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A quarterly solutions-based project update report

Snapshot of projects under Lighthouse Smart Cities

AMCHAM INDIA

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Foreword

The American Chamber of Commerce (AMCHAM) is the apex association of American companies operating in India. AMCHAM fully supports the US Government's and Government of India's Smart Cities Mission in the three identified pilot projects of Ajmer, Allahabad and Vizag. AMCHAM member companies have actively partnered in India's smart cities initiatives by offering cutting-edge technologies across multiple sectors in the development of smart city projects.

This publication is an attempt to bring together vital information on projects being undertaken and successfully executed in a few of India's smart cities so that they become examples for other cities to emulate. US companies would like to offer the latest technologies in diverse areas, best practices and skilled professionals to facilitate the creation of smart cities in India.

AMCHAM is steadily working its way to becoming an established knowledge bank and interactive platform on the subject of smart cities through AMCHAM's Infrastructure and Smart Cities Committee. The committee has categorised members' capabilities into sub-committees such as potable water supply, sewage collection and treatment, dredging, smart grid, energy efficiency, road development, street lighting, smart lighting, safety and cyber security of urban landscapes, command and control centres, land monetisation programmes, mobility and transport solutions, solid waste management, and regulatory uphauling for city administrations. Each sub-committee is individually responsible for taking up the latest needs of urbanisation in India and, through the AMCHAM platform, engaging with government agencies and ministries to make every smart city project in India a grand success.

The expertise of AMCHAM members is showcased in a capability deck on www.amchamindia.com in the publications section.

AMCHAM would like to thank PwC, the knowledge partner for the Smart Cities and Infrastructure Summit-2017, for bringing out such a comprehensive status update on smart cities, a useful guide for American companies wanting to be partners in the growth of India's smart cities.

Ranjana Khanna
Director General CEO
American Chamber of
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Purpose of the document

The report has been prepared for providing a solutions-based project update of Lighthouse Smart Cities to the American Chambers of Commerce (AMCHAM) in India. AMCHAM intends to release this document at the upcoming 'AMCHAM Smart Cities and Infrastructure Summit - 2017' to be held on 4 December 2017.

This is a working document which will be followed by a quarterly update by AMCHAM and PwC.

The document provides a solutions-based update of eight Lighthouse Smart Cities (Round 1 cities) under the following eight solutions:

Lighthouse Smart Cities	Solutions category
Pune	Integrated command and control centre
Surat	Mobility and transport
Ahmedabad	Roads, street lighting, smart lighting
Jabalpur	Safety and security
Vishakhapatnam	Smart grid and energy efficiency
Chennai	Solid waste management
Ludhiana	Water supply and water treatment, dredging
Bhopal	Land monetisation

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Approach for the study

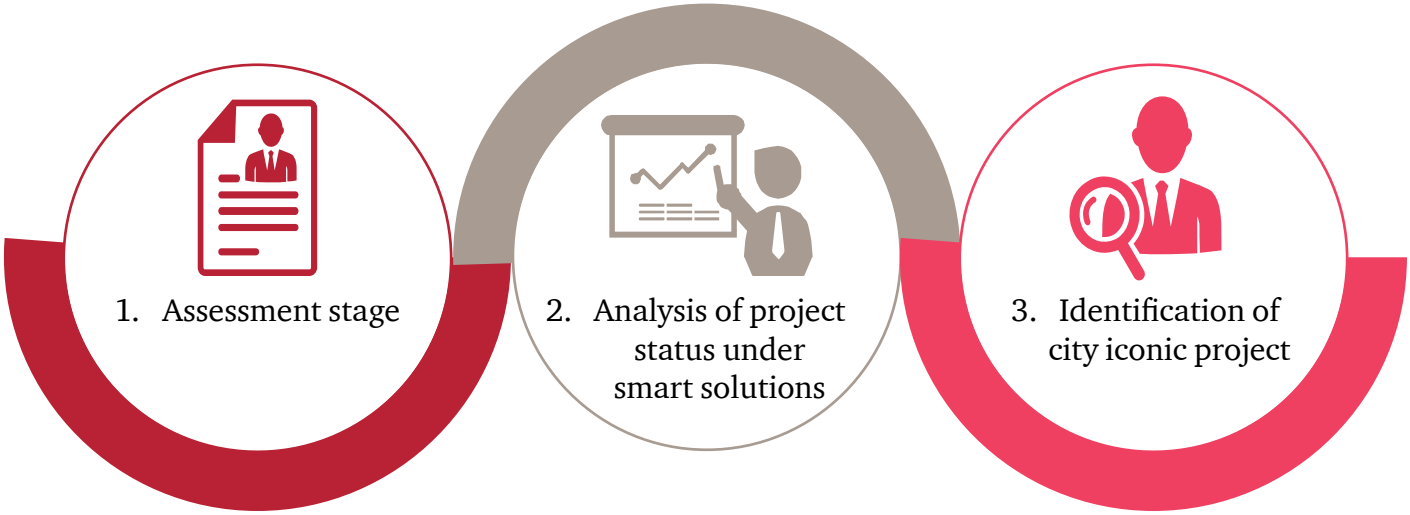
A structured approach was taken for capturing the solutions-based project status for selected Lighthouse Smart Cities. The approach involved a detailed assessment of fundamental and critical data proposed within the Smart Cities Mission.

The smart city proposals available on the MoHUA website for the selected cities were studied to understand and list the various projects proposed within a particular smart city for both area-based development (ABD) and PAN-city area.

For the purpose of this study, eight solutions for the lighthouse cities were selected by AMCHAM and the solutions were categorised as below:

- Integrated command and control centre
- Smart grid and energy efficiency
- Mobility and transport
- Solid waste management
- Roads and smart street lighting
- Water supply and water treatment, dredging
- Safety and security
- Land monetisation

The research methodology included the following core activities to validate solutions parameters and the status of these projects, as part of the study. We have divided the work areas into the following three stages:



Stage I: Assessment stage

Under stage I, the assessment of the eight lighthouse cities (under Round 1, MoHUA) is carried out by applying primary and secondary research. The eight lighthouse cities are: Pune, Surat, Ahmedabad, Jabalpur, Vishakhapatnam, Chennai, Ludhiana and Bhopal.

Primary and secondary research

Our research team started by identifying research goals, information areas, city demographics, city projects, investment planned in ABD and PAN-city area.

Desktop research has been carried out using:

- Smart city proposals (SCPs) available on the MoHUA website;
- Public reports and statistics;
- City-specific government websites;
- City-specific departmental websites;
- Surveys done with various analyst organisations; and
- Indian government information portals such as https://smartnet.niua.org, http://smartcities.gov.in/content/, etc.

Stage II: Analysis of project status under various smart solutions

Under stage II, smart solutions that were relevant for the infrastructure sector were identified.The smart solutions were categorised into solution sub-categories by mapping the 24 elements of smart cities with various solution categories.

Integrated command and control centre

- Command and Control centre

Mobility and transport

- Trasnport
- Walkable

Roads and smart street lighting

- Street lights
- Smart lights
- Smart poles
- Smart roads

Safety and security

- Safety and security

Smart grid and energy efficiency

- Energy source
- Energy supply
- Energy efficiency
- Underground electric wiring

Solid waste management

- Sanitation
- Waste management

Water supply and water treatment, dredging

- Water supply
- Water management
- Waste water management

Land monetisation

- Multi-ducting
- Underground wiring
- Optical fibre network

Researchers identified city projects from the smart city proposals and laid emphasis on the assessment of the projects and their status. The stages of project implementation were categorised as:

- Not started
- Tender issued
- DPR under preparation
- Under implementation
- DPR approved
- Work completed
- Work order issued

The status of the projects were identified by analysing the implementation stages of the projects within city departments and agencies responsible for operations and management and from city-specific government and departmental websites and surveys.

Under this stage, a solutions-based project status update and city-wise solutions based project status analysis is done.

Stage III: Identification of city iconic projects

Under stage III, the iconic project for each of the selected smart city was identified on the basis of the project description, investment proposed by the city and the importance of the project for that city based on the impact on its citizens.

Disclaimer

This document is a working report and includes the project status update of the projects undertaken by the eight of the Lighthouse cities. The update for other projects and the remaining cities will be done in successive quaterly reports.

This document doesnot show the ranking of the cities.The purpose of this document is to provide project status update under eight solutions that will be useful for industries to connect with Indian smart city government clients.

Need for smart cities

Globally, a demographic shift has been observed with more people living in urban areas than in rural parts. It has been projected that by 2050, 66% of the world's population will be urbanised, with Africa and Asia urbanising faster than other regions and projected to become 56% and 54% urban respectively. The continuing population growth and increased urbanisation is estimated to add 2.5 billion people to the world's urban population by 2050.[1]

Rapid urbanisation is a global megatrend and is paving the way for social and environmental challenges. Globally, cities are seen as engines for sustainable economic growth. They provide opportunities and additional prospects of entrepreneurship as well as employment. This further enables the inclusion of more people in the growth of the country. Furthermore, growth achieved by cities is strongly linked to their ability to address issues related to urbanisation and associated social, environmental and economic issues in a holistic manner while making the most of future opportunities.

Today, all urban areas have one obstacle in common—critical infrastructure is inadequate, increasingly fragile, technologically outdated and incapable of meeting the current needs of inhabitants. With an increase in population explosion, cities need to alter their way of functioning in order to disseminate public services. Therefore, for urbanisation to be successful, the following benefits need to be obtained:

- Social equitability
- Economic viability
- Environment sustainability

In the Indian context, the population of urban dwellers is estimated to add 404 million people. Cities in India have developed into centres of focus for business, livelihoods, comfort as well as a higher quality of life. As a result, the urban population has increased; however, service delivery and infrastructure in these cities have degraded.

The smart city concept can be looked upon as a framework for implementing a vision to help achieve the aforementioned benefits and modern urbanisation. The inclination to adopt the smart city model is driven by the need to surpass the challenges posed by traditional cities as well as overcoming them in a systematic manner. It is crucial for cities to explore a shift towards adopting sustainable city development measures amongst all stakeholders, namely citizens, businesses and the government.

Smart cities have an integrated system for collecting, measuring, collating and broadcasting city data as well as making it easily accessible to stakeholders for efficient, effective development, governance and management. Cities leverage technology and utilise existing and planned infrastructure investments to provide a higher quality of life to their residents, a favourable investment climate for businesses and also to allow maximum utilisation and transparency for governments. They can be considered as an organic integration of systems, IT infrastructure, and physical infrastructure as well as social and business infrastructure. Together, these systems work collectively to generate intelligent and actionable information for decision makers.

1. United Nations Department of Economic and Social Affairs. (2014). World Urbanization Prospects: 2014 Revision. Retrieved from https://esa.un.org/unpd/wup/publications/files/wup2014-highlights.pdf (last accessed on 29 Nov 2017)

Though there is no universal definition of a smart city, these cities leverage information and communications technology (ICT) so as to mitigate most of the challenges attributed to rapid urbanisation. They offer a better and more sustainable lifestyle to citizens in the following ways:

Optimised usage of resources

Governments and citizens are increasingly adopting renewable and alternative modes of energy to minimise the depletion of fossil fuels as well as non-renewable energy sources. It is becoming imperative to use ICT and advanced technology solutions so as to optimise the consumption of resources such as power, water and fuel. Adopting these technology solutions can lead to direct economic and environmental benefits and can be corroborated by customised energy consumption through instances such as smart metering, micro-grids and dynamic pricing.

Enhanced quality of life

Leveraging ICT in smart cities can integrate as well as expand the creation of robust links between education, industry and the government. These can provide superior amenities in terms of housing, schools, hospitals, institutions, etc., to ensure a superior quality of life to citizens.

Better safety and security

Smart cities leverage integrated public safety and security solutions such as smart cameras, pattern recognition, remote monitoring as well as red flagging through heuristic platforms in order to ensure a secure and safe environment for citizens.

Connected and transparent public services

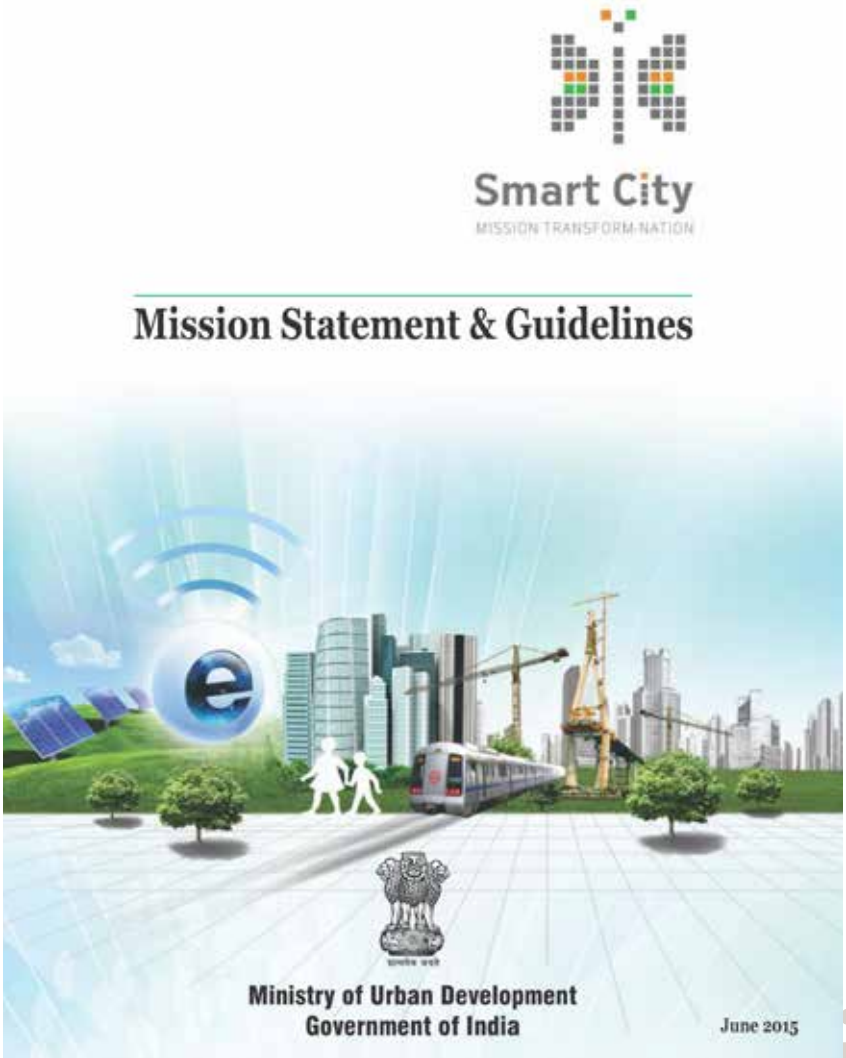
Earlier, the efficiency of public and citizen services was driven by e-governance initiatives running in silos. Now, the focus has shifted towards connected delivery of government services in order to provide a better experience to citizens.

Smart cities in India

The Smart Cities Mission Statement and Guidelines were issued in June 2015 by the Ministry of Housing and Urban Affairs (MoHUA), Government of India, in order to tackle the various challenges of urbanisation. The Smart Cities Programme aims to holistically rejuvenate 100 cities in India by improving the physical, economic, social and the governance structure.

The focus lies on sustainable and inclusive development and creating replicable models which would act as a lighthouse to other aspiring cities well as catalyse the creation of similar cities in various regions and parts of the country.[2]

Smart Cities Mission Guidelines



http://smartcities.gov.in/upload/uploadfiles/files/SmartCityGuidelines(1).pdf

2. Ministry of Housing and Urban Affairs website: Smart Cities http://moud.gov.in/cms/smart-cities.php

The Smart Cities Mission

Objective

Programme	Objective
The Smart Cities Mission is an urban renewal and retrofitting programme by the Government of India with a mission to develop 100 cities (the target has been revised to 109 cities) all over the country making them citizen friendly and sustainable.	To promote sustainable and inclusive cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and application of 'smart' solutions.

The MoHUA took concrete steps to make smart cities a reality by initiating the Smart Cities Mission in June 2015. The mission has identified 100 cities that are proposed to be developed under the scheme in its duration of five years (FY 2015–16 to FY2019–20).

The mission is an urban renewal and retrofitting programme which aims at developing 109[3] cities all over the country to make them citizen friendly and sustainable. It aspires to promote cities by providing core infrastructure and giving a decent quality of life to its citizens, a clean and sustainable environment and application of smart solutions. The purpose is to drive economic growth as well as to improve the quality of life for citizens by enabling local area development and harnessing technology leading to smart outcomes.[4]

The strategic components of 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 to cover larger parts of the city.

A. Area-based development (ABD): The area-based strategy focuses on transforming existing areas into better planned ones, thereby improving the liveability of the whole city. New areas will be developed around cities so as to accommodate the expanding population in urban areas.

The area-based development strategy has three models:

1. **Retrofitting:** Developing a city's existing area by adopting smart solutions without making major modifications to the built environment. An area consisting of more than 500 acres will be identified by the city and depending on the existing level of infrastructure services in the identified areas and the vision of the residents, the cities will prepare a strategy to become smart.

   Under this model, the existing infrastructure will remain intact and it is expected that more intensive infrastructure service levels as well as a large number of smart applications will be packed in the retrofitted smart city.

2. **Redevelopment:** Replacement of the existing built-up environment, enabling co-creation of a new layout with enhanced infrastructure using mixed land use and increased density.

   Redevelopment envisages work on an area of more than 50 acres which has been identified by the urban local bodies (ULBs) in consultation with their citizens.

3. **Greenfield:** Developing a city's vacant area (more than 250 acres) using innovative planning, plan financing as well as plan implementation tools. Greenfield developments are beneficial as they address the needs of an expanding urban population.

B. Pan-city development: Pan-city development is the extension of ABD solutions at a city-wide level so as to make it inclusive. This envisages the application of selected smart solutions to the existing city-wide infrastructure. The application of these solutions will involve the use of technology, information and data to improve the infrastructure and quality of services.

Examples of applications under pan-city development include city surveillance, intelligent poles, smart parking, citizen engagement platforms and intelligent traffic management systems (ITMS).

3. As per the Office Memorandum issued by the MoHUA on 25 May, 2016, the Competent Authority has approved the inclusion of 11 new cities in the Smart Cities Challenge process.
4. MoHUA, Government of India: Smart City Mission Statement and Guidelines, June 2015. Retrieved from http://smartcities.gov.in/upload/uploadfiles/files/SmartCityGuidelines(1).pdf (last accessed on 29 Nov 2017)

Mission execution

Selection of cities

The process of selecting a smart city takes place in two stages[5]:

A. Stage 1: Shortlisting of the cities by state/ union territory

The first stage of the competition is intra-state; cities in the state shall compete on the conditions precedents and the scoring criteria laid out. The state/union territory shortlists the potential smart cities based on conditions precedents, scoring criteria and in accordance to the total number allocated to it. The cities with the highest scores will be shortlisted and recommended to participate in Stage 2 of the challenge.

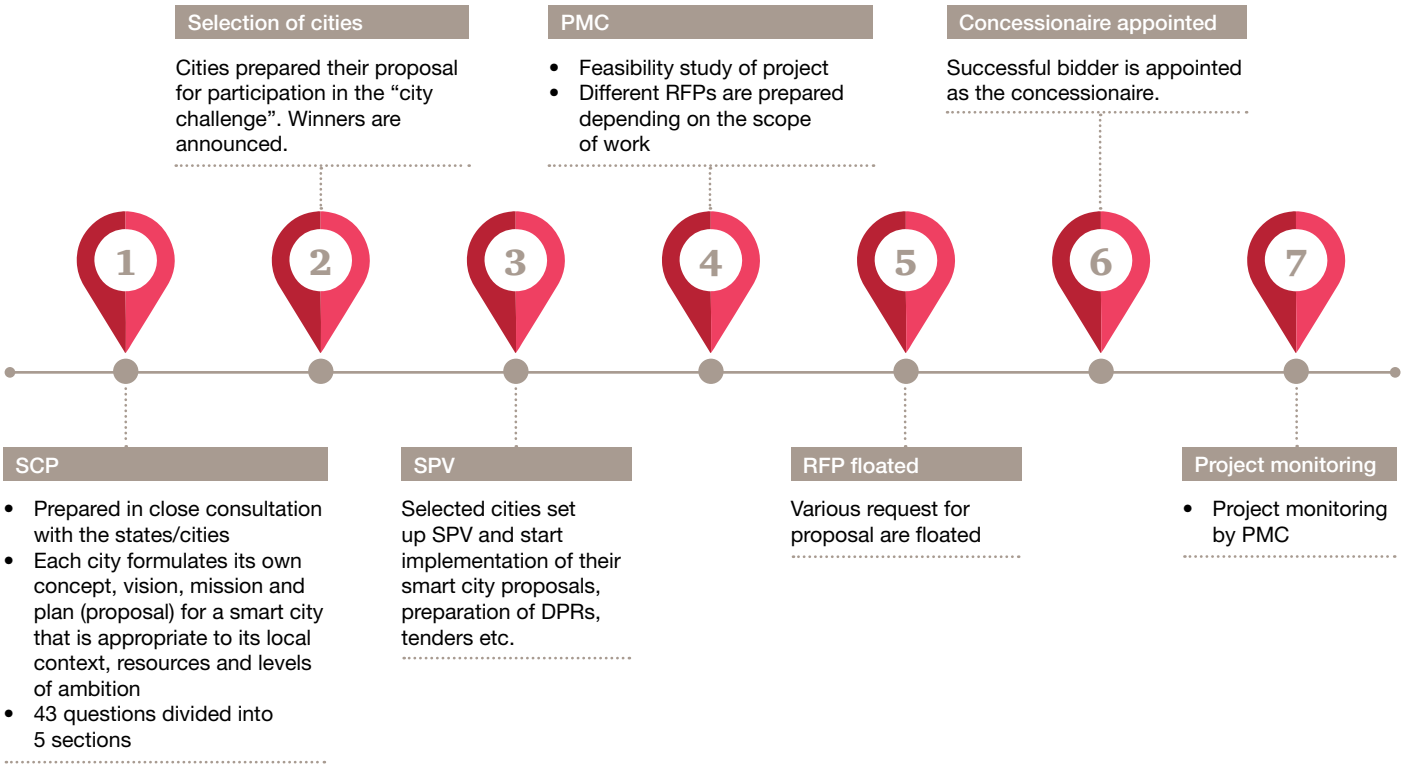
The state/union territory will recommend the names of cities that have successfully been selected in this round to the MoHUA, who shall thereafter announce the list of 100 smart cities.

B. Stage 2: Challenge round for selected cities

In the second stage, each of the potential 100 smart cities shall prepare their proposals for participating in the city challenge. The Smart City Proposal (SCP) for each city should outline the preferred model for ABD as well as pan-city development with smart solutions, the proposed financing and revenue model to attract private participation, etc.

These proposals shall be evaluated by a committee comprising national and international experts, organisations and institutions. After the evaluation, a list of winning cities is announced. The remaining cities rework and improve their SCPs in order to be considered in the next round.

Mission execution roadmap



5. MoHUA, Government of India: Smart City Mission Statement and Guidelines, June 2015. Retrieved from http://smartcities.gov.in/upload/uploadfiles/files/SmartCityGuidelines(1).pdf (last accessed on 29 Nov 2017)

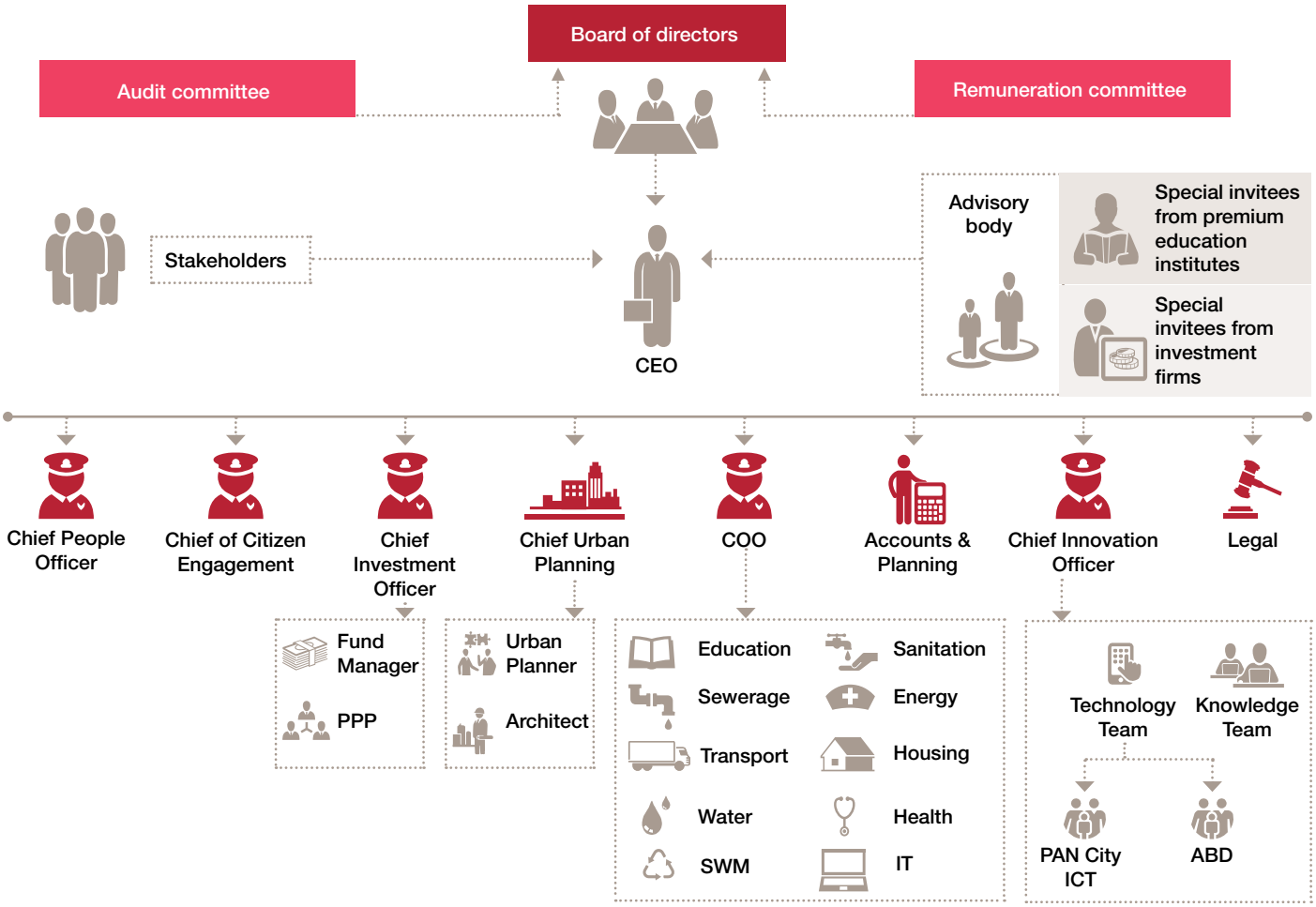
Role of SPV

Once a city has been selected under the programme, a special purpose vehicle (SPV) shall be created and would be responsible for the execution of projects in the city.

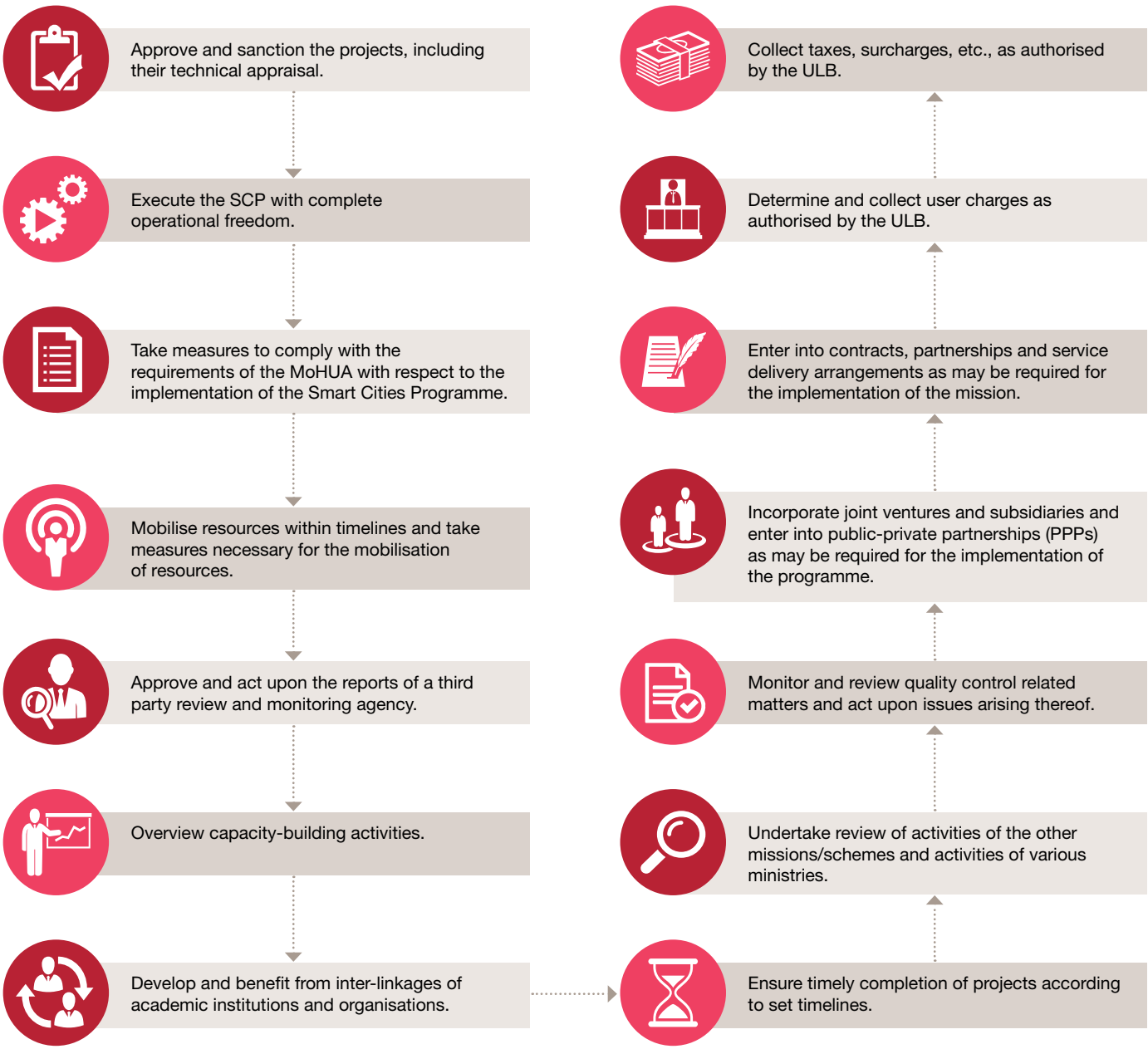
The SPV would be a limited company incorporated under the Companies Act, 2013, at the city level and would be formulated through equity contributions from the state and Central governments. The private sector or financial institutions can be considered for an equity stake in the SPV; however, the shareholding pattern of 50:50 of the state/union territory and the ULB has to be maintained and they together should have a majority shareholding and control of the SPV.

The SPV would be headed by a full-time CEO and would be appointed with the approval of the MoHUA. The board of directors shall be constituted by representatives of the Central Government, state government, ULB, independent directors as well as the CEO and functional directors. The Divisional Commissioner/ Collector/Municipal Commissioner/Chief Executive of the Urban Development Authority shall be the Chairperson of the SPV.

Illustrative SPV structure



The key functions and responsibilities of the SPV would be as follows: [6]



6. MoHUA, Government of India: Smart City Mission Statement & Guidelines, Annexure 5, June 2015. Retrieved from http://smartcities.gov.in/upload/uploadfiles/files/SmartCityGuidelines(1).pdf (last accessed on 29 Nov 2017)

Role of PMC

A systematic way has to be followed to convert the plans contained in the SCPs to a group of similar projects. For this purpose, a project management consultant (PMC)[7] would be required.

There are two types of PMCs—a single one for the ABD and smart solutions projects or separate PMCs for ADB and smart solution projects. The PMC shall be responsible for designing, developing the set of projects, preparing the detailed project reports (DPRs) and request for proposal (RFPs) for the modules given in the SCPs and assist the respective city in their implementation.

Mission monitoring

National level

At the national level, an Apex Committee (AC) would approve the SCPs and monitor the progress and release of funds for the Smart Cities Mission. This committee will be headed by the Secretary, MoHUA, and will comprise representatives from related ministries and organisations such as the World Bank, the Energy and Resources Institute (TERI), other bilateral and multilateral agencies, and urban planning experts (they may be invited with the approval of the Chair).

The AC will provide overall guidance and act as an Advisor to the Mission in carrying out the following key responsibilities:

1. Review the list of cities sent by the state governments after Stage 1.
2. Review the SCPs evaluated by the panel of experts after Stage 2.
3. Approve the release of funds based on the implementation progress.
4. Recommend mid-course correction in the implementation tools as and when required.
5. Undertake quarterly review of activities of the scheme, including budget, implementation and coordination with other missions/schemes and activities of various ministries.

A National Mission Director, not below the rank of Joint Secretary to the Government of India, will be the overall in-charge of all activities related to the mission. A Mission Directorate will take support from subject matter experts and such staff as considered necessary.

The key responsibilities of the Mission Directorate are:

1. Develop a strategic blueprint and detailed implementation roadmap of the mission, including the detailed design of the city Challenge.
2. Coordinate across the Centre, states, ULBs and external stakeholders so as to ensure external agencies are efficiently used for preparing SCPs, DPRs, sharing of best practices, developing smart solutions, etc.
3. Oversee capacity building and assist in the hand-holding of SPVs, state and ULBs. This includes developing and retaining a best practice repository and mechanism for knowledge sharing across states and ULBs.

State level

At the state level, there shall be a High Powered Steering Committee (HPSC), chaired by the Chief Secretary, which would steer the mission programme in its entirety. The HPSC will have representatives from state government departments and the Mayor and Municipal Commissioner of the ULB relating to the smart city would be represented in the HPSC.

There would also be a State Mission Director, functioning as the Member-Secretary of the State HPSC, who will be an officer not below the rank of Secretary to the state government, nominated by the state government.

The key responsibilities of the HPSC are:

1. Provide guidance to the mission and provide a state-level platform for exchange of ideas pertaining to the development of smart cities.
2. Oversee the process of first stage intra-state competition on the basis of Stage 1 criteria.
3. Review SCPs and send them to MoHUA for participating in the challenge.

City level

A Smart City Advisory Forum will be established at the city level for all smart cities to advise and enable collaboration among various stakeholders and shall also include the District Collector, MP, MLA, Mayor, CEO of SPV, local youths, technical experts, and at least one member from the area who is a:

1. President/secretary representing the registered residents welfare association
2. Member of registered taxpayers association/rate payers association
3. President/secretary of slum-level federation
4. Members of a non-governmental organisation (NGO) or mahila mandali/chamber of commerce/youth associations.

The CEO of the SPV will be the convener of the Smart City Advisor Forum.

7. Office Memorandum issued on 5 October, 2016 by the MoHUA

Project funding

The Smart City Mission is a Centrally Support Scheme (CSS) whereby 48,000 crore INR would be given by the MoHUA and an equal amount will be contributed by states, translating to an average of 100 crore INR funding per city by the municipal corporation and another 100 crore INR by the state.

Funds under the scheme are proposed to be distributed as follows:[8]

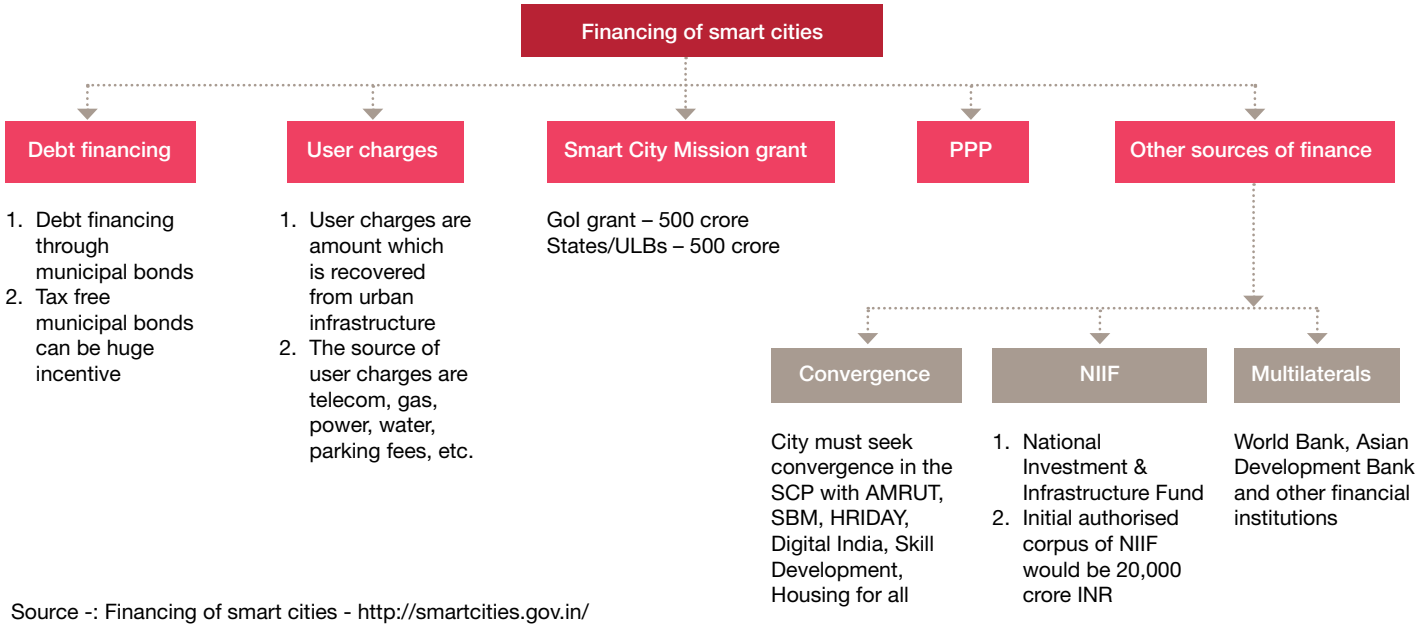
Allocation share	Purpose
93%	Project funds
5%	Administrative and office expenses fund for state/ULB
2%	Administrative and office expenses funds for the MoHUA

The balance amount to fund the proposed projects mentioned in the SCPs can come from the following or as advised by the Centre:

1. State/ULB's own funds (user charges, beneficiary charges, impact fees, land monetisation, etc.)
2. National Investment and Infrastructure Fund which was announced by the Finance Minister in his 2015 Budget speech
3. Private sector investments through PPPs
4. Borrowings from financial institutions, including bilateral and multilateral institutions and other domestic and international sources
5. Innovative finance mechanisms such as municipal bonds, tax increment financing and pooled finance mechanism
6. Additional resources transferred due to acceptance of the recommendations of the Fourteenth Finance Commission (FFC)
7. Other Central Government schemes such as Swachh Bharat Mission, Atal Mission for Rejuvenation and Urban Transformation (AMRUT) and National Heritage City Development and Augmentation Yojana (HRIDAY).
8. Municipal bonds

The Central Government provides funds to the SPV in the shape of tied grants, which are kept in a separate grant fund. These funds are meant to be utilised only for the purposes mentioned in the Mission Statement and Guidelines and are subject to the conditions laid down by the Central Government.

Financing of a smart city



Source -: Financing of smart cities - http://smartcities.gov.in/

8. MoHUA, Government of India: Smart City Mission Statement and Guidelines, June 2015. Retrieved from http://smartcities.gov.in/upload/uploadfiles/files/SmartCityGuidelines(1).pdf (last accessed on 29 Nov 2017)

Convergence

Cities can derive great benefits by seeking convergence of other Central and state government programmes and schemes along with the Smart Cities Mission.

There are four main criteria for obtaining convergence:

a. Approval of scheme

b. Appointment of consultant

c. DPR has been prepared

d. RFP for concessionaire should be floated

If all four criteria are met, the SPV shall then act as a project implementation and monitoring agency.

On the other hand, if all criteria are not met, then the concerned department will transfer the funds to the SPV.

Current status of smart cities

Overview of the Smart Cities Scheme till date

Central government	State government
April 2015 Note drafted	
June 2015 Scheme launched	
	July 2015 States identified cities qualifying precedent conditions
	Aug - Sept 2015 Selection of consultants
	Sept - Dec 2015 Consultant prepared pre-feasibility reports at PAN city level under retrofitting, redevelopment & greenfield
15 December 2015 Plan submitted to MoUD	
Dec – Jan 2016 Evaluated by the committee	
28 January 2016 Selection of top 20 cities in 1st round	
	March 2016 SPV formation & selection of handholding agencies
	15 April 2016 Submission by 23 fast track cities
May 2016 Selection of next 13 fast track cities	
25 June 2016 Launch of Bhopal quick projects	
	30 June 2016 Submission by 40 Stage 2 cities
	July 2016 DPR, bid process management began
20 September 2016 Selection of 27 cities in 2nd round	
Nov 2016 - Jan 2017 Vendors started implementation	
31 March 2017 Submission for 3rd Round	
June 2017 Selection of 30 cities	
30th November 2017 Submission of proposals for remaining 16 cities	

Key highlights

90 winning proposals

152.6k crore INR
invested in ABD

Urban population of
9.56 crores
has been impacted

189.26k crore INR
invested in projects across various solutions

Pan-city solutions amounting to
36.66k crore INR

Cities selected under the mission till date

State-wise number of smart cities

It can be seen that 31 states have participated in the challenge and thus far, 90 cities have been selected. As announced by the MoHUA, list of cities is as follows:[9]

Round 1 cities:

Sr. no.	City	State/union territory	Sr. no.	City	State/union territory
1	Bhubaneswar	Odisha	11	Indore	Madhya Pradesh
2	Pune	Maharashtra	12	NDMC	Delhi
3	Jaipur	Rajasthan	13	Coimbatore	Tamil Nadu
4	Surat	Gujarat	14	Kakinada	Andhra Pradesh
5	Kochi	Kerala	15	Belagavi	Karnataka
6	Ahmedabad	Gujarat	16	Udaipur	Rajasthan
7	Jabalpur	Madhya Pradesh	17	Guwahati	Assam
8	Vishakhapatnam	Andhra Pradesh	18	Chennai	Tamil Nadu
9	Solapur	Maharashtra	19	Ludhiana	Punjab
10	Davanagere	Karnataka	20	Bhopal	Madhya Pradesh

Fast-track cities

Sr. no.	City	State/union territory	Sr. no.	City	State/union territory
1	Lucknow	Uttar Pradesh	8	Panaji	Goa
2	Warangal	Telangana	9	Port Blair	Andaman and Nicobar Islands
3	Dharamshala	Himachal Pradesh	10	Imphal	Manipur
4	Chandigarh	Chandigarh	11	Ranchi	Jharkhand
5	Raipur	Chhattisgarh	12	Agartala	Tripura
6	New Town Kolkata	West Bengal	13	Faridabad	Haryana
7	Bhagalpur	Bihar			

9. Cities have been listed based on the scores awarded to them.

Round 2 cities

Sr. no.	City	State/union territory
1	Amritsar	Punjab
2	Kalyan-Dombivali	Maharashtra
3	Ujjain	Madhya Pradesh
4	Tirupati	Andhra Pradesh
5	Nagpur	Maharashtra
6	Mangaluru	Karnataka
7	Vellore	Tamil Nadu
8	Thane	Maharashtra
9	Gwalior	Madhya Pradesh
10	Agra	Uttar Pradesh
11	Nashik	Maharashtra
12	Rourkela	Orissa
13	Kanpur	Uttar Pradesh
14	Madurai	Tamil Nadu

Sr. no.	City	State/union territory
15	Tumakuru	Karnataka
16	Kota	Rajasthan
17	Thanjavur	Tamil Nadu
18	Namchi	Sikkim
19	Jalandhar	Punjab
20	Shivamogga	Karnataka
21	Salem	Tamil Nadu
22	Ajmer	Rajasthan
23	Varanasi	Uttar Pradesh
24	Kohima	Nagaland
25	Hubli-Dharwad	Karnataka
26	Aurangabad	Maharashtra
27	Vadodara	Gujarat

Round 3 cities

Sr. no.	City	State/union territory
1	Thiruvanthapuram	Kerala
2	Naya Raipur	Chhattisgarh
3	Rajkot	Gujarat
4	Amravati	Andhra Pradesh
5	Patna	Bihar
6	Karimnagar	Telangana
7	Muzaffarpur	Bihar
8	Puducherry	Puducherry
9	Gandhinagar	Gujarat
10	Srinagar	Jammu & Kashmir
11	Sagar	Madhya Pradesh
12	Karnal	Haryana
13	Satna	Madhya Pradesh
14	Bengaluru	Karnataka
15	Shimla	Himachal Pradesh

Sr. no.	City	State/union territory
16	Dehradun	Uttarakhand
17	Tiruppur	Tamil Nadu
18	Pimpri Chinchwad	Maharashtra
19	Bilaspur	Chhattisgarh
20	Pasighat	Arunachal Pradesh
21	Jammu	Jammu and Kashmir
22	Dahod	Gujarat
23	Tirunelveli	Tamil Nadu
24	Thoothukudi	Tamil Nadu
25	Tiruchirapalli	Tamil Nadu
26	Jhansi	Uttar Pradesh
27	Aizawl	Mizoram
28	Allahabad	Uttar Pradesh
29	Aligarh	Uttar Pradesh
30	Gangtok	Sikkim

Round 4 cities (10 cities to be selected)

Sr. no.	City	State/union territory
1	Ghaziabad	Uttar Pradesh
2	Meerut	Uttar Pradesh
3	Sharanpur	Uttar Pradesh
4	Moradabad	Uttar Pradesh
5	Rampur	Uttar Pradesh
6	Bareilly	Uttar Pradesh
7	Rae Bareilly	Uttar Pradesh
8	Itanagar	Arunachal Pradesh
9	Biharsharif	Bihar
10	Dindigul	Tamil Nadu

Sr. no.	City	State/union territory
11	Erode	Tamil Nadu
12	Kavaratti	Lakshadweep
13	Amravati	Maharashtra
14	Greater Mumbai	Maharashtra
15	Silvassa	Dadra & Nagar Haveli
16	Shillong	Meghalaya
17	Diu	Daman and Diu
18	Bidhannagar	West Bengal
19	Durgapur	West Bengal
20	Haldia	West Bengal

Solutions-based update: Lighthouse Smart Cities (Round 1)

Integrated command and control centre

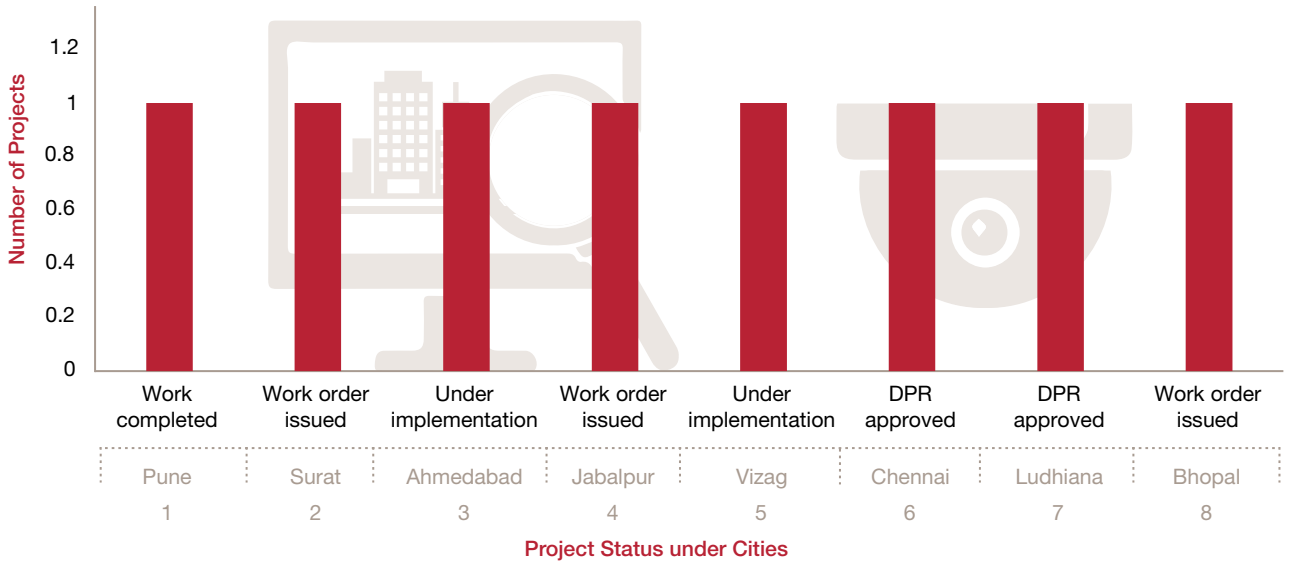
Solution sub category

Integrated command and control centre

The state-of-the-art command and control centre would have ultra-modern surveillance cameras, water, environmental Internet of things (IoT) sensors, red light violation detection (RLVD), automatic number plate recognition (ANPR) and automatic fare collection system (AFCS) systems to ensure the traffic movement remains smooth in the city and offenders are punished.

Central command and control center is integrated with various other systems for traffic management, solid waste management, etc. and controls all the operations from central location

Solutions-based update under integrated command and control centres



For details of the projects, please refer to section 5 of the report.

Mobility and transport

Smart cities strive to make mobility easier and improve the public transport system. Some of the major components of the mobility sector are transit-oriented development, creation of pavements, introducing other means of transport, integrated traffic management systems, parking management systems, etc.

Solution sub category

Transport

A smart city does not require an automobile to get around; distances are short, buildings are accessible from the sidewalk, and transit options are plentiful and attractive to people for all income levels. This sector includes projects such as:

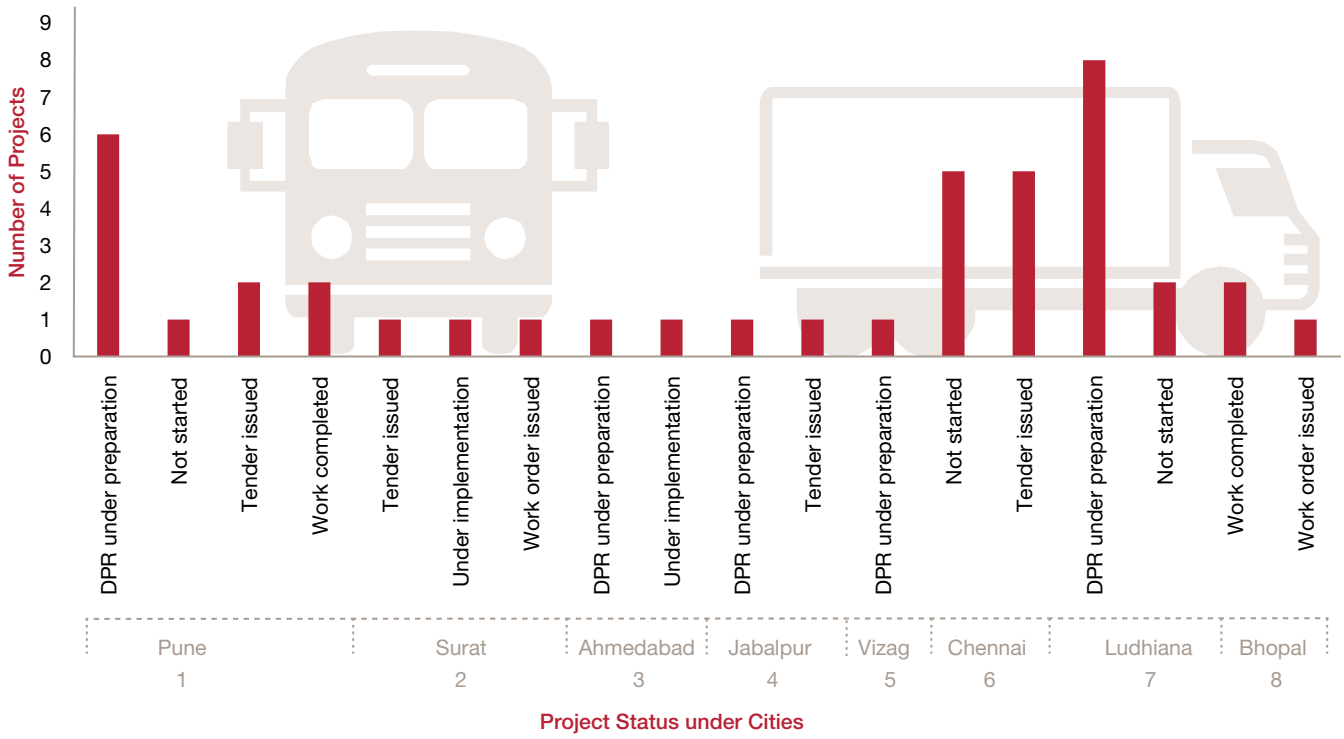
- Traffic management
- ITMS
- Smart parking
- Adaptive traffic control system
- Intelligent multi-modal transport hub
- Electric buses
- NMT transport
- Road redevelopment/ widening of roads
- Transit management
- Smart mobility
- Construction of flyovers
- Junction improvement
- Automatic fare collection system (AFC)

Walkable

A smart city's roads are designed equally for pedestrians, cyclists and vehicles; and road safety and sidewalks are paramount to street designs. Traffic signals are sufficient and traffic rules are enforced. Shops, restaurants, building entrances and trees line the sidewalk to encourage walking and there is simple lighting so the pedestrian feels safe both during the day and at night. The sector includes projects such as:

- Redesign of streets
- Upgrade of footpaths
- Pedestrian-friendly pathways
- Road improvement and streets scaping

Solutions based update under mobility and transport



Project Status under Cities

For details of the projects, please refer to section 5 of the report.

Road, street lighting and smart lighting

This solution category involves improvement in roads, street improvement, street designing, landscaping, and facade improvement type of projects.

Solution sub category

Street lighting and smart lighting

The smart street lighting solution includes unified poles with multiple facilities, including LED street lighting projects, variable message system, PA system and CCTV cameras, smart metering for power and water, Wi-Fi hot spots.

Smart poles

The modular design of the smart poles allows for mobile boosters to be installed. As a practice, telecom service providers invest in infrastructure for installing such signal boosters on smart poles. The smart poles have energy-efficiency systems and provisions for plug-ins for surveillance cameras, Wi-Fi hotspots and SOS terminals. The projects under this category includes:

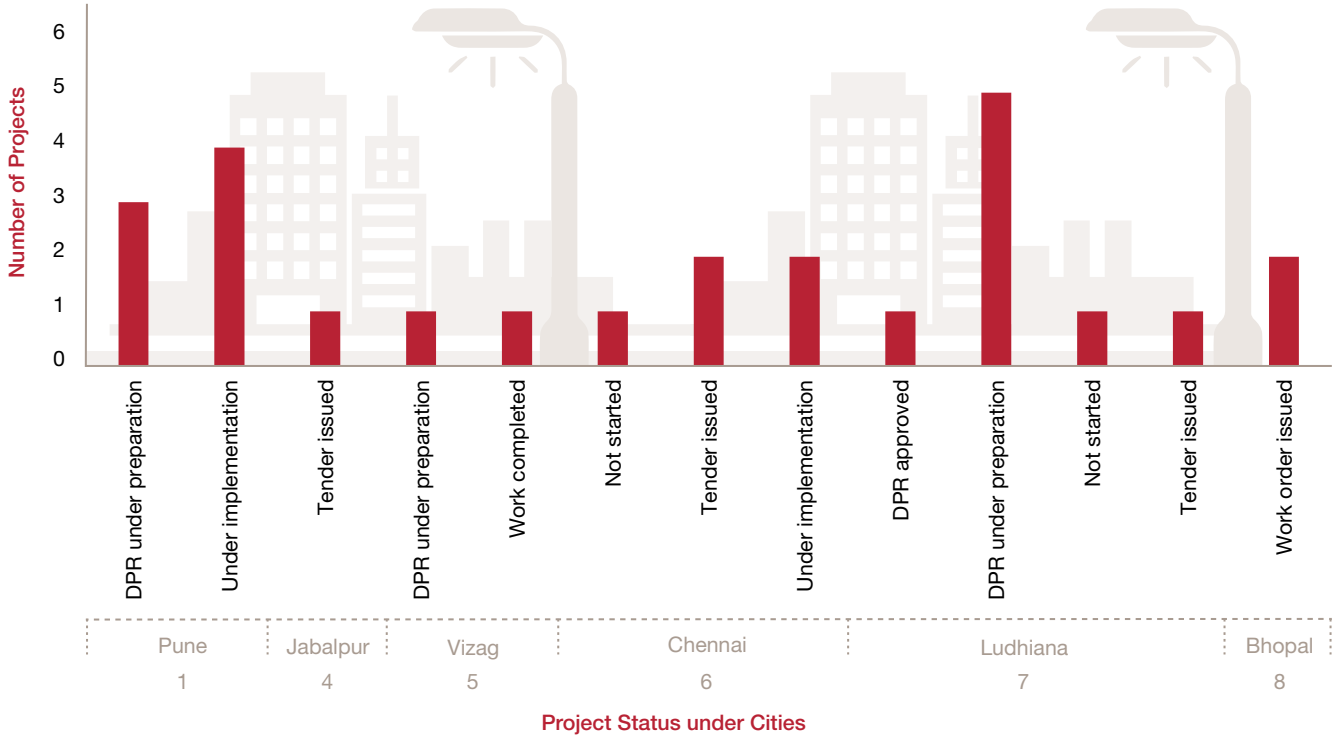
- Solar-based LED smart poles

Smart roads

Smart roads include development of road infrastructure to meet ideal road density as per city norms. The projects under this category include:

- Dedicated cycle tracks shared with footpath;
- Elevated bus rapid transit;
- Foot-over bridges

Solutions-based update under road, street lighting and smart lighting



For details of the projects, please refer to section 5 of the report.

Safety and security

A smart city has high levels of public safety, especially focused on women, children and the elderly; men and women of all ages feel safe on the streets at all hours.

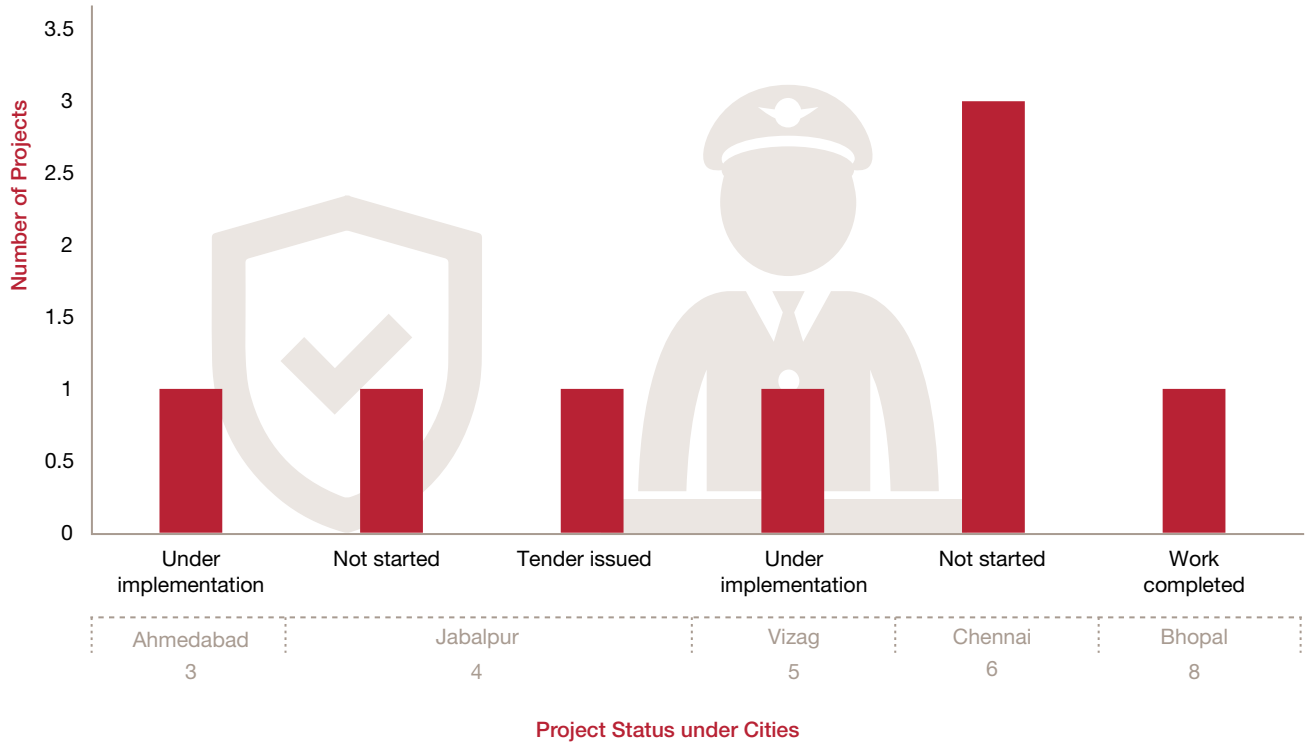
Solution sub category

Safety and security

Some of the main projects under this sector include:

- CCTV cameras
- Safety and security management
- Disaster management
- Beach protection
- Safety and surveillance
- Flood management

Solutions-based update under safety and security



Project Status under Cities

For details of the projects, please refer to section 5 of the report.

Smart grid and energy efficiency

To cope with rising urbanisation and climate change issues and improving quality of life, energy consumption needs to be minimised. Smart cities aim to provide 24x7 energy supply with at least 10% generated through renewable sources as well as integrating energy efficiency practices in buildings, street lights and transit systems, etc. Almost every smart city which is selected has planned to create a sustainable energy infrastructure, thereby making it a sector with high potential.

Solution sub category

Energy source

A smart city aims to have at least 10% of its electricity generated by renewable sources. The sector includes projects such as:

- Solar power projects
- Rooftop panel installation
- Wind power generation
- Piped gas network
- Solar mission

Energy supply

Smart cities aim to provide reliable, 24x7 electricity supply with no delays in requested hook-ups. The typical projects in the sector include:

- 24 X 7 energy supply
- Installation of electric SCADA system
- Electrical network
- Electricity distribution network
- Smart metering

Energy Efficiency

Smart cities aim to inculcate state-of-the-art energy efficiency practices in building, street lights as well as transit systems. The sector includes projects such as:

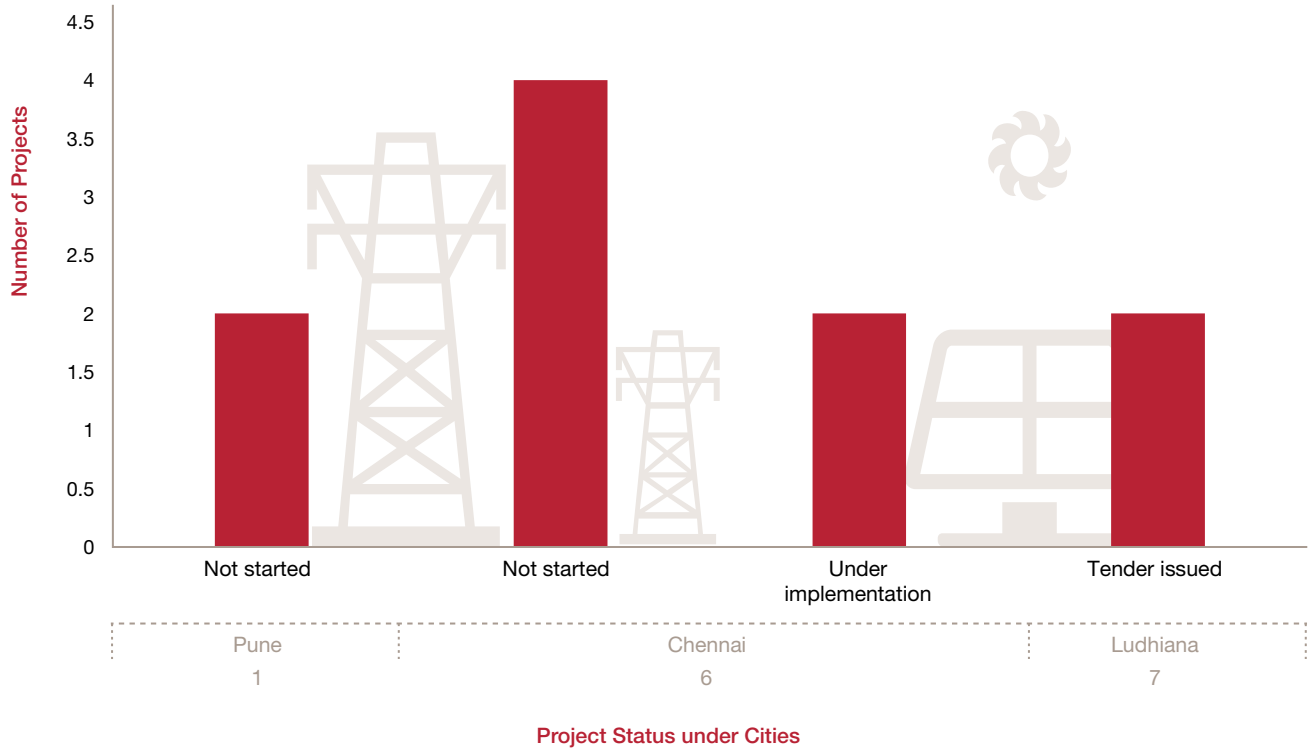
- Streetlight control system
- Intelligent street lighting
- Smart sensors
- Smart power grid
- Energy efficiency
- Multi-utility smart poles

Underground (UG) electric wiring

A smart city has an underground electric wiring system to reduce blackouts due to storms. The sector typically includes projects such as:

- Smart road
- Multi-utility duct
- UG ducting
- UG–low tension (LT) cabling
- UG–High tension (HT) line

Solutions-based update under smart grid and energy efficiency



Project Status under Cities

For details of the projects, please refer to section 5 of the report.

Solid waste management

Economic and environment-friendly methods of disposing of waste such as underground dustbins, mechanised vehicles for waste management and radio-frequency identification (RFID) based collection ensure the city is in better liveable conditions.

Solution sub category

Sanitation

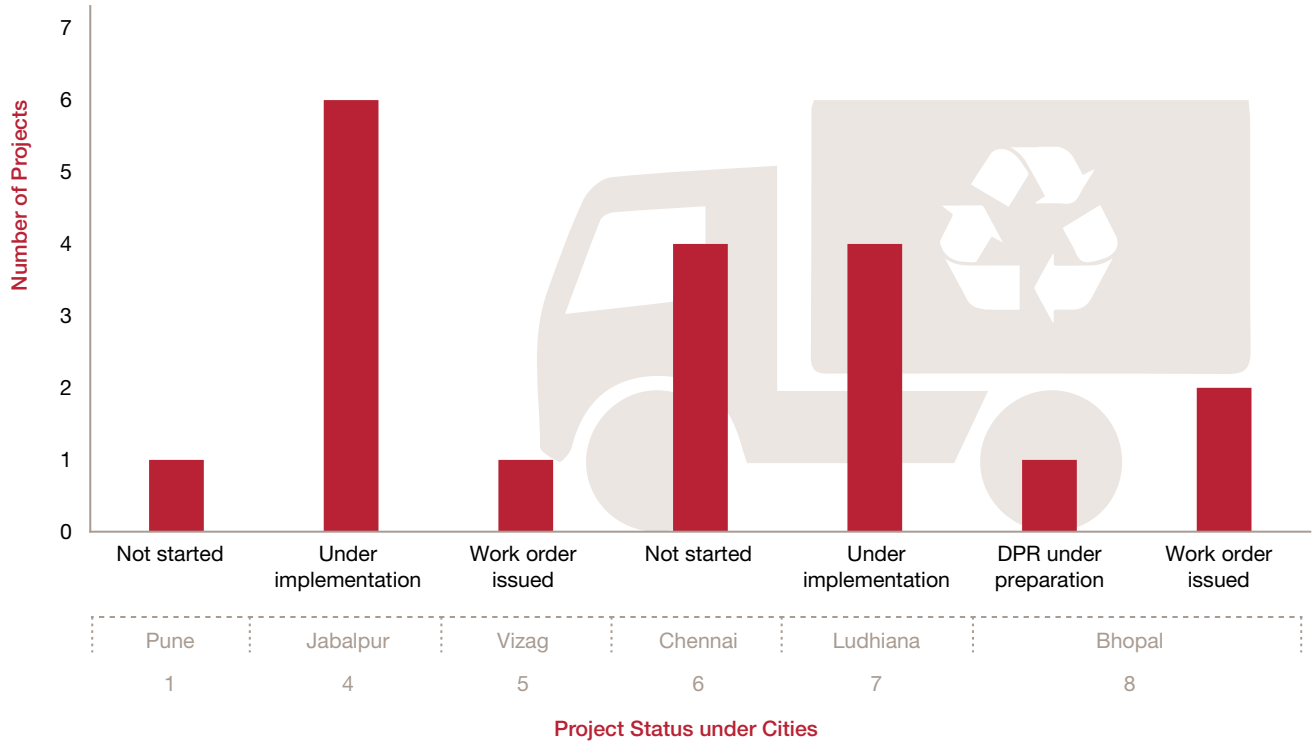
A smart city has no open defecation and a full supply of toilets based on the population. Cities have proposed to invest in sanitation management.

Waste management

A smart city has a waste management system that removes household and commercial garbage, and disposes of it in an environmentally and economically sound manner. The sector includes projects such as:

- Waste processing and disposal
- Waste to energy
- Construction of Sewerage treatment plant (STP)
- Intelligent solid waste management

Solutions-based update under solid waste management



For details of the projects, please refer to section 5 of the report.

Water supply and water treatment

Water management in cities basically comprises water supply and management, sewerage, recycling of water, waste water treatment and disposal, etc.

Solution sub category

Water supply

A smart city has reliable, 24x7 supply of water that meets national and global health standards. The sector typically includes projects such as:

- Water supply
- ICT solutions for water supply
- Continuous pressurised 24x7 water supply system
- Water supply augmentation (including smart metering)
- Water supply distribution network

Water management

A smart city has advanced water management programmes, including smart meters, rain water harvesting and green infrastructure to manage storm water run-off. The sector typically comprises projects such as:

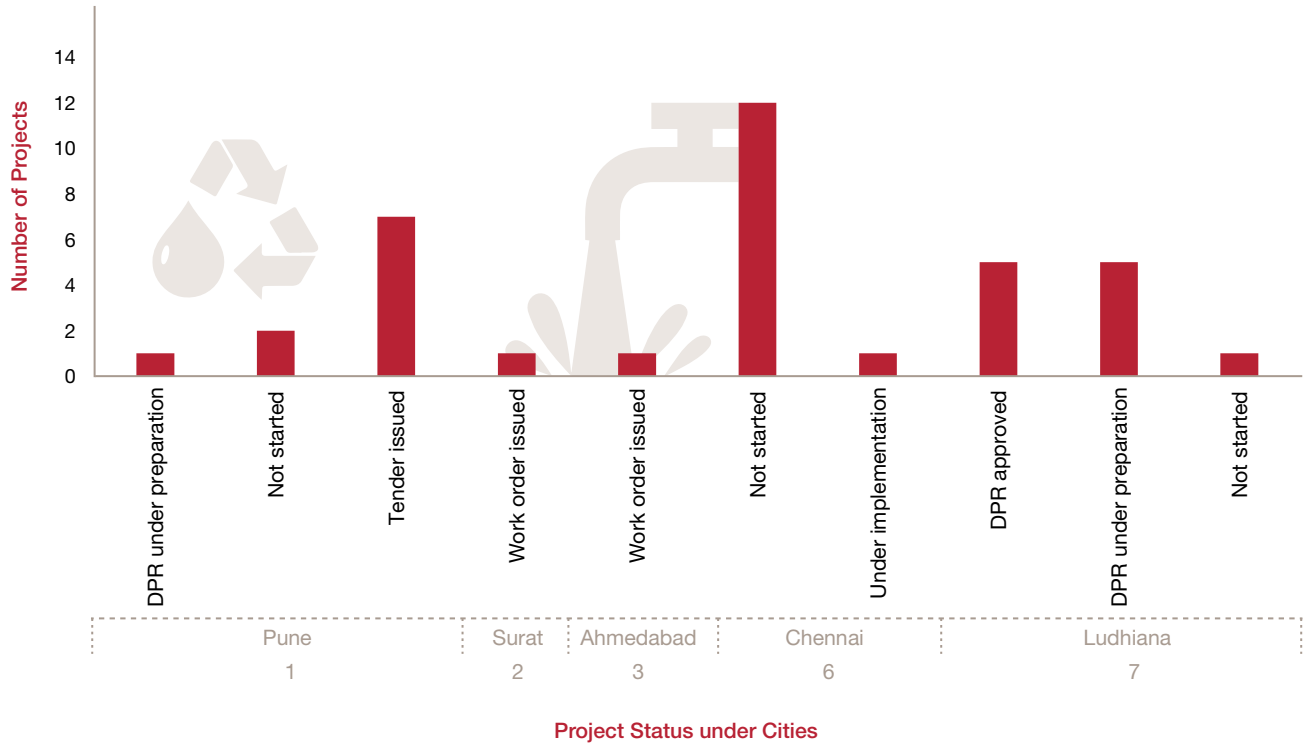
- Rain water harvesting
- Storm water drainage management
- Smart metering
- Smart water management
- Waterways improvement

Waste water management

A smart city treats all of its sewage to prevent to polluting of water bodies and aquifers. The sector typically consists of projects such as:

- Waste water management
- Sewerage/septage management
- Waste water, collection, treatment and recycle
- Construction of STP
- Strengthening and augmentation of sewer network
- Sewerage infrastructure/ utility upgrade
- Public utility improvement – underground drainage system
- Sewerage collection

Solutions-based update under water supply and water treatment



Project Status under Cities

For details of the projects, please refer to section 5 of the report.

Land monetisation

Under the Smart Cities Mission, many models have been suggested for financing capital and operational investments. Land monetisation is one of the sources of income for brownfield projects. Returns on investment can be generated through land monetisation by increasing the floor area ratio or total floor area of a building in comparison to the size of the land upon which it is built. Land monetisation by metro rail operators or authorities, railways and bus transporters is estimated to be an over 30 billion USD investment opportunity over the next 5 to 10 years. The government needs to work out investor-friendly commercial structures while ensuring transparency and accountability in the transaction process. Therefore, land monetisation is a priority agenda under the Smart Cities Mission.

Solution sub category

Multi-ducting

The electricity ducts for street lights will be used for the fibre optic network in the near future.

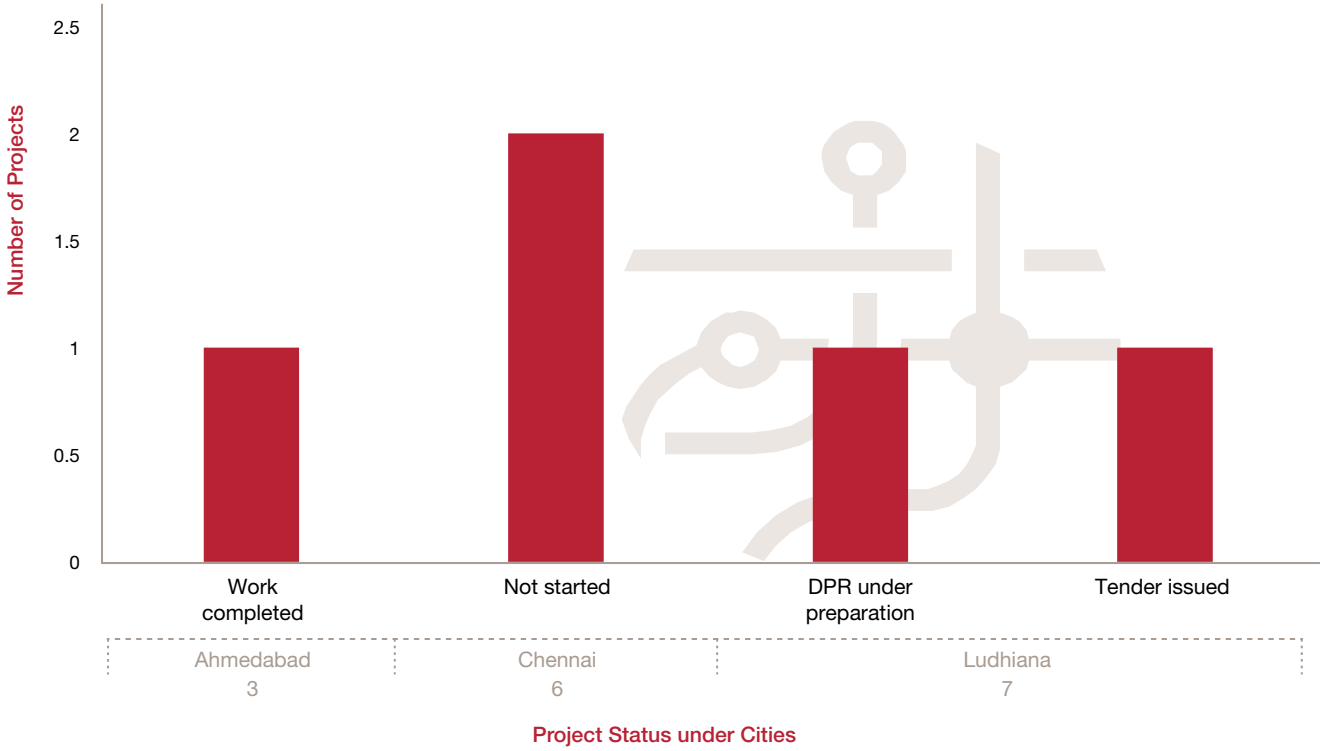
Underground (UG) wiring

Projects under this element include digital hoarding and information kiosks and Wi-Fi hotspots.

Optical fibre network

The city-wide optical fibre network will leverage the existing electricity ducts.

Solutions-Based update under land monetisation



Project Status under Cities

For details of the projects, please refer to section 5 of the report.

City-wise solutions-based update: Lighthouse Smart Cities under Round 1

Pune

City snapshot

Total population
31.24 lakhs

Population growth rate
30.37%

Total area
700 km

Crime index
42.61

Literacy rate
89.56%

Safety index
56.59

Total investment across SCP – 2,363 crore INR
ABD investment – 1,851 crore INR
PAN investment – 512 crore INR

Source: https://smartnet.niua.org/smart-cities-network

City projects

The following is a list of all projects as proposed in the SCP.

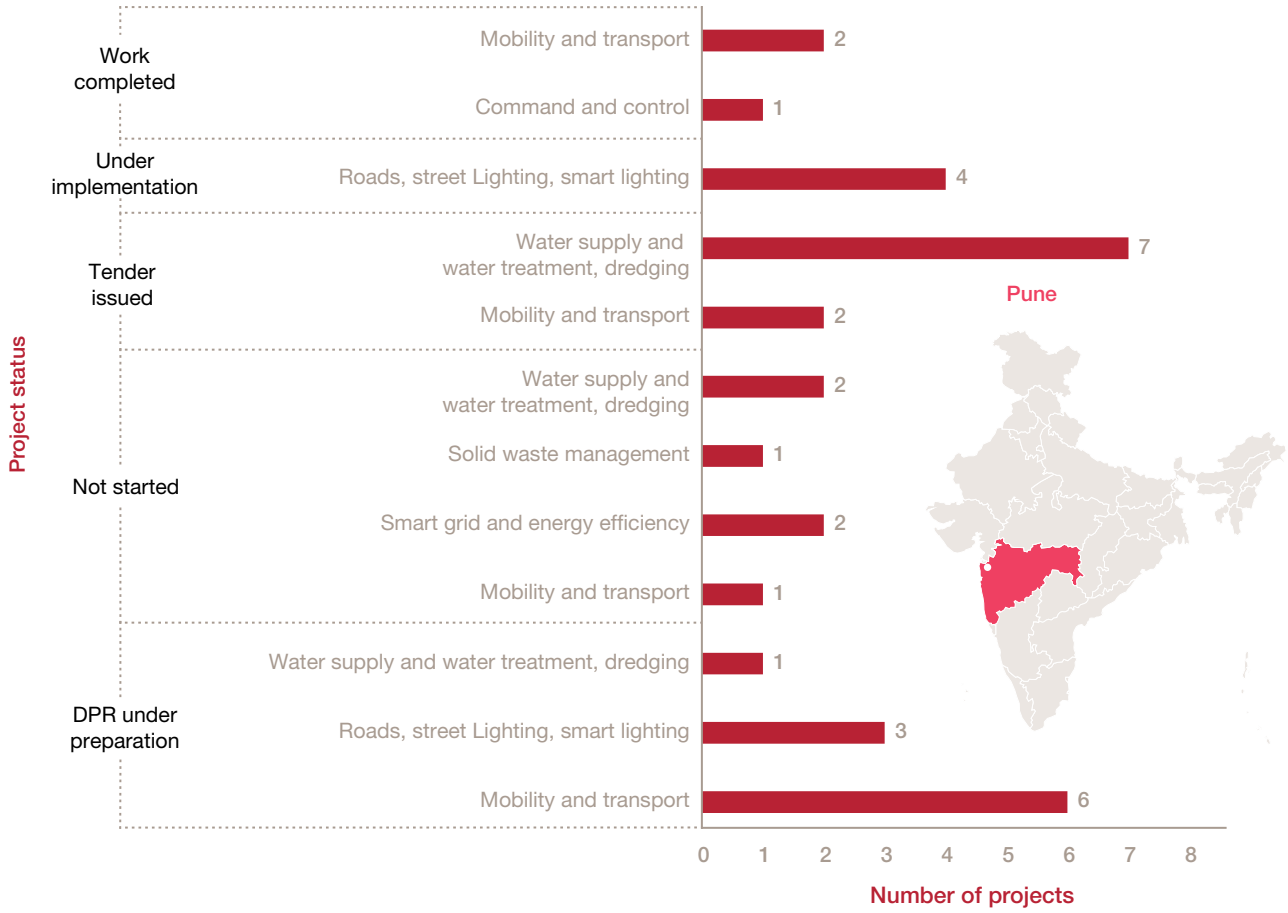
Sr. no.	ABD/ PAN	Project Name	Sub-Project Name	Total Project Cost (crores)
1	ABD	Road & road widening	Road & road widening	190
2	ABD	100 electric buses	100 electric buses	125
3	ABD	Redesign of streets	Redesign of streets	189
4	ABD	Smart parking	Smart parking	50
5	ABD	Footpaths (additional & retrofit)	Footpaths (additional & retrofit)	31
6	ABD	Place making	Place making	30
7	ABD	Bicycles	Bicycles	10
8	ABD	Bus stops (revamp of 54 stations)	Bus stops (revamp of 54 stations)	27
9	ABD	Junction redesign for 14 junctions	Junction redesign for 14 junctions	14
10	ABD	Non-motorized street	Non-motorized street	5
11	ABD	Bus rapid transit (BRT)	Bus rapid transit (BRT)	210
12	ABD	Express airport service	Express airport service	3
13	ABD	E-rickshaws	E-rickshaws	1
14	ABD	Waste water recycling	Waste water recycling	99
15	ABD	Storm water use	Storm water use	43
16	ABD	Adequate water supply	Adequate water supply	87
17	ABD	Rainwater harvesting	Rainwater harvesting	6
18	ABD	Smart metering (water)	Smart metering (water)	22
19	ABD	Root zone to clean water	Root zone to clean water	8
20	ABD	Solid waste management	Solid waste management	16
21	ABD	Sanitation	Sanitation	2
22	ABD	Electricity distribution- smart grid & metering	Electricity distribution- smart grid & metering	364
23	ABD	Security	Security	27
24	ABD	Riverfront development	Riverfront development	100

Sr. no.	ABD/ PAN	Project Name	Sub-Project Name	Total Project Cost (crores)
25	ABD	Open spaces	Open spaces	4
26	ABD	Fire stations (2)	Fire stations (2)	3
27	ABD	Low income skill development and healthcare	Low income skill development and healthcare	20
28	ABD	Build affordable housing	Build affordable housing	40
29	ABD	IT connectivity	IT connectivity	146
30	PAN	Adaptive traffic control system	Adaptive traffic control system	123
31	PAN	Bus system Intelligent transport management system (ITMS)	Bus system Intelligent transport management system (ITMS)	70
32	PAN	Command & control center	Command & control center	42
33	PAN	Smart parking	Smart parking	15
34	PAN	Intelligent road management	Intelligent road management	3
35	PAN	Citilogik solution	Citilogik solution	18
36	PAN	e-challan	e-challan	1
37	PAN	Pilot DMA for 24x7 water	Pilot DMA for 24x7 water	22
38	PAN	Bulk meters	Bulk meters	83
39	PAN	Helium leak identification	Helium leak identification	19
40	PAN	Smart commercial meters	Smart commercial meters	60
41	PAN	Smart domestic meters	Smart domestic meters	20
42	PAN	Customer mapping & survey	Customer mapping & survey	5
43	PAN	Naidu STP generation	Naidu STP generation	6
44	PAN	Mobile app and website	Mobile app and website	1
45	PAN	Online bill payment	Online bill payment	1
46	PAN	Consultancy services	Consultancy services	2
47	PAN	Consumer awareness	Consumer awareness	20

Source: Smart City Proposal

City projects update

City-wise solutions-based project update



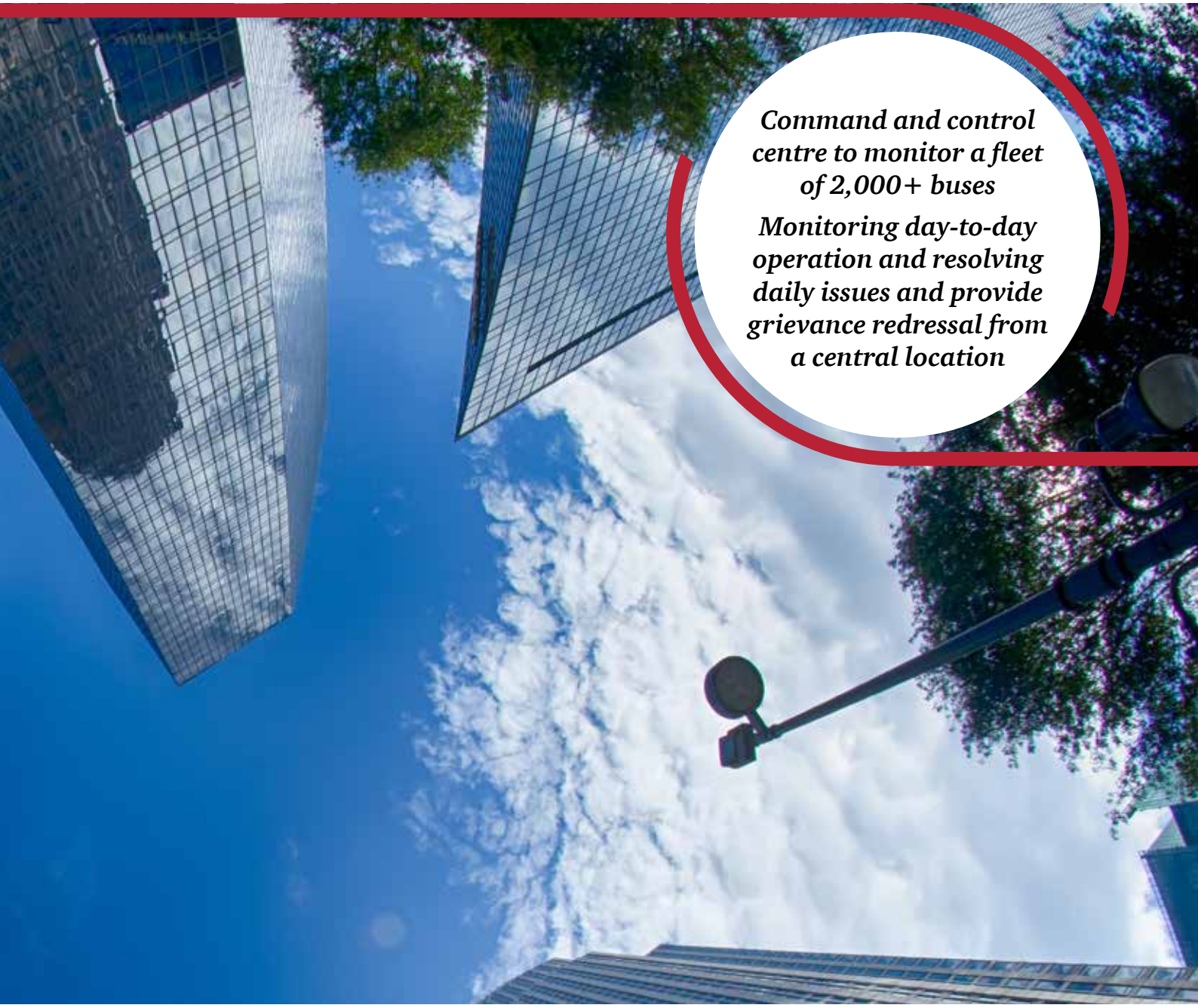
Project details under the above-mentioned solutions

Project Name	Sub-Project Name	Solution Category	Projects Status
Command and control centre	Command and control centre	Command and control centre	Work completed
100 electric buses	100 electric buses	Mobility and transport	Tender issued
Smart parking	Smart parking	Mobility and transport	DPR under preparation
Bicycles	Bicycles	Mobility and transport	Tender issued
Bus stops (revamp of 54 stations)	Bus stops (revamp of 54 stations)	Mobility and transport	DPR under preparation
Bus rapid transit (BRT)	Bus rapid transit (BRT)	Mobility and transport	DPR under preparation
Express airport service	Express airport service	Mobility and transport	DPR under preparation
E-rickshaws	E-rickshaws	Mobility and transport	Not started
Transit hub	Transit hub	Mobility and transport	DPR under preparation
Adaptive traffic control system	Adaptive traffic control system	Mobility and transport	Work completed
Bus system Intelligent Transport Management System (ITMS)	Bus system Intelligent Transport Management System (ITMS)	Mobility and transport	Work completed
Smart parking	Smart parking	Mobility and transport	DPR under preparation
Road & road widening	Road & road widening	Roads, street lighting, smart lighting	Under implementation
Redesign of streets	Redesign of streets	Roads, street lighting, smart lighting	DPR under preparation
Footpaths (additional and retrofit)	Footpaths (additional and retrofit)	Roads, street lighting, smart lighting	DPR under preparation
Junction redesign for 14 junctions	Junction redesign for 14 junctions	Roads, street lighting, smart lighting	Under implementation
Non-motorised street	Non-motorised street	Roads, street lighting, smart lighting	DPR under preparation
Street lighting	Street lighting	Roads, street lighting, smart lighting	Under implementation
Intelligent road management	Intelligent road management	Roads, street lighting, smart lighting	Under implementation
Electricity distribution- smart grid and metering	Electricity distribution- smart grid and metering	Smart grid and energy efficiency	Not started
Solar energy supply	Solar energy supply	Smart grid and energy efficiency	Not started
Solid waste management	Solid waste management	Solid waste management	Not started

Project Name	Sub-Project Name	Solution Category	Projects Status
Waste water recycling	Waste water recycling	Water supply and water treatment, dredging	Not started
Storm water use	Storm water use	Water supply and water treatment, dredging	DPR under preparation
Adequate water supply	Adequate water supply	Water supply and water treatment, dredging	Tender issued
Rainwater harvesting	Rainwater harvesting	Water supply and water treatment, dredging	Not started
Smart metering (water)	Smart metering (water)	Water supply and water treatment, dredging	Tender issued
Root zone to clean water	Root zone to clean water	Water supply and water treatment, dredging	Tender issued
Pilot District metering analysis (DMA) for 24x7 water	Pilot District metering analysis (DMA) for 24x7 water	Water supply and water treatment, dredging	Tender issued
Bulk meters	Bulk meters	Water supply and water treatment, dredging	Tender issued
Smart commercial meters	Smart commercial meters	Water supply and water treatment, dredging	Tender issued
Smart domestic meters	Smart domestic meters	Water supply and water treatment, dredging	Tender issued

City iconic project

Command and control project



Surat

City snapshot

Total population
44.68 lakhs

Population growth rate
65%

Total area
326.5 km

Crime index
42.49

Literacy rate
87.89%

Safety index
57.51

Total investment across SCP –2,597 crore INR
ABD investment –1,802 crore INR
PAN investment –795 crore INR

Source: https://smartnet.niua.org/smart-cities-network

City projects

The following is a list of all projects as proposed in the SCP.

Sr. no.	ABD/ PAN	Project Name	Sub-Project Name	Total project cost (crore INR)
1	ABD	Water supply management and quality	24x7 water supply and water quality	178
2	ABD	Water supply management and quality	Common utility meter	17
3	ABD	Water recharging	• Rain water recharging and zero liquid discharge • Water recharging through storm water drainage system	30
4	ABD	Sewerage	Novation of Sewerage treatment plants (STP) with Supervisory control and data acquisition (SCADA) and energy generation	155
5	ABD	Sewerage	Recycling/reuse of waste water	100
6	ABD	Renewable energy and energy efficiency initiatives	• Solar (1 MW) and wind power generation (2.1 MW) • Biogas plant for organic waste	35
7	ABD	Renewable energy and energy efficiency initiatives	Smart street lighting and monitoring system	32
8	ABD	Storm water	Remodelling and restructuring of existing creek to create open spaces with smart	200
9	ABD	Town planning and development	Smart parking (mechanised Parking)	210
10	ABD	Town planning and development	Visible improvement in area (non-vehicle zone street, walkability – footpath, non-motorised vehicles, signage, skywalk)	50
11	ABD	Economic development	Innovation, incubation and start-up and trade facilitation centre	20
12	ABD	Economic development	Modernisation of logistics park	50
13	ABD	Housing and inclusiveness	Affordable housing (PMAY) (1,050 EWS/1950 LIG)	240
14	ABD	Housing and inclusiveness	Affordable housing (PPP) (5750 units)	460
15	ABD	Smart city system	• Advanced grievance redressal system Smart waste collection system • Air and water quality monitoring system • Area surveillance network	25
16	PAN	Surat Integrated transport-mobility administration centre (IT-MAC)	• Surat IT-MAC • Intelligent transit management system • Automated traffic control system	183

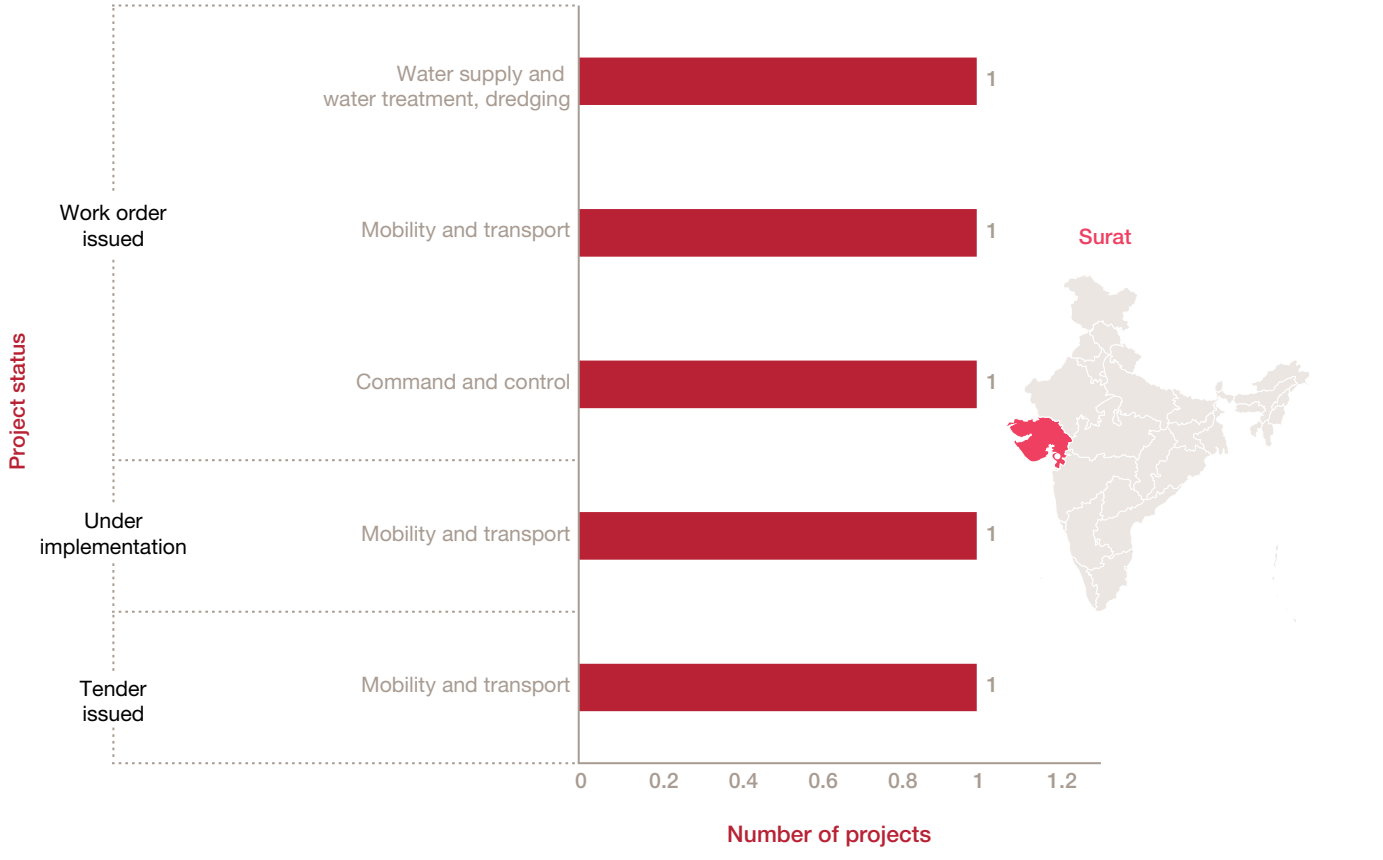
Source: Smart City Proposal

Sr. no.	ABD/ PAN	Project Name	Sub-Project Name	Total project cost (crore INR)
17	PAN	Automatic fare collection system	• Automatic fare collection system • Automated sliding door at high mobility corridor and BRTS	166
18	PAN	Development of ERP with GIS Platform	Development of ERP with GIS Platform	107
19	PAN	SMAC Centre (Smart city centre)	• SMAC Centre (Smart city centre) • MySurat.in [active citizen engagement] • Data centre strengthening and DR site • Open Surat – open data • Mobile apps, mobile tickets, social media, mobile ID (M-ID)	75
20	PAN	S-Connect Card Management System (co-branded multi-application contactless smart card)	S-Connect card management system (co-branded multi-application contactless smart card)	44
21	PAN	Connected Surat [Wi-Fi-Surat :: fibre to home (FTH)]	Connected Surat [Wi-Fi-Surat :: FTH]	220

Source: Smart City Proposal

City projects update

City-wise solutions-based project update



Project details under the above-mentioned solutions

Project Name	Sub-Project Name	Solution Category	Projects Status
Water supply management and quality	24 x 7 water supply and water quality	Water supply and water treatment, dredging	Work order issued
Town planning and development	Smart parking (mechanised parking)	Mobility and transport	Tender issued
Surat IT-MAC (Integrated transport-mobility administration centre)	• Surat IT-MAC (Integrated transport mobility administration centre) • Intelligent transit management system • Automated traffic control system	Mobility and transport	Work order issued
Automatic fare collection system (AFCS)	• Automatic fare collection system (AFCS) • Automated sliding door at high mobility corridor and BRTS	Mobility and transport	Under implementation
Integrated command control centre	Integrated command control centre	Command and control centre	Work order issued

City iconic project

Intelligent Transport Management System (ITMS)

ITMS in PAN city includes:

- 154 BRTS stations
- 275 city Buses
- 116 BRTS buses
- 535 department vehicles
- 50 emergency vehicles

Scope of Surat ITMS project covers:

- Automatic vehicle locator service (AVLS)
- Depot management system
- Incident management system
- Vehicle scheduling and dispatch module
- Enterprise management system
- Mobile app
- Public website
- Public information system (PIS)

Ahmedabad

City snapshot

Total population
55.76 lakhs

Population growth rate
19.17%

Total area
464 km

Crime index
40.07

Literacy rate
88.29%

Safety index
59.93

Total investment across SCP –2,290 crore INR
ABD investment –1,751 crore INR
PAN investment –539 crore INR

Source: https://smartnet.niua.org/smart-cities-network

City projects

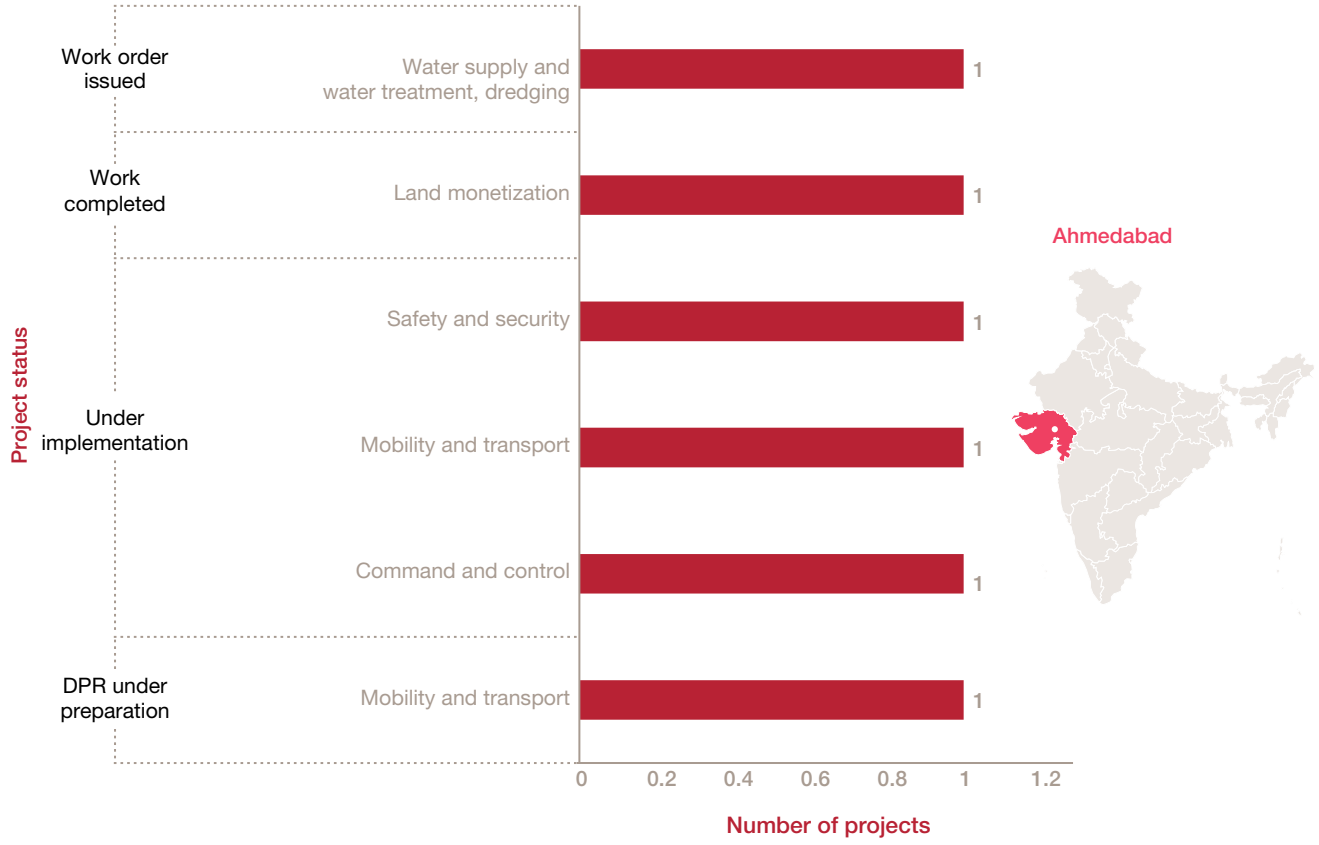
The following is a list of all projects as proposed in the SCP.

Sr. no.	ABD/ PAN	Project Name	Sub-Project Name	Total project cost (crore INR)
1	ABD	TOZ	Intermodal hub	125
2	ABD	TOZ	Infrastructure development schedule	462
3	ABD	TOZ	Smart features	109
4	ABD	Slum redevelopment	Redevelopment of buildings (PPP)	836
5	ABD	Slum redevelopment	Infrastructure development schedule (slum redevelopment)	67
6	ABD	Slum redevelopment	Smart features (slum redevelopment)	37
7	ABD	Slum redevelopment	Waste water treatment plant at Wadaj	115
8	PAN	BRT Optical fibre cabling (OFC)	BRT Optical fibre cabling (OFC)	150
9	PAN	Command centre	Command centre	53
10	PAN	Surveillance	Surveillance	57
11	PAN	Intelligent transport management systems (ITMS)	Intelligent transport management systems (ITMS)	50
12	PAN	Integration with existing services, real-time tracking and other applications	Integration with existing services, real-Time tracking and other applications	35
13	PAN	City-wide leased circuits network	City-wide leased circuits network	62
14	PAN	Common city payment system	Common city payment system	87
15	PAN	Capital cost – smart transit Project	Capital cost – smart transit Project	194

Source: Smart City Proposal

City projects update

City-wise solutions-based project update

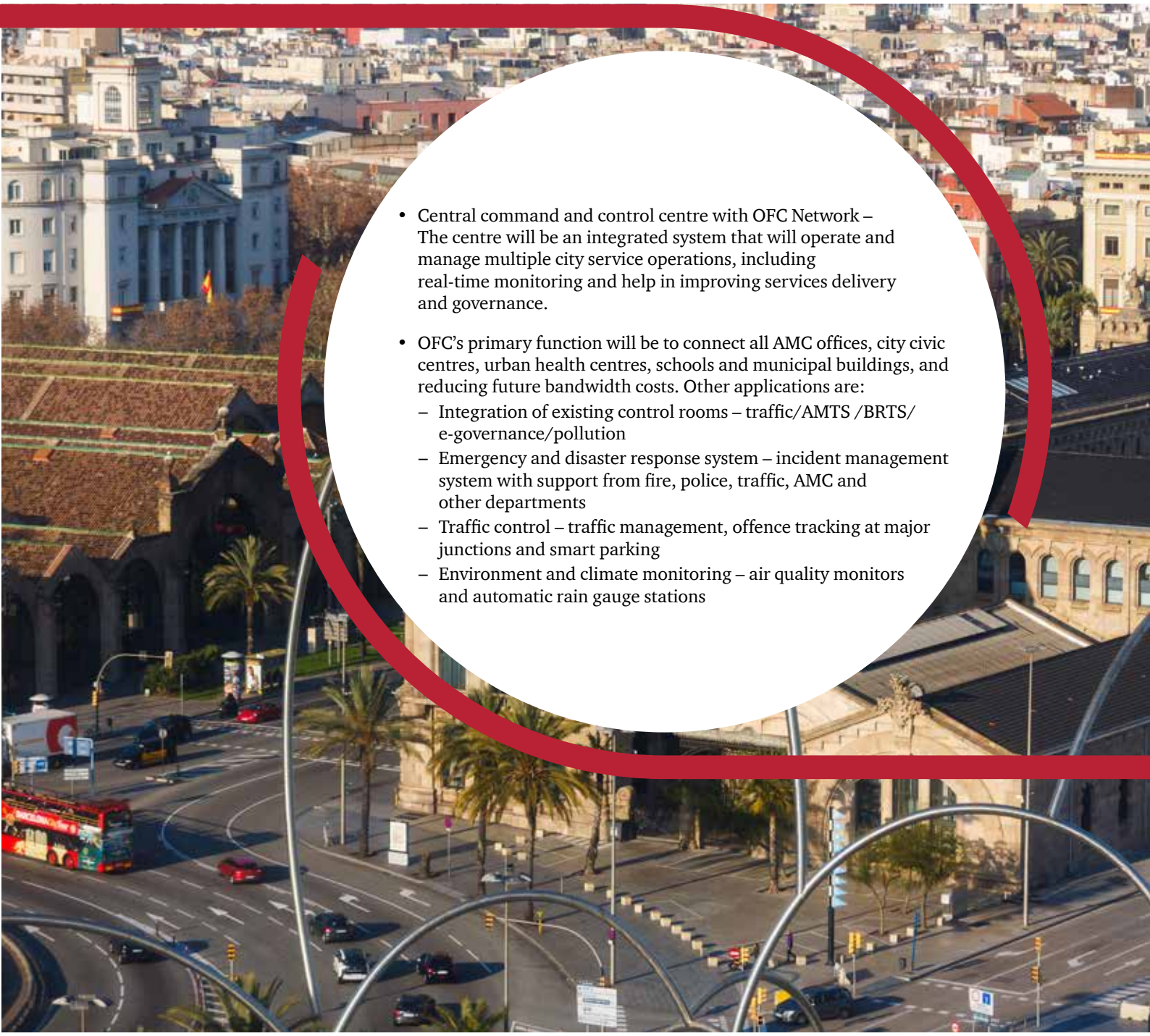


Project details under the above mentioned solutions

Project Name	Sub-Project Name	Solution Category	Projects Status
TOZ	Intermodal hub	Mobility and transport	DPR under preparation
Slum Redevelopment	Waste water treatment Plant at Wadaj	Water supply and water treatment, dredging	Under implementation
BRT Optical fibre cabling (OFC)	BRT Optical fibre cabling (OFC)	Land monetisation	Work completed
Command Centre	Command centre	Command and control centre	Under implementation
Surveillance	Surveillance	Safety and security	Under implementation
Intelligent transport management systems (ITMS)	Intelligent transport management systems (ITMS)	Mobility and transport	Under implementation

City iconic project

Command and control centre



- Central command and control centre with OFC Network – The centre will be an integrated system that will operate and manage multiple city service operations, including real-time monitoring and help in improving services delivery and governance.
- OFC's primary function will be to connect all AMC offices, city civic centres, urban health centres, schools and municipal buildings, and reducing future bandwidth costs. Other applications are:
  - Integration of existing control rooms – traffic/AMTS /BRTS/ e-governance/pollution
  - Emergency and disaster response system – incident management system with support from fire, police, traffic, AMC and other departments
  - Traffic control – traffic management, offence tracking at major junctions and smart parking
  - Environment and climate monitoring – air quality monitors and automatic rain gauge stations

Jabalpur

City snapshot

Total population
12.69 lakhs

Population growth rate
14.51%

Total area
152 km

Crime index
25.78

Literacy rate
88.29%

Safety index
74.22

Total investment across SCP –3,999 crore INR
ABD investment –3,795 crore INR
PAN investment –203 crore INR

Source: https://smartnet.niua.org/smart-cities-network

City projects

The following is a list of all projects as proposed in the SCP.

Sr. no.	ABD/ PAN	Project Name	Sub-Project Name	Total project cost (crore INR)
1	ABD	Economy and employment	Convention and exhibition centre	50
2	ABD	Economy and employment	Skill development centres for garment manufacturing and tribals handicrafts	18
3	ABD	Economy and employment	Development of civic centre	20
4	ABD	Economy and employment	Development of GoI bazaar	20
5	ABD	Economy and employment	Incubation centres	9
6	ABD	Redevelopment of public land	Slum housing built up	83.72
7	ABD	Redevelopment of public land	Compensatory tenements built up	284.75
8	ABD	Redevelopment of public land	Real estate sale components built up	1228.54
9	ABD	Redevelopment of public land	Parking built up	502.06
10	ABD	Redevelopment of public land	Development cost	78.49
11	ABD	Underground utility ducts	Underground utilities duct on major roads	93.62
12	ABD	Underground utility ducts	Underground utilities duct on other roads and pedestrian paths	5.76
13	ABD	Underground utility ducts	Shifting of overhead power cables in utility duct	62.41
14	ABD	Underground utility ducts	Shifting of overhead communication lines including DPs in utility duct	4.37
15	ABD	Underground utility ducts	Shifting of overhead power lines including DPs in other local and pedestrian streets	28.78
16	ABD	Underground utility ducts	Shifting of overhead communication lines including DPs in other local and pedestrian streets	0.81
17	ABD	Underground utility ducts	Laying of underground gas line on Major roads	18.72
18	ABD	Underground utility ducts	Laying of underground gas line on other roads and pedestrian paths	6.91
19	ABD	Water supply and reuse of recycled water	Elevated service reservoirs	7.9
20	ABD	Water supply and reuse of recycled water	Feeder mains and distribution network	39.61

Source: Smart City Proposal

Sr. no.	ABD/ PAN	Project Name	Sub-Project Name	Total project cost (crore INR)
21	ABD	Water supply and reuse of recycled water	SCADA sensor enabled flow meter	2.5
22	ABD	Water supply and reuse of recycled water	SCADA enabled pressure transducers	0
23	ABD	Water supply and reuse of recycled water	SCADA enabled level sensor system	0.12
24	ABD	Water supply and reuse of recycled water	Geo-thermal imaging leak detectors	0.5
25	ABD	Water supply and reuse of recycled water	Smart consumer water meters	5.85
26	ABD	Water supply and reuse of recycled water	Soft wares for area command and control center	3
27	ABD	Water supply and reuse of recycled water	Water quality monitoring system	2
28	ABD	Waste water management - sewerage and sanitations	Sewerage existing network laying of new sewerage network	34.17
29	ABD	Waste water management - sewerage and sanitations	Sewerage primary network for DEWATS	2.25
30	ABD	Waste water management - sewerage and sanitations	Decentralised waste water treatment plant of 6 MLD each	24
31	ABD	Waste water management - sewerage and sanitations	Construction of public toilets	1.2
32	ABD	Water Management : storm water drainage	Underground primary storm water drainage network	20.5
33	ABD	Water Management : storm water drainage	Underground secondary storm water drainage network	20.5
34	ABD	Water Management : storm water drainage	Underground tertiary storm water drainage network	17.09
35	ABD	Education	Smart classrooms in schools	6.75
36	ABD	Education	Wi-Fi hotspots for schools	0.22
37	ABD	Education	Smart facilities for schools	4.4
38	ABD	Health	Emergency response system for vulnerable	5
39	ABD	Identity and culture	Rejuvenation of Ranital Tank	25
40	ABD	Identity and culture	Development of cultural art alley at Bhavartal	5

Source: Smart City Proposal

Sr. no.	ABD/ PAN	Project Name	Sub-Project Name	Total project cost (crore INR)
41	ABD	Public open space and air quality	Development of landscape around Ranital	45.84
42	ABD	Public open space and air quality	Improvements in other existing parks	73.5
43	ABD	Public open space and air quality	Up-gradation of Durgawati sports complex	30
44	ABD	Public open space and air quality	Development of Wright town stadium	5
45	ABD	Public open space and air quality	Air quality monitoring sensors on unified pole	0.25
46	ABD	Energy supply, renewable energy and energy efficiency	Smart components in power sub-stations 33/11KV	4
47	ABD	Energy supply, renewable energy and energy efficiency	Smart components in sub-stations 11KV/440v	8
48	ABD	Energy supply, renewable energy and energy efficiency	Smart distribution network with meters and sensors	36
49	ABD	Energy supply, renewable energy and energy efficiency	Solar power terrace installations on redevelopment buildings	188.27
50	ABD	Energy supply, renewable energy and energy efficiency	Solar panels on street lights	0.53
51	ABD	Energy supply, renewable energy and energy efficiency	Solar power terrace installations on convention centre and sports complex	27.63
52	ABD	Energy supply, renewable energy and energy efficiency	Solar power terrace installations on other government buildings	24.05
53	ABD	Energy supply, renewable energy and energy efficiency	Smart consumer: metering	7.31
54	ABD	Transportation and walkability	Road development	126.62
55	ABD	Transportation and walkability	Vehicular intersection improvement	60.5
56	ABD	Transportation and walkability	Signalisation	57.5
57	ABD	Transportation and walkability	IPT services- battery operated E-Rickshaws	3.75
58	ABD	Transportation and walkability	Multilevel parking with smart components	18.84
59	ABD	Transportation and walkability	Smart parking and other components	12
60	ABD	Transportation and walkability	Development of green corridor	4

Source: Smart City Proposal

Sr. no.	ABD/ PAN	Project Name	Sub-Project Name	Total project cost (crore INR)
61	ABD	Transportation and walkability	Development of bus stops	4.3
62	ABD	Transportation and walkability	ITMS	2
63	ABD	IT connectivity	Wi-Fi Hot spots	12
64	ABD	IT connectivity	Laying of OFC network in utilities duct integration with pan city proposal	0
65	ABD	IT connectivity	Laying of underground OFC network in other local streets and pedestrian streets integration with pan city proposal	0
66	ABD	IT connectivity	GIS Mapping of the Area linking all the properties, Services and its management monitoring	2
67	ABD	IT enabled government services	Area CCC hardware	12.85
68	ABD	IT enabled government services	Area CCC software	5.51
69	ABD	IT enabled government services	Area CCC building	3.6
70	ABD	IT enabled government services	Public facilitation centres 6 numbers	9
71	ABD	Safety and security	Street lighting	28.85
72	ABD	Safety and security	Lighting of public open spaces on unified Pole	14.05
73	ABD	Safety and security	Installation of CCTV night vision camera	9.61
74	ABD	Safety and security	Pedestrian/NMT façade lighting on unified pole	0.43
75	ABD	Safety and security	VMS on unified pole	0.85
76	ABD	Safety and security	PA System	0.14
77	ABD	Safety and security	Variable sensors for pedestrian count	0.43
78	ABD	Safety and security	Water storage for fire fighting	10
79	ABD	Safety and security	Fire hydrants network with Pumps	10
80	ABD	Safety and security	Disaster Management centre	2
81	PAN	RFID components including OFC cabling	Household bins with RFID Tags	6.68

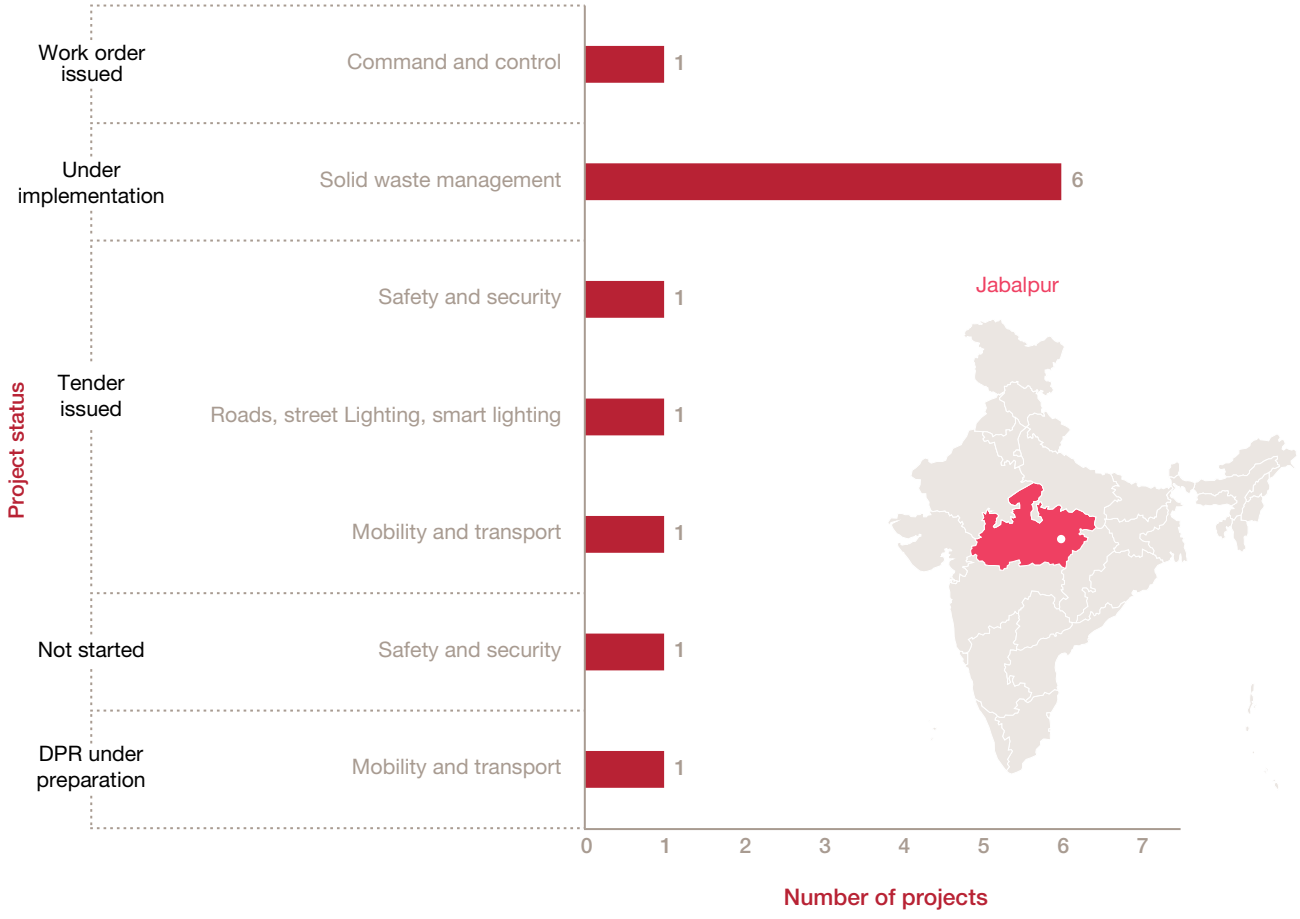
Source: Smart City Proposal

Sr. no.	ABD/ PAN	Project Name	Sub-Project Name	Total project cost (crore INR)
82	PAN	RFID components including OFC cabling	Community bins with RFID Tags	22.26
83	PAN	RFID components including OFC cabling	Road Side Bins with RFID Tags	9
84	PAN	RFID components including OFC cabling	RFID Reader for Door to Door Collection	11.13
85	PAN	RFID components including OFC cabling	PDA based reader for collecting vehicles	0.5
86	PAN	RFID components including OFC cabling	Antennas	10
87	PAN	RFID components including OFC cabling	OFC cabling in utility duct and networking	100
88	PAN	RFID components including OFC cabling	Geo-fencing bins, routes and Manpower	5
89	PAN	RFID components including OFC cabling	WMITS Software	5
90	PAN	Vehicle tracking and monitoring system (VTMS) components	Primary collection vehicles	8
91	PAN	Vehicle tracking and monitoring system (VTMS) components	Secondary collection vehicles: Electronics	2.4
92	PAN	Vehicle tracking and monitoring system (VTMS) components	Secondary collection vehicles: Manual	0.36
93	PAN	Vehicle tracking and monitoring system (VTMS) components	GPS devices on all primary collection vehicles	1
94	PAN	Vehicle tracking and monitoring system (VTMS) components	Software for monitoring	2
95	PAN	Central command and control Centre	Hardware requirements	2
96	PAN	Central command and control Centre	Software requirements	1
97	PAN	Central command and control Centre	Buildings to be integrated with ABD central C&CC	0
98	PAN	Other misc. components including IEC campaigns	Street Sweeping Machines	10
99	PAN	Other misc. components including IEC campaigns	Cleanliness metering- Integration with apna nigum app	0.05
100	PAN	Other misc. components including IEC campaigns	IEC campaigns for citizens	2
101	PAN	Other misc. components including IEC campaigns	Capacity building programmes	5

Source: Smart City Proposal

City projects update

City-wise solutions-based project update

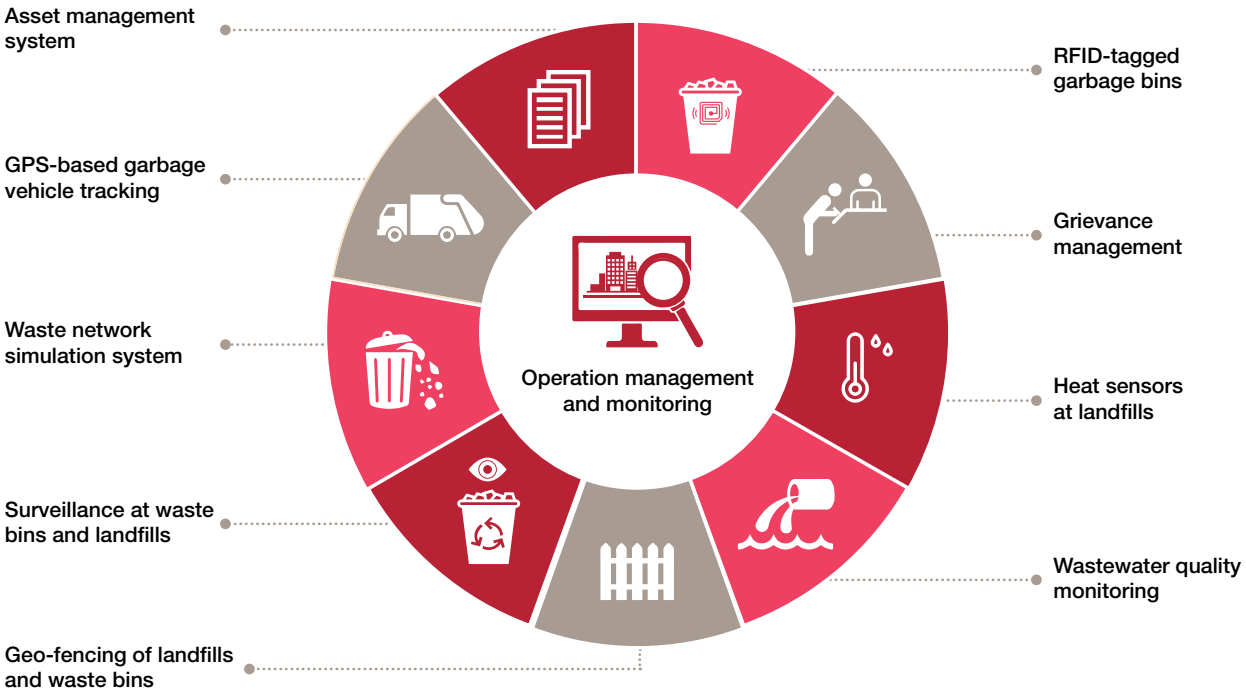


Project details under the above-mentioned solutions

Project Name	Sub-Project Name	Solution Category	Projects Status
Transportation and walkability	Smart parking and other components	Mobility and transport	Tender issued
Transportation and walkability	ITMS	Mobility and transport	DPR under preparation
Safety and security	Street lighting	Roads, street lighting, smart lighting	Tender issued
Safety and security	Lighting of public open spaces on unified pole	Safety and security	Tender issued
Safety and security	Installation of CCTV night vision camera	Safety and security	Not started
RFID components including OFC cabling	Household bins with RFID tags	Solid waste management	Under implementation
RFID components including OFC cabling	Community bins with RFID tags	Solid waste management	Under implementation
RFID components including OFC cabling	Road side bins with RFID tags	Solid waste management	Under implementation
RFID components including OFC cabling	RFID reader for door to door collection	Solid waste management	Under implementation
RFID components including OFC cabling	Geo-fencing bins, routes and Manpower	Solid waste management	Under implementation
RFID components including OFC cabling	WMITS software	Solid waste management	Under implementation
Command and control centre	Command and control centre	Command and control centre	Work order issued

City iconic project

Solid waste management



The Solid Waste Management Project comprises the following:

- 75,000 RFID installed
- 5,000 identified geo points
- RFID tags (passive tags, 13.56 MHz) for household bins
- RFID-based dust bins (passive tags, 13.56 MHz) for public places
- Personal digital assistance (PDA) based RFID readers for collecting vehicles, RFID reader for door-to-door collection, antennas

Vishakhapatnam (Vizag)

City snapshot

Total population
17.28 lakhs

Population growth rate
65.8%

Total area
514 km

Crime index
41.68

Literacy rate
81.76%

Safety index
59.78

Total investment across SCP –1,602 crore INR
ABD investment –1,461 crore INR
PAN investment –141 crore INR

Source: https://smartnet.niua.org/smart-cities-network

City projects

The following is a list of all projects as proposed in the SCP.

Sr. no.	ABD/ PAN	Project Name	Sub-Project Name	Total project cost (crore INR)
1	ABD	Water supply (24X7)	Network of uncovered area 8km and replacement of damaged pipelines	2.38
2	ABD	Water supply (24X7)	Ensuring 24X7 water supply and revenue improvement (Replacement of 25% pipelines)	1.12
3	ABD	Water supply (24X7)	Ensuring 24X7 water supply and revenue improvement (self-actualised valves)	0.45
4	ABD	Water supply (24X7)	Dismantling and restoration of roads	2.52
5	ABD	Water supply (24X7)	SCADA	10.56
6	ABD	Water supply (24X7)	Smart metering for water consumption	11.66
7	ABD	Sewerage	Coverage of Jalaripeta – 22 km sewer line	5
8	ABD	Sewerage	Pumping main and pumping station	9
9	ABD	Sewerage	improvements to pump houses	2
10	ABD	Sewerage	improvement to 25 MLD STP (including SCADA and monitoring)	9
11	ABD	Recycle water supply	Recycle water supply	62.5
12	ABD	Storm water management	Storm water drains	2.26
13	ABD	Storm water management	Roadside drains	7.68
14	ABD	Waste management	Awareness programme	1
15	ABD	Waste management	Equipment including road sweeping machine) and manpower - smart bins	2.53
16	ABD	Urban planning, design and landscape	Footpaths	1.92
17	ABD	Urban planning, design and landscape	Green spaces, landscaping, tree plantation etc. (hardscape, soft scape, signage and furniture)	95.69
18	ABD	Transportation	Public bike sharing + bike charging stations	50.75
19	ABD	Underground wiring	Underground wiring	250

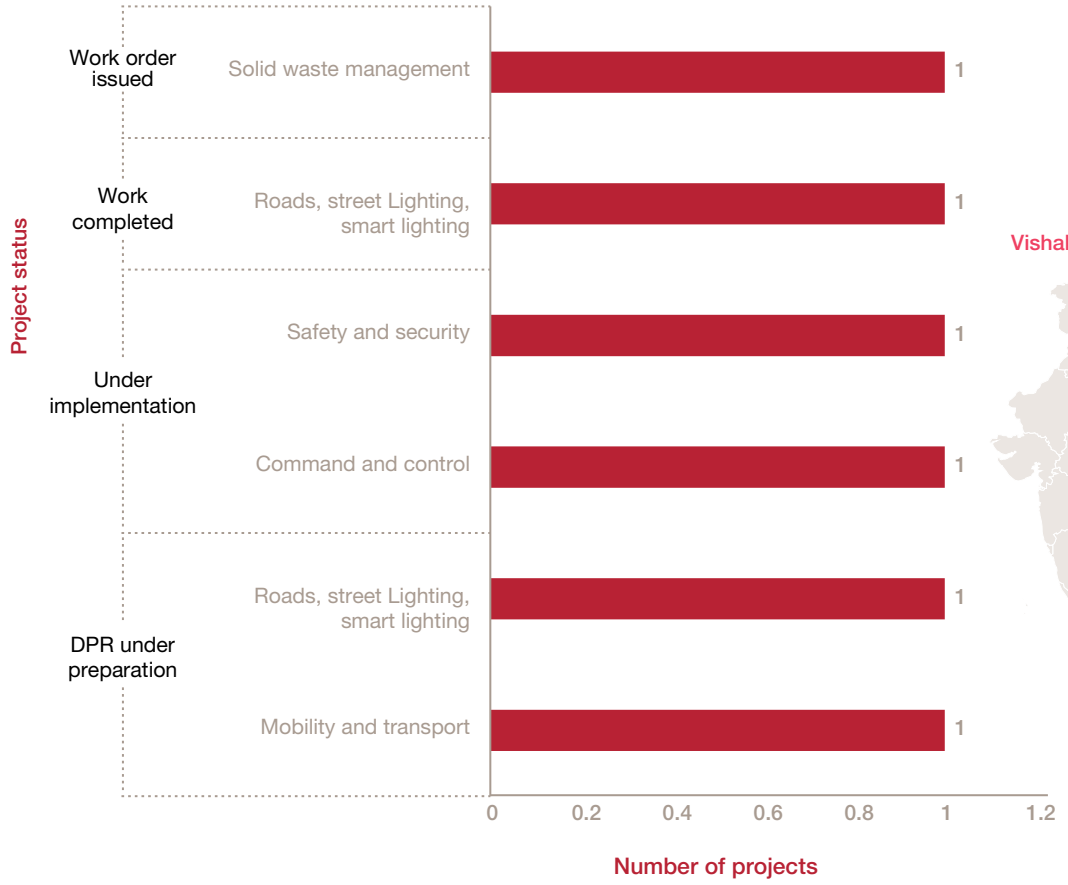
Source: Smart City Proposal

Sr. no.	ABD/ PAN	Project Name	Sub-Project Name	Total project cost (crore INR)
20	ABD	Pollution monitoring systems	Pollution monitoring systems	1.38
21	ABD	Public toilets	Public toilets	6.4
22	ABD	Community toilets	Community toilets	0.43
23	ABD	Multi-level car parking (MLCP)	Multi-level car parking (MLCP)	66.9
24	ABD	Solar roof top	Solar roof top	305.33
25	ABD	Refurbishing of Rajeev memorial + solar rooftop	Refurbishing of Rajeev memorial + solar rooftop	9.44
26	ABD	Smart metering for electricity	Smart metering for electricity	26.42
27	ABD	Shore protection along beach road	Shore protection along beach road	125
28	ABD	Smart signalling and traffic surveillance + command/ data centre	Smart signalling and traffic surveillance + command/data centre	12
29	ABD	Science labs in GVMC schools	Science labs in GVMC schools	5.5
30	ABD	Housing for all	Housing for all	54.24
31	ABD	Solar city	Solar city	0.5
32	ABD	Beach beautification project	Beach beautification project	240
33	ABD	Retrofitting of VUDA Park	Retrofitting of VUDA park	12
34	ABD	E-Rickshaws	E-Rickshaws	2.3
35	ABD	Centrally controlled monitoring system for street lighting	Centrally controlled monitoring system for street lighting	15
36	ABD	Area based ICT solutions	Area based ICT solutions	50
37	PAN	Disaster management and E-Governance	Disaster management and E-Governance	141

Source: Smart City Proposal

City projects update

City-wise solutions-based project update



Vishakhapatnam (Vizag)

Project details under the above-mentioned solutions

Project Name	Sub-Project Name	Solution Category	Projects Status
Waste management	Equipment including road sweeping machine) and manpower - Smart Bins	Solid waste management	Work order issued
Smart signalling and traffic surveillance + command/data centre	Smart signalling and traffic surveillance + command/data centre	Mobility and transport	Under implementation
Centrally controlled monitoring system for street lighting	Centrally controlled monitoring system for street lighting	Command and control centre	Work completed
Disaster management and E-Governance	Disaster management and E-Governance	Safety and security	Under implementation
Smart road	Smart road	Roads, street lighting, smart lighting	DPR under preparation
Multi-level car parking (MLCP)	Multi-level car parking (MLCP)	Mobility and transport	DPR under preparation

City iconic project

Command and control center and disaster management

- A central control and command centre for operational ease of the different departments involved in service delivery to the citizens and coordination of different ongoing projects
- Central command and control centre easing the effort towards inter-departmental coordination
- Integration with IT enabled modelling systems for predicting disasters and alerting systems

Chennai

City snapshot

Total population
65 lakhs

Population growth rate
25.99 %

Total area
426 km

Crime index
42.55

Literacy rate
81.26%

Safety index
57.45

Total Investment across SCP – INR 1,366 Crores
ABD Investment – INR 878 Crores
PAN Investment – INR 488 Crores

Source: https://smartnet.niua.org/smart-cities-network

City projects

The following is a list of all projects as proposed in the SCP.

Sr. no.	ABD/ PAN	Project Name	Sub-Project Name	Total project cost (crore INR)
1	ABD	Electrical network	Micro grid management system	0.8
2	ABD	Electrical network	Electrical and ICT utility corridor	172.5
3	ABD	Electrical network	Smart metering	88.5
4	ABD	Electrical network	Installing roof top solar system in public buildings	5.31
5	ABD	Energy efficient LED Street lighting	Energy efficient LED street lighting - converting 250W HPSV luminaires on main roads to 120W LED luminaries	2.64
6	ABD	Energy efficient LED Street lighting	Energy efficient LED street lighting - converting 40W FTL luminaires on main roads to 20W LED luminaries	3.12
7	ABD	Water supply	Water supply network augmentation / rehabilitation	28.72
8	ABD	Water supply	Electromagnetic flow meter for water supply network	1
9	ABD	Water supply	Reliable source augmentation (desalination plant) for 24 X 7 water supply	173.33
10	ABD	Water supply	Augmentation of existing pump stations including future requirement	2
11	ABD	Water supply	Water pressure and quality monitoring meter	1
12	ABD	Sewerage	Sewerage network augmentation / rehabilitation	15.12
13	ABD	Sewerage	Installation of sensors at strategic location	1.51
14	ABD	Sewerage	Waste water recycling (parks, medians, gardens, etc.)	4
15	ABD	Sewerage	Augmentation of existing pump stations	1.6
16	ABD	Storm water drainage	Augmentation of existing storm water network	117
17	ABD	Storm water drainage	Installation of level sensors at strategic locations along storm water drains	1
18	ABD	Storm water drainage	Rain water harvesting @ every 30 m intervals	4
19	ABD	Solid waste management	Collection bins including sensors	0
20	ABD	Solid waste management	Vehicle monitoring system	0

Source: Smart City Proposal

Sr. no.	ABD/ PAN	Project Name	Sub-Project Name	Total project cost (crore INR)
21	ABD	Solid waste management	Geofencing of collection bins	0
22	ABD	Solid waste management	Modernisation of transfer station	0
23	ABD	Robust IT connectivity	Wi-Fi zones and hot spots	50.69
24	ABD	Robust IT connectivity	City surveillance system	0
25	ABD	Robust IT connectivity	Digital sign ages and billboards	0
26	ABD	Robust IT connectivity	Website for e-Governance features	0
27	ABD	Robust IT connectivity	Integration of all utilities using Geographic Information system (GIS)	0
28	ABD	Sanitation	Modular toilet	4.2
29	ABD	Non-motorised transport (NMT)	Pedestrianised streets	9.9
30	ABD	Non-motorised transport (NMT)	Traffic calming streets	7.43
31	ABD	Non-motorised transport (NMT)	Differently-abled footpath	15.84
32	ABD	Non-motorised transport (NMT)	Bicycle lanes	15.84
33	ABD	Non-motorised transport (NMT)	MLCPs with ICT application	120
34	ABD	Non-motorised transport (NMT)	On-street parking management system with ICT application	0.3

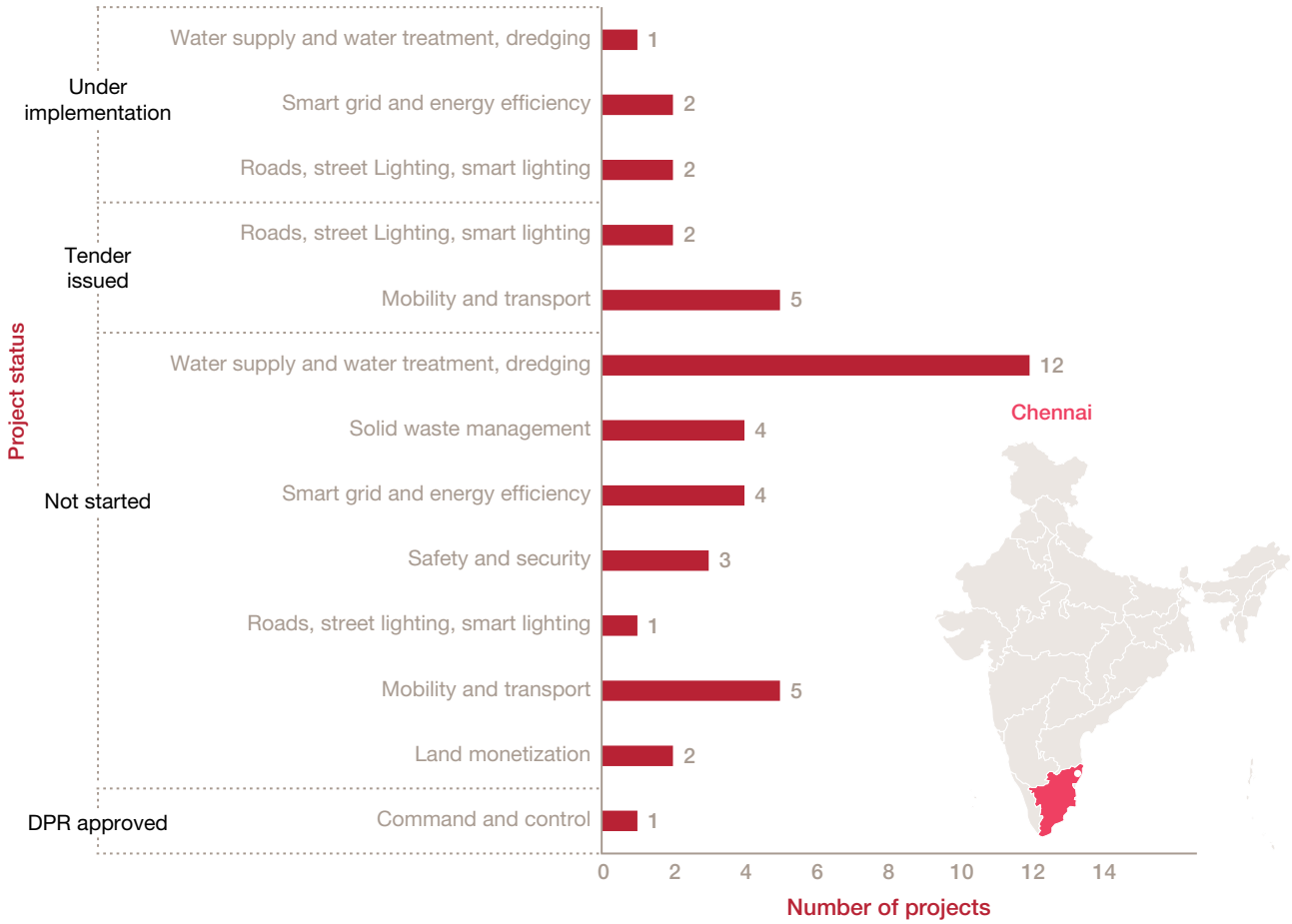
Source: Smart City Proposal

Sr. no.	ABD/ PAN	Project Name	Sub-Project Name	Total project cost (crore INR)
35	ABD	Non-motorised transport (NMT)	Cycle sharing system with ICT application	0.15
36	ABD	Non-motorised transport (NMT)	Installation of solar charging stations for e-Rickshaws	6.2
37	ABD	Intelligent traffic management	Smart signalling	5.12
38	ABD	Intelligent traffic management	Intelligent transport system	3
39	ABD	Retrofitting of green open spaces	Hard landscape	2.97
40	ABD	Retrofitting of green open spaces	Soft landscape	1.98
41	PAN	ICT for Non-motorised transport	Cycle Sharing system with ICT application	15
42	PAN	ICT for Non-motorised transport	City surveillance system	61.98
43	PAN	ICT for Non-motorised transport	On-street parking management with ICT application	20
44	PAN	ICT for Non-motorised transport	Street light monitoring system	248.47
45	PAN	ICT for Non-motorised transport	Automatic ON / OFF with timer	6.87
46	PAN	ICT for Non-motorised transport	Intelligent traffic management system	100
47	PAN	ICT for water Management	Disaster management: flood and tsunami monitoring and warning system	20
48	PAN	ICT for water Management	Smart water: digital solutions for citizen services	16

Source: Smart City Proposal

City projects update

City-wise solutions-based project update



Project details under the above-mentioned solutions

Project Name	Sub-Project Name	Solution Category	Projects Status
Electrical network	Micro grid management system	Smart grid and energy efficiency	Not started
Electrical network	Electrical and ICT utility corridor	Smart grid and energy efficiency	Not started
Electrical network	Smart metering	Smart grid and energy efficiency	Not started
Electrical network	Installing roof top solar system in public buildings	Smart grid and energy efficiency	Not started
Energy efficient LED street lighting	Energy efficient LED street lighting - converting 250W HPSV luminaires on main roads to 120W LED luminaries	Smart grid and energy efficiency	Under implementation
Energy efficient LED street lighting	Energy efficient LED street lighting - converting 40W FTL luminaires on main roads to 20W LED luminaries	Smart grid and energy efficiency	Under implementation
Water supply	Water supply network augmentation / rehabilitation	Water supply and water treatment, dredging	Not started
Water supply	Electromagnetic flow meter for water supply network	Water supply and water treatment, dredging	Not started
Water supply	Reliable source augmentation (desalination plant) for 24 X 7 water supply	Water supply and water treatment, dredging	Not started
Water supply	Augmentation of existing pump stations including future requirement	Water supply and water treatment, dredging	Not started
Water supply	Water pressure and quality monitoring meter	Water supply and water treatment, dredging	Not started
Sewerage	Sewerage network augmentation / rehabilitation	Water supply and water treatment, dredging	Not started
Sewerage	Installation of sensors at strategic location	Water supply and water treatment, dredging	Not started
Sewerage	Waste water recycling (Parks, medians, gardens, etc.)	Water supply and water treatment, dredging	Not started
Sewerage	Augmentation of existing pump stations	Water supply and water treatment, dredging	Not started
Storm water drainage	Augmentation of existing storm water network	Water supply and water treatment, dredging	Under implementation
Storm water drainage	Installation of level sensors at strategic locations along storm water drains	Water supply and water treatment, dredging	Not started
Storm water drainage	Rain water harvesting @ every 30 mt intervals	Water supply and water treatment, dredging	Not Started
Solid waste management	Collection bins including sensors	Solid Waste Management	Not Started
Solid waste management	Vehicle monitoring system	Solid Waste Management	Not Started

Source: Smart City Proposal

Project Name	Sub-Project Name	Solution Category	Projects Status
Solid waste management	Geofencing of collection bins	Solid Waste Management	Not Started
Solid waste management	Modernisation of transfer station	Solid Waste Management	Not Started
Robust IT connectivity	Wi-Fi zones and hot spots	Land monetisation	Not Started
Robust IT connectivity	City surveillance system	Safety and security	Not Started
Robust IT connectivity	Digital sign ages and billboards	Land monetisation	Not Started
Non-motorised transport (NMT)	Pedestrianised streets	Roads, street lighting, smart lighting	Under implementation
Non-motorised transport (NMT)	Traffic calming streets	Roads, street lighting, smart lighting	Under implementation
Non-motorised transport (NMT)	Differently-abled footpath	Roads, street lighting, smart lighting	Tender issued
Non-motorised transport (NMT)	Bicycle lanes	Roads, street lighting, smart lighting	Tender issued
Non-motorised transport (NMT)	MLCPs with ICT application	Mobility and transport	Tender issued
Non-motorised transport (NMT)	On-Street Parking Management system with ICT application	Mobility and transport	Tender issued
Non-motorised transport (NMT)	Cycle Sharing system with ICT Application	Mobility and transport	Tender issued
Non-motorised transport (NMT)	Installation of solar charging stations for e-rickshaws	Mobility and transport	Tender issued
Intelligent traffic management	Smart signaling	Mobility and transport	Not started
Intelligent traffic management	Intelligent transport system	Mobility and transport	Not started
ICT for Non-motorised transport	Cycle Sharing system with ICT application	Mobility and transport	Tender issued
ICT for Non-motorised transport	City surveillance system	Safety and security	Not started
ICT for Non-motorised transport	On-street parking management with ICT application	Mobility and transport	Not started
ICT for Non-motorised transport	Street light monitoring system	Roads, street lighting, smart lighting	Not started
ICT for Non-motorised transport	Automatic ON / OFF with timer	Mobility and transport	Not started
ICT for Non-motorised transport	Intelligent traffic management system	Mobility and transport	Not started
ICT for water management	Disaster management: flood and tsunami monitoring and warning system	Safety and security	Not started
ICT for water management	Smart water: digital solutions for citizen services	Water supply and water treatment, dredging	Not started
Integrated Command and control centre (CCC)	Integrated Command and control centre	Command and control centre	DPR approved

City iconic project

LED street lighting

Energy-efficient street lighting: Street lights automatically switch ON/OFF

Sensor-based LED street lighting management system to reduce power consumption, smart metering system

Ludhiana

City snapshot

Total population
16 lakhs

Population growth rate
14.44 %

Total area
159.37 km

Crime index
58.09

Literacy rate
82.52%

Safety index
41.91

Total Investment across SCP – INR 1,049 Crores
ABD Investment – INR 892 Crores
PAN Investment – INR 158 Crores

Source: https://smartnet.niua.org/smart-cities-network

City projects

The following is a list of all projects as proposed in the SCP.

Sr. no.	ABD/ PAN	Project Name	Sub-Project Name	Total project cost (crore INR)
1	ABD	Portable water	Water storage facility	2
2	ABD	Portable water	Water distribution network	0.9
3	ABD	Portable water	Replacements of valves	9.6
4	ABD	Portable water	SCADA system	11.5
5	ABD	Portable water	Smart meters system	20.06
6	ABD	Waste water collection system	Replacement and rehabilitation of sewerage distribution system	4.8
7	ABD	Waste water collection system	Sewerage treatment plant (STP) for recycling for 10MLD of this area sewage with tertiary treatment	5
8	ABD	Waste water collection system	Recycle water distribution network for reuse	4.5
9	ABD	Power	Underground distribution network	58.05
10	ABD	Power	Street lighting	10
11	ABD	Storm water management	Storm water network	37.15
12	ABD	Storm water management	Rain water harvesting	2.5
13	ABD	Storm water management	Replacement of old brick masonry drain along Ferozpur road and along Rose garden road for 2km	12
14	ABD	Waste management	Collection bins	0.26
15	ABD	Waste management	Augmenting tippers capacity 1 ton	4.72
16	ABD	Waste management	Bio-meth nation plant	1.7
17	ABD	Waste management	ICT waste management	0.84
18	ABD	Urban design and landscape	Streetscape improvement	7
19	ABD	Urban design and landscape	Bio swale on Ferozepur road	4.25
20	ABD	Urban design and landscape	Digital hoarding and information kiosks	20
21	ABD	Urban design and landscape	Public toilets (10 nos. with 10 seats/toilet with Solar roof top)	3.2
22	ABD	Urban design and landscape	Rooftop solar installation	252.52
23	ABD	Transportation	Footpath	8.69

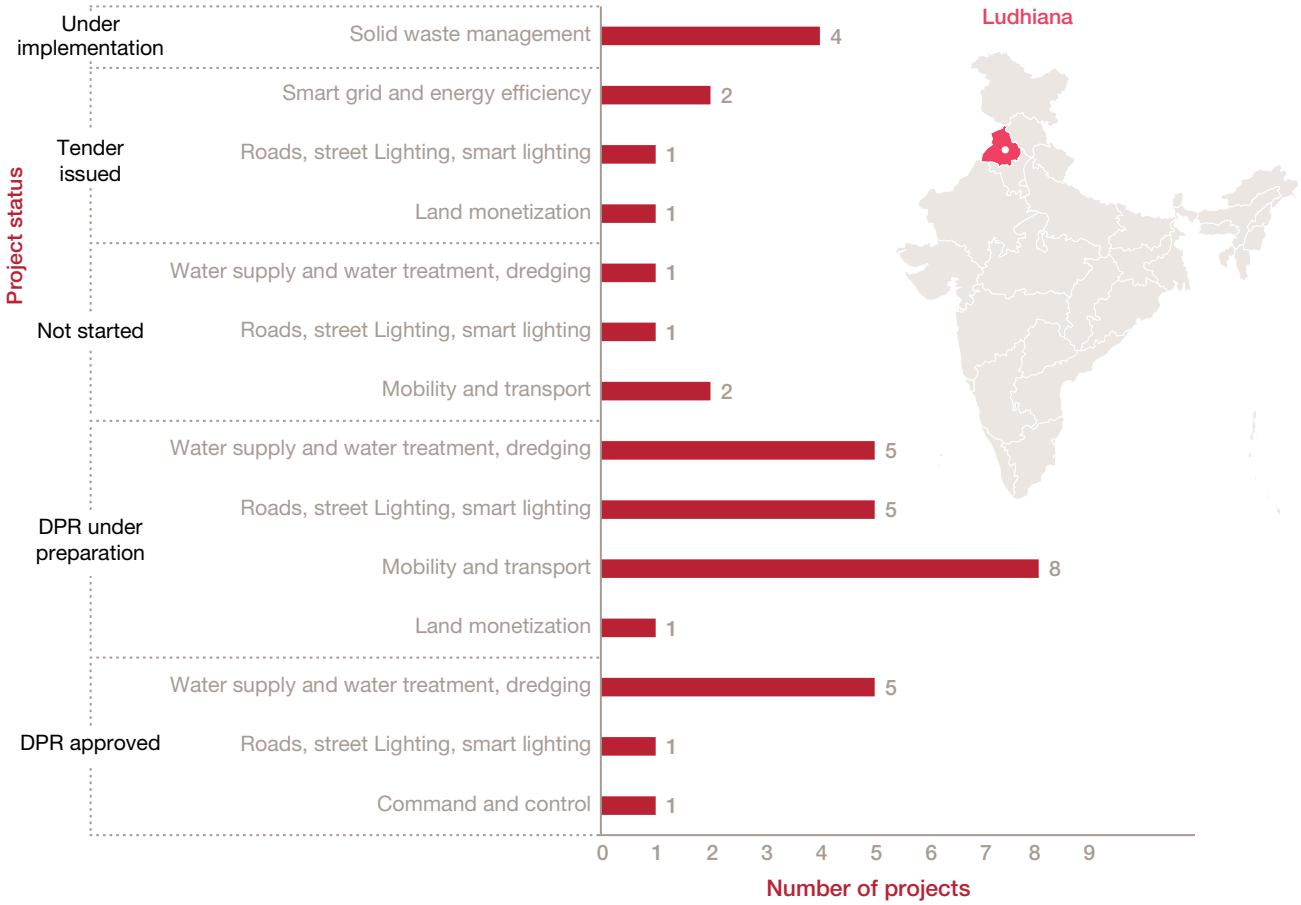
Source: Smart City Proposal

Sr. no.	ABD/ PAN	Project Name	Sub-Project Name	Total project cost (crore INR)
24	ABD	Transportation	Dedicated cycle tracks shared with footpath	6.15
25	ABD	Transportation	Elevated BRT along Ferozepur Road	190
26	ABD	Transportation	BRT stops	125
27	ABD	Transportation	Temporary bus shelters	2
28	ABD	Transportation	Foot over bridges	2.6
29	ABD	Transportation	Public bike sharing	1.45
30	ABD	Transportation	Area wise E-rickshaws (50 no)	0.58
31	ABD	Transportation	Signalisation at intersections (Vehicle activated ATCS compatible traffic signals)	3.5
32	ABD	Transportation	Smart on-street parking (300 Bays	3.23
33	ABD	Transportation	Signage, road marking and wayfinding	2
34	ABD	Transportation	Multilevel car park (300 Cars capacity) (Cost 5,00,000 INR/ECS	45
35	ABD	Transportation	RoB Pakhowal Road	40
36	ABD	Transportation	Miscellaneous	1
37	PAN	E-rickshaw	E-rickshaw	57.5
38	PAN	E-rickshaw	GPS	15
39	PAN	E-rickshaw	Charging stations	0.23
40	PAN	E-rickshaw	Kiosk	0.3
41	PAN	E-rickshaw	Control centre	7
42	PAN	GIS based mapping	Mapping and ground proofing	5
43	PAN	GIS based mapping	2 GIS application centre and remote sensing centre and block networks	28
44	PAN	GIS based mapping	License and staffing	12
45	PAN	GIS based mapping	Central command centre and DR site	32.5

Source: Smart City Proposal

City projects update

City-wise solutions-based project update



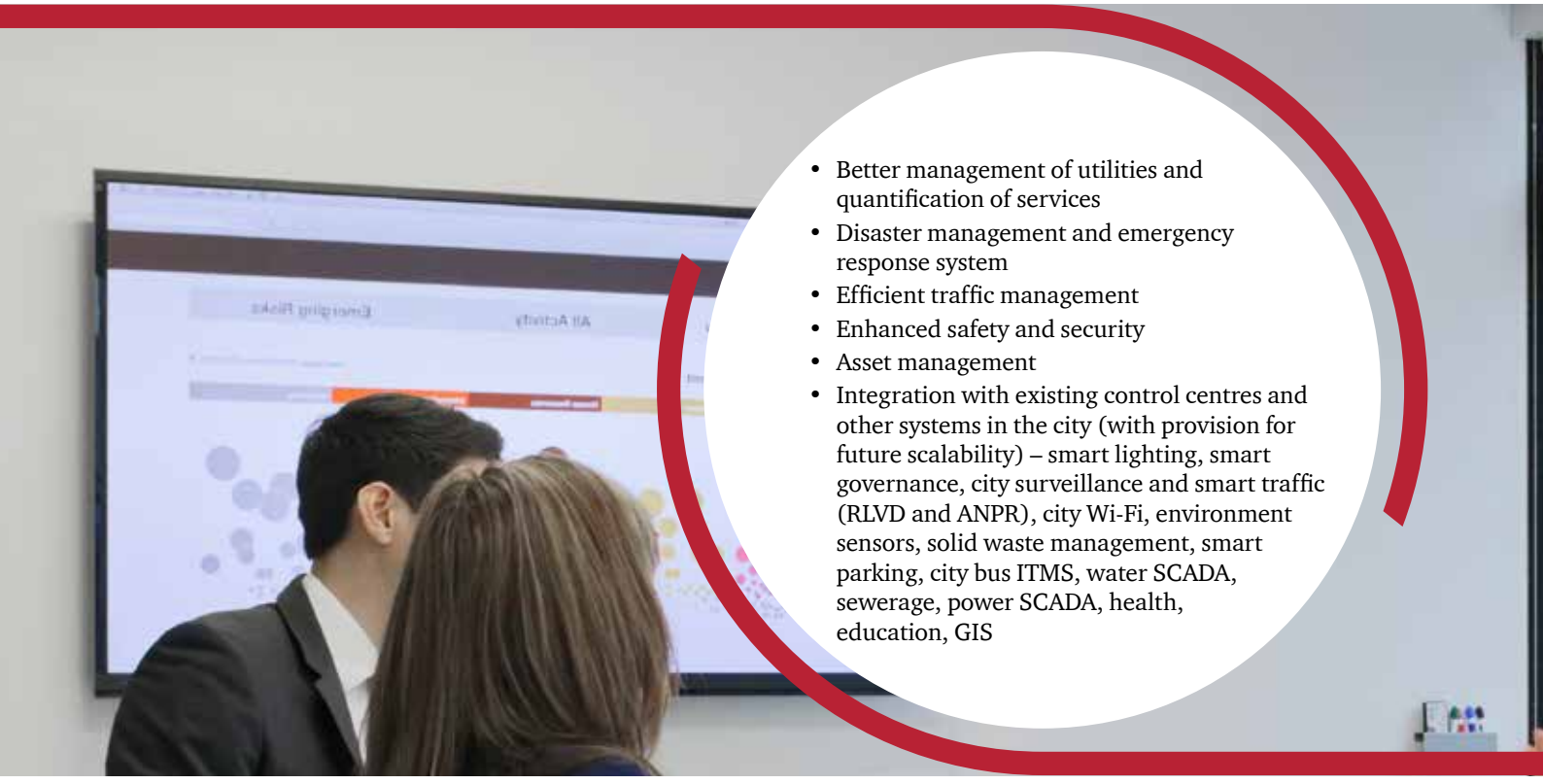
Project details under the above-mentioned solutions

Project Name	Sub-Project Name	Solution Category	Projects Status
Portable water	Water storage facility	Water supply and water treatment, dredging	DPR approved
Portable water	Water distribution network	Water supply and water treatment, dredging	DPR approved
Portable water	Replacements of valves	Water supply and water treatment, dredging	DPR approved
Portable water	SCADA system	Water supply and water treatment, dredging	DPR approved
Portable water	Smart meters system	Water supply and water treatment, dredging	DPR approved
Waste water collection system	Replacement and rehabilitation of sewage distribution system	Water supply and water treatment, dredging	DPR under preparation
Waste water collection system	Sewerage treatment plant (STP) for recycling for 10MLD of this area sewage with tertiary treatment	Water supply and water treatment, dredging	DPR under preparation
Waste water collection system	Recycle water distribution network for reuse	Water supply and water treatment, dredging	DPR under preparation
Power	Underground distribution network	Land monetisation	DPR under preparation
Power	Street lighting	Smart grid and energy Efficiency	Tender issued
Storm water management	Storm water network	Water supply and water treatment, dredging	DPR under preparation
Storm water management	Rain water harvesting	Water supply and water treatment, dredging	Not started
Storm water management	Replacement of old brick masonry drain along Ferozpur road and along Rose garden road for 2km	Water supply and water treatment, dredging	DPR under preparation
Waste management	Collection Bins	Solid waste management	Under implementation
Waste management	Augmenting tippers Capacity 1 ton	Solid waste management	Under implementation
Waste management	Bio-meth enation plant	Solid waste management	Under implementation
Waste management	ICT solid waste management	Solid waste management	Under implementation
Urban design and landscape	Streetscape Improvement	Roads, street lighting, smart lighting	DPR approved
Urban design and landscape	Bio swale on Ferozepur road	Roads, street lighting, smart lighting	Tender issued
Urban design and landscape	Digital hoarding and information kiosks	Land monetization	Tender issued
Urban design and landscape	Rooftop solar installation	Smart grid and energy efficiency	Tender issued
Transportation	Footpath	Roads, street lighting, smart lighting	DPR under preparation
Transportation	Dedicated cycle tracks shared with footpath	Roads, street lighting, smart lighting	DPR under preparation
Transportation	Elevated BRT along Ferozepur road	Roads, street lighting, smart lighting	DPR under preparation
Transportation	BRT stops	Roads, street lighting, smart lighting	Not started
Transportation	Temporary bus shelters	Mobility and transport	DPR under preparation

Project Name	Sub-Project Name	Solution Category	Projects Status
Transportation	Foot over bridges	Roads, street lighting, smart lighting	DPR under preparation
Transportation	Public bike sharing	Mobility and transport	DPR under preparation
Transportation	Area wise E-rickshaws (50 no)	Mobility and transport	DPR under preparation
Transportation	Signalisation at intersections (Vehicle activated ATCS compatible traffic signals)	Mobility and transport	Not started
Transportation	Smart on-street parking (300 bays	Mobility and transport	Not started
Transportation	Signage, road marking and wayfinding	Mobility and transport	DPR under preparation
Transportation	Multilevel car park (300 Cars capacity) (cost 500000 INR /ECS	Mobility and transport	DPR under preparation
Transportation	RoB Pakhowal Rd.	Mobility and transport	DPR under preparation
Transportation	Miscellaneous	Mobility and transport	DPR under preparation
Smart pole	Smart pole	Roads, street lighting, smart lighting	DPR under preparation
E-rickshaw Project	E rickshaw	Mobility and transport	DPR under preparation
Command and control centre	Command and control centre	Command and control centre	DPR approved

City iconic project

Integrated command and control centre



- Better management of utilities and quantification of services
- Disaster management and emergency response system
- Efficient traffic management
- Enhanced safety and security
- Asset management
- Integration with existing control centres and other systems in the city (with provision for future scalability) – smart lighting, smart governance, city surveillance and smart traffic (RLVD and ANPR), city Wi-Fi, environment sensors, solid waste management, smart parking, city bus ITMS, water SCADA, sewerage, power SCADA, health, education, GIS

Bhopal

City snapshot

Total population
17.45 lakhs

Population growth rate
19.69 %

Total area
463 km

Crime index
37.67

Literacy rate
80.37%

Safety index
62.33

Total investment across SCP –2,719 crore INR
ABD investment –2,071 crore INR
PAN investment –648 crore INR

Source: https://smartnet.niua.org/smart-cities-network

City projects

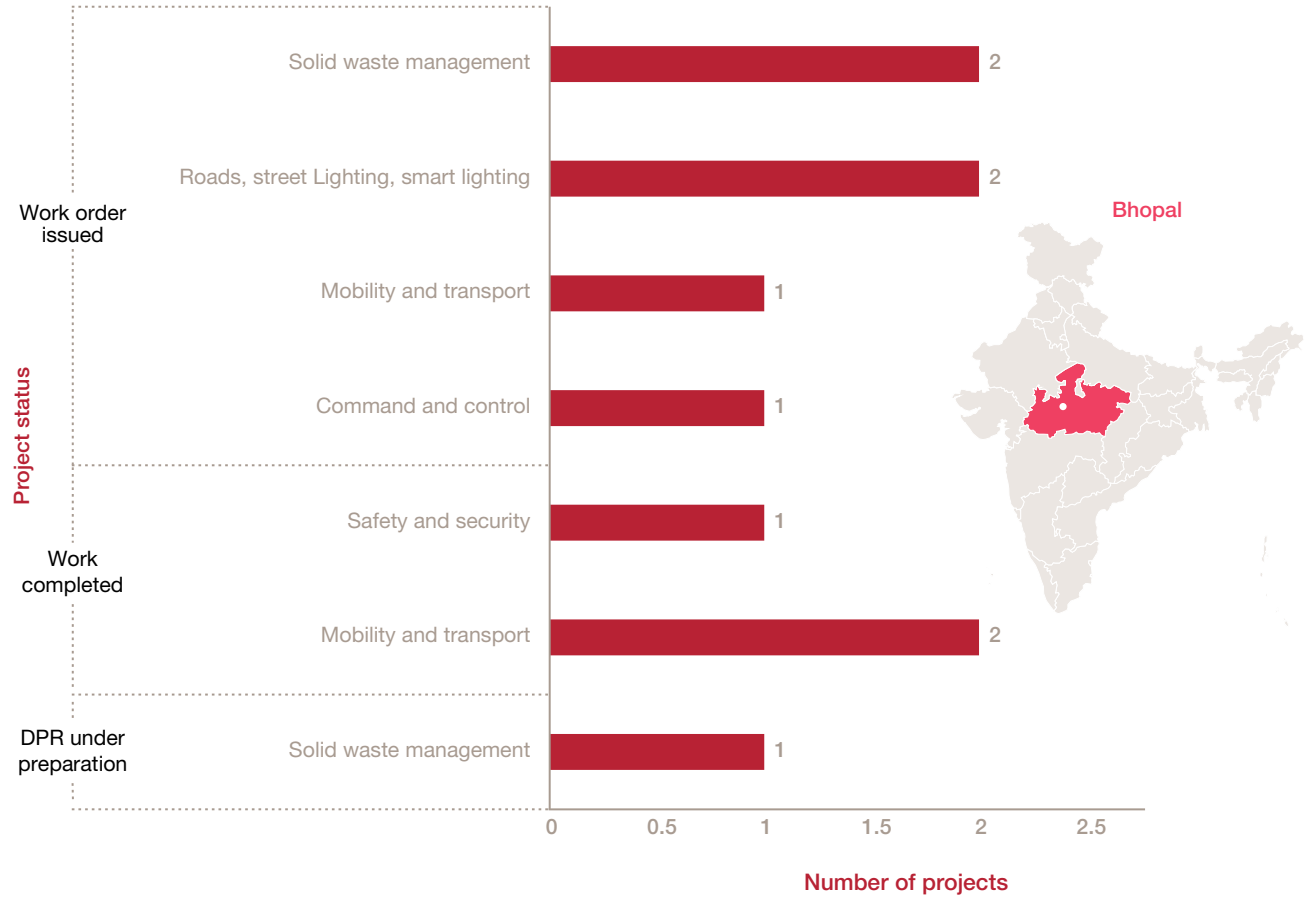
The following is a list of all projects as proposed in the SCP.

Sr. no.	ABD/ PAN	Project Name	Sub-Project Name	Total project cost (crore INR)
1	ABD	Electricity provision and energy efficiency	Electricity provision and energy efficiency	120
2	ABD	Sanitation	Sanitation	50.5
3	ABD	ICT	ICT	150
4	ABD	Water supply	Water supply	86
5	ABD	Mobility	Mobility	95
6	ABD	Area improvement	Area improvement	20
7	ABD	Housing	Housing	914
8	PAN	Smart unified governance	Smart unified governance	200
9	PAN	Intelligent street lighting	Intelligent street lighting	448.21

Source: Smart City Proposal

City projects update

City-wise solutions-based project update

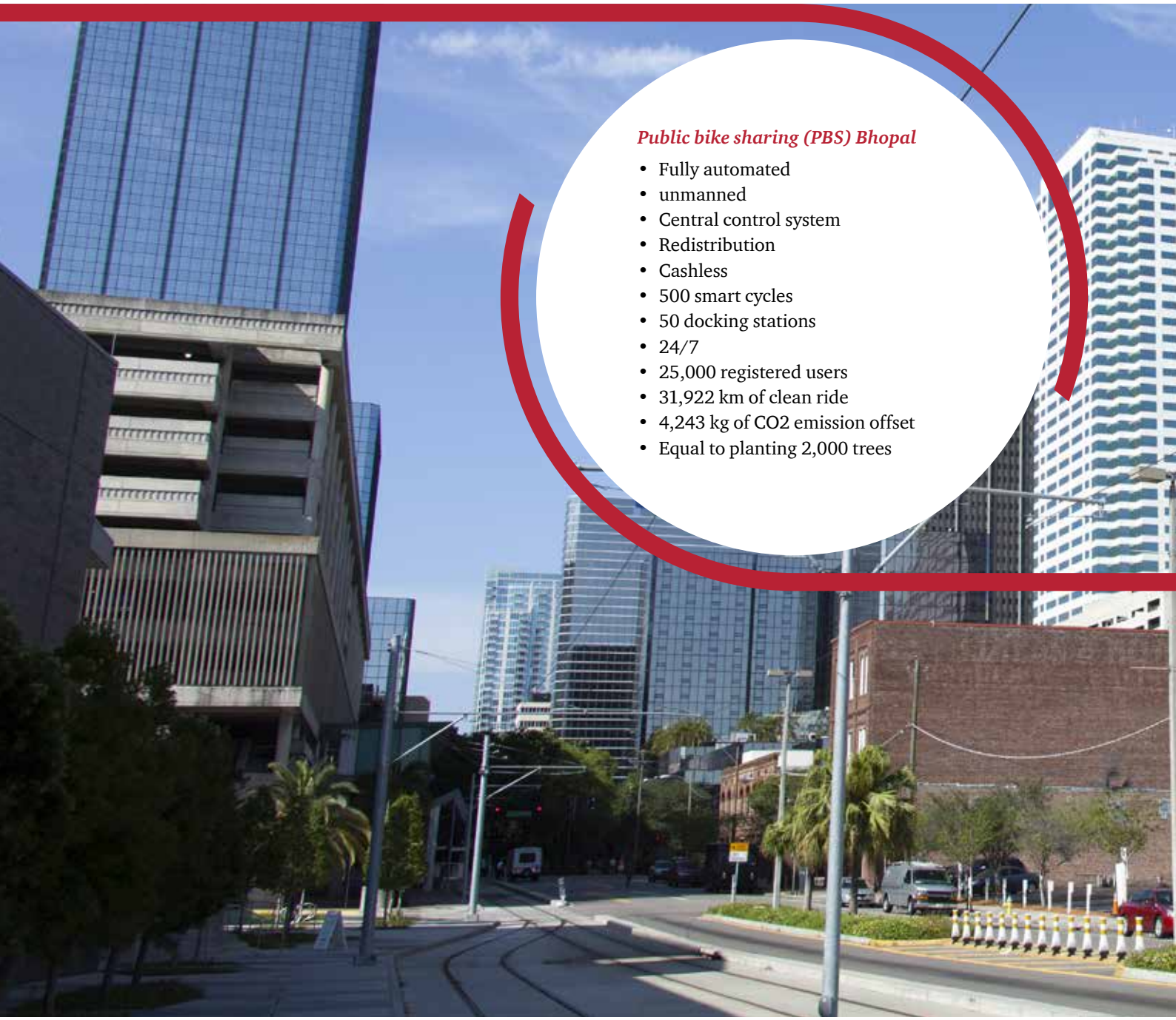


Project details under the above-mentioned solutions

Project Name	Sub-Project Name	Solution Category	Projects Status
Mobility	ITMS	Mobility and transport	Work order issued
Smart pole & intelligent street Lighting	Intelligent street lighting	Roads, street lighting, smart lighting	Work order issued
Integrated solid waste management	Solid waste management - waste to energy Plant	Solid waste management	Work order issued
Sewerage waste management	Sewerage waste management	Solid waste management	DPR under preparation
Solid waste management	Radio frequency identification (RFID) based smart bins	Solid waste management	Work order issued
ICCC	ICCC	Command and control centre	Work order issued
Smart road	Smart road	Roads, street lighting, smart lighting	Work order issued
Public bike sharing	Public bike sharing	Mobility and transport	Work completed
Bhopal plus (city app)	Bhopal plus (city app)	Safety and security	Work completed
Intelligent transport system	Intelligent transport system	Mobility and transport	Work completed

City iconic project

Public bike sharing



Public bike sharing (PBS) Bhopal

- Fully automated
- unmanned
- Central control system
- Redistribution
- Cashless
- 500 smart cycles
- 50 docking stations
- 24/7
- 25,000 registered users
- 31,922 km of clean ride
- 4,243 kg of CO2 emission offset
- Equal to planting 2,000 trees

Conclusion

This solution-based project status report is a working document that will be updated jointly by AMCHAM and PwC on a quarterly basis. The comprehensive project status update under various solutions will be useful for industries to connect with Indian smart city government clients.

Notes

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