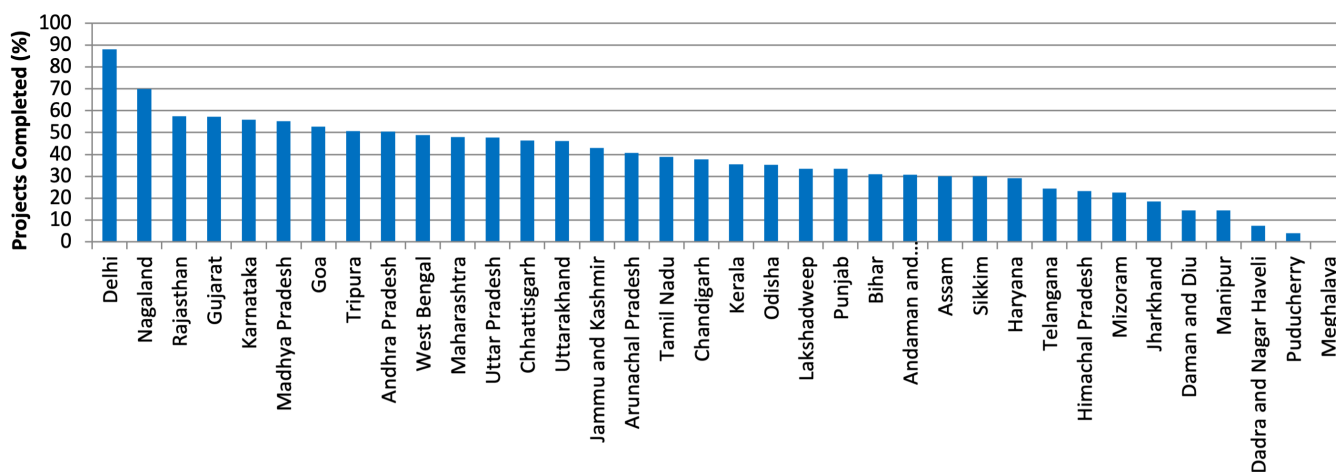


Source: Ministry of Housing and Urban Affairs.¹¹
Note: Based on data up to 28 July 2021.

Of the total number of tenders issued, Delhi and Nagaland have completed over 70 percent of their projects, while another seven states – Rajasthan, Gujarat, Karnataka, Madhya Pradesh,

Goa, Tripura, and Andhra Pradesh – have finished 50-60 percent. However, many other states/UTs are not performing well (see Figure 6). Meghalaya has not completed even a single project.

**Figure 6:
Projects Completed**

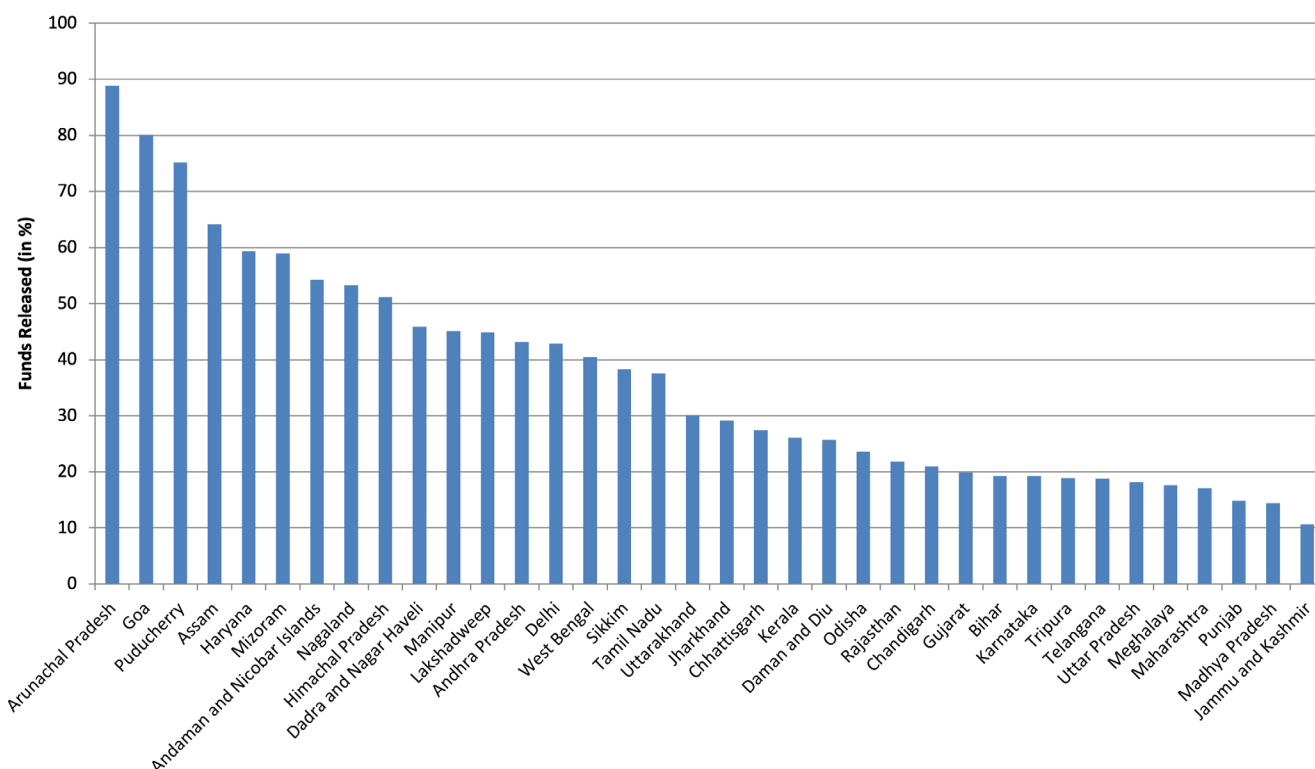


Source: Ministry of Housing and Urban Affairs.¹²
 Note: Based on data up to 28 July 2021.

Release of both central and state government funds to SPVs for the tenders issued so far has been above 80 percent in Arunachal Pradesh and Goa. These are followed by Puducherry,

Assam, Haryana, and Mizoram, for whose projects 58-75 percent of funds have been released. The releases are lowest (below 18 percent) in Jammu and Kashmir, Madhya Pradesh, Punjab, Maharashtra, and Meghalaya (see Figure 7).

**Figure 7:
Funds Released**



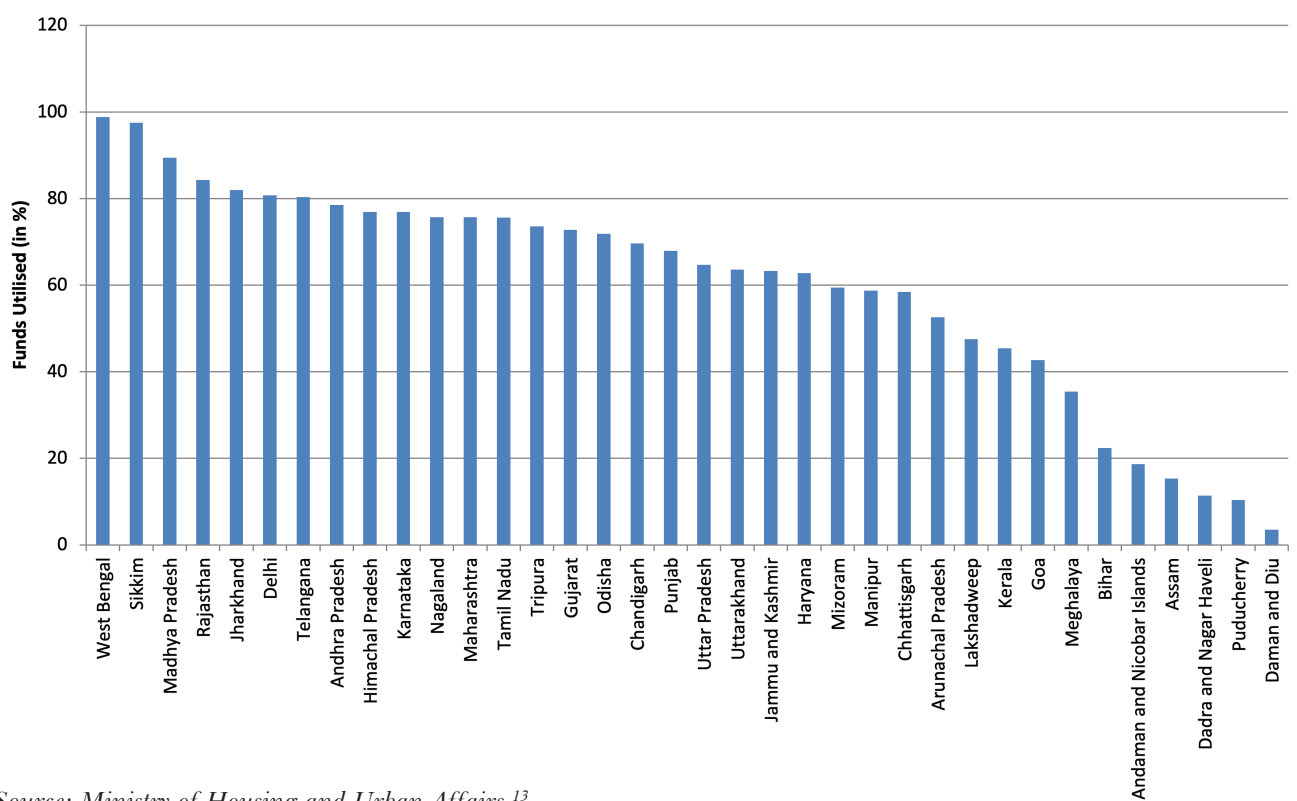
Source: Ministry of Housing and Urban Affairs.

Note: Based on data up to 28 July 2021.

Overall, the release of funds has been below expectations. Many states/UTs are unable to mobilise a counterpart share of funds. Dadra and Nagar Haveli, Assam, Haryana, and Goa are slightly better than the worst performers in this regard (between 29 and 33 percent). At the bottom are several northeastern states, along with the erstwhile Jammu and Kashmir, Lakshadweep, and Telangana.

As for utilisation of funds, 26 states/UTs have used over 50 percent of the funds released. West Bengal and Sikkim have performed the best with over 90 percent utilisation. Lowest utilisation rates are observed in Daman and Diu, Dadra and Nagar Haveli, Puducherry, and Assam (see Figure 8).

Figure 8:
Funds Utilised

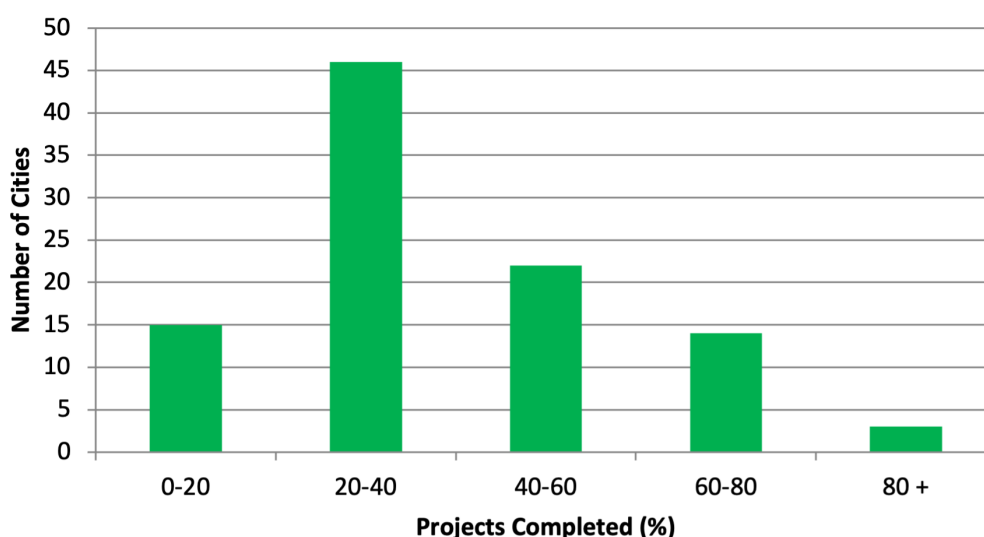


Source: Ministry of Housing and Urban Affairs.¹³
Note: Based on data up to 28 July 2021.

City level: The highest number of project tenders has been issued in Indore (277), followed by Belagavi (219) and Raipur (217). Itanagar and Imphal have issued less than 10 tenders.

In New Delhi, Chennai, and Indore, over 80 percent of projects have been completed. In Amaravati, Bhagalpur, Muzaffarpur and Shillong, not a single project has been finished. Cities in Dadra and Nagar Haveli, Puducherry, Bihar and Meghalaya are trailing. In 61 cities, project completion is below 40 percent (see Figure 9).

**Figure 9:
Projects Completed in Cities**



Source: Ministry of Housing and Urban Affairs.¹⁴
Note: Based on data up to 28 July 2021.

The proportion of central government funds released, to total tendered amount, is over 87 percent for Dharamshala, followed by Itanagar, Pasighat, Namchi, and Panaji. In the remaining cities, this proportion is less than 50 percent. In Bareilly, Biharsharif, Thane, and Bilaspur, it is below 5 percent. This share urgently needs to be increased.

In 64 cities, all funds released by the Centre have been transferred to the SPVs. In the remaining 36 cities, this share is between 40 and 99 percent. Release of central government funds has been the least (below 50 percent) in Aizawl, Amritsar, and Jalandhar.

The state governments for all 100 cities are lagging in raising their counterpart funds for the projects—the rate is less than 45 percent so far for all cities. Faridabad and Chennai have received the highest share from their state governments, between 40 and 45 percent. Cities with the lowest share are Srinagar, Kavaratti, and Gangtok. For Karimnagar and Warangal, available data shows that the Telangana government has not released any amount at all. The state government’s share too needs to quickly increase if the SCM is to succeed.

The cities of Rajkot, Indore, Ujjain and Bhopal are at the forefront of utilising the funds they received. Besides these four, there are

seven more cities where utilisation has been over 90 percent. In 23 cities, it has been less than 50 percent, the lowest (below 10 percent) in Bhagalpur and Diu.

A ranking of the top and bottom five cities based on different criteria is provided in Tables 2 and 3.

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 (see Table 2). Other states/UTs that have done well are Delhi, Haryana, Chhattisgarh, Dadra and Nagar Haveli, and West Bengal.

**Table 2:
Physical and Financial Status of Top Five Cities**

| Rank | Highest number of project tenders issued | Highest percentage of projects completed | Received highest percentage of allocated Central funds | Transferred 100 percent of Central funds to SPV | Received highest percentage of matching funds from respective state govt | Highest utilisation of funds by percentage |
|------|--|--|--|---|--|--|
| 1 | Indore | New Delhi | Dharamshala | | Faridabad | Rajkot |
| 2 | Belagavi | Chennai | Itanagar | | Chennai | Indore |
| 3 | Raipur | Indore | Pasighat | 64 cities | Atal Nagar | Ujjain |
| 4 | Tumakuru | Surat | Namchi | | Coimbatore | Bhopal |
| 5 | Ajmer | Coimbatore | Panaji | | Silvassa | NT Kolkata |

Source: Ministry of Housing and Urban Affairs.¹⁵
Note: Based on data up to 28 July 2021; NT: New Town.

States/UTs where significant improvements are required include Bihar, Punjab, Telangana, Puducherry, Meghalaya, Goa, Mizoram, Jammu and Kashmir, Sikkim, Assam, Lakshadweep, Dadra and Nagar Haveli, Daman and Diu (see Table 3). Bhagalpur, Muzaffarpur and

Biharsharif in Bihar, Amritsar and Jalandhar in Punjab, and Karimnagar and Warangal in Telangana figure prominently among the bottom five cities on different criteria.

Table 3:
Physical and Financial Status of Bottom Five Cities

| Rank | Lowest in number of project tenders issued | Lowest percentage of projects completed | Lowest percentage release of allocated Central funds | Lowest transfer of funds to SPVs (40-60 percent) | Received lowest percentage of matching funds from concerned state govt | Lowest percentage of funds utilised |
|------|--|---|--|--|--|-------------------------------------|
| 96 | Bhagalpur | Puducherry | Nagpur | Panaji | Srinagar | Saharanpur |
| 97 | Nagpur | Amaravati | Bareilly | Satna | Kavaratti | Guwahati |
| 98 | Guwahati | Bhagalpur | Biharsharif | Aizawl | Gangtok | Puducherry |
| 99 | Itanagar | Muzaffarpur | Thane | Amritsar | Karimnagar | Bhagalpur |
| 100 | Imphal | Shillong | Bilaspur | Jalandhar | Warangal | Diu |

Source: Ministry of Housing and Urban Affairs.¹⁶

Note: Based on data up to 28 July 2021.

Project Implementation: Wide Range, Mixed Results

The smart city projects have been varied. Some examples:

- On June 18, 2020, MoHUA issued an advisory directing SPVs to prioritise projects that help build resilience against COVID-19.¹⁷ In response, Dehradun has set up a unit for COVID-19 care under the SCM, and a 400-bed facility at Doon Medical College.¹⁸ Jammu launched an e-pass system for emergency movement during the lockdown and a COVID-19 control room.¹⁹ Kalyan-Dombivali converted the MIDC Savlaram sports complex into a 185-bed intensive care facility.²⁰ Srinagar launched six mobile apps, and set up a COVID-19 call centre.²¹ Thane created a digital platform (named DigiThane) to provide information on hotspots and containment areas, medical and testing facilities.²² The Tumakuru Integrated Command and Control Centre (ICCC) is coordinating COVID-19 control.²³ Bengaluru was one of the first cities to set up a COVID-19 room that provided free telemedicine facility even before the lockdown was announced.²⁴

- Agra has started four micro skill development centres to offer training in traditional skills, *zardosi* (gold embroidery), and stone inlay. It is linking 104 women self-help groups (SHGs) to the skill centres for capacity building and other livelihood interventions.²⁵ It is also developing street vending zones, and upgrading housing areas for poor families.
- 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.²⁶
- Thiruvananthapuram has set up three smart anganwadis, with renovated buildings, upgraded activity areas, and CCTV surveillance.²⁷ It has installed Automotive Industry Standard (AIS) compliant GPS systems in 15 e-autos and 15 e-rickshaws, which have been given to women drivers from the below poverty line (BPL) category.²⁸

- Coimbatore is restoring eight lakes, developing the lakefront, providing open air recreation, food kiosks, open plazas, cycle tracks, fountains, and building an amphitheatre.²⁹ 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.³⁰
- Kavaratti has installed a rainwater harvesting system.³¹ Its solid waste management system has been reformed – bio-degradable waste is buried to produce manure, recyclable waste is processed, while the remaining waste is incinerated.³²
- 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.³³
- Mangaluru has started six roof-top solar power projects on government buildings with an installed capacity of 393 KW.³⁴ 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.³⁵
- Greater Warangal is creating cycling and walking facilities along 40 km of road.³⁶ Newtown, Kolkata too has laid a graded barrier-free three km cycle track.³⁷ Surat has begun a chartered bicycle project, setting up 42 bike stations with 1,160 bicycles. So far, 61,000 persons have registered to use this facility.³⁸
- 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.³⁹ Solapur is redeveloping a sports stadium.⁴⁰

- 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.⁴¹
- 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.⁴²

Overall, cities included in the Mission are working towards data-driven governance. So far, 70 of them have established Integrated Command and Control Centres (ICCC) to monitor the environment/traffic/water logging/law-and-order situation, which facilitates decision-making and daily operations. The centres are collaborating with concerned government departments dealing with COVID-19 response and helping to manage the crisis. Services offered include dedicated lines for handling hospital bed requests, monitoring COVID-19 hotspots, oxygen capacity, availability of hospital beds, number of patients in ICU, and ambulance services.

“Of the cities included in the Mission, 70 have established Integrated Command and Control Centres to monitor the environment/traffic/water logging/law-and-order situation, which facilitates decision-making and daily operations.”

Government Initiatives to Support the SCM

The MoHUA has initiated a number of programmes to enhance the SCM's impact. The following paragraphs describe some of them.

- Digital infrastructure and tools to ensure data availability and skill building are being created under a National Urban Digital Mission (NUDM) launched on 23 February 2021. Examples include India Urban Data Exchange (IUDX), which is an open-source platform that will provide data on numerous urban indicators. Smart Cities Open Data Portal is another example, being created to develop products and build solutions. A third example is SmartCode, which will serve the software development demand of cities, providing data and solutions for various urban problems.
- Capacity-building is being promoted through the National Urban Learning Platform (NULP). It conducts virtual training programmes to build leadership qualities and facilitate partnerships. It enrolls knowledge creators, consolidates skills, and makes these available to stakeholders.
- An Ease of Living Index (EoLI) 2020 has been computed for 111 cities to keep city governments informed of the well-being of citizens. It shows the gaps in urban policies, planning and implementation initiatives, and offers an opportunity to plug them. Bengaluru and Shimla have been ranked at the top in their respective population categories (i.e. above and below one million) in this regard, whereas Srinagar and Muzaffarpur are at the bottom.⁴³

- A Municipal Performance Index (MPI) 2020 has also been calculated for the 111 cities. This describes the quality of urban governance (the performance of municipalities). Indore's and New Delhi's municipal councils have been ranked best in their respective population categories (i.e. above and below one million), while Guwahati and Shillong received the lowest rankings.⁴⁴
- An India Smart Cities Awards Contest (ISAC) has been organised every year since 2018 to recognise the best performing cities.⁴⁵ A special award was also instituted at the third edition of the contest in 2020 to recognise the most innovative responses to the COVID-19 crisis. The winners of this prize, announced at the fourth edition on 25 June 2021 were Chennai (Round 1), Kalyan-Dombivali and Varanasi (Round 2), Bengaluru (Round 3) and Saharanpur (Round 4).^b
- Over 10,000 internships have been offered under The Urban Learning Internship Programme (TULIP), launched on 4 June 2020,⁴⁶ which offers experiential learning opportunities to fresh graduates.

“An Ease of Living Index (EoLI) 2020 has been computed for 111 cities to keep city governments informed of the well-being of citizens.”

b At the 2021 edition of the awards, Uttar Pradesh was adjudged the best performing state and Chandigarh the best performing union territory. The city of Indore (Madhya Pradesh) won four awards – for built environment, culture, economy, and innovation. Tirupati (Andhra Pradesh) got two awards, in ‘social aspects’ and sanitation, Vadodara (Gujarat) for governance, Bhopal (Madhya Pradesh) for best urban environment, Aurangabad (Maharashtra) for best mobility, Dehradun (Uttarakhand) for smart water management, Agartala (Tripura) for its sustainable business model and Ahmedabad (Gujarat) for leadership.

Key Challenges

The slow progress in implementing the Smart Cities Mission is a matter of concern. Overall, less than 50 percent of the projects had been completed at the end of the Mission's six-year period.

Management: The SPVs are not functioning well. In Panaji, for example, which was among the cities selected during the fast track round in May 2016, the SPV functioned without a Board for over a year. Four Board positions still remain vacant. There have been several audit violations, including failure to file statutory returns during 2016-17 and 2017-18.⁴⁷

Inadequate understanding of data, and how to analyse it to provide effective solutions has also created difficulties. But MoHUA, in collaboration with Tata trusts, has begun conducting training programmes for city data officers.⁴⁸

A Ludhiana Smart City Company Ltd (LSCL) director has publicly expressed dissatisfaction over execution of projects, maintaining problems have arisen due to lack of coordination among multiple government departments.⁴⁹

Finance: An analysis of the financial data reveals that the Centre, as well as most state and local governments, are finding it difficult to mobilise funds, transfer them to SPVs, and use them efficiently.

For Srinagar, for instance, the Centre released INR 1.27 billion. However, the state/local government has released only INR 200 million.

A former Faridabad Smart City Ltd (FSCL) CEO admitted that arranging funds and monetising land have been major hindrances,⁵⁰ noting too that the financial condition of the Faridabad Municipal Corporation was not strong. Of the total 23 projects tendered in Faridabad, only six have been completed.

Similarly, Imagine Panaji Smart City Development Ltd (IPSCDL) has been affected by delays in release of funds by the Goa government. The centre released INR 1.96 billion for Panaji's development, but the state government has only transferred INR 1.18 billion to IPSCDL. There have also been irregularities in the transfer of the state's matching grant to IPSCDL.⁵¹

Technology: Smart cities rely on sensors and network-connected devices and systems that generate large volumes of data, which are vulnerable to hacking by cyber criminals who can steal confidential data, shut down access to essential resources, and gain illegal access to security cameras.⁵² The data needs to be adequately protected.

While this has not happened in India yet, in Oldsmar, Florida, in February 2021, such hacking had serious consequences. “The intruder boosted the level of sodium hydroxide (used to control acid levels and remove metals from drinking water) in the water supply to 100 times higher than normal.”⁵³ Consuming excessive sodium hydroxide can cause serious health problems, including bleeding, vomiting, pain, and burns. However, in Florida’s case, efficient monitoring helped to restore the system to normal.

“The Centre, as well as most state and local governments, are finding it difficult to mobilise funds for the Smart Cities Mission.”

Conclusion

There has indeed been progress on a wide variety of smart projects in the 100 cities and towns chosen under the Smart Cities Mission. The completed projects are providing social and economic benefits, especially to the marginalised sections of the populations of these cities. However, the study also shows that several cities are lagging in project implementation. No doubt the COVID-19 pandemic has impeded progress, but there are also various administrative and financial reasons for the underperformance.

In some cities, the SPVs set up to implement the Mission are not functioning well due to inadequate managerial, technical, and financial capabilities. Deficiencies were observed in data handling and its analysis, levels of digitalisation, fund mobilisation, release, and utilisation.

This report makes the following recommendations:

- The SCM should be a long-term programme, not restricted to five or six years as currently envisioned. Indian cities are at a low level of development, and given the quality of governance, and the social and economic problems facing these towns and cities, any transformation will take a long time. Critics of the SCM's performance so far should realise that rapid change is impossible when local governments are financially strapped and large sections of society are poor. But governments too should refrain from making unrealistic promises.
- More projects should be identified to meet city requirements. During the current monsoon season in 2021, it has been seen that drainage systems in many of the selected smart cities have still not ensured proper management of rainwater.
- Training programmes should be organised to build managerial and financial capacities of the staff employed by the SPVs and urban local bodies. Training needs must be properly identified. SPVs should be supported with adequate funds, trained personnel, and proper equipment.
- Empirical studies should be undertaken of the SPVs in cities that lag behind in implementation to find out why. Available data shows that, for instance, not a single project in Amaravati, Bhagalpur, Muzaffarpur and Shillong, has been completed.

- The Centre, and more so state governments and urban local bodies, should make a greater effort to mobilise funds. More revenue needs to be generated through efficient taxation, and alternate sources of financing found. The potential of municipal lending needs to be tapped. In the US, for example, the North Cascades Bank provides finance (from simple terms loans to complex borrowing solutions) to local governments across the state of Washington to finance capital projects and equipment.⁵⁴ Similarly, Ameris Bank offers financial support to many US cities, towns, and counties.⁵⁵
- The process of fund transfer from the Centre to state governments/urban bodies to SPVs should be made easier.
- Greater efforts should be made to maintain infrastructure assets created under the Mission.
- The role of the Integrated Command and Control Centres in cities should be expanded. In cities such as Moscow, such centres are effectively providing a variety of services, including traffic management, health, and security services.⁵⁶
- Smart cities should be made cyber secure by ensuring data security and encryption.

“Empirical studies should be undertaken to find out why cities are lagging in implementation of their Smart City projects.”

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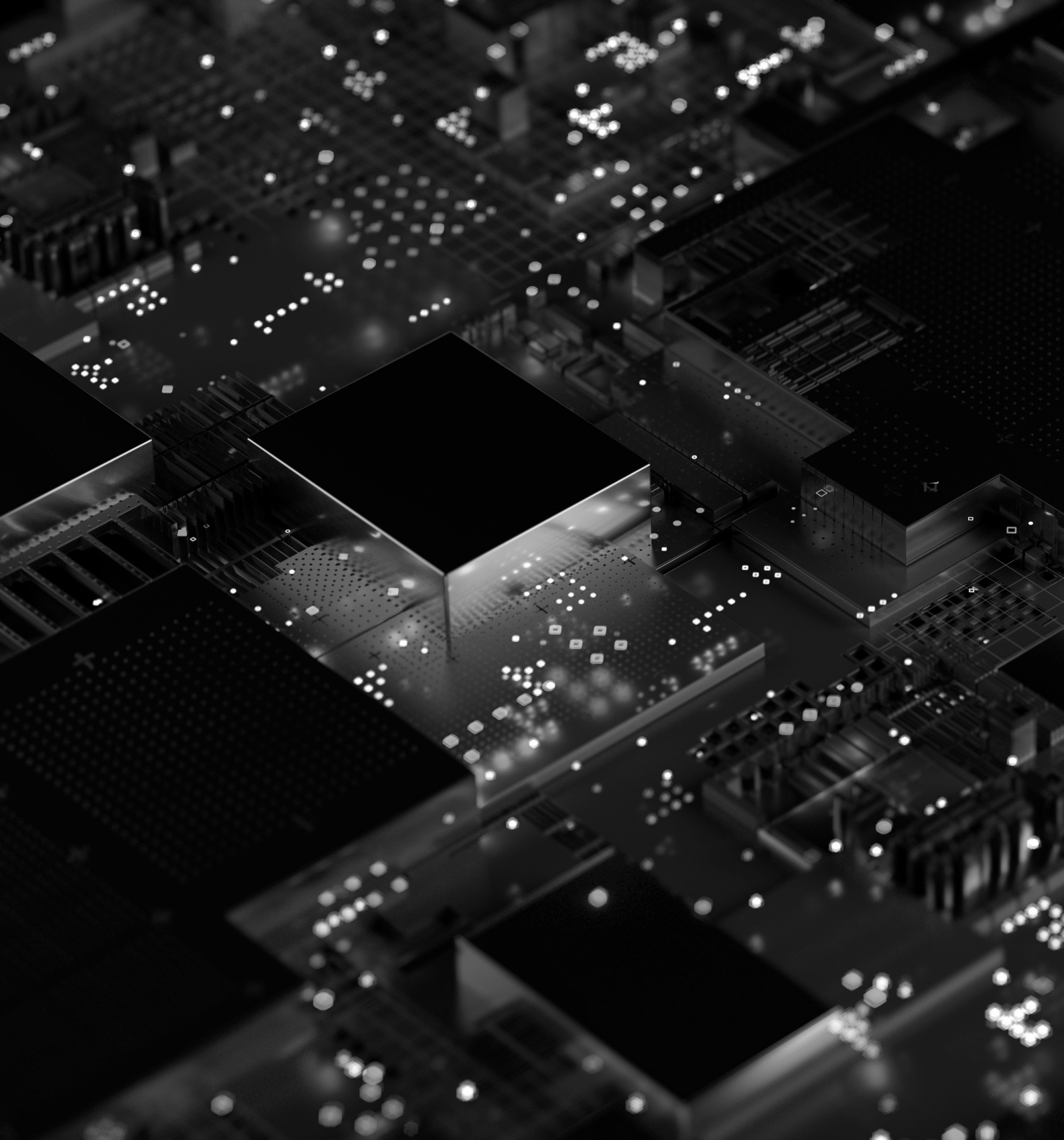
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