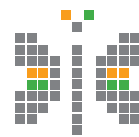




Ministry of Urban Development  
Government of India



**INDIA**  
**SMART CITIES**



Smart City  
MISSION TRANSFORM-NATION

Success Stories from Mission Cities



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# PREFACE

India is mirroring the world's trend towards urbanization; being one of the rapidly urbanizing countries, Indian urban population is projected to increase from 370 million in 2015 to 590 million in 2030. Cities in India currently contribute to 2/3<sup>rd</sup> of national GDP.

In this backdrop, over the last few years, the Government of India has substantially increased its focus on the urban sector/ cities. In this context, the Hon'ble Prime Minister of India launched one of the most important national flagship missions, the Smart Cities Mission (SCM) on 25 June 2015. The Mission will contribute to overall impetus of the government to transform cities into engines of economic growth. The broad objectives of the Mission are: (a) provision of core infrastructure and decent quality of life to residents, (b) application of Smart Solutions, and (c) ensuring clean and sustainable environment.

Hence, under the SCM, Smart Cities are to features but are not centered exclusively on technology; and the cities will include emphasis on area-based development, citizen preferences, and basic infrastructure and services. The pillars of development of Smart Cities being:

1. **Physical Infrastructure** – includes access to utilities such as water, electricity, sewerage and connectivity
2. **Institutional Infrastructure** – refers to the activities that relate to governance, planning and management of a city
3. **Social Infrastructure** – includes infrastructure for performance and creative arts, sports, theatres, concert halls, open spaces, children's parks and gardens
4. **Economic Infrastructure** – strives to ensure that urbanization leads to economic development of cities by establishing required infrastructure to attract investment and create employment

Under the Mission, Smart City in India are expected to develop and provide good quality core infrastructure that is IT enabled; this should contribute to a decent quality of life to city dwellers, especially the poor.

The SCM provides for two-pronged strategy, which concentrates on: (i) Area Based Development – redevelopment/ retrofitting/ greenfield infrastructure projects, and (ii) Pan City Development – electronic service delivery/ intelligent IT enabled systems (traffic, integrated multi-modal transport, smart metering, video surveillance etc.)

Ministry of Urban Development is responsible for implementing the mission across India. The cities for implementing the SCM were selected (and prioritized for support under the mission) based on: (a) laid down objective criteria with respect to urbanization in various states (100 cities were selected across states/ UTs), and (b) competition for prioritized on boarding the mission. 60 Mission Cities have been on boarded until now in three phases: Phase 1 – 20 cities in Round 1 in January 2016, Phase 2 – 13 cities in Fast Track Round in May 2016, and Phase 3 – 27 cities in Round 2 in September 2016. The 20 cities that were initial selected in Phase 1 are known as Lighthouse Cities, it is expected that Smart City project implementations in these cities will provide useful learning and way forward for other Mission Cities that are subsequently on boarded.

As we are approaching the 2nd Anniversary of the Smart Cities Mission (SCM), many of the Lighthouse Cities have succeeded in a wide gamut of projects/ interventions. The present document captures some of the important successes being achieved by these cities by way of: (A) Success Stories – where the highlighted project/ intervention has been substantially completed and (B) Upcoming Innovative Projects – where the city has done the groundwork and is committed to undertake innovative interventions. The projects/ interventions covered as part of this document include a variety of areas on which the cities have focused, this includes:

- E-Governance, m-governance/ mobile applications, Common Payment System etc.
- Command and Control Centres – covering and converging multiple sectors/ areas and departments
- Smart Transport/ traffic control/ Vehicle Tracking and Monitoring System (VTMS)
- Heritage and placemaking – riverfront development, rejuvenation of lakes, upgradation of parks/ eateries, open gym, retrofitting/ conservation of markets
- Smart roads/ streets/ Multi-Level Car Parking (MLCP)
- City Surveillance
- Smart Solid Waste Management
- Sanitation/ toilets/ E-toilets
- Solar power/ solar rooftop
- Social sector - Smart School
- Other smart solutions – pertaining to multiple sectors

The experiences documented by way of Success Stories and upcoming innovative projects may be referenced by all stakeholders of the SCM, especially the Fast Track and Round 2 cities, who in many cases will implement similar interventions.



# SUCCESS STORIES

# 1. PUBLIC BICYCLE SHARING – BHOPAL

## *“Availability of multimodal connected networks”*

– Strategy of Bhopal as expressed for in its Smart City Proposal (SCP)

### CONTEXT

Bhopal has a population of 2,371,061 (2011). It is one of the greenest cities in India and an international tourist destination famous for its lakes, heritage and UNESCO world heritage sites etc. Being the capital city of Madhya Pradesh, it is also a hub of economic activity. As a result of this, the city needs to sustainably manage the increasing local travel demand of both its resident as well as a sizeable floating population.

Bhopal suffer from high levels of vehicular pollution; additionally due to large number of motorized vehicles, there are traffic congestions. The city roads are also prone to accidents leading to loss of life and disability. All these have a high socio-economic cost and leads to loss in GDP.

Bicycle is a safe, economical, healthy and eco-friendly mode of transport for individual to go to nearby places and to connect to other public transit modes. However, most Indian city roads are not planned for bicycles transit.

### THE INTERVENTION

#### Project description

In order to promote bicycle ride and provide for first and last mile connectivity to BRT, Smart City Bhopal has initiated a public bicycle-sharing program in the city. The prominent features of this program are:

- 12 km of dedicated bicycle tracks have been constructed
- Around 50 locations within the city have been identified where bicycles are placed and from where one can hire a bicycle
- A public bicycle-sharing app is available, where users may register themselves, choose a suitable bicycle-sharing plan and pay for the same
- Direct/ without registration, public bicycle-sharing is also available, where one can hire a bicycle for an hour of half an hour by making direct/ on-site payments

The project is scheduled for completion on 20 June 2017



### Key outputs/ outcomes

A large number of people are using the public bicycle-sharing program, where more than 50% of the users are registered members. Currently 250 bicycles are placed/ available in 40 location for hiring with plans for increasing the number of bicycles to 500 at 50 locations in the city.

### Impacts

It is expected that in the medium to long term, there will be reduction in vehicular traffic of the city and lesser demand for vehicle parking. This should result in safer transport and less pollution/ congestion on roads. This will also have a favorable impact on the health of citizens. The program is also expected to contribute significantly to the first and last mile connectivity to BRT in the city.

### Support and mobilized resources

The project has an outlay of approximately INR 7 crore, where INR 3 crore has been financed through Smart City Mission (SCM) funds and INR 4 crore has been invested by the private sector concern.



Public bicycle sharing docking station in Bhopal

## 2. ADAPTIVE TRAFFIC SIGNAL CONTROL SYSTEM – BHUBANESWAR

*“Reduce loss of human-hours through improved mobility”*

– Part of Vision, as mentioned in Smart City Proposal (SCP) of Bhubaneswar

### CONTEXT

Bhubaneswar is the capital of the Indian state of Odisha. It is the largest city in Odisha and is a centre of economic and religious importance in Eastern India. According to the 2011 census of India, Bhubaneswar had a population of 837,737. Bhubaneswar has emerged as one of the fast-growing, important trading and commercial hub in the state and Eastern India. The fast paced development of the city has started putting adverse pressure on the ease of mobility in the city.

Traffic Management has been identified as a key to enhance mobility of citizens in Bhubaneswar. Bhubaneswar has about 300 intersections of which at present, 23% of intersections are signalized for conducive traffic movements. However, the existing signalized intersections are not optimally utilized. This is causing vehicle accumulation, delays at intersections, and increased pollution at intersections.

### THE INTERVENTION

#### Project description

To enhance the efficiency of the signalized intersections the city has proposed to have a coordinated traffic signal control system. This necessitates installation of Adaptive Traffic Signal Control System at signalized intersections in the city. In light of the above Bhubaneswar, has recently procured the requisite technology of traffic engineering named Composite Signal Control Strategy (CoSiCoSt) developed by C-DAC (Centre for Development of Advanced Computing) – a research and development organization under the Department of Electronics and Information Technology, Government of India. CoSiCoSt technology is an advanced control system capable to synchronize the traffic signal according to real time traffic conditions. The system gets input from sensors embedded in road and synchronizes the group of traffic signals accordingly. This signaling system is run on solar power and is planned to be upgraded with automatic number plate recognition, variable message

signs, surveillance camera for real-time emergency and incident management system. The system shall be integrated with other smart city modules in the Central Command Centre and provide real-time decision support. The Adaptive Traffic Signal Control System is part of the Intelligent City Operations and Management Centre under the Pan City Proposal.

### Key outputs/ outcomes

Implementation for pilot intersection is currently underway. The Adaptive traffic signal control system is planned to be installed at 58 traffic signals, 14 pelican crossings and blinkers at five locations in the city. The project is leading to distribution of green phase (traffic signal) time equitably and faster response to traffic conditions & emergencies. The system also predicts traffic volumes and accordingly adjusts signal timings.

### Impacts

The project will improve travel time reliability, reduce congestion, and related Green House Gas (GHG) emissions.

### Support and mobilized resources

The project is funded through Smart City Funds with a financial outlay of INR 14.7 crore. The implementing agency for the project is Bhubaneswar Smart City Limited (BSCL).



Adaptive Traffic Signal Control System – Bhubaneswar

# 3. BHUBANESWAR ONE – BHUBANESWAR

## *“Easy access to Information”*

– Aspiration of the city, as expressed in Smart City Proposal (SCP) of Bhubaneswar

### CONTEXT

Bhubaneswar is the capital of the Indian state of Odisha. It is the largest city in Odisha and is a centre of economic and religious importance in Eastern India. According to the 2011 census, Bhubaneswar had a population of 837,737. Bhubaneswar has emerged as one of the fast-growing, important trading and commercial hub in the state and Eastern India. Tourism is a major industry for the city, attracting about 1.5 million tourists annually.

Ease in access of information about tourist places, public services, events etc. to citizens is an important aspect for a Smart City. In Bhubaneswar the information on various public services like water supply, parking, tourism, health, security etc. used to be available through different media/ sources. The citizens often found it difficult to access information through multiple media/ sources; also in many cases, the accessed information was not up to date.

### THE INTERVENTION

#### Project description

Bhubaneswar One is an e portal that integrates geo-spatial data from all the government and private organizations for providing easy and hassle free information for the residents and tourists. It is an integrated GIS based map system for government agencies to deliver location-based services and information.

#### Key outputs/ outcomes

This e-platform is being used to find locations, ward information, information on public services, updated notifications from various government organizations, location & significance of different tourist sites, event calendar of Bhubaneswar City etc. The portal is updated regularly for access to the latest/ pertinent information. Bhubaneswar is also planning to collaborate with other government departments for expanding the utility of the portal.

## Impacts

The project is increasingly becoming a one-stop solution for resident of the city, with respect to services, government and local information.

## Support and mobilized resources

The project is funded through Smart City Funds with a financial outlay of INR 6.25 crore.



Snapshot of the online Bhubaneswar One portal



# 4. SMART ROADS – COIMBATORE

*“Enabling seamless mobility”*

– Part of vision of Coimbatore as expressed in its Smart City Proposal (SCP)

## CONTEXT

Coimbatore with a population of 1,051,721 (according to the 2011 census) and a decadal growth rate of around 20% is a rapidly growing city in Tamil Nadu. It is a hub of economic activity and is famous for its textile manufacturing also known as Manchester of South India. The city needs to sustainably manage the increasing travel demand of both its resident as well as a sizeable floating population.

## THE INTERVENTION

### Project description

As a key step in achieving its goal of seamless mobility for citizens, Coimbatore Smart City is developing Smart Roads. Walking constitutes around 20% of all trips in Coimbatore; hence, a considerable emphasis has been given on improving pedestrian facilities / amenities. A plan for a network of ‘Complete Streets’ has been prepared for 49 km. The key features include high quality walking and cycling facilities, improved access to public transport, organized parking and vending zones as well as streamlined junctions.

For the first phase of the project following six roads have been identified: DB Road, TV Swamy Road, Sanganoor Road, NSR Road, Masakalipalayam Road and Race Course Road, making up a total of 13.1 km; the design for these roads has been prepared. Implementation has started for 2 roads: D.B and T.V Swamy roads (3 km stretch), which is expected to be completed by July 2017.

### Key outputs/ outcomes

The expected benefits of the project are:

- Improved walkability
- Safety of pedestrians and cyclists
- Improved Public Transport ridership
- Better parking facilities
- Improved Junction geometrics
- Enhances public amenities including accessible vending zones

### Impacts

The project is expected to enhance mobility of the citizens with improved quality of travel as well as contribute to reduction in pollution level.

### Support and mobilized resources

Coimbatore Smart City Limited is implementing the project



*Proposed Smart Road – Coimbatore*

# 5. SMART SOLUTIONS – COIMBATORE

## *“Universal access to Best-In-Class Civic Services”*

– Part of vision of Coimbatore as expressed in its Smart City Proposal (SCP)

### CONTEXT

Coimbatore with a population of 1,051,721 (according to the 2011 census) and a decadal growth rate of around 20% is a rapidly growing city in Tamil Nadu. It is a hub of economic activity and is famous for its textile manufacturing also known as Manchester of South India. Coimbatore is undertaking numerous initiatives towards improving basic services and quality of life of citizens. Some of the initiatives are: (i) 24x7 water supply, advanced leak detection and smart metering; (ii) sewerage/ septage; (iii) 24x7 electricity and broadband access; (iv) public transport/ seamless mobility, ‘mass transit’, NMT and targeting ‘zero accident fatalities’; (v) extension of ‘Project Shunya’ (decentralized composting) in all zones including bio-methanation and composting facilities for local waste treatment, creating Waste-to-Energy plant; (vi) sustainable environment initiatives (vii) tagging sanitation assets to Property Tax database for traceability/ sustainable O&M; (viii) public safety and (ix) Transparent ICT-led governance/ citizen engagement.

However being a city of more than a million population the above initiatives are significantly challenging in scale and complexity to accomplish.

### THE INTERVENTION

#### Project description

With the aim of effective implementation of the initiatives, Coimbatore has decided to adopt ICT/ technology based Smart Solutions for many of its initiatives. Towards this, an inventory of Smart Solutions and technology options was prepared keeping in mind the major interventions/ priorities for the city. These Smart Solutions and technology were then suitably assigned to the major interventions for the city.

The Smart Solutions include: (a) technology solutions for improvement of water supply, SWM, sanitation etc.; (b) Intelligent Transport System (ITS); (c) online ambient air quality monitoring; (d) energy efficient street lighting (e) GIS Mapping and Spatial Information Centre; (f) integrated CCTV surveillance; (g) web-enabled e-governance application; and (h) mobile-governance and citizen engagement platform.



## Key outputs/ outcomes

The emerging benefits of Coimbatore's approach of adopted ICT/ technology based Smart Solutions shall be realized in the following areas:

- Water supply – SCADA, 'smart metering', advanced leak detection, online quality monitoring
- Solid Waste Management – RFID tracking of vehicles , Bio-methanation, Waste-to-energy, decentralized waste processing
- Traffic Management System – covering dynamic signal synchronisation, Automatic Number Plate Recognition (ANPR) cameras, license plate recognition camera, red light violation detection system and radar based speeding detectors built on the surveillance camera network
- Air quality – monitoring equipment at select locations to capture information on critical air quality parameters
- Street lighting – energy efficient LED street lighting in all roads and public locations
- Surveillance – surveillance network consisting of PTZ cameras, fixed box cameras, mobile transport cameras, at different locations, to capture high-resolution real-time images with facilities for wireless and wire connectivity download
- Scalable Data Centres, as part of Command and Control Centre, with an application portfolio covering Video Management System, Recording System, Analytics System, GIS and customized dashboards for Coimbatore City Municipal Corporation and various line departments including police/ Traffic Police
- Seamless IT connectivity built on wireless and fiber backbone to relay information from Smart Solution related equipment to Data centres
- Universal access to essential services for Citizen through web/ mobile platform

## Impacts

In medium to long run, Smart Solution based approach is likely to improve governance/ administration/ monitoring of civic services thereby ensuring good quality service delivery/ convenience to citizens.

## Support and mobilized resources

Project components are accessing funding from various sources including PPP, SCM fund and convergence from other schemes etc.



Smart Solutions –  
Coimbatore

# 6. SMART ROAD – DAVANAGERE

*“Liveable, Convenient and Safe Davanagere”*

– Part of goals of Davanagere as expressed in its Smart City Proposal (SCP)

## CONTEXT

Davanagere, situated in Karnataka and has a population of 4.34 lakhs, and has been well known for its textile industry. Davanagere has around 1,010 km of city roads. However, many roads in Davanagere city are not in good condition/upkeep, with insufficient storm water drains, incomplete water & sewerage networks, insufficient street lighting, overhead utility ducting and insufficient footpaths. This made the roads open to hazards.

## THE INTERVENTION

### Project description

Davanagere City Corporation has embarked on a project plan to improve the quality of its city roads. Under the plan, ten roads have been identified in the ABD area; these roads are to be taken up for implementation of the smart roads components in the first phase of project. The smart components of the project are:

- Underground utility corridor on both sides (electricity, data, cable & gas)
- Underground sewerage network
- Underground water supply lines (both sides)
- Underground storm water system (both sides)
- Smart concrete road with footpath, LED street lighting, street-scaping etc.



Concept image: Section of Smart Road in Davanagere

Out of these 10 roads, 4 roads were selected for the first phase for development; these are Mandipet Road, Chowkipet Road, Chamarajpet Road and M. G Road.

### Key outputs/ outcomes

The likely benefits of the Smart Roads project in Davanagere are in the following areas:

- Improved walkability
- Better Safety of pedestrians and cyclists with lower rate of accidents
- Better parking facilities
- Improved Junction geometrics
- LED street lights will lead to energy savings
- Enhances public amenities including accessible vending zones

### Impacts

The project intervention is expected to enhance economic and social life of citizens by providing: (a) better mobility and improved quality of travel, (b) increased Non-Motorized Traffic (NMT) share and (c) enhanced walkability; thereby reduce pollution levels and GHG emissions.

### Support and mobilized resources

Davanagere Smart City Limited is implementing the project.



# 7. GPS-BASED VEHICLE TRACKING AND MONITORING SYSTEM (VTMS) FOR SWM – INDORE

*“Achieve ZERO WASTE status for Indore”*

– Part of vision as expressed in the Smart City Proposal (SCP) for Indore

## CONTEXT

Indore is known as the commercial capital of Madhya Pradesh. It is also one of the largest and most populous city in Madhya Pradesh with a population of 1,964,086 (according to the 2011 census). The Swachh Sarvekshan Survey 2017 ranked Indore as the cleanest city in India.

Indore Municipal Corporation (IMC) considers sanitation and Solid Waste Management as priority areas for the city. The city is aiming for 100% coverage of Solid Waste Management. Timely clearing of secondary collection bins and transportation has been a major issue in Solid Waste Management in Indore – around 750 open garbage dumps in the city were not cleared regularly until recently.

## THE INTERVENTION

### Project description

To ensure efficient Solid Waste Management a GPS based Vehicle Tracking and Monitoring System (VTMS) has been taken up as a significant step recently. The key features of the project are:

- Online real-time monitoring of garbage vehicle movement and effective enforcement through a web based Vehicle Tracking and Monitoring System (VTMS)
- Web based application for real-time route adherence of garbage vehicles using data feeds
- Installation of IP cameras at entry and exit of the landfill site
- Integrated Weighbridge Vehicle Monitoring System (IWMMS) at the entry and exit points
- Integration of VTMS with the Central Command and Control Centre
- Training to stakeholders for managing the complete VTMS eco-system

## Key outputs/ outcomes

The project became operational since 1 March 2017; as on 16 May 2017, more than 90% garbage vehicles (more than 700 of 750 vehicles) had already been included in the system. The project has led to real-time monitoring of garbage vehicle movement ensuring tracing of collection route and improvement in solid waste handling and operational efficiency.

## Impacts

The VTMS is expected to ensure regular clearance of garbage dumps and help the city to achieve 'Zero Waste' status. The system will contribute significantly to cleanliness and public health in the city.

## Support and mobilized resources

Indore Smart City Development Limited (ISCDL) has appointed a Master System Integrator (MSI) for Implementation of Command Control and Communication Centre. Implementation of GPS-based Vehicle Tracking and Monitoring System (VTMS) is one of the services provided by the MSI. The component for GPS-based VTMS has been tendered at a costs INR 1.8 crore.



Main Dashboard of the GPS based Vehicle Tracking and Monitoring System for Solid Waste Management in Indore

# 8. GARBAGE COLLECTION AND MANAGEMENT – JABALPUR

*“Smart solutions will be used to optimize processes along the entire value chain of Solid Waste Management”*

– Strategy of Jabalpur as mentioned in its Smart City Proposal (SCP)

## CONTEXT

Jabalpur is a major city of Madhya Pradesh with a population of 1,055,525, and decadal growth rate of 14.51% (according to the 2011 census).

The growth of urban population in large Indian cities is leading to pressure of municipal bodies for effective services, Solid Waste Management (SWM) being one of the foremost challenge confronting the municipal bodies. With the availability and increasing affordability of new technologies suitable for city level deployment, it has now become feasible for municipal bodies to deploy such technologies in the areas of basic service delivery.

Managing solid waste requires huge effort involving street/ public places/ household level collection, transportation and proper disposal. However, the use of new technologies such as Radio Frequency, sensors, etc. offers new ways to reduce the coordination/ management effort and optimize the steps required for municipal SWM.

## THE INTERVENTION

### Project description

Jabalpur Municipal Corporation (JMC) has initiated a Garbage Collection and Management system to ensure optimal collection, transportation and processing/ disposal of waste.

The main features of the system are:

- Ensuring waste collection
  - ~ Door-to-Door collection, tracking and monitoring of waste through RFID tags on household garbage bins.
  - ~ Suitable collection and monitoring from public bin (semi underground bins) through deployment of Bin Level Sensors (BLS)
- Vehicle Tracking and Monitoring System (VTMS) for coordination, tracking of SWM vehicles.



- Estimation of Solid Waste generation for planning in respect to disposal and input waste for Waste to Energy Plant

The project is scheduled to complete by 1 January 2018.

### Key outputs/ outcomes

The monitoring system is being used in conjunction with VTMS solutions; this has resulted in:

- Ensuring complete coverage of door-to-door and community collection
- Manage refuse picking routes for SWM
- Monitoring and tracking all JMC vehicles under SWM department; reduced human intervention in monitoring process
- Monitoring and tracking the refuse weight by the refuse vehicle along the route; integration of refuse transfer station facilities with the centralized monitoring facility

### Impacts

The project has enabled Jabalpur to have effective control and management on collection, transfer and disposal of Solid Waste; this has led to effective Solid Waste management starting from the household level.

### Support and mobilized resources

The cost outlay for the intervention's RFID component is INR 169.57 crore and for the VTMS component is INR 13.76 crore.



Deployed garbage collection and transportation vehicle

# 9. M-GOVERNANCE: JABALPUR-311 – JABALPUR

*“To be the pioneer in the state in providing e-governance services for citizens”*

– Aspiration of Jabalpur, as mentioned in its Smart City Proposal (SCP)

## CONTEXT

Jabalpur is a major city of Madhya Pradesh with a population of 1,055,525, and decadal growth rate of 14.51% (according to the 2011 census). It has been a challenge for the city’s municipal corporation to make civic services/ facilities easily accessible for its increasing population.

Over the last few years, mobile phones have become the preferred mode of internet access, with most people preferring to quickly access information and services over their mobile devices; however most government/ civic services available over the internet are optimized for accessing through computer/ PC. To overcome this limitation, governments are increasingly trying to take their services and interactions with the citizens on the mobile platform – this is commonly referred to as M-Governance. In many cases, M-Governance complements E-Governance and increases the flexibility and agility in governance functions, including those, which are citizen focused.

## THE INTERVENTION

### Project description

Jabalpur Municipal Corporation has launched a mobile-based citizen app (by the name of Jabalpur -311) in order to enable citizens of the city to access a range of civic services using their smartphone – this includes:

- Access to services like apply online for Birth and Death Certifications
- Access and payment of property tax, water bill etc.
- Access to civic services such as water connection, building plan approval, ration card etc.
- Helpline for Jabalpur Police, ambulance service, women helpline, children helpline and senior citizen helpline
- Online booking for water tanker and community hall
- Real time traffic and parking information
- Searches for nearby places



Citizens have started using the application for paying utility bills (water/ electricity), property tax & estate bills, etc. The application is also being used to get in touch with emergency services like fire, disaster management & women helpline, and to get real-time traffic/ parking information, find nearby places like hotels, hospitals, petrol pumps, etc.

### Key outputs/ outcomes

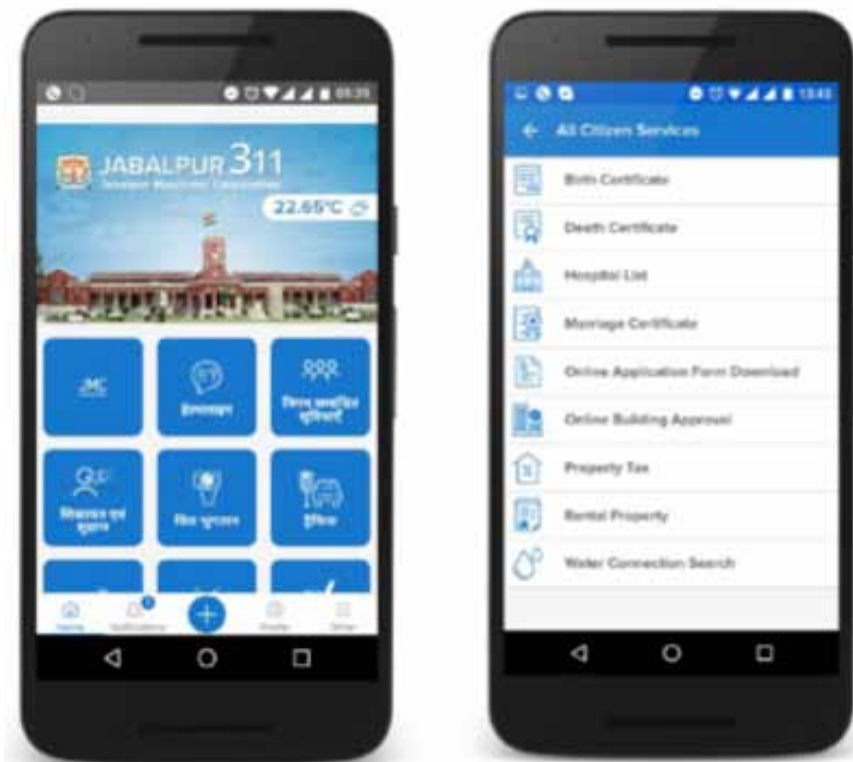
Over two thousand citizens are actively using Jabalpur-311 application for accessing enabled services, including reporting of issues; over 1.5 thousand issues have been reported by the citizens with a resolution rate of over 90%.

### Impacts

Jabalpur-311 has significantly quickened and eased the access of civic services and reporting of issues for citizens by allowing them to access various services at any time and from any place using their smart mobile phones. The Jabalpur-311 application has made it easy for the ULB to track, manage & analyze the service delivery and solve issues for effective delivery on its mandate for citizen convenience.

### Support and mobilized resources

The initiative has a costs outlay of around INR 1 crore, which has been financed through Smart City Mission (SCM) funds.



A snapshot of the Jabalpur-311 App

# 10. INDIVIDUAL TOILETS FOR URBAN SLUMS – KAKINADA

*“A city that is economically vibrant, inclusive, livable & sustainable”*

– Vision of Kakinada, as mentioned in its Smart City Proposal (SCP)

## CONTEXT

Kakinada has a population of 312,538 according to census 2011; around 40% of the population is economically weaker and lives in slums, which has had deficient sanitation facilities.

Smart cities are expected to maintain high standards of cleanliness; however, Open defecation is prevalent in 382 out of 500 cities recently surveyed across India. Open defecation is not only a sanitation problem but also a social issue, which specially undermines the dignity of women. One of the aims of Swachh Bharat Mission is to aims to make India Open Defecation Free (ODF) The Smart City Mission also shares this vision and all Smart Cities are required to facilitate proper sanitation facilities for all sections of the society.

## THE INTERVENTION

### Project description

Kakinada Municipal Corporation aims to provide proper sanitation facilities to the poor citizens of the city dwellers. Under this agenda, a survey was conducted to assess the number of houses/ families in slum areas under Area Based Development (ABD), which do not have individual toilets. An appropriate location for the toilet within the dwelling unit was also identified. Subsequently individual toilets were constructed.

### Key outputs/ outcomes

Under this initiative, 508 individual toilets have been constructed in slum areas under Area Based Development (ABD). Each toilet has associated septic tanks, which will collect the waste for 20 years in normal circumstances. The project was completed in July 2016 and all constructed toilet are now in use.

## Impacts

The ABD area of Kakinada is now Open Defecation Free (ODF). There is a reduction in water borne diseases in the area; and dignity of dwellers, especially women is preserved, as they do not need to go out of their premises for defecation. The project has contributed to Kakinada being judged as the cleanest city in population 2 to 10 lakh category in South India for the 'Swachh Survekshan Awards 2017'.

## Support and mobilized resources

The project has an outlay of INR 76 lakh, and has been financed through convergence, where Swachh Bharat Mission has contributed funds.



Toilets build in the ABD area in Kakinada

# 11. UPGRADATION OF EATERIES FOR HYGIENIC STREET FOOD – KAKINADA

*“A city that is economically vibrant, inclusive, livable & sustainable”*

– Vision of Kakinada, as mentioned in its Smart City Proposal (SCP)

## CONTEXT

Kakinada has a population of 312,538 according to census 2011. Like in most Indian cities, street food vending is a common practice in Kakinada. A large number of people uses street food eateries across social strata; but especially the working class uses these eateries for their regular day meals and refreshments, as these eateries are able to meet their food requirements at affordable prices.

Although ubiquitous, the street eateries have remained a concern in respect to hygiene and public health – as most food vendors’ have no training in safety & hygiene practices and in many cases use dilapidated food-vending facilities.

## THE INTERVENTION

### Project description

The food regulator in India, Food Safety and Standards Authority of India (FSSAI) has launched a national campaign to give training to street food vendors for improving their hygiene practices and safety standards. However, suitable facility/ equipment are equally important for preparation and vending of safe and hygienic food. Keeping this in mind Kakinada took initiative to improve street food-vending facility in the city. Under the initiative, modern food-vending carts were procured for street eateries. These carts were provided to food vendors from economically weaker section of the society by arrangement of bank loans.

### Key outputs/ outcomes

100 modern food-vending carts have now replaced the dilapidated food-vending facilities, facilitating safer/ more hygienic food for consumers.

### Impacts

The initiative is likely to improve public health by facilitating safer street food for a large number of citizens.

### Support and mobilized resources

The project centre has a costs outlay of around INR 5.6 crore, with 80% financing from the beneficiaries (by way of bank loans) and 20% financing from Smart City Mission (SCM) funds.



*Modern food-vending eateries for safe/ hygienic food vending in Kakinada*

# 12. PUBLIC TOILET UTILITIES ON PPP BASIS – NDMC

*“To be the global benchmark for a Capital City”*

– Vision of NDMC, as expressed in its Smart City Proposal (SCP)

## CONTEXT

Delhi is the capital city of India and one of most populous cities of the world with a population of 21.75 million according to 2011 census. NDMC is the municipal council for the central Delhi area, which also substantially, houses the central government/ ministries. NDMC covers an area of 43.7 square kilometer. Apart from being the central government hub, NDMC area also has one of the most significant Central Business District (CBD) of the city.

There have been many efforts for provisioning of basic sanitation facilities in the city. However, the demand for such facilities has been exceeding supply, as the current sanitation infrastructure is inadequate for a large population of city dwellers and outsiders that visit NDMC area.

## THE INTERVENTION

### Project description

In order to address the sanitation needs, NDMC has devised an innovative Public Private Partnership (PPP) model where NDMC provides space for construction of Public Toilet Utilities (PTUs) along with some additional space, which the private sector can use for revenue generation. However, the permitted activities are defined, such as water ATM, bank ATM and vending machines etc. The private sector will also operate and maintain the facility in line with the defined standards of facility management throughout the concession period. The PTUs have separate women and men toilets, toilets for differently abled persons, wash basins, bank ATMs, sanitary pad vending machines and water ATMs.

### Key outputs/ outcomes

About 30 PTUs from amongst the planned 109 PTUs have been developed and are in public use. Construction work is underway for about 20 more PTUs.



## Impacts

The provision of PTUs facility at multiple places have encouraged the people to access these facilities and avoid open urination. This is contributing to keeping a clean ambience in NDMC area.

## Support and mobilized resources

This project is being implemented on Public Private Partnership (PPP) basis. Where NDMC has provides space to the private sector partner; and the private sector partner constructs and maintains the facility for a specific concession period – generating revenue from the appurtenant facilities such as water ATM, bank ATM and vending machines.



*Public Toilet along with Water ATM and Bank ATM in NDMC*

# 13. SOLAR ROOFTOP IN NDMC BUILDINGS – NDMC

*“70% of total energy derived from renewable sources by 2025”*

– Aspiration of the city, as expressed in the Smart City Proposal (SCP) for NDMC

## CONTEXT

Delhi is the capital city of India and one of most populous cities of the world with a population of 21.75 million according to 2011 census. NDMC is the municipal council for the central Delhi area, which also substantially, houses the central government/ ministries. NDMC covers an area of 43.7 square kilometer. Apart from being the central government hub, NDMC area also has one of the most significant Central Business District (CBD) of the city.

One of the major components of Smart City initiative, which NDMC is part of, is to reduce the dependence of cities on non-renewable energy resources and shift toward use of renewable energy resources. Solar energy and energy efficient and green buildings have been prescribed as a focus for Smart Cities’ energy requirement management.



*Solar Rooftop installed on a NDMC School building*



## THE INTERVENTION

### Project description

NDMC has recently started implementing solar rooftops for harnessing solar power in municipal buildings; grid-connected roof top solar power has been installations on multiple government/ public buildings in NDMC area.

### Key outputs/ outcomes

Solar power installations of aggregate capacity of 1,495 kWp have been installed on 28 different government buildings in NDMC area.

### Impacts

Following were the immediate impacts upon installation of solar rooftops:

- Reduced the dependency on conventional source of power.
- Reduced carbon emission contributing to reduced environmental pollution.
- Cost cutting for government office with respect to power bills.

### Support and mobilized resources

The total cost incurred for installing the solar power capacity was INR 93,908,425. The funding is through a mix of RESCO and Capex model. According to the policy, the project has also received 30 percent capital subsidy from the Ministry of New and Renewable Energy.



# 14. PUNECONNECT MOBILE APP – PUNE

*“Enabling easier, faster and hassle free service delivery”*

– CARE (Citizen Assistance Response and Engagement) framework  
of Pune Municipal Corporation

## CONTEXT

Pune an IT hub of Maharashtra has a population of 5,057,709 and is the second largest city of the state. Mercer's Quality of living ranking of 2017, places Pune second amongst Indian cities. Pune has been continuously striving to enhance the quality of life of its citizens through smart and sustainable solutions.

Pune Municipal Corporation (PMC) is responsible for multiple civic needs of the citizens spread across an area span of 237 sq.km. Most of the service-oriented functions of the corporation are computerized. There are 144 wards and 42 Citizen Facilitation Centres (CFC's) across Pune, which helps in bring various services close to the citizens.

Despite successful implementation of the above initiatives, it was felt that there is a wide scope to leveraging technology for closer citizen engagement with PMC on matters related to services, complaint resolution, and civic information support etc.

## THE INTERVENTION

### Project description

In order to bring services even closer to the citizens and enhance citizen participation, PMC has developed a single city app. This app – PuneConnect mobile app, has been launched under PMC CARE framework, i.e. Citizen Assistance Response and Engagement, to provide governance at the fingertips of citizens and its stakeholders. The app is used by residents of Pune as well as visitors to avail services, information & city updates.

PuneConnect mobile app provides the following services:

- PMC CARE: log and track grievance on the go
- Property Tax: add properties, check dues and pay tax
- Water Bill: add consumer number, get bills, check dues and pay bills
- Emergency Information: key emergency numbers
- Perception Survey: an online survey to capture the feedback/ perception of citizens and tourists of Pune

- Directory: PMC office directory covering all municipal departments
- Facility Finder: helps locate key landmarks/ facilities such as schools, hospitals, temples, parks etc.
- Who's Who: provides contact information for key personnel such as Commissioner, Mayor, Cooperators, Deputy Mayor, Chairperson of Standing Committee etc.

### Key outputs/ outcomes

Over 10,000 citizens are using the app for the intended purposes including grievance redressal; over 30,000 complaints have been made by the citizens using PuneConnect over the last 12 months.

### Impacts

Over 10,000 citizens are now more closely connected to PMC with PuneConnect mobile app. This has helped in better access to services, transparency and accountability for citizens with respect to municipal services.

### Support and mobilized resources

The initiative has a costs outlay of around INR 1 crore, which has been financed through Smart City Mission (SCM) funds.

**Features of PuneConnect App**

- 1 Pay your Property Tax and water bill through your smart phone
- 2 Get all the information of ongoing work/ project in your area
- 3 Now you can log and track grievance on the go
- 4 Emergency services and facility center finder on your fingertips

Scan the code to download PMC PuneConnect App

A snapshot of the Pune Connect App

# 15. TRANSPORT COMMAND AND CONTROL CENTRE – PUNE

## *“Faster decision-making in traffic management”*

– Defined priority, as mentioned in the Smart City Proposal (SCP) of Pune

### CONTEXT

Pune an IT hub of Maharashtra has a population of 5,057,709 and is the second largest city of the state. Mercer’s Quality of living ranking of 2017, places Pune second amongst Indian cities. Pune has been continuously striving to enhance the quality of life of its citizens through smart and sustainable solutions.

Citizen mobility is a key issue in the city of Pune. Pune relies solely on buses for public transportation. The average number of buses per lakh population is only 37. Additionally, buses in Pune have significant issues with availability (25% fleet off-road most of the time) and reliability (84% routes have a waiting time of more than 20 minutes). As a result, the public transport trip share is only 18%. The city has also grown radially, with most new job opportunities in IT and manufacturing being created on its outskirts; this has increased the average trip length to 10 km. A significant rise in the number of private vehicles, lack of efficient public transportation options, and 30% of the bypass traffic going through the heart of the city, leads to massive traffic congestions in the city. The current average traffic speed in Pune is 18 km/h only.

### THE INTERVENTION

#### Project description

A state of the art Transport Command and Control Centre for Traffic has been set-up at the Pune Mahanagar Parivahan Mahamandal Ltd. (PMPML) headquarter. The Transport Command and Control Centre captures the real time movement of buses in the city based on the GPS tracker, which is placed on the buses. The Transport Command and Control Centre has 4 servers and 20 computers, which is managed by 21 people on the ground. The key interventions of the project are:

- The central command control room to monitor driving quality and service levels
- Real-time tracking of 1,500+ buses (Vehicle Tracking System ‘VTS’) by installing GPS

- Vehicle health monitoring system (VMS) across ~1,080 buses with intelligent kits and back-end maintenance management system
- CCTV surveillance and panic buttons on 510 buses to improve security
- 'Public Information System (PIS)' comprising bus guides and LED screens depicting 'Expected Time of Arrival (ETA)' and other critical information across all 190 bus stops and in around 510 buses, along with mobile apps and website providing the real-time information
- In-bus information system and Wi-Fi in around 1,080 buses

The Transport Command and Control Centre is operational.

### Key outputs/ outcomes

The emerging benefits of the project are:

- The vehicle tracking system is enabling PMPML to respond to incidents of over-speeding, harsh braking, skipping red lights, etc.
- Vehicle health monitoring is expected to improve fleet utilization, translating to a 4-5% increase in revenue and making PMPML healthier.
- The surveillance system will improve security of passengers and transport assets/ fleet, and ensure faster emergency response system.
- Using central command control room will ensure faster decision-making for traffic management, forecasting of traffic conditions & volume, and will help with future planning of transportation. Intelligent asset management will optimize investments and save 10-20% of the annual maintenance cost.

### Impacts

The likely impacts of the project are:

- Increased modal share of public transport – owing to reliability of city busses
- Citizen convenience – once the data is provided on the open data portal people will be able to visualise where exactly the buses are.
- Increase control/ transparency of the bus movement for PMPML; which helps in managing its own fleet of buses as well as the operator run buses.



A snapshot of the operational Transport Command & Control Centre at PMPML

### Support and mobilized resources

The project has an outlay of approximately INR 48 crore, and is being financed through convergence; Pune Mahanagar Parivahan Mahamandal Ltd. (PMPML) is funding the entire project.

# 16. OPEN GYM – SOLAPUR

*“Better and accessible public spaces”*

– Part of vision, as mentioned in the Smart City Proposal (SCP) of Solapur

## CONTEXT

Solapur having a population of 951,558 (according to the 2011 census) is one of the major cities of Maharashtra. It is a textile and bidi-manufacturing hub with around 30% slum population. Some parts of the city are very dense with about 60% population living in 18% area of the city. These areas in particular lack quality open spaces.

Well-managed public open spaces form a critical part in improving the quality of life of the citizens. Solapur Municipal Corporation (SMC) maintains 32 gardens and parks in the SMC area. Some of these gardens/ parks are not utilized to their potential owing to lack of opportunities for open space related activities. The citizens aspire to have better open spaces with more recreational and physical activity related facilities. However these facilities are limited for citizens and are relatively lesser accessible to the poor section of the society.

## THE INTERVENTION

### Project description

Solapur has focused on open spaces for citizens and social inclusion as key areas for their Smart City implementation. In light of this, Open Gyms have been constructed with a view of realizing better utilization of the available open spaces as well as contribute towards the health needs of the citizens. This intervention targets to make quality health and recreation options accessible to all sections of the society. The following gym equipment have been installed in the SMC garden:

- Step up
- ABS Board
- Circular pull up station
- Hip twister
- Shoulder twister



### Key outputs/ outcomes

The open gym is operational since 16 February 2017. A large number of citizens, from all sections of the society, are using the facility for their morning and evening exercises.

### Impacts

The open gym has contributed to improving the quality of life of citizens by providing a healthy environment to meet their daily exercise and rejuvenation needs.

### Support and mobilized resources

SMC carried out the project work through a garden development contractor over a span of two months. The project work costed INR 4 lakh.



Open gym at Solapur Municipal Corporation (SCM) Garden

# 17. E-TOILETS – SOLAPUR

*“Solapur: clean, efficient and progressive”*

– Vision of Solapur, as expressed in its Smart City Proposal (SCP)

## CONTEXT

Solapur having a population of 951,558 (according to the 2011 census) is one of the major cities of Maharashtra. It is a textile and bidi-manufacturing hub and attracts a sizeable number of visitors for business/ commercial purposes. The city is also of religious importance with more than five lakh pilgrims visiting the Siddheshwar Temple, every year. However the city does not have adequate public conveniences facility for the large visiting/ floating population of the city. It has also been noticed that the hygiene routine with respect to usage of public toilets is poor.

## THE INTERVENTION

### Project description

Considering the need for enhanced/ sustained public convenience, especially for visitors/ floating population, Solapur has installed E-Toilets.

E-Toilet (or electronic toilet system) in Solapur, are unmanned, automated/ self-cleaning toilets having remote monitoring facility. The E-Toilets deploy integrating electrical, mechanical and web-mobile technologies.

The E-Toilets are made of steel, are pre-fabricated and are modular in design. These toilets have attached bio-digesters.

The toilet having features for electronic control with respect to upkeep/ hygiene of the toilet facility. The features of the E-Toilet include: (a) display and instruction boards, (b) access based on water availability in the toilet unit, (c) automatic pre-flush and after-use flushes, (d) automatic toilet platform/ floor cleaning mechanism, and (e) real-time electronic monitoring of toilet usage and upkeep of toilet facility.

The project is scheduled to complete by 25 June 2017.

### Key outputs/ outcomes

E-Toilets at 8 out of 10 locations in ABD area have been installed and are being used being by the public.



## Impacts

The E-Toilets has started contributing to cleanliness and hygiene in the city. Availability of E-Toilets has also reduce open urination in the ABD area of the city.

## Support and mobilized resources

The project is being implemented on DBFOT (Design Build, Finance Operate and Transfer) model wherein the implementing agency is funding and operate all the e-toilets and is retaining the user charges and the revenue from the advertisements on the panel of the e-toilets. The implementing agency will be responsible for operation and maintenance for five years. At the end of this period, the implementing agency will be required to transfer the assets to Solapur City Development Corporation Limited (SCDCL).



*E-Toilets in Solapur*

# 18. INTELLIGENT TRANSIT MANAGEMENT SYSTEM (ITMS) – SURAT

*“Upgradation of civic infrastructure by incorporation of smart features”*

– Aspiration of the city as expressed in the Smart City Proposal (SCP) for Surat

## CONTEXT

Surat Municipal Corporation (SMC) has a population of about 5.5 million and has seen a decadal growth rate of 55.29% over the last census decade. Surat, being the centre of opportunities for laborers and investors, has attracted migrants from nearby rural areas and cities. This has increasing the demand for intra-city transportation.

In the year 2006, SMC limits were increased from 112.28 sq.km to 326.515 sq.km. The expanding geography of the city requires good level of coordination and consistency to deliver transport services and manage the traffic.

Surat has a bus transportation system with 291 operational routes in the city with a low average kilometer travelled per day of 0.22 lakh. The citizens in Surat have traditionally preferred personal vehicle and auto-rickshaw over public transport. This has led to a situation, where significant on-road parking is prevalent on 60% of the city roads, thereby hampering traffic movement.

## THE INTERVENTION

### Project description

Surat is implementing a city wide integrated system – “Intelligent Transit Management System” (ITMS), to manage diverse set of transportation needs for the city – this includes: (a) public transport and (b) vehicles related to civic services like Solid Waste Management, Drainage, Heavy Engineering, Emergency Services etc.

ITMS is planned to bring in best-in-class operational efficiency and automation to the operational capability of the city in respect to transport.

Some of the key features of the project are:

- Enterprise Management System: to monitor operations and adherence to laid down service levels
- Automatic Vehicle Location System (AVLS): to track buses on service lines and provide alerts like route deviation, trip adherence, skipped stops, etc.
- Incidence Management system (IMS): helps streamline incidence management in cases like vehicle breakdown, accident, etc.
- Depot Management System (DMS): Manages all bus/ driver information; facilitating schedule management and allocations of the same
- PIS Management System: This is the central module, which manages all data from buses' GPS units and pushes it to Passenger Information System (PIS)/ mobile app/ website etc.
- Command and Control Centre (CCC): provides overall management, ensure smooth ITMS functions by coordinating with relevant stakeholders – the CCC is presently operated by 10 designated/ trained personnel
- Data Centre: ITMS has its own data centre comprising of switches, servers and storage systems, which is specifically designed for the ITMS project

The project is under implementation and is expected to complete by 15 June 2017

### Key outputs/ outcomes

Under the project, the Command & Control Centre along with Data Centre has been established and four Bus Depots have started utilizing DMS. The project covers 30 operational routes for bus services in the city. The emerging benefits of the project are:

- At present, 115 BRTS buses and 200 City buses are being tracked using ITMS, where ridership of – 85,000 per day (for BRTS) & 45,000 per day (for other City Bus service) has been recorded
- 154 BRTS Stations and more than 400 City Bus Stops have been integrated with ITMS
- BRTS & City Buses are now available with an average frequency of 8-10 minutes
- There is increased information about public transit covering BRT buses and City buses, to citizens with help of mobile app and public website

### Impacts

In the medium to long run, the implementation of ITMS is expected to:

- Improved public transport connectivity across the city – increased number of buses on BRTS as well as City Bus routes, in accordance with demand analysis through ITMS
- Increased ridership and increased usage of public transport
- Reduction of travel time owing to dedicated BRT corridors managed through ITMS

- Reduction of local travel/ commute cost for citizens and visitors
- Increased security and traffic enforcement
- Improved incident management

#### Support and mobilized resources

The Intelligent Transit Management System (ITMS) has a cost outlay of around INR 48.9 crore, which is being financed entirely from Smart City Mission (SCM) funds. The operation and maintenance of ITMS is planned through PPP.



*Buses managed by ITMS in Surat*

# 19. SMAC (SMART CITY) CENTRE – SURAT

*“Smart utilization of Surat City’s potential for enhancing quality of life for citizens”*

– Part of vision, as expressed in the Smart City Proposal (SCP) for Surat

## CONTEXT

Surat is a rapidly growing city with a decadal city growth rate of 55% (2011); the current population of the city is about 5.5 million. The municipal limits of Surat Municipal Corporation (SMC) covers an area of 326 square kilometer. SMC has the overall mandate to manage the city, for which it has a budget exceeding INR 5,000 crore and employees a workforce of about 17,000 persons. SMC provides various services like healthcare, water supply, sewerage, solid waste management, fire and emergency response, ambulance, parks and gardens, swimming pools & sports facility, primary & secondary education, etc.

Rapid population growth, extended geography and extended/ coordinated city operations need a huge coordination effort to deliver citizen services and manage the city. As managing/ coordinating and monitoring the city functions is a complex task; it was felt that a centralized system will be required for the purpose.

## THE INTERVENTION

### Project description

SMC is building a SMAC (Smart City) centre as an Integrated Command and Control Centre (ICCC) for effectively managing the city of Surat, including provision of good quality municipal/ allied services for the citizens.

The SMAC centre building has been constructed. This building has a floor area of 2,100 square feet, with a seating capacity of 22 operators and a meeting room. As a key feature, the centre houses a Video Wall spanning across 240 square feet area.

SMAC Centre of SMC was launched on 25 June 2016 and in the first phase, the following systems are covered:

- Property tax system
- VBD Health Survey Application
- Complaint Management System

- Monitoring City Operations through CCTV Network
- Water Treatment Plant (WTP) SCADA
- Sewage Treatment Plant (STP) SCADA
- Intelligent Transit Management System (ITMS)
- Swachh Bharat (Swachhata App)
- Monitoring of Door to Door Garbage Collection using GPS

It is planned to incorporate and monitor various SMC operation through SMAC Centre in future. The list of such system is as under:

- Intelligent Traffic Control System (ITCS)
- Automatic Fare Collection System (AFCS)
- Green Surat
- D2D Municipal Solid Waste Management
- Biometric Attendance
- Parking Management
- Hoarding & Advertising Management
- Call Centre
- Road Asset Management System (Service Application for Road and Streets in Surat)
- Health System (Surat Urban Health Action System)
- Multipurpose Payment & Service Access Card (S-Connect Card)
- Water Quality Monitoring (Water+)
- Street Light Maintenance System (i-Promise)
- Property Tax Revision
- Night Round Monitoring (Suman Watch)
- EWS EMI Collection

The SMAC centre will collate/ integrate data from all departments of SMC and the other collaborating departments – that will participate as part of the SMAC centre; notably for BRTS/ city bus service, traffic control/ policing, RTO services, fire/ emergency services etc. The SMAC centre is expected to onboard all intended functions by April 2018.

#### Key outputs/ outcomes

SMAC Centre (Smart City Centre) is an administrative control centre for Surat and it will help the city in:

- Improving coordination, administration/ management and service delivery
- Bringing in synergy between different departmental activities by effective coordination/ monitoring of city operations
- Monitoring of the abnormal events and help take corrective actions
- Monitoring the Key Performance Indicators (KPIs) for various activities
- Optimal utilization of municipal assets



Once fully operational the SMAC centre is expected to integrate 30 civic services from SCM and other departments. SMAC Centre will also provide for composite management of services where multiple agencies have interest.

### Impacts

By providing a 360-degree view of the key functions for managing the city, the SMAC centre will enable city officials to better allocation of resources, adopt preventative maintenance measures, and proactively manage issues that affects quality of life for citizens in Surat.

### Support and mobilized resources

The SMAC centre has a costs outlay of around INR 32 crore, which will be financed entirely from Smart City Mission (SCM) funds. The operation and maintenance of SMAC centre is planned through PPP.



SMAC Centre Surat



# 20. CITIZENS APP: ACTION UDAIPUR – UDAIPUR

*“Efficient and citizen-centric governance”*

– Vision of Udaipur, as expressed in its Smart City Proposal (SCP)

## CONTEXT

Udaipur is a major city in Rajasthan, which is rapidly urbanizing, with about half a million population and a decadal growth rate of 16%. The municipal corporation is finding it challenging to provide facilities that are easily accessible to its increasing population.

Participation of citizens and citizen action is a key tenet of democratic governance. Participation/ citizen action develops ownerships, which is crucial for success of any government initiative. However, direct participation/ action of citizens in government programs and civic activities poses many operational challenges, particularly in terms of efficacy and cost of participation. The digital media, specifically the mobile apps, provide an effective media for direct participation of citizens in the democratic governance process.

## THE INTERVENTION

### Project description

‘Action Udaipur’ is a mobile application developed for participation of citizens in the Government interventions. The application has seven major features viz. Jan Bhagidari (citizens’ participation), Civic Complaint (grievance redressal), Stay Fit, Go Organic, Corporate Social Responsibility (CSR), Smart City and Start-up Udaipur.

Initially the app was developed to encourage citizens in maintaining cleanliness and provide a platform for participation in cleanliness activities. Gradually other mentioned features were added. The app was used extensively for seeking participation of citizens in the Smart City mission processes.

The app is freely used by citizens for various purposes; for example, in the Jan Bhagidari feature one can seek participation of citizens in cleanliness activities or remodeling of walls; from the same feature the requisite approval from the authorities are sought and received. Additionally supports for small items such as colors, tools etc. can be requested and obtained from the concerned authorities.



# 21. MULTI-LEVEL CAR PARKING – UDAIPUR

*“Smart and resilient infrastructure”*

– Vision of Udaipur, as expressed its Smart City Proposal (SCP)

## CONTEXT

Udaipur is a major city in Rajasthan, which is rapidly urbanizing, with about half a million population and a decadal growth rate of 16%.

As cities in India are growing, there has been a large increase in vehicular traffic, especially cars. Most cities have inadequate parking facility for the increased number of cars. This leads to on-street parking, which narrows the transit space for vehicles and significantly contributes to traffic congestion/jams.

Parking of vehicles on the street is commonplace in Udaipur – the situation is particularly pronounced in marketplaces, commercial and office areas in the city. This has made travel through these areas difficult with slow movement of traffic, long travel time and significant vehicular pollution.

## THE INTERVENTION

### Project description

For providing well managed, off-street parking, five car-parking facilities have been planned for Udaipur. The facility at Municipal Corporation office precinct has been the first to be developed, with other planned car parking at various stages of implementation.

The car-parking at Municipal Corporation office precinct has been constructed using RCC framed structure. It provides two level parking space for cars and two-wheelers.

The key smart features of the multi-level car parking are:

- Variable Message Sign (VMS) display of available parking at the nearest road junctions
- Display of available parking spots at the entrance of the parking facility
- Sensors and guidance to vehicles for available parking spot

- Bicycle and walking facility integrated with bus shelter; integration with public transport facilities

### Key outputs/ outcomes

The parking facility at Municipal Corporation office precinct provides:

- A dedicated and safe parking facility for cars and two-wheeler vehicles with 84 and 96 spaces respectively
- Easy locating of parking space and vehicle parking
- Option for commuters to use public transport, enabled through linkage with the public transport system

### Impacts

The parking facilities in Udaipur is likely to help in restricting on-street vehicle parking. This should ease the traffic flow in key city areas, with reduction in travel time and lesser pollution on the streets.

### Support and mobilized resources

The project/ initiatives are being been financed through Smart City Mission (SCM) funds.



*Parking facility for cars and two-wheelers in Udaipur*

# 22. REJUVENATION OF LAKES – UDAIPUR

*“Eternal Udaipur – World’s favorite Lakeside Heritage City”*

– Vision of Udaipur, as expressed in its Smart City Proposal (SCP)

## CONTEXT

Udaipur is a major city in Rajasthan, which is rapidly urbanizing, with about half a million population and a decadal growth rate of 16%. Udaipur is a leading holiday destination in India, famous for its history and lakes, along with palaces. Udaipur’s pristine lakes have been the key attraction for visitors to the city. Today,

Lakes are the lifeline and identity of Udaipur. These are also the most preferred places for denizens of the city for regular stroll/ outings. However, as in case of many other cities in India, the civic infrastructure in terms of water supply, sewerage and drainage distribution networks has not been upgraded to the level required for the growing population of the city. This has resulted in pollution to the lakes. The main contributing factor being, discharge of sewage water into the lakes; and pollution by local lake side activities like throwing of garbage etc. The discharges also contributed to siltation of the lakes.

## THE INTERVENTION

### Project description

In the recent past, Udaipur has taken multiple steps to abate pollution of the lake and beautification of the lake vicinity, some of the prominent steps being:

- The sewage discharge points closure and commissioning of sewage treatment plants
- Prohibition of idol immersion in the lakes
- Deployment of de-weeding machines for regular clearing of weeds from the lake
- Patrolling as well as CCTV based surveillance of the lakes
- Commissioning of Open Gyms

### Key outputs/ outcomes

The emerging benefits of various interventions with respect to rejuvenated of lakes has been:

- Sewage discharge in the lakes has been stopped almost completely
- Idol immersion in the lakes has now completely stopped, the separate tank provided for the purpose is being used by devotees

- De-weeding is being done regularly in the lakes, contributing to its beauty
- Adverse local activities contributing to lake pollution/ detonation has been severely curtailed due to robust surveillance
- Open Gyms is being regularly used by citizens/ tourists

### Impacts

The lakes in Udaipur are increasingly getting better in terms to cleanliness and beauty and the same is reflected in increased footfall/ gradual increase in numbers of people coming to these places.

### Support and mobilized resources

Project components are accessing funding from various sources including the Smart Cities Mission (SCM) funds, Atal Mission for Rejuvenation and Urban Transformation (AMRUT) and National Lake Conservation Program (NLCP).



*Open gym at lakefront*





# UPCOMING INNOVATIVE PROJECTS

# I. CITY SURVEILLANCE – AHMEDABAD

## CONTEXT

Ahmedabad is the largest city in the state of Gujarat and the second largest industrial centre in Western India after Mumbai. With a city population of more than 6.3 million and metropolitan population of approximately 7.8 million, it is the sixth largest city and seventh largest metropolitan area of India. Ahmedabad has traditionally been famous for its textile industry and is known as the “Manchester of the East”; the last few years has also seen the rise of the Information Technology industry in Ahmedabad. In this backdrop, Ahmedabad has high inflow of people from other parts of the country.

In light of the above city dynamics, providing adequate safety and security for the city dwellers and other accessing the city is an important focus area for Ahmedabad.

## THE INTERVENTION

### Project description

The Smart City Mission has kept city safety component at an important priority and the city of Ahmedabad has planning for a technology based surveillance intervention to make the Ahmedabad a safer city to live in.

The intervention is aimed at implementing a holistic and integrated video surveillance system for the city. This system shall also integrate with surveillance systems of different departments operation in the city with the objective of enhancing safety & security in the city and monitoring municipal assets. The system is intended to achieve the following objectives:

- Continuous monitoring of vital installations/ public places in the city for keeping eye on regular activities and for disaster management support
- Monitoring of suspicious people, vehicles, objects etc. for protecting life and property
- Support police to maintain law and order; help in deterring, detecting and thus dealing with criminal activities; and aid investigations
- Continuous monitoring of important municipal assets
- Attain faster turnaround time for municipal services through improved situational awareness
- Synergizing safety components with other Smart City components

The city surveillance project when successfully implemented is expected to benefits the city in the following ways:

- Provide for a comprehensive security management system for the city, which will improve the overall security cover
- Provide improved situational awareness through availability of real-time video feeds
- Improve the overall the law and order situation of the city
- Aid of the authorities, by enabling better decision making through precise information/ data
- Provide evidence for investigations, thereby aiding faster resolution of criminal cases
- Provide citizens and visitors to the city, with a sense of security



*City surveillance - Ahmedabad*

## II. COMMON PAYMENT CARD SYSTEM (CPCS) – BHUBANESWAR

### CONTEXT

Bhubaneswar is the capital of the Indian state of Odisha. It is the largest city in Odisha and is a centre of economic and religious importance in Eastern India. According to the 2011 census of India, Bhubaneswar had a population of 837,737. Bhubaneswar has emerged as one of the fast-growing, important trading and commercial hub in the state and Eastern India. Tourism is a major industry, attracting about 1.5 million tourists annually. The World Bank ranked Bhubaneswar as the best place to do business in India in 2014.

To coincide with trend and to avail the benefits of cashless economic transactions, Bhubaneswar aspiring to shift towards digital payment systems.

### THE INTERVENTION

#### Project description

Bhubaneswar is taking up a Common Payment Card System (CPCS) for the city. This system intends to provide a safe digital mode of economic transactions to the citizen and reducing their dependence on cash for transactions.

The intervention for CPCS will include developing, commissioning, operating and maintaining a digital payment eco-system through smart cards, mobile wallets, etc. for the city of Bhubaneswar. It also includes providing 325 PoS (Point of Sale) machines maintained at a grid of 500 meter in the city. This system is expected to provide an ecosystem in the city for digital payment of government fees & taxes, utility bills, transit charges, parking and other services charges.



Common Payment Card System

# III. SMART ROADS (SMART POLES AND STREET LIGHTS) ON PPP BASIS – BHOPAL

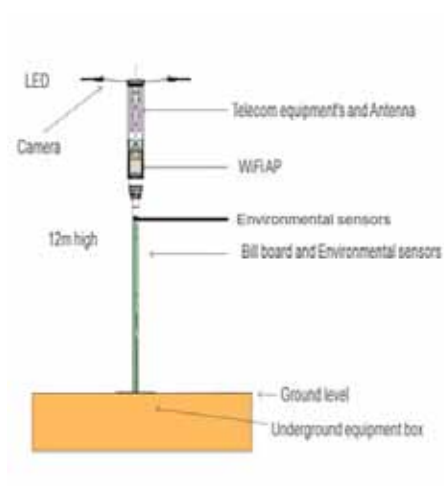
## CONTEXT

Bhopal is the capital of the Indian state of Madhya Pradesh known for its lakes and world heritage sites. It is also one of the greenest cities in India. Bhopal has a population of 2,371,061 (2011). Bhopal is also a vibrant economic centre of the state. To position itself as a global capital city, Bhopal aims to improve its infrastructure by introduction of innovative Smart Solutions.

## THE INTERVENTION

### Project description

Bhopal has launched first an innovative Public Private Partnership (PPP) based smart poles and intelligent streetlights project under the Smart Cities Mission. The project is innovatively structured in such a manner that it delivers bundled smart services to citizens and maximum values for money to the city authority.



Smart Poles with Intelligent Street Lighting in Bhopal

The two major components of this project are as follows:

**A. Smart Poles:** 400 Smart poles to be installed across the city. Smart Pole offers multiple services to the city residents; the integral parts of the smart pole are as below:

- ~ Energy efficient and remotely controllable LED street lights
- ~ Surveillance cameras for safety and parking violation detection
- ~ Environmental Sensors to monitor air quality, temperature and humidity
- ~ Wi-Fi hotspot services for the city
- ~ Electric vehicle charging points to promote use of electric vehicles in the city
- ~ Mobile based application with functionality of SoS
- ~ Optical fiber for better bandwidth to the Wi-Fi users/ providing backhaul to telecom operators
- ~ Smart pole has telecom tower infrastructure to match with city aesthetic and ready to accommodate upcoming technology as 4G and 5G

**B. Intelligent Street Lights:** 20,000 LED street lights to be installed by replacing the conventional sodium lamps and mercury lamps. Main features of intelligent street lighting system are as follows:

- ~ Increased life of LED lights
- ~ Intelligent, programmable street light system for efficient power management
- ~ Remote operation and control of street light system
- ~ Report of operating (green sign) and non-operating (red sign) luminaries
- ~ Power theft control detection
- ~ SMS to maintenance field staff in event of faults
- ~ Workforce cost saving
- ~ Automatic report generation for day/ month/ year

# IV. CONSERVATION AND RESTORATION OF HARI RAO HOLKAR ‘CHHATRI’ – INDORE

## CONTEXT

Indore is known as the commercial capital of Madhya Pradesh; it is also one of the largest and most populous city in Madhya Pradesh. Indore is a commercial centre for goods and services, and recently many of the IT sectors companies have setup operations in Indore.

Along with commercial importance, Indore is also known for its many historical tourist attractions, which include the forts, and cenotaphs build by the Maratha rulers. The Maratha rulers were skilled in the field of architecture; an exquisite example of their architectural style comprise of the ‘Chhatris’ of Indore – these ‘Chhatris’ are the cenotaphs built in the memory of the Holkar rulers.

## THE INTERVENTION

### Project description

- The Smart City Proposal (SCP) of Indore has given due importance to heritage and place-making and one of the major intervention on this area are the conservation & restoration of ‘Chhatris’ and palaces.



*Hari Rao Holkar ‘Chhatri’ site in Indore*



- Chhatris are elevated, dome shaped pavilions, a cenotaph built on the cremation spot of Shri Hari Rao Holkar. The entire precinct is surrounded by an enclosure and has two gates. West side gate act as the main entrance gate while the East side opens towards Gangor Ghat on the bank of River Kahn. The precinct consists of a main Chhatri with a water kund (tank) in front along with five small temples, Samadhi, Deepmaal and Vrindavan.
- The contractors for the restoration work of the Chhatris have been selected; once the restoration works are completed, it is expected to bring in the following benefits:
  - ~ Provide a quality recreational green space in the old part of the city
  - ~ Create awareness among the public about the cultural heritage of the city and it can help in preserving the valuable monuments and heritage of the city
  - ~ Promote tourism

# V. RIVERFRONT DEVELOPMENT – INDORE

## CONTEXT

Indore is the largest and most populous city of the Indian state of Madhya Pradesh, with a population of about 2 million. Indore is a commercial centre for goods and services, and recently many IT sectors companies have set up have setup their operations in the city. Indore also has industrial hubs around Pithampur area of the city, which host about 1.5 thousand large, medium and small industrial set-up.

Since the mid-1960's, Indore has witnessed rapid industrialization and population growth; this growth was coterminous with the increased sewerage flow in the Khan River, affecting the health of the river adversely. In addition, encroachments of its catchment area of the river, including setting up of slum colonies over the have affected the flow of the river.

## THE INTERVENTION

### Project description

Riverfront Development is a key initiative of the city in ABD area of Indore Smart City. The Indore Municipal Corporation (IMC) has started riverfront development work of Kahn River under the Smart City project. The first phase of development of riverfront would be done from Rambagh Bridge to Krishnapura. In the second stage, the stretch from Jawahar Marg to Gangaur Ghat is planned for renovation. The scope of the work includes:

- Construction of retaining walls and dredging of riverbed along 3.9 km of riverfront
- Development of landscaping and open spaces
- Development of City-level recreational space
- Development of Fruits & Vegetables Market to accommodate shops/ hawkers in the area
- Development of adequate parking areas

Once the construction works are completed, following are benefits are expected:

- Restoration/ visual improvement of the riverfront
- Preventing entry of sewerage into the river
- Creation of a city-level recreational area
- Enhanced opportunity of the riverfront for tourism purpose



Concept photograph: Riverfront development in Indore

# VI. SMART ROADS – INDORE

## CONTEXT

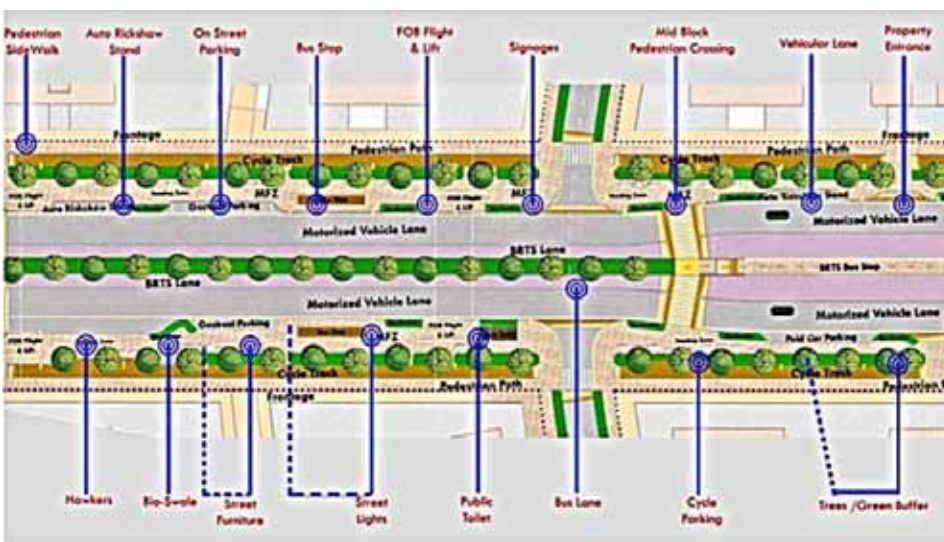
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The city's population over the last census decade has seen an annual growth of about 2.86%; this has contributed to increased number of vehicles and traffic congestions on the city roads. This situation is more accentuated during civil works, like laying of cables or pipes, leading to acute traffic congestion.

## THE INTERVENTION

### Project description

The Indore Smart City Proposal has emphasized core infrastructure improvement and one of the major intervention under the same is the development of Smart Roads. Smart Roads will be free from any of the overhead utility cables & poles and provides for adequate spacing for any future work. The Smart Roads will provide better road surface and RCC (Roller-Compacted Concrete) utility trench; through proper placement of utilities, future



Proposed Layout of Smart Roads in Indore

maintenance interference will be minimized and utilities will be better protected.

The scope of the work for Smart Road includes:

- Construction of CC (Cement Concrete) roads
- Construction of RCC utility trench
- Laying of all utility services and providing house connections
- Providing proper central median, street-lighting

Currently construction work on Smart Road is in progress across Mhow Naka to Tori corner, Bada Ganpati to Jinsi Bus depot and Raj Mohalla to Bada Ganpati which a total length of 3.3 km. Once the construction works are completed, following immediate benefits are likely:

- Improvement in road geometry and alignment
- Improvement of junctions
- Provide better central divider and crossing
- Provide under-ground utilities trench
- Provide better street-lighting
- Lower possibility of traffic congestions on account of civil works

# VII. INTEGRATED COMMAND & CONTROL CENTRE – KAKINADA

## CONTEXT

According to the 2011 census of India, Kakinada had population of 312,538. The city is a part of the Visakhapatnam-Kakinada PCPIR (Petroleum Chemicals and Petrochemical Investment Region), which would be the largest petrochemical hub of the region. Kakinada has a 10,000 acre SEZ and is also a part of Visakhapatnam-Chennai Industrial Corridor (VCIC). Hence, Kakinada is well positioned to develop as an economic hub in the region. To achieve its vision of becoming “an Economically Vibrant City” Kakinada aims to leverage the potential offered by smart development concepts and use of ICT based smart solutions.

## THE INTERVENTION

### Project description

Kakinada Smart City is in the process of implementation of a Command and Control Centre; the project envisages creating an IT backbone for integrating many civic services. This will improve the accessibility of services and government to citizens. It will also enhance ability of the government to respond fast, by leveraging good quality data and information.

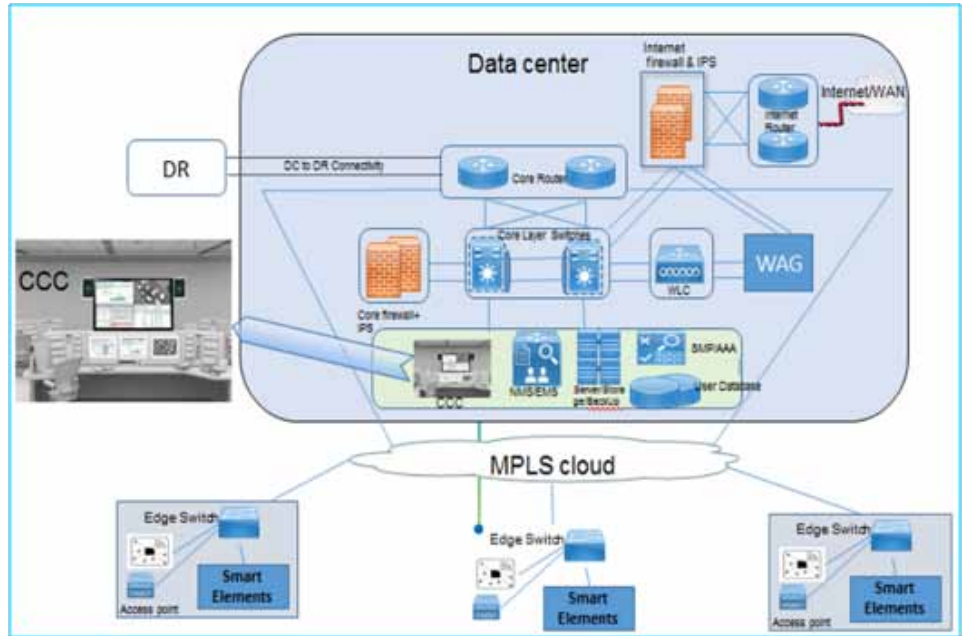
The key features of the initiative are:

- Integration of GIS, ERP & Smart Elements over the IoT platform; this component has already been undertaken
- Fiber connectivity & SIM based connectivity
- Disaster Management with sensors & Public Address system
- Smart Poles along with environment sensor, PA system & Wi-Fi etc.
- Single Window Access control
- Improved business agility and responsiveness
- High Security measures

Through implementation of the initiative, the following civic infrastructure will be integrated under a single command and control system:

- Integration of ERP to the Command Control Centre
- City Surveillance System
- City-wide Wi-Fi Connectivity
- Environmental Sensors; Smart devices, sensors and infrastructure installations

- Smart Parking – 2 closed parking spots with around 98 open parking spaces
- Smart Traffic
- ICT enabled Solid Waste Management System
- Smart Pole/ Smart Lighting – 640 lights & 12 Gateways



Command and Control Centre Architecture for Kakinada



# VIII. RETROFITTING OF SARABHA NAGAR MARKET – LUDHIANA

## CONTEXT

Ludhiana is the largest city in the state of Punjab, with a population of more than 1.6 million. The city is known for its small-scale industrial units, which produce industrial goods, machine parts, auto parts, household appliances, hosiery, apparels and garments. Ludhiana is also famous for its historical markets in apparels and garments; but due to increased footfall and limited up-keep, the markets have become congested and unhygienic; lack of suitable vehicle parking space has also become a major issue.

## THE INTERVENTION

### Project description

The Ludhiana Municipal Corporation has planned to undertake retrofitting model of development in the market place to address the up-keep issues of the markets. Under the initiative, Sarabha Nagar Market has been re-conceptualized to create spaces that accommodates the needs of local shopkeeper, street vendor and the public. These spaces will be more safe,



Concept photograph: Before & After – Sarabha Nagar Market

well organized and reinforce the identity of Sarabha Nagar (Kipps) Market. The development will improve pedestrian accessibility & the public amenity at the site; green areas will be increased and parking will be regulated. The idea is to revitalize the urban space and thus create additional opportunities for the increased market activity. Retrofitting works will include design, supply and installations with respect to:

- All landscape works (hardscape and softscape)
- Facade works
- All allied civil and services work (including undergrounding of electrical services)

The interventions are expected to complete by mid-2018 and once the redevelopment works are completed, following are the expected impacts:

- Reduced congestion and pollution in the market area, including enhanced parking for vehicles
- Increased pedestrian safety
- Highly visible spatial improvement and aesthetic enhancements of the market place
- Long term economic benefits through improved market ambiance and productivity

# IX. CONSERVATION OF BAZAARS IN THE WALLED CITY – UDAIPUR

## CONTEXT

Udaipur is a major city in Rajasthan, which is rapidly urbanizing, with about half a million population and a decadal growth rate of 16%. It is the sixth largest city of Rajasthan

Udaipur is 400 year old major city in Rajasthan and a preferred tourist destination. The city is known for its history and lakes; along with the pristine lakes, Udaipur is famous for its historic palaces including traditional bazaars – these are of major interest to local and foreign tourists. Henceforth Udaipur has been making efforts to conserve the historic bazaars.

## THE INTERVENTION

### Project description

As part of the Udaipur Smart City theme: “Eternal Udaipur: World’s favorite Lakeside Heritage City”, there is a keen focus on heritage conservation. In this background, the initiative to conservation the historic bazaars of Udaipur has recently been taken up under the Smart Cities Mission – the intervention is part of the comprehensive heritage conservation of Udaipur walled city.

As a part of the initiative, a study of the city was done to identify the historic market places, where five major markets were identified for suitable conservation and development interventions. These interventions are subsequently being taken up by Udaipur. The interventions are expected play a major role in the upkeep, maintenance and up-gradation of the traditional markets of Udaipur; the interventions are:

- Conservation of the traditional character of the historic ‘bazaars’ – restoration and conservation of historic/ heritage building facade
- Development & up-gradation of physical infrastructure of the historic ‘bazaars’ – shifting overhead electrical/ other cables underground and street/ facade illumination
- Developing tourist amenities in the historic ‘bazaars’ – developing amenities like toilet, drinking water facilities, and parking spaces
- Uniform development and branding of the historic ‘bazaars’ (providing street furniture like benches, street signage, building/ shop signage, and uniform street section development)

The work under the intervention is scheduled for completion by December 2017. The intervention will help in resolving various issues that these bazaars have been facing. The interventions is likely to help the city is conserving its heritage and bring the following benefit:

- Upgrading infrastructure for local inhabitants
- Improving working environment within the bazaars
- Improving aesthetics of the bazaars



*Ongoing conservation work of bazaars in the Walled City area*

# X. ALL ABILITIES PARK – VISAKHAPATNAM

## CONTEXT

Visakhapatnam is the largest city and financial capital of Andhra Pradesh. It is the most populous city in the state and one of the million-plus cities in India with a population of over 2 million. The core city and its surrounding settlements together constitute Visakhapatnam Metropolitan Region, one of the most populous urban regions in the country with a population of over 5.3 million. The economy of the city is the tenth largest in the country. Visakhapatnam is famous as a port city due to the presence of two big ports namely Visakhapatnam Port and Gangavaram Port. Recently the city has seen the growth of IT and Pharmaceutical industry as well. Being a large city, having a keen focus on the convenience of citizens, Visakhapatnam intends to provide suitable infrastructure and services accessible to all citizens and every section of the society.

## THE INTERVENTION

### Project description

Visakhapatnam has taken up a project to develop a new park, 'All Abilities Park'. This project is aimed at showcasing the city's strong emphasis on enhancing the social infrastructure of the city (in this case for improving health and wellness of all its citizens) which includes differently abled. The park is scheduled to be developed by March 2018.



Proposed concept for 'All Abilities Park' at Beach Road in Visakhapatnam

The 'All Abilities Park' seeks to balance the needs of the differently abled without segregating them from the balance of the community.' The salient features of the park include:

- Opportunity for all park users to engage in structured and unstructured play in a scenic location facing the Bay of Bengal.
- Dedicated space with multiple levels of play, which will allow people with different level of abilities to participate in a safe and managed environment.
- Active encouragement to visitors to engage in activities, including: climbing, crawling, swinging and water play.
- Focus on expanding the skillsets of the participants and encourage physical activity with participants of mixed levels of abilities.
- Provide citizens with good quality open space for encouraging them to spend more time outdoors, thereby aiding physical activity and healthy living.



# XI. MODERNIZING OF GVMC SCHOOLS – VISAKHAPATNAM

## CONTEXT

Visakhapatnam is the largest city and financial capital of Andhra Pradesh. It is the most populous city in the state and one of the million-plus cities in India with a population of over 2 million. The core city and its surrounding settlements together constitute Visakhapatnam Metropolitan Region, one of the most populous urban regions in the country with a population of over 5.3 million. The economy of the city is the tenth largest in the country. Visakhapatnam is famous as a port city due to the presence of two big ports namely Visakhapatnam Port and Gangavaram Port. Recently the city has seen the growth of IT and Pharmaceutical industry as well.

Greater Visakhapatnam Municipal Corporation (GVMC) has a total of 149 schools including 118 Primary Schools, 4 Upper Primary Schools and 27 High Schools. All GVMC schools can accommodate nearly 45,000 students in an academic year. Yet, in the academic year 2015-16, only 20,725 students enrolled in these schools. The lack of adequate infrastructure and modern tool kits have been attributed as one reason for lesser enrollment in GVMC schools. To address these concerns GVMC has taken up the initiative of modernising the schools under them as a part of the Smart City proposal.

## THE INTERVENTION

### Project description

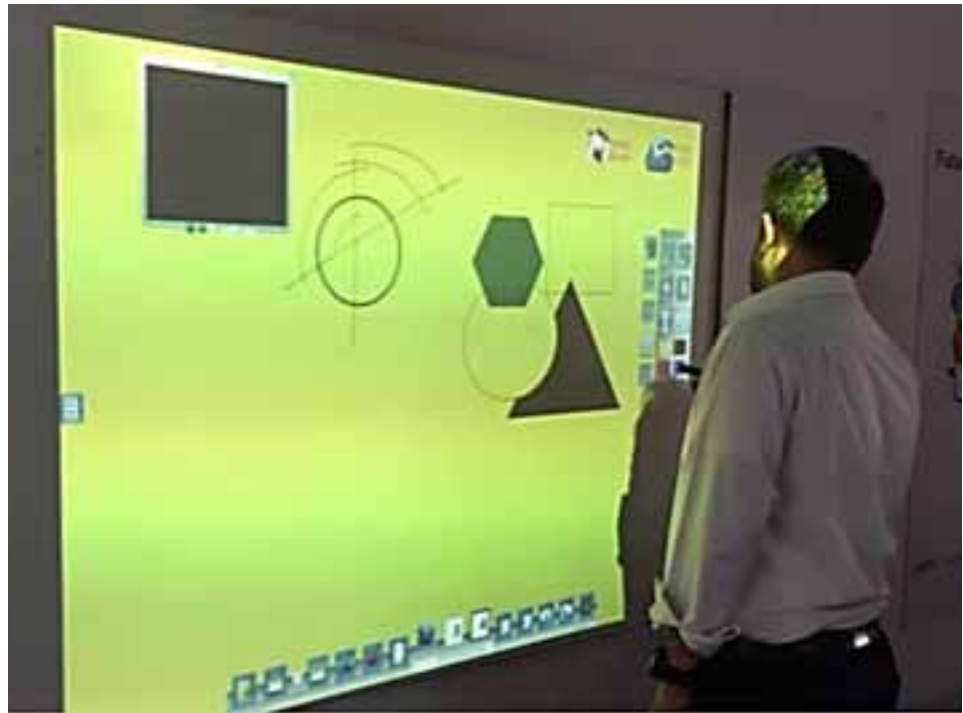
Modernising GVMC Schools and transforming them as smart campus has been conceptualized by Visakhapatnam Smart City, to create modern education infrastructure for all strata of the society by focusing on:

- Equip schools with technology based learning resources
- Equip schools to have video conferencing where a teacher in one location is able to teach/ interact with students from other schools in different locations
- Equip schools to have interactive learning sessions with other schools
- Providing universal accessible design in all schools
- Creating an identity/ brand building for GVMC schools
- Creating clean and green education campuses
- Providing active outdoor spaces for sports and extra-curricular activities



The project interventions are expected to be completed by mid 2017, and once completed following are the envisaged impacts:

- Digital literacy amongst students, preparing them at an early age for taking up further educational and professional challenges of the context of IT enabled/ digital environment
- Optimum use of under-utilized land within school premises by creation of functional spaces
- Reduced paved areas in schools through addition of pervious surfaces and playgrounds/ sport courts, thus reduction in urban heat island effect
- Preservation of all existing trees and addition of new trees and landscaping element
- More outdoor activity areas for students to provide them opportunities for greater physical activity



*Digital classroom for GVMC schools*

# XII. SMART STREETS – VISAKHAPATNAM

## CONTEXT

Visakhapatnam is the largest city and financial capital of Andhra Pradesh. It is the most populous city in the state and one of the million-plus cities in India with a population of over 2 million. The core city and its surrounding settlements together constitute Visakhapatnam Metropolitan Region, one of the most populous urban regions in the country with a population of over 5.3 million. The economy of the city is the tenth largest in the country. Visakhapatnam is famous as a port city due to the presence of two big ports namely Visakhapatnam Port and Gangavaram Port. Recently the city has seen the growth of IT and Pharmaceutical industry as well.

The city has a large network of roads but almost all of these roads are designed for vehicular traffic. The road design in most cases have not considered users such as: pedestrians, hawkers, differently abled persons etc.

## THE INTERVENTION

### Project description

Under the Smart City Mission there is an emphasis on design and development of roads/ streets with priority to pedestrians. In this backdrop; the Greater Visakhapatnam Municipal Corporation (GVMC) has planned a Smart Street intervention under their Smart City agenda.

A pilot project of 7 km including 2 major streets – Waltair Main Road and Chinna Waltair Road has been planned under this intervention. This project includes: wide footpaths, cycle tracks, landscape corridor with trees, pedestrian street lighting, bus bays, on-street parking, road markings, median, hawker zone, improved junctions, table tops, universal accessible design by introduction of ramps, benches and planting beds, provision for future bus stops, public toilets and ATMS, reserving the space for utilities in a specified corridor, reserving the utility crossing duct at every 500 m along the Smart Street, rehabilitation of tertiary storm water road side drain for easing out of rain water with proper shoulders, new water supply lines, Public Bike Sharing system (PBS).

The project intervention is expected to be completed by mid 2018, and is likely to benefit in the following ways:

**Road Diet & Safe Streets:** This transportation planning technique will reduce the width of the carriageway to achieve systemic improvements. Streets with clearly demarcated spaces for vehicles, pedestrians, cyclists and dedicated on-street parking will emerge, this will minimize conflicts between vehicular and pedestrian traffic. Safe Streets with shaded walkways will promote walking as a daily activity for encouraging a healthy lifestyle.

**Resilient Streets:** Streets will have defined utility corridors including undergrounding overhead utilities, where upgraded utilities will be able to withstand severe natural and human-made disasters. Streets will provide infrastructure allowing safe walking experience in night time through pedestrian lighting; and clean public space through dustbins at regular intervals.

**Inclusive Streets:** Streets will allow and provide multiple mobility options to citizens including walking, cycling, driving private vehicles and commuting through public transport. Universally accessible design will allow safe walking experience to all citizens especially elderly and people with special needs.

**Streets as Public Spaces:** Streets will provide spaces outside homes for social, cultural or intellectual interactions, to walk or to just breathe fresh air. Streets will have reduced congestion through removal of encroachments, also contribute to curtail low carbon emission.



Concept Image: Proposed SMART Street in Visakhapatnam





Ministry of Urban Development  
Government of India