

# **SBI** Research

Smart Cities Mission to soon complete a decade.. Rs 1.64 trillion worth of projects completed across 100 cities with Mobility & Potable Water / Sanitation spearheading the movement... Near Universal Urban Transformation, Significant reduction in Crime Rates & Visible improvement in Air Quality signal transformative Urban infrastructure in the making

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#### **Executive Summary....**



- Alleged backlashes in recent period questioning the efficacy of Smart Cities Mission prompted us to do a threadbare analysis imploring the transformative changes ushered in through a decade of collaborative policy making
- Smart Cities Mission / SCM that was launched by the Hon'ble Prime Minister on 25 June 2015 across 100 cities, is going to complete a decade soon. The main objective of the Mission is to promote cities to provide core infrastructure, clean and sustainable environment and offer a decent quality of life to their citizens through the application of 'smart solutions'
- More than 8,000 multi-sectoral projects are being developed by these 100 cities, amounting to approximately Rs1.64 lakh crore. More than 90% of the total projects (7,504 projects amounting to Rs1.50 lakh crore) completed
  - Of the total Rs 1.64 lakh crore amount that was spent on 100 cities so far, 92% of the amount spend in 21 major states only with top 3 states (UP, TN and Maharashtra in that order) accounted for one-third of the total amount
  - Almost 50% of total project cost is spent on two heads only (Mobility, Water/sanitation) spanning more than 3,000 projects. Overall, on an average Rs 22 crore spent on each project
- Impact Analysis of SCM show significant transformation
  - Normalized entropy score of 0.96 (maximum score=1) indicates near universal equity in the distribution of the average monetary value of completed projects across states
  - Higher utilization of funds in states with >80% utilization result in lowering crime rates by 27%
  - Smart cities have witnessed a significant 23% improvement in air quality over non-smart cities for the 6-year period ended 2024



# Smart Cities Mission Progress So Far....

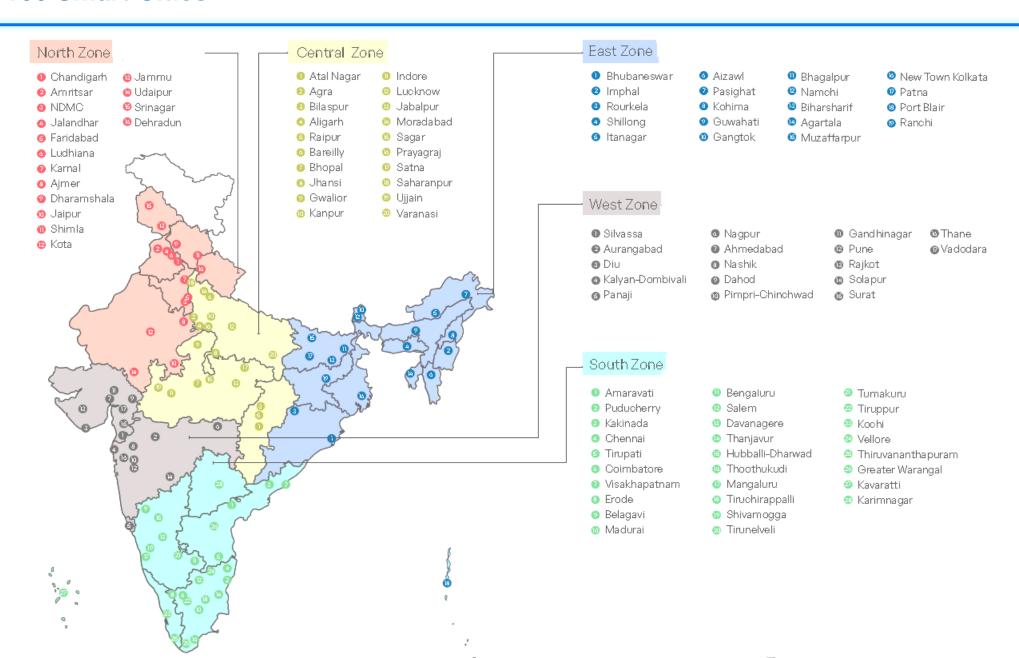
#### **Smart Cities Mission**



- □ Smart Cities Mission was launched by the Hon'ble Prime Minister on 25 June 2015
- □ 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 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 focus is on sustainable and inclusive development by creation of replicable models which act as lighthouses to other aspiring cities
- The Mission is operated as a Centrally Sponsored Scheme. Central Government gives financial support to the extent of Rs 48,000 crores over 5 years i.e. on an average Rs 100 crore per city per year. An equal amount on a matching basis is to be provided by the State/ULB
- Additional resources are to be raised through convergence, from ULBs' own funds, grants under Finance Commission, innovative finance mechanisms such as Municipal Bonds, other government programs and borrowings

#### **List of 100 Smart Cities**

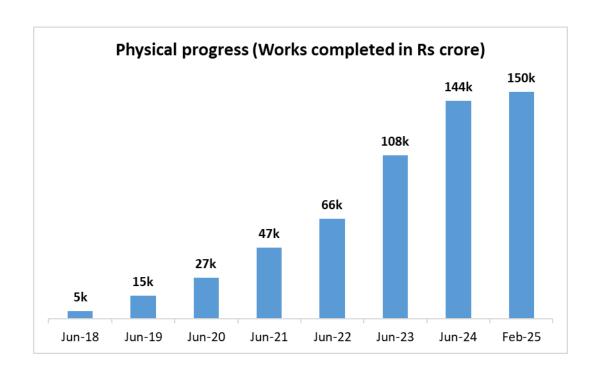


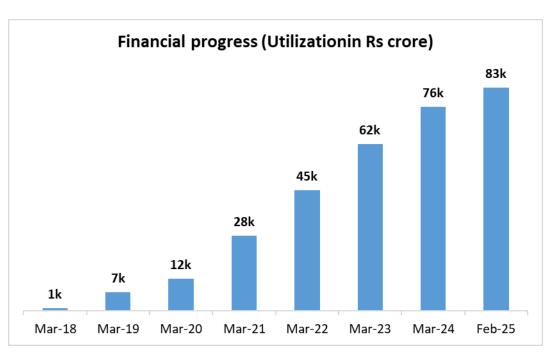


## **Smart Cities Mission: Physical & Financial Progress**



- More than 8,000 multi-sectoral projects are being developed by these 100 cities, amounting to approximately Rs 1.64 lakh crore. More than 90% of the total projects (7,504 projects amounting to Rs 1.50 lakh crore) undertaken under the Smart Cities Mission have been completed
- Each city has developed a diverse set of projects, many of which are unique and being implemented for the first time, thus enhancing the cities' capabilities and experience and achieving broader transformational goals at the city level





#### **State-wise Status**



Of the total Rs 1.64 lakh crore amount that was spent on 100 cities so far, 92% of the amount spend in 21 major states with top 3 states (UP, TN and Maharashtra in that order) accounted for one-third of the total amount

State-wise Project Status (Amount in Rs crore)							
Major States	Number of	Total P	rojects	Completed		Ongoing	
Major States	Smart Cities	Number	Amount	Number	Amount	Number	Amount
Andhra Pradesh	4	280	6589	235	5661	45	928
Assam	1	21	755	19	722	2	32
Bihar	4	152	5349	126	4211	26	1138
Chhattisgarh	3	520	4443	494	4009	26	435
Gujarat	6	354	11451	345	11019	9	432
Haryana	2	164	2079	141	1700	23	379
Himachal Pradesh	2	291	1552	265	1206	26	346
Jammu	2	288	6597	265	6166	23	430
Jharkhand	1	26	1847	26	1847	1	-
Karnataka	7	917	13808	891	13393	26	415
Kerala	2	177	3003	153	2571	24	432
Madhya Pradesh	7	788	15070	758	14410	30	661
Maharashtra	8	348	17044	324	15146	24	1898
Odisha	2	107	3589	104	3427	3	162
Punjab	3	205	4450	179	3969	26	481
Rajasthan	4	579	8640	566	8368	13	272
Tamil Nadu	11	730	17954	717	17626	13	328
Telangana	2	169	2918	108	2249	61	669
Uttar Pradesh	10	891	21145	868	20423	23	722
Uttarakhand	1	33	1144	32	939	1	204
West Bengal	1	226	1604	220	987	6	618
21 Major States	83	7266	151031	6836	140049	430	10982
Other States & UTs	17	797	13513	668	10258	129	3257
Grand Total	100	8063	164544	7504	150307	559	14239

Source: SBI Research

#### **Snapshot of Beachhead Projects**



- □ Almost 50% of total project cost is spend on two heads only (Mobility, Water/Sanitation) spanning more than 3000 projects
- □ Overall, on an average, Rs 22 crore has been spent on each project

Beachhead project progress					
Sector	Completed			Work in progress	
Sector	Projects	Rs cr	% Share	Projects	Rs cr
ICCC	100	11,775	7%	-	1
Smart Mobility	1,582	37,362	22%	159	4,296
Smart Energy	676	13,864	8%	18	387
WASH	1,440	46,730	27%	106	3,005
PPP	195	9,193	5%	3	26
Vibrant Public Spaces	1,314	10344	6%	95	2,005
Economic Infrastructure	839	11,088	6%	93	1867
Social Infrastructure	848	12073	7%	50	1,110
Smart Governance	644	16,262	10%	41	1400
Environment	147	2,433	1%	4	274
I					

Source: SBI Research; Integrated Command and Control Centres (ICCC); WASH: Water, Sanitation and Hygiene

## **Top 25 Cities: Project-wise/Amount-wise**



Top 25	Smart Cities: Based	on Numb	er of Proje	ects
City	State	Projects	Amount	Cost per
City	State	Projects	(Rs cr)	project (Rs c
Raipur	Chhattisgarh	342	1,734	5.1
Indore	Madhya Pradesh	232	3,759	16.2
New Town Kolkata	West Bengal	226	1,604	7.1
Belagavi	Karnataka	217	2,780	12.8
Tumakuru	Karnataka	217	2,099	9.7
Shimla	Himachal Pradesh	211	896	4.2
Ajmer	Rajasthan	179	2,224	12.4
Jaipur	Rajasthan	170	2,545	15.0
Srinagar	Jammu	161	3,627	22.5
Prayagraj	Uttar Pradesh	144	2,326	16.2
Udaipur	Rajasthan	143	1,717	12.0
Jabalpur	Madhya Pradesh	130	2,197	16.9
NDMC	Delhi	129	1,034	8.0
Davanagere	Karnataka	128	1,976	15.4
Jammu	Jammu	127	2,969	23.4
Bilaspur	Chhattisgarh	126	1,765	14.0
Karnal	Haryana	120	1,150	9.6
Greater Warangal	Telangana	119	1,800	15.1
Varanasi	Uttar Pradesh	117	3,342	28.6
Saharanpur	Uttar Pradesh	115	1,287	11.2
Salem	Tamil Nadu	114	1,861	16.3
Shivamogga	Karnataka	112	1,381	12.3
Mangaluru	Karnataka	105	2,573	24.5
Tirupati	Andhra Pradesh	104	2,083	20.0
Thanjavur	Tamil Nadu	103	996	9.7
Тор	25	3891	51725	13.3
Top 25	Share	48%	31%	-
Source: SBI Research				

So far, Raipur has accomplished maximum number of projects followed by Indore

Top 25 cities account for almost half of all projects

Amount-wise, Indore spent the highest amount followed by Srinagar

40% of total amount spent by Top 25 cities only

Top 25 Smart Cities: Based on Project Cost				
City	Ctoto	Projects (Rs cr) project (Rs		Cost per
City	State			project (Rs cr)
Indore	Madhya Pradesh	232	3,759	16.2
Srinagar	Jammu	161	3,627	22.5
Varanasi	Uttar Pradesh	117	3,342	28.6
Pune	Maharashtra	55	3,333	60.6
Nashik	Maharashtra	54	3,197	59.2
Kanpur	Uttar Pradesh	91	3,060	33.6
Jammu	Jammu	127	2,969	23.4
Aurangabad	Maharashtra	47	2,835	60.3
Tiruppur	Tamil Nadu	28	2,833	101.2
Bhopal	Madhya Pradesh	82	2,791	34.0
Belagavi	Karnataka	217	2,780	12.8
Chandigarh	Chandigarh	97	2,694	27.8
Ahmedabad	Gujarat	70	2,655	37.9
Surat	Gujarat	82	2,638	32.2
Mangaluru	Karnataka	105	2,573	24.5
Jaipur	Rajasthan	170	2,545	15.0
Agra	Uttar Pradesh	62	2,369	38.2
Prayagraj	Uttar Pradesh	144	2,326	16.2
Ajmer	Rajasthan	179	2,224	12.4
Jabalpur	Madhya Pradesh	130	2,197	16.9
Rajkot	Gujarat	71	2,184	30.8
Kota	Rajasthan	87	2,154	24.8
Lucknow	Uttar Pradesh	103	2,126	20.6
Tumakuru	Karnataka	217	2,099	9.7
Vellore	Tamil Nadu	53	2,096	39.5
	Гор 25	2781	67406	24.2
Тор	25 Share	34%	41%	-
Source: SBI Res	Source: SBI Research 9			

## **Core Infrastructure Elements under Smart Cities Mission**



Areas	Progress So Far (Latest Available)	
Alcas		
Public Safety and Security	Over 83,000 CCTV surveillance cameras have been installed in 100 Smart Cities, aiding in crime monitoring. Additionally, 1,884 emergency call boxes, 3,000 public address systems, and traffic enforcement systems for red light violations and automatic number plate recognition have been installed, enhancing public safety	
Water Supply	More than 9,900 kilometers of the water supply system are being monitored through SCADA, reducing non-revenue water and leakages	
Solid Waste Management	Over 50 cities are managing solid waste with increased technology use, improving route management, efficiency of collection, and daily management. Around 4,400 vehicles have been RFID-enabled for Automatic Vehicle Location (AVL) to digitize and improve solid waste management efficiency	
Streetlights	More than 52 lakh solar/LED streetlights have been installed, and over 86,000 kilometers of underground electricity cabling have been constructed	
Mobility	Over 4,700 kilometers of smart roads have been constructed or improved, and 712 kilometers of cycle tracks have been developed. 1,510+ Public transport Buses Procured in 25 cities	
Affordable Housing and Shelter	49,300 dwelling units have been constructed, along with 1,562 rooms in community housing projects such as Rain Basera, Hostels (noneducational), and night shelters under the Mission	
Vibrant Public Spaces	Over 1,300 parks, green spaces, and lakefront/riverfront promenades have been developed or are under development	
Education	9,433 smart classrooms and 41 digital libraries have been developed	
Health	172 e-health centers and clinics (without dedicated beds) have been developed, and 155 health ATMs also have been installed	
<b>Economic Hubs</b>	21 incubation centers/skill development centers have been developed, and over 56 market redevelopment projects have been completed	

### **Financing of Smart Cities Mission**



- The Smart Cities Mission in India is a centrally sponsored scheme. It also requires state governments and urban local bodies (ULBs) to contribute an equal amount for implementing projects under the Smart City Proposal (SCP). States are expected to seek funds for projects outlined in the Smart City Proposal from multiple sources including the following:
  - ✓ Using State/ULB's resources (from collection of user fees, beneficiary charges & impact fees, land monetization, debt, loans, etc.)
  - ✓ Deploying additional resources transferred due to acceptance of recommendations of the Fourteenth Finance Commission
  - ✓ Utilizing innovative finance mechanisms, such as municipal bonds with credit rating of ULBs, Pooled Finance Development Fund Scheme and Tax Increment Financing (TIF)
  - ✓ Leveraging borrowing from financial institutions including bilateral and multilateral institutions (both domestic and external sources)
  - ✓ Availing the National Investment and Infrastructure Fund (NIIF)

#### **Countries Supporting India's Smart Cities Mission**



- □ Leading economies worldwide have shown interest in India's smart city mission and are looking forward to participating in the development of smart cities:
  - ✓ **Spain** has proposed to cooperate with India to develop Delhi into smart citiy. The Barcelona Regional Agency of Spain has shown an interest in exchanging technology with India
  - ✓ **The United States** 'Trade and Development Agency (USTDA) has decided to develop Visakhapatnam (Andhra Pradesh), Allahabad (Uttar Pradesh) and Ajmer (Rajasthan) as smart cities
  - ✓ **Germany** has inked a deal with India to develop Bhubaneswar (Odisha), Kochi (Kerala) and Coimbatore (Tamil Nadu) as smart cities
  - ✓ Japan has decided to assist India with the development of Chennai, Ahmedabad, and Varanasi as smart cities.
  - ✓ **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).
  - ✓ **Singapore** has shown an interest in helping India's Smart City Mission and offered to help develop Amravati, the new capital of Andhra Pradesh, as a smart city
  - ✓ Sweden, Israel, the Netherlands, the UK, and Hong Kong have also shown interest in investing in India for developing smart cities
  - ✓ **Italy** has shown interest in the smart city concept and decided big ticket investment over the next 20 years through numerous initiatives. The Italian companies will contribute in terms of design and technology for the smart cities, with services ranging from consultancy to actual construction of the infrastructure
  - ✓ Twenty cities across three Indian states—Punjab, Haryana and Rajasthan—are likely to have a fast-track development under a **new Indo-Canadian initiative** to train smart city planners on capacity building and governance, reform implementation, and water supply and sewerage among others. The proposal aims at training at least 150 official urban planners and designers and building localised platforms and tools for efficient and predictable planning and execution of smart cities



# Smart Cities Mission Impact Assessment

Inclusive Urban Transformation, Significant decline in Crime Rates & Major Improvement in Air Quality



# Inclusive Urban Transformation

Shannon's normalized entropy score of 0.96 (maximum score=1) indicates near universal equity in the distribution of the average monetary value of completed projects across states

### A spatial Analysis of Inclusive Urban Transformation...(1/3)



- Objective: To evaluate the spatial equity in the monetary value of completed projects under the Smart Cities Mission (SCM) across Indian states to understand how uniformly project completions are distributed across states
- Rationale: SCM is an urban transformation programs, aiming to enhance the quality of urban life through targeted investments in infrastructure, technology, and governance reforms. However, while the Mission is centrally guided, its implementation is decentralized—entrusted to city-level Special Purpose Vehicles (SPVs) operating within the diverse fiscal and administrative ecosystems of the states
- The study uses a **normalized**, **equity-oriented approach** by focusing on the **average monetary value of completed projects per Smart City in each state**. This variable enables a **per-capita-like assessment** that adjusts for the number of selected cities, providing a more balanced lens to assess how effectively the benefits of the Mission have been distributed geographically.
- The study leverages **Shannon's Entropy**—a robust statistical measure from information theory often used to evaluate **diversity and evenness** in spatial analysis. When applied to the per-city value of completed projects across states, Shannon's entropy offers a concise indicator of whether the Smart Cities Mission has upheld the principle of **equitable development**

### A spatial Analysis of Inclusive Urban Transformation... (2/3)



- □ <u>Mathematical Formulation:</u>
- Shannon's Entropy value is given by

$$H = -\sum_{i=1}^{N} p_i \cdot ln(pi)$$

Where pi represents the proportional share of average project value per city in state i

To make it comparable across different states, the entropy value has been normalized

$$H_{norm} = \frac{H}{\ln(N)}$$

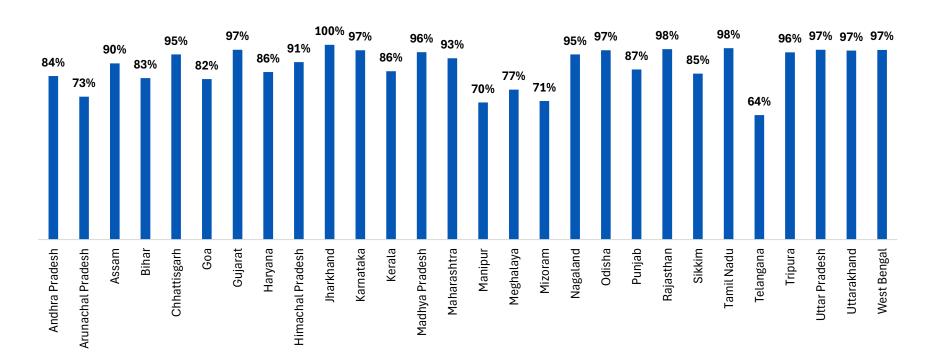
- The computed Shannon's normalized entropy score of 0.96 indicates spatial equity in the distribution of the average monetary value of completed SCM projects across states. This implies that the benefits of SCM in terms of project completion is evenly distributed
- This indicates that <u>laggard states such as Bihar and Chhattisgarh have also made significant progress under the Mission</u>. The Mission's outcome are not disproportionately skewed in favour of more urbanized states. This implies that SCMs design which includes centrally guided funding, city level SPV has effectively mitigated structural asymmetries to at least some extent and fostered urban inclusive growth

## A spatial Analysis of Inclusive Urban Transformation (3/3)



- ☐ The Smart Cities Mission appears to have successfully diffused capacity, allowing even lower-capacity states to implement projects effectively.
- ☐ This is further corroborated by the distribution of project completion rates across states which reveals that even states traditionally viewed as laggards- such as Bihar, Odisha, Chhattisgarh have achieved significant implementation progress. Furthermore, majority of the states have demonstrated substantial progress in the implementation of SCM. This points not just to financial allocation equity but also to implementation equity

#### Project Completion rates across states as on 4th Mar'2025





# Decline in Crime Rates

Higher utilization of funds in states with >80% utilization result in lowering crime rates by 27% (as% of overall crime rate) in such states

## Safer cities through smarter spending... A study of crime rates across states...(1/2)



- Objective: To estimate the impact of high utilization of Smart Cities Mission (SCM) funds on crime rates across Indian states, using a Difference-in-Differences (DiD) framework. We hypothesized that States with greater utilization rate of SCM funds (>80%) witnessed a larger reduction in crime rates compared to states with lower utilization, given the SCM utilization as of 2021
- □ <u>Context:</u> A large number of projects under the "Pan-city" and "Area-based Development" models focus on public safety and surveillance. We hypothesized that <u>States with high utilization (>80%) are more likely to have completed key safety-related projects</u>, such as Integrated Command and Control Centres, Intelligent traffic and surveillance systems, Real-time crime monitoring platforms etc. These investments are theorized to deter crime, improve emergency response times, and enhance urban surveillance
- DID helps in isolating the effect of the treatment from time related or group related confounding factors. It is sample agnostic implying it can estimate causal inferences with the treatment and control group being identical. DID approach used here is an intensity based DID where treatment intensity is defined as the level of SCM funds utilization used to identify the causal impact of effective implementation on crime outcomes

**Treatment group**: States with >80% cumulative utilization of Smart Cities funds as of 2021

**Control group**: States with ≤80% utilization of SCM funds

We have estimated ATET( Average treatment effect on the treated). ATET helps in capturing a more precise estimate of the impact SCM funds utilization on crime rate (Treatment group)

#### Safer cities through smarter spending... A study of crime rates across states...(2/2)



☐ The equation we used for our analysis is as follows:

$$Yit = \alpha + \beta Xi + \gamma Tt + DID + \varepsilon it$$

Y is crime rate
I represent states and t is time

T = Time Dummy = 
$$\begin{bmatrix} 1 \text{ for } 2022 \\ 0 \text{ for } 2020 \end{bmatrix}$$

$$DID = Xt*Tt$$

Difference in Difference Estimation: High vs Low utilization of SCM funds					
Crime Rate	Coefficient	p-value			
ATET	-116.97	0.104**			
** significant at 10%					

DID is the difference in difference estimate, the coefficient of which indicates ATET i.e., Average treatment effect on the treated ATET= E [ Y(1)- Y(0) | X =1

For the individuals belonging to Treatment Group and Control Group, it has been estimated that higher utilization of SCM

funds result in lowering crime rates by 117 per 100000 population as compared to states with lower utilization rates i.e. control group between 2020 and 2022. This translates to a 27% (as% of overall crime rate) reduction in crime rate in states with >80% utilization of SCM funds as compared to states with lower utilization



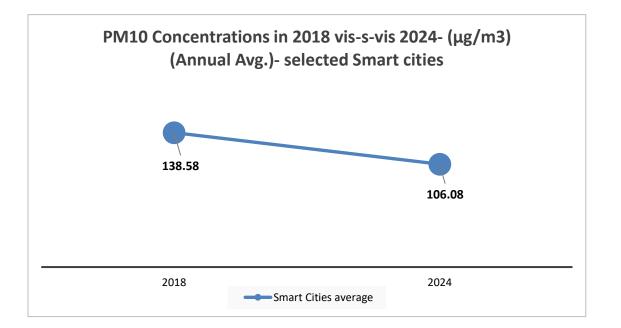
# Major Improvement in Air Quality

Smart cities have witnessed a significant 23% in PM levels over non-smart cities for the 6 year period ended 2024

### Assessing gains in ambient air quality under Smart Cities Mission



- □ <u>Objective</u>: To assess whether the implementation of the Smart Cities Mission has led to greater improvements in air quality, as measured by the reduction in particulate matter (PM) concentrations, compared to Non-Smart Cities over the period FY 2018 to FY 2024
- The deployment of air quality monitoring systems, increased green cover, and adoption of clean energy solutions under SCM are theoretically grounded in urban environmental economics, which posits that infrastructure and governance investments targeting pollution sources—particularly in high-density areas—can significantly improve ambient air quality and public health outcomes
- We have taken the difference in particulate matter for selected smart and non- smart cities for 2018 and 2024. Give the sample is a subset of total smart cities, the statistically significant results of the t test is indicative of the evidence that smart cities have witnessed greater reduction in PM levels over non-smart cities. It is however a combined effort under SCM and National Clean air Programme. This underscores the effectiveness of coordinated urban and environmental interventions



Two Sample t- test Results				
t= 3.8814				
H0: Mean(1) - Mean(0) = 0				
Ha: Mean(1) - Mean(0) > 0				
Pr (T > t) =0.0013				
*significant at 5%				



# Key Issues & Way Forward

#### Issues in Financing & How to Resolve (A case study of MP's Indore & Bhopal)



- While cities have different avenues of financing, the progress of the states is non-satisfactory. As of Dec'23, only 6% of Smart Cities Mission projects across 100 cities were funded through PPP, far below the targeted 21%. Additionally, six cities (Bhopal, Hubbali-Dharwad, Kochi, Visakhapatnam, Chandigarh, and Srinagar) were able to raise ₹5,298 crore through loans, which is only 54% of the proposed ₹9,844 crore. This reflects the limited success of alternative financing mechanisms under the Mission
  - Moreover, municipal bonds have failed to perform satisfactorily under SCM due to financial constraints of ULBs and overreliance on government grants. Despite significant responsibilities, municipal corporations' revenue receipts are quite modest (0.6% of GDP in FY24) and pale in comparison to those of Central and State governments (9.2% and 14.6% of GDP in FY24, respectively)
- Madhya Pradesh's Indore and Bhopal are most performing smart cities in country
  - In MP both Indore and Bhopal Nagar Nigam have successfully issued municipal bonds in Jun'18 and Sep'18 respectively. After the issuance of the country's first Private Placement Muni Bonds on the National Stock Exchange, Indore Municipal Corporation has also raised Rs 244 crore through a green bond in Feb'23. This was the first green municipal bond in the country issued by the way of public issue. The issue was meant to raise funds for installation of a captive solar power plant of 60 MW capacity to reduce amount spent on electricity cost by the Indore Municipal Corporation on pumping and supply of drinking water.
  - Indore Smart city corporation has monetized total 1.26 acre land and have generated Rs 8 crore.
  - Bhopal smart city corporation has monetized 10.86 acre land and have generated Rs 297 crore in revenue
- □ We believe that other smart cities may learn from MP and explore the financing potentials that are hidden till now

### **Way Forward**



- □ Cities accommodate ~31% of India's current population and contribute 63% to the GDP (Census 2011). By 2030, urban areas are expected to accommodate 40% of India's population and contribute 75% to the GDP. Population growth in cities leads to infrastructure management and service delivery challenges. The Smart Cities Mission in India is an initiative that aims to tackle these challenges efficiently and effectively
- One of the greatest challenges facing smart cities is how to finance them. The government is concentrating on encouraging Public-Private Partnerships (PPP) for successful implementation of the smart city project in India
  - Urban Local Body resources (from collection of user fees, beneficiary charges & impact fees, land monetization, debt, loans, etc.)
  - Utilizing innovative finance mechanisms, such as municipal bonds with credit rating of ULBs, Pooled Finance Development Fund Scheme and Tax Increment Financing (TIF)
  - Leveraging borrowing from financial institutions including bilateral and multilateral institutions (both domestic and external sources)
  - Availing the National Investment and Infrastructure Fund (NIIF)



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