HUDCO AWARDS FOR BEST PRACTICES TO IMPROVE THE LIVING ENVIRONMENT

2017-2018

A COMPENDIUM OF THE AWARD WINNING ENTRIES AND OTHER ENTRIES

A HUDCO-HSMI PUBLICATION

hudco

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Housing and Urban Development Corporation Limited

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FOREWORD

The world today is increasingly urban. While urbanisation is an important determinant of national growth, it also brings its own set of challenges. India's proportion of urban population has grown rapidly from 28% in 2001 to 31% in 2011 and will keep on increasing. As one of the fastest growing economies in the world, India today is trying to strike a balance between the various pillars of development - social, economic and environmental. While it works to achieve inclusive and sustainable growth, the country also needs to manage urbanisation without additional stress on city's infrastructure.

The city managers, planners and local bodies have a very important role to play in this regard. They have to ensure the protection of the environment, a better quality of life for the people and an inclusive and sustainable development for the cities. In this process, the urban development officials and professionals are constantly looking for innovative, environmentally friendly and achievable solutions.

Housing and Urban Development Corporation (HUDCO), as the premier techno-financial organisation, involved in housing and urban development sector, has undertaken various initiatives for sustainable development, in keeping with its vision of promoting sustainable habitat development. HUDCO recognises and rewards good practices at the national as well as local levels for improving the urban areas of our country and thereby improving the quality of life of the urban citizens through various initiatives, including its Best Practice Awards.

Recognition can spur not only the project teams to further excellence but also provide a benchmark for other similar projects. The idea behind the documentation of the award winning entries of HUDCO Best Practices Awards is to share good practices and experiences with other local bodies and stakeholders in urban development. The sharing of knowledge of best practices among Urban Local Bodies and other organisations can help improve planning practices in India.

I commend HUDCO's HSMI for bringing out this compendium as an effort towards documenting and disseminating good practices. The publication of this compendium on the occasion of the World Habitat Day, 2018, will help wide sharing of these Best practices.

I extend my heartiest congratulations to all the winners of the awards for their achievement. I also appreciate all those who sent in their entries for the awards. I hope that HSMI will receive good participation in future as well for these prestigious awards.

Dr. M Ravi Kanth, IAS (KL: 86)
Chairman & Managing Director, HUDCO

ABOUT THE HUDCO AWARDS FOR
BEST PRACTICES 2017-18

IIn order to promote and propagate best practices, HUDCO has initiated "HUDCO Awards for Best Practices to Improve the Living Environment" in the year 2011-12 to encourage efforts in these areas and to motivate Government Departments/ Parastatals Agencies/Local Bodies/Authorities/NGO's/Private and Corporate Sector/ Research and Academic Institutions etc. who have demonstrated outstanding initiatives to encourage innovative and sustainable projects. HUDCO gives award under the following 7 themes:-

1. Urban Governance

2. Housing, Urban Poverty and Infrastructure

3. Urban Transport

4. Environment Management, Energy Conservation and Green Building

5. Sanitation

6. Urban Design & Regional Planning, Inner City Revitalization & Conservation

7. Disaster Preparedness, Mitigation and Rehabilitation

Each Theme had the following sub-themes:

THEME 1- URBAN GOVERNANCE

Sub-themes: Urban management and administration, E-governance/M-governance, Partnerships with civil society, Participatory budgeting and decision making, Human Resources and leadership development, Decentralization/ Devolution of powers, Institutional reform, Transparency and accountability, Empowerment of Women, Innovative methods of collection of property tax/other taxes/bills, Municipal double entry pure accrual accounting & Improved service delivery initiatives.

THEME 2- HOUSING, URBAN POVERTY & INFRASTRUCTURE

Sub-themes: Affordable housing, Access to housing ,Access to housing finance/credit, Slum and settlement upgrading and improvement, Application of environment friendly building materials, Cost effective urban housing including innovative, emerging and disaster resistant technologies in housing, Access to land/services for urban poor, Provision of basic services, Public-Private partnerships/Public-Private-Community partnerships & Community based capacity building/livelihood generation solutions.

THEME 3- URBAN TRANSPORT

Sub-themes: Mass public transport, Environmentally friendly public transport, Traffic bottleneck reduction planning, GPS based initiatives for transport improvement, Urban transport planning, Parking solutions, Transit Oriented Development/ Transit Corridor development & Last Mile connectivity.

THEME 4- ENVIRONMENTAL MANAGEMENT, ENERGY CONSERVATION & GREEN BUILDING

Sub-theme: Innovative pollution reduction measures at city level, Urban greening, Application of Environmentally friendly technologies at city/building level, integrated assessment, monitoring and control, and "Green" accounting, Tangible measures for ecological sustainability at city/zone level, Energy conservation practices at building/city level, Appropriate and cost effective building materials and construction technology, Green buildings and Green building indicators & water conservation measures/Rain water harvesting at City/building level.

THEME 5-SANITATION

Sub-themes: Solid Waste Management, Sewerage management, Cost effective/eco-friendly/Innovative sanitation solutions & Waste to energy solutions.

THEME 6-URBAN DESIGN & REGIONAL PLANNING, INNERCITY REVITALIZATION & CONSERVATION

Sub-themes: Smart City solutions, Sustainable/inclusive city planning, Innovative Urban design/New township designs,

Innovative regional planning approaches, Urban renewal/Heritage conservation or retrofitting, Inner city renewal/ revitalization & Accessibility improvement for differently abled/vulnerable groups.

THEME 7-DISASTER PREPAREDNESS, MITIGATION & REHABILITATION

Sub-themes: Reduction of vulnerability, Civic awareness and preparedness. Contingency planning and early warning systems. Response capacity, Hazard and risk reduction and mitigation, Post disaster rehabilitation/reconstruction, Risk assessment and zoning, Gender specific risks and needs, Building bye-laws for disaster mitigation.

The selection criteria are based on Planning and Implementation Processes, Innovativeness, Stakeholder's Participation, Resource Mobilisation and Impact, Sustainability and Explicability. A jury comprising of eminent professionals with diverse background scrutinise each received entry as per selection criteria.

This year HUDCO received 101 entries for this award, of which 10 winners were selected by a jury of eminent professionals. This Award consists of cash prize of Rupees One lakh each to 10 winning entries along with a commemorative plaque and certificate. Awards were given in six categories as no entry was found suitable by Jury for Award under the Disaster preparedness , mitigation and rehabilitation category. Additionally, this year, six entries were also selected for a certificate for appreciation as upcoming projects of excellence in the field of urban development. The list of award winners is given below:

HUDCO Awards for Best Practices 2017-18:

Sl. No.	Title of the Best Practice	State	Name of the Organization
THEME 1 : Urban Governance			
1	Urban Governance through Technology Enabled Reforms in Grievance Redressal	Maharashtra	Navi Mumbai Municipal Corporation
	'etc' Education, Training & Services Centre for Persons with Disabilities		
2	Creating a Roadmap for Financial Sustainability of ULBs in Rajasthan	Rajasthan	Directorate of Local Bodies, Rajasthan
3	Property Mapping in Urban Local Bodies	Telangana	Municipal Administration Department, Govt. of Telangana
	GIS based Revenue Improvement in Urban Local Bodies		
THEME 2: Housing, Urban poverty & Infrastructure			
4	Janaadhar Mangala - Integrated Township under Public-Private-Partnership Model with a Focus on Affordable Housing	Gujarat	Janaadhar (India) Private Limited
THEME 3: Urban Transport			
5	Seamless Transport – Kochi Metro	Kerala	Kochi Metro Rail Limited
THEME 4: Environmental Management, Energy conservation and Green Building			
6	HERMA- Sustainable Habitat	Tripura	NB Institute for Rural Technology
7	Pune Street Lighting Project under Public-Private-Partnership Model	Maharashtra	Pune Municipal Corporation
THEME 5: Sanitation			
8	System Integrator for Radio-Frequency Identification (RFID), Internet of Things (IoT) based Smart Bin Implementation as well as Real Time Vehicle Tracking System (RTVTS) and Fuel Tracking System for Solid Waste Vehicles in Bhopal	Madhya Pradesh	Bhopal Municipal Corporation

9	Non-Sewered Sanitation and Faecal Sludge and Septage Management in Warangal City	Telangana	Greater Warangal Municipal Corporation
THEME 6: Urban Design and regional Planning, Inner city Revitalization and Conservation			
10	Tender S.U.R.E. - Specifications for Urban Roads Execution	Karnataka	Jana Urban Space Foundation (India), Bangalore

Certificate for Appreciation under HUDCO Awards for Best Practices 2017-18:

Sl No	Title of the Best Practice	State	Name of the Organization
THEME 2: Housing, Urban poverty & Infrastructure			
1	Direct Benefit Transfer - Online Payment System (DBT-OPS) for Beneficiary Led Construction under Pradhan Mantri Aawas Yojana- Urban	Odisha	Housing & Urban Development Department, Govt. of Odisha
	Land Rights to Slum Dwellers in Urban Areas of Odisha		
2	Urban Resource Center(URC)	Gujarat	Saath Charitable Trust
THEME 3: Urban Transport			
3	Introduction and Running Bi-Cycling Sharing System in New Town, Kolkata	West Bengal	New Town Kolkata Development Authority
THEME 4: Environmental Management, Energy conservation and Green Building			
4	Urban Greening Initiatives in Andhra Pradesh	Andhra Pradesh	Andhra Pradesh Urban Greening & Beautification Corporation
THEME 5: Sanitation			
5	IEC Chhattisgarh : Chhota Bheem, Captain Clean Campaign	Chhattisgarh	State Urban Development Agency, Chhattisgarh
THEME 6: Urban Design and regional Planning, Inner city Revitalization and Conservation			
6	Rejuvenation of J.M. Road under Pune Street Program, Inclusiveness of Urban Street Design Guidelines	Maharashtra	Pune Municipal Corporation

ACKNOWLEDGEMENTS

DISCLAIMER:

The projects featured in this publication are the compilation of Award winning entries of HUDCO Best practices award 2017-18, and are selected by the awards jury based upon the information provided by the participating agencies for the awards, in form of write-ups and presentations. HUDCO does not take responsibility for the accuracy, technical soundness or completeness of the content of these entries and shall not be liable for any loss or damage that may be occasioned directly or indirectly through the use or reliance on the contents of this publication.

The contents given in this publication are for general reference only and not intended to replace the need for professional advice in any particular area.

URBAN GOVERNANCE THROUGH TECHNOLOGY ENABLED REFORMS IN GRIEVANCE REDRESSAL

With an objective of providing simple, faceless and transparent services to all its stakeholders through multiple service delivery channels such as web portal, mobile and citizen facilitation centers, the Navi Mumbai Municipal Corporation (NMMC) embarked on an innovation led journey to improve citizen service delivery by introducing robotics driven unique online grievance mechanism which not only helped citizens in filing their complaints, but also helped the Corporation to incorporate various policy making decisions based on the feedback and nature of complaints submitted by the citizens. More than 10,000 complaints have been received till month of February 2018, out of which 98.84% have been resolved with an average resolution time of 5.85 days only. This initiative has transformed the way in which the Corporation is working which has enabled them to improve service delivery to citizens and to meet ever increasing demand for greater efficiency, transparency, effectiveness and accountability.

BACKGROUND

The e-Grievance Management System is specifically designed to ease the process of logging grievances and getting them serviced for the citizens, and floating population of Navi Mumbai. A total of around 14,00,000 (fourteen lakh) citizens from across Mumbai Metropolitan area are benefitted.

KEY DATES

DATES	Significance/ Achievement
27th Sep 2016	Launch of Robotics driven e-Grievance system on web portal
5th December 2017	Launch of Mobile application (NMMC e-Connect)
24th January 2018	Short listing of the project for the final round of presentation for National E-Governance project (NCEG-2017)

ESTABLISHMENT OF PRIORITIES

Under the ambit of e-Governance initiatives umbrella, Navi Mumbai Municipal Corporation (NMMC) senior management identified a need to overhaul the grievances redressal system and consulted various officers including the Municipal Commissioner, Heads of Departments in NMMC, Sectoral Experts, Private Consultants and Developers to formulate the following priorities in order – (i) Understanding the current/existing situation, (ii) Business Process Re-engineering, (iii) Stakeholders' consultation, (iv) Taking Citizen's feedback, (v) Standardization of forms and making system more user friendly, (vi) Leverage existing applications and infrastructure, (vii) Changes in the software, (viii) Capacity building of employees, (ix) Launch of revamped application, and (x) Continuous improvement and monitoring.

PROCESS

The earlier process of lodging complaints and concerns of the citizens of Navi Mumbai was very cumbersome and difficult. The citizens had to visit the office physically to lodge a grievance and were also required to know the minute details about their concerns such as the name of the department, ward etc. in order to file a complaint which many of the people were not aware of. Further, due to the manual system in place, the problems and grievances lodged by citizens were not addressed on a timely basis. This led the citizens running from pillar to post to get their problems addressed and grievances resolved.

Citizens felt ignored as their views, opinions and feedback were not considered in the planning and running of the city. No provision of alert mechanism for citizens/officers was available. Considerable paperwork and trips to NMMC office were required to follow up on the status of the application. The system neither had defined timelines nor had any provision for complaints and there was minimal accountability in addressing issues of citizens.

To overcome all the problems and difficulties of citizens, NMMC conducted BPR exercise and came up with a unique Citizen Centric Grievance Module that bridges the gap between citizens and Municipal Corporation as the system offers Instant

notifications, real time tracking, citizen's feedback, built in accountability, automated workflow with auto escalation and reopening of grievances

Regular monitoring and evaluation of the initiative has changed the work pattern of the Corporation. Citizens come online and not in line. Every Head of the Department, Additional Commissioners and Commissioner have an illustrative dashboard with dynamic real time data. Additionally, real time reports are available for internal monitoring and for preventive actions.

Analytics driven proactive and preventive measures been undertaken to ensure efficient governance (e.g. weekly data analyzed to identify repeated complaints regarding a particular service or areas and the same is addressed proactively). System also automatically generates a list based on random sampling on weekly basis for review of the quality of resolution.

The data obtained through the system is analyzed on weekly basis for trends, proactive measures to be undertaken and planning. Ratings provided by the citizens are taken as a benchmark by the Municipal Commissioner to evaluate the individual performance for official(s) Annual Confidential Report. Meeting on weekly basis is also taken by the Municipal Commissioner with all Head of the Departments to review and monitor each

suggestion and complaint and any problem arisen there to is resolved so that better services can be provided to the citizens. This is the first time that a Municipal Commissioner of a large city is directly interacting with citizens and resolving the issues with the use of ICT.

RESULTS ACHIEVED

Better citizen services: 82.99% of grievances (total of 10, 357 grievances have been registered in the system since 27th September 2016 to 31st December 2017) have been resolved within 7 days with an overall resolution percentage of 98.85% which led to reduction in average resolution days from 45 days to 5.85 days. Direct participation of Citizens in online grievances has also instilled trust and confidence in public that the problems are getting heard directly without paying any visit to NMMC offices.

Impact on Decision and Policy making: Based on the data and analytics derived from the online feedback / suggestions, citizen participation materialized resulted in the reduction of encroachment activities, opened of e-toilets and repaired public and community toilets to make Navi Mumbai open defecation free city which also helped Navi Mumbai to bag 1st rank in Maharashtra in Swachh Survekshan 2017. Also, several roads, pot holes etc. got repaired due to active participation.

MOBILISATION OF RESOURCES

There has been the introduction of new bus routes for public convenience. Mosquito nuisance areas were studied through system data and appropriate action taken on all affected areas. Feedback and suggestions from online grievances are used for city planning, development and improvement.

Impact in terms of enhanced accountability, transparency and participation: Built in system accountability has empowered citizens for real time tracking, instant notifications which has made officers responsive as system generates automatic notices to defaulters. This has brought transparency for both citizens and officers. Grievance redressal system data is used to conduct proactive and predictive analytics to help the Corporation to address various issues in a proactive manner.

Grievance Link Mobile application

SUSTAINABILITY

The initiative has a defined standard operating procedure(s) for all the stakeholders which have been developed after carefully examining the citizens' and stakeholders' feedback. The activities which makes it sustainable are - (i) Formulated Standard Operating Procedures, (ii) Capacity building of employees, (iii) Aligning data entry operators with departments for IT support, (iv) Regular review meetings, (v) Monitoring and Analyzing data, (vi) Continuous improvement in software by standardizing the forms, (vii) Awareness amongst citizens about the initiatives, and (viii) Preventive measures in all sections of the society.

TRANSFERABILITY

Through adopting NMMC's Standard Operating Procedure, it can be used in any environment/ department. The software is easily transferable as the application is developed on an Open Source platform and the ownership of the source code lies with the Corporation and can be shared with any Government set up.

LESSONS LEARNED

The important takeaways from the project are that monitoring mechanism has to be robust, as it can increase employee accountability. Real time tracking fosters trust in Corporation's actions. Simplification and standardization increases ease for citizens' participation and it increases if the service delivery methods are transparent and accountable, which comes through awareness. Provision of online services has reduced the rush and over crowdedness at offices. With increased smart phone penetration and technologically advanced population, the Government organizations have to match the pace and increase services on the mobile platform.

Preventive interventions, connected and participative governance is a key component in improving standard of living by increasing community participation in the planning and development of the city. In order to build lasting relationships with citizens as well as to ensure their lasting contribution towards the overall growth of

the city, engage citizens' prior implementation of key policies.

Curative interventions, which stem from stringent enforcement mechanism and strong institutional arrangements are the key for decision making process, for identification of gaps and weaknesses in institutional arrangements and to suggest reforms. Assess various suggestions, views and complaints of all stakeholders and enact new proposals and initiatives.

Photograph of Award Function

'ETC'- EDUCATION, TRAINING & SERVICES CENTRE FOR PERSONS WITH DISABILITIES

'etc' (Education, Training & Services Centre for persons with disabilities) is an initiative by Navi Mumbai Municipal Corporation (NMMC). It is a one stop resource Centre which provides educational and rehabilitative facilities to Divyaang Children and adults from Navi Mumbai Municipal corporation area. The Centre serves the special children with education, training and other allied services as well as the adult Divyaanjan by providing them with required assistive aids, economical support and giving benefits through various innovation schemes designed for People with Disabilities (PWDs) by the project 'etc'. The Centre serves the special children as well as the adult persons with disabilities (CWDs/PWDs) by providing them with required assistive aids, economical support and giving benefits through various schemes designed for PWDs. The awareness programmes conducted by 'etc' Centre help CWDs to know their rights and empower them to live life with dignity which is the vision of 'etc'. Students gain special education, learn skills to develop independence, develop socialization skills, and cognitive skills. Vocational training is also being provided to widen their employment opportunities. Along with the vocational training 'etc' centre started various vocational courses as well as the placements of candidates after finishing the course. The environment at the centre is disabled friendly.

BACKGROUND

The 'etc' (Education, Training and Service Centre for Persons with disabilities) is a project initiated and comprehensively implemented by Navi Mumbai Municipal Corporation (NMMC) since 2007. It started as a school for children with hearing impairment and within a span of three years, it gain the magnitude of a centre dealing with Child with disabilities (CWDs) of all disabilities with a motto to make them to live life with confidence and dignity. The Institute provides services to all age groups with various disabilities under one roof. This project initiated by Local Municipal Corporation is an example to be followed to serve the population of about 15-20% (mild to profound level disability).
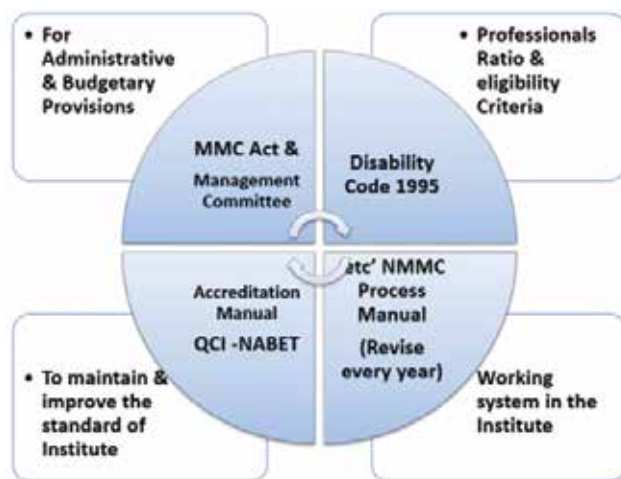
Institutional Framework of 'ETC'

A survey was conducted by the Corporation in 2006-07 on the number of children who are out of school, normal and differently-abled. As per survey, the population residing within NMMC area during 2006-07 was 9.25 lakhs. This survey was used as a checklist for initial screening, and the suspected cases were diagnosed at various camps organized by the 'etc' Centre. The survey results indicated that children with different abilities comprise 2.5 percent of the sample population.

The survey indicated to the Municipal Corporation of the huge financial burden that was borne by parents of Children with Different Abilities (CWDAs) for special education as well the society's lack of awareness on issues pertaining to different abilities. So this project was designed to make education accessible and affordable for CWDs.

KEY DATES

DATES	Significance/Achievement
2007	Centre for Education and Training for Children with Hearing Impairment started.
2008	Education and Training Centre for Children with Different Abilities was founded in 2008.
2010-11	The centre extended educational and rehabilitative facilities to Home Based Training unit.
2012	Procured a plot of 2.5 acres with the permission of 4,000 sq meter construction area opposite Vashi railway station, Navi Mumbai to develop an advance resource centre.

2014-2015	The centre extended educational and rehabilitative facilities to children with visual impairment by initiating new unit 'JIVAN KIRAN'.
2015-2016	The centre started Sign Language classes for Rehab Professionals.
2017-2018	National award 2017 by Hon'ble President of India for outstanding performance for providing holistic comprehensive services to the person with disabilities (Divyangjan).

ESTABLISHMENT OF PRIORITIES

The managing committee provides leadership to the centre run by NMMC. The committee includes NMMC's Commissioner as a President, Dy. Commissioner of Administration & Dy. Commissioner of Schemes as Members, CAFO of NMMC as treasurer, the Director of 'etc' holds the position of Member Secretary in management committee. The Director of the Centre develops various strategies and plans for the Centre and discusses these in the managing committee meeting for approval, mobilization of funds for different projects.
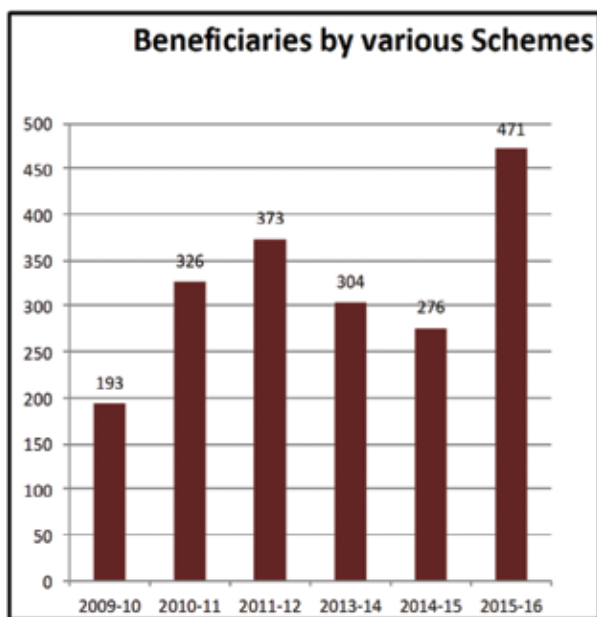
Beneficiaries by various Schemes

'etc' has established a formal Quality Management System (QMS) and is effectively maintaining and continually improving it in accordance with the requirements of the Accreditation Standard for Quality Centre Governance.

'etc' has adopted a Process Approach, wherein, processes required for establishment of QMS have been determined along with their general and specific applications and the same is reflected in various procedures, lists, charts, plans & formats. This effort is directed to define and describe the QMS and to provide general outline of all activities. This system refers to all the supporting quality procedures, and quality documents and activities to be carried out on day-to-day basis as well as to prepare an annual action plan. This has also defined individual duties and responsibilities as a staff, as a process owner and as a part of society.

PROCESS

Pre & post scenario to NMMC:

As per MMC Act, 1949 Section 66, Corporations must fund institutes to look after persons with disabilities and other who need extra care due to illness & health issues. There is also a 3% budget reservation for the poor. By starting 'etc' project NMMC has made optimal utilization of the resources and has become the first Corporation to start a one stop resource Centre for CWDs/PWDs.

Pre & post scenario to Children:

Many children with disability were earlier left without intervention and education due to dearth of professionals in special schools, children did not receive proper, timely intervention or children had to be taken to different places. This has been eased out due to availability of such professionals at 'etc' Centre.

Children at the Centre are well trained and so their socialization improves drastically as intervention process starts at 'etc'. The children are taken for educational visits, picnic, other co-curricular events and competitions. They also get to interact with people on the occasions like exhibition, workshop, Institute's annual program, etc. and also obtain prevocational training, guidance & counseling for various vocational courses.

Pre & post scenario to Parents:

Parents of special children have to bear a financial burden during the rehabilitation process of the child. Many parents are daily wage earners or single parents without employment. Needy parents are

hired on contract basis as class assistants or as care takers based on their qualifications and get stipend for class observation and financial help to attend parent-training programs conducted within and outside the Institute. Parents at the Centre also share a special bond with teacher, therapist, staff and the Director, which makes them feel, secured & looked after.

Pre & post scenario to Rehab professionals:

In the course of five years a total of 110 professionals got employment at the Centre. In future, more job opportunities will be created in government set up for the Rehabilitation professionals, special educators, and paramedical professionals with replication of this initiative.

Pre & post scenario to CWDs/PWDs:

Persons with disabilities face difficulty procuring aids and appliances for themselves. 'etc' provides various aids and appliances to such persons. They also have chances of employment at 'etc''. Post of Class assistant and Caretaker are especially reserved for PWDs. Persons with different abilities get financial help for self- employment.

Pre & post scenario to Society:

Awareness programs are successful in creating recognition and directing attention of the society towards the education, problems and needs of children / persons with different abilities. They also help to create awareness in general public and sensitize society towards the cause.

Pre & post scenario to Government Organizations and NGOs:

NMMC's initiative has encouraged other local government bodies to start similar initiatives. Etc has been a medium to deal with cases of CWDs in areas like crime, Aaganwadi education and community workers 'etc Centre' could successfully create and explore networking amongst the organizations and agencies. It has also empowered the other Institutes working in the field of special education.

MOBILISATION OF RESOURCES

The Centre is completely funded by Navi Mumbai Municipal Corporation utilizing the provision of 3%

budget reservation existing in the local government bodies for the progress of unprivileged section of society and for the rehabilitation of the CWDs/PWDs. Timely electronic transfer of funds is in effect to the 'etc' centre's bank account once the proposed budget by the 'etc' centre gets approval in the Board Meeting. Budget provisions for the centre have been increased to satisfy the growing needs of NMMC 'etc' Centre. Land was allotted by CIDCO at minimal cost so the expenditure on land cost was almost negligible. Technical expertise as well as administrative monitoring were provided by NMMC. Cost of construction of disabled friendly infrastructure was 4.2% and on equipment was 8.5% of the overall cost. Under CBR various preventive programs and society intervention projects are conducted. Schemes contribute for 16% expenditure of which training and empowerment of CWDs and parents is a major chunk. Awareness and prevention programs contribute 10% of total expenditure. Facilities and services provided to the CWDs apart from schemes comprises of 14% of office expenditure, 7% for maintenance and 3% are other expenditures of the center.
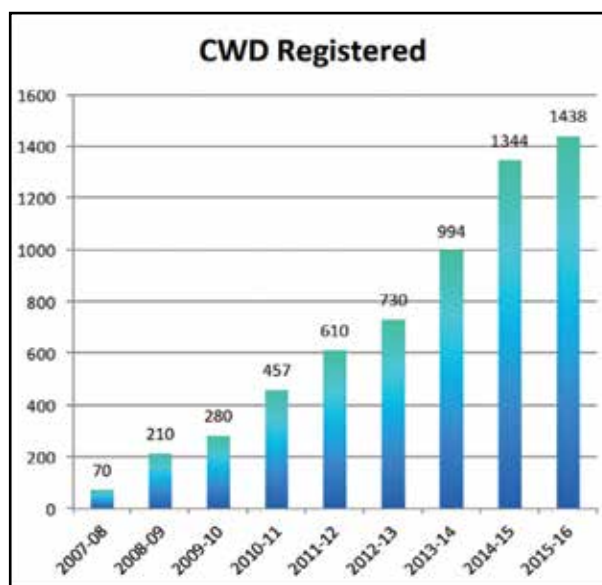
CWDs registered

RESULTS ACHIEVED

Benefit to children with disabilities:

Vocational training provided to children made them employable and helping them to develop self-esteem. Before the existence of this centre the children with special needs had to adjust according

to the others' environment. But at this centre the environment is tuned as per the requirements of the special children. As a result, they enjoy their childhood thoroughly by playing and learning with their peer.

Benefits to parents:

Many parents who are daily wage earners or single parents without employment, are relieved of the financial burden of their child's rehabilitative expenses.

Benefits to Persons with Different Abilities:

PWDs get financial help for self- employment. Children with Different Abilities get financial aid up to 1 lakh for cochlear implant surgery. Persons with Different Abilities who are home bound and cannot pursue any kind of employment because of the limitations imposed upon them due to disability are given monthly financial aid. Financial assistance for academic and vocational training programs for PWDs
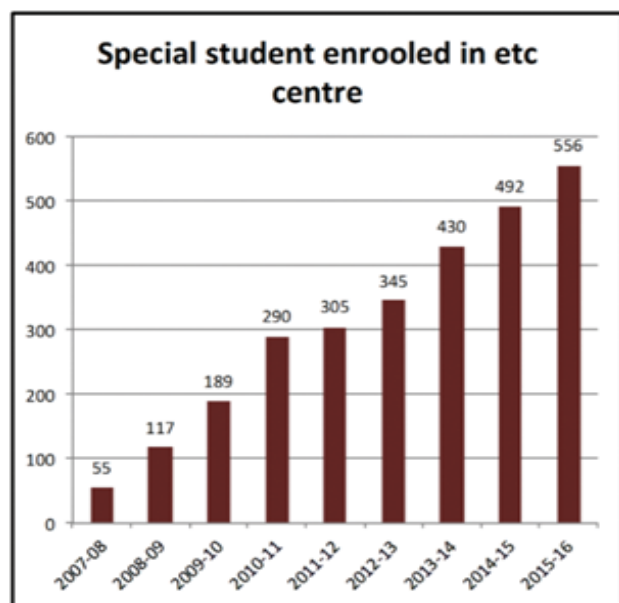
Special student enrolled in ETC Center

Benefits to Society:

Print, audio and visual media have appreciated the work and have given wide publicity to most of the activities conducted by 'etc' Centre. The articles and interviews served as a platform for solving queries and give much needed feedback to the target population of the society.

Individual from society gets information about the Institute through different mass media. The

quality of work done in the centre creates a positive impact on individuals. With training and help for self-employment or recruitments, the income generating group is widening.

**Benefits to Government Organizations and NGOs:**

NMMC's initiative has encouraged other local government bodies to start similar initiatives for PWDs. 'etc Centre' could successfully create and explore networking amongst the organizations and agencies. It has also empowered the other institutes working in the field of special education.

Benefits to Rehabilitation professionals:

In the course of five years a total of 110 professionals got employment at the Centre. In future more job opportunities will be created in Govt. set up for the rehabilitation professionals, special educators, and paramedical professionals with replication of this initiative.

SUSTAINABILITY

The initiative addresses a crucial need of looking after a section of differently abled persons and fulfills an important social need, hence it is socially sustainable. It also helps participants to gain confidence and employment. Professionals move to take training in specialized field within their profession or related to rehab profession. They go for bridge courses or to learn new trends and technological updates in the field to study the global change in rehab profession and to update with it and the centre automatically.

The State Disability code 1995 has brought about increase in pay scale. Different abled get financial aid up to 1 Lakh for cochlear implant surgery. Persons with different abilities who are home bound and cannot pursue any kind of employment because of the limitations imposed upon them due to disability are given monthly financial aid.

The Center encourages rehabilitation professionals for updating their knowledge and upgrading professional skills. The Center conducts various indoor and encourages participation in outdoor conferences, seminars and informative lectures for professionals, associating staff and parents. This enrichment in knowledge and experience

enhances the productivity of the center. The center has monitoring system, which controls and communicates with all the staff. The financial sustainability of the center is with support from the local body fund.

TRANSFERABILITY

The concept can be transferred to other urban local body, with the following possibilities:

Possibility due to availability of master plan:

NMMC 'etc' already has a master plan with proper process manual that can be easily replicable, if any local body is ready to take initiative. The process manual gives in depth information of day-to-day working process as an ideal rehabilitation center.

Possibility of flexibility in regard to Funding from 3% budget reservation of local body:

Minimal budget required (Essential/ Optional services) for the replication with different combinations of services

Possibility with limited professional backup:

Initially management can appoint limited rehab professionals. Project can initially be started with smaller group of CWDs concentrating on quality of rehabilitation services. On later date, with increase in resources, the strength can be increased.

Possibility of limited infrastructure:

The project may start in small setup of 2-3 rooms. It will grow as per the demand of CWDs and availability of infrastructure.' etc' also grown-up in similar manner.

Possibility in any kind of set up (urban/rural):

Projects like 'etc' can be set in urban as well as rural area. The requirements and the available sources have to be put to use optimally. There may be transportation difficulty so home base program option can work on.

Possibility of partnership and various sectors:

In some case it may not be possible for a single sector like Government, Local Government or NGO to independently handle a centre for CWDs/PWDs. In such a scenario various sector willing to work for the cause can come together and give in their best

to start a centre. The causes will surly benefit a lot with Public Private Partnership.

Possibility of flexibility in regard to Administration:

NMMC 'etc' Centre is self-monitored and administered by local government body. Similar option can be opted for or local government body or can be outsourced. Policy can be made at Central and State Level to initiate projects like 'etc' at local government level with Modality of 'Uniform System'.

LESSONS LEARNED

Normally GOs and NGOs working in field of special education in India concentrate only one or two educational options. Generally special schools or institutes provide option of segregation or/and integration but 'etc' is providing all educational options under one roof for the choice of parent and PWDs.

'etc' had screened 4000 students & after diagnosis, 8 % to 9 % students were found with learning disabilities in regular school. The Centre supports them by providing remedial education as well curriculum support and personal intervention on 1: 8 basis to help them to cope with mainstream education. The Center gives periodical training to regular school classroom teachers & Principals to handle all above mainstreamed students.

MMC Act, chapter 6, section 66 (1) directs to give services for CWDs as optional area which motivates the local bodies from working for CWDs/PWDs. This can be dealt with by making CWDs a mandatory service area. The initiative can be taken only after the master plan is ready.

The laws about disabled friendly infrastructure should be firmly imposed so that resource centers and small setups can be started in any available structure.

Photograph of Award Function

CREATING A ROAD MAP FOR FINANCIAL SUSTAINABILITY OF URBAN LOCAL BODIES IN RAJASTHAN

The Govt. of Rajasthan in partnership with Janaagraha Centre for Citizenship and Democracy initiated Accounting and Audit reforms in 188 Urban Local Bodies (ULBs) in May 2015. Phase – I of the engagement commenced with the signing of an MOU between Directorate of Local Bodies (DLB), Govt. of Rajasthan and Janaagraha for constitution of Municipal Finance Reforms Cell to facilitate preparation of audited annual accounts for all ULBs. Phase – II of the engagement commenced in November 2017 for development of a Municipal Finance Blueprint for the state.

ULBs in Rajasthan achieved a major milestone in migrating from single entry accounting to double entry accounting, producing audited financial statements through empanelled Chartered Accountants (CAs) and took the first step towards financial sustainability. Through a process of empanelment all 188 ULBs in Rajasthan have appointed CAs, and in less than a year, more than 500 audited annual accounts have been produced for the first time in ULBs of Rajasthan. Phase - II reforms would undertake transformative reforms for financial self-sufficiency and financial accountability of ULBs.

BACKGROUND

India's urban infrastructure is estimated to require Rs.40 trillion of investments in a 20-year period from 2011 to 2031. Today, municipal revenues are approximately Rs.1.5 trillion and account for approximately 1% of the country's GDP as against 6% plus in Brazil, South Africa.

A large majority of the 4,000 plus municipalities in India do not have balance sheets, as many of them continue to follow cash basis of accounting. In several states, municipal laws don't even mandate audit of annual accounts. Municipalities have not carried out physical verification of their assets and inventories for decades. They also do not provide for any uniform accounting standards to be followed, rendering municipal accounts largely incomparable across states and sometimes even within the same state.

More recently there have been two significant developments which provided impetus to Accounting reforms in Municipalities. Publication of audited annual accounts was made a mandatory condition to avail close to Rs. 17,500 crores of performance grants under the Fourteenth Finance Commission (14th FC) and also a mandatory reform condition under the Atal Mission for Rejuvenation and Urban Transformation (AMRUT).

KEY DATES

DATES	Significance/Achievement
11 May, 2015	Phase-I :- Signing of MoU with Janaagraha.
13 January, 2016	Request for Proposal in national newspaper.
15 February, 2016	Empanelment of Chartered Accountants (CAs) for providing services of accounting and audit financial year 2013-14 (and 2012-13 for AMRUT Cities) to 2015-16.
14 March, 2016	Creation of Municipal Finance Reform Cell.
30 September, 2016	Receipt of 100 audited annual financial statements from the empanelled CAs for various ULBs.
09 February, 2017	Order of DLB for uploading of Audit Reports on the ULB website
22 August, 2017	Award Event for Felicitation of ULBs in Rajasthan for outstanding performance in Accounting and Audit Reforms.
06 September, 2017	Order for uploading of audit reports on the central website of Department.
30 November, 2017	Receipt of over 500 audited annual financial statements.
23 January, 2018	Order for empanelment of CAs for FY 2017-18 and FY 2018-19.

ESTABLISHMENT OF PRIORITIES

As per 14th FC, publication of audited annual accounts is a mandatory condition to avail performance grants. The same is also a mandatory reform condition under AMRUT. An MoU was executed with Janaagraha for forming a Municipal Reforms Cell (MRC) to facilitate publishing audited financial statements of all ULBs. The Municipal Reform Cell (MRC) monitored empanelment process of external Chartered Accountants (CAs). One group of CAs was created for preparation of account statements for all ULBs while other group was created for auditing the same. MRC was supported with staff by nominees from Directorate of Local Bodies and Janaagraha. In the second phase of the reforms, a Municipal Finance Blueprint was published to improve municipal revenues and strengthen financial accounting.

PROCESS

Engagement of DLB and ULB staff

The office of the DLB and his team were appreciative of the need for the reforms and were very supportive of the initiative, however for the initiative to be successful and sustainable it was important for ULBs to be engaged in the project and be motivated to cooperate with the CAs to fulfill the desired objectives. Initially there was lack of support from the ULBs which manifested itself in delays in submission of financial information to the CAs. The DLB team organized division level meetings attended by the Chief Account Officer (CAO), Assistant Account Officer (AAO) and representatives of the ULBs to sensitize them and seek their cooperation. The DLB team undertook several field visits to get a firsthand account of the ground realities to understand the concerns of the ULBS and address them. The DLB also organized camps for submission of audited reports

CA Empanelment Challenges:

Empanelment of the CAs was proposed to be based on technical criteria on a fixed rate contract. However, in order to ensure that the process was transparent and not subject to scrutiny later, the Govt. of Rajasthan opted for an L 1 based tender for empanelment of CAs.

Coordination challenges:

The DLB office had limited manpower to manage the project and ensure coordination. Additional resources were hired and were supplemented by Janaagraha by deputing a CA to assist the DLB in vetting the applications and on boarding the CAs. The team also ensured coordination between ULBs and the CAs for timely preparation of account statements and audit reports.

In 2017, the Local Self Government (LSG) with Janagraha's support held an Awards event to felicitate the best performing ULBs in the area of Accounting and Audit reforms. It was a first of its kind event not only for the state but also nationwide where ULBs were ranked and awarded on their financial performance. The winners were felicitated by the Honorable Urban Development and Housing Minister of Rajasthan.

MOBILISATION OF RESOURCES

As per MoU, Janaagraha deployed an onsite and offsite team to support the reforms process and deputed a CA at the DLB office to oversee the empanelment process and provide technical guidance. Janaagraha offsite team provided technical guidance and support on data analysis and policy reforms. The Principal Secretary – Urban Development, Directorate of Local Body, and Chief Account Officer (CAO) played key roles in guiding and supporting the reforms and ensuring that ULBs were on board.

Since the beginning of the project, over 30 CA firms have been working with 160 ULBs across the length and breadth of the state. One group of CAs were tasked with preparation of Account Statements for all ULBs and another group of CAs were responsible for auditing the same. The CAs were chosen through a tendering process.

RESULTS ACHIEVED

Over 160 ULBs published their audited accounts for FY 2014-15 and over 140 ULBs published their audited accounts for FY 2015-16. All audited accounts are accessible at a single location on the website of the Department of Local Self Government.

Table: No. of ULBs submitted audit reports per year

Division	Total No. of ULBs	No. of ULBs submitted Audit Report				
		2012-13*	2013-14	2014-15	2015-16	2016-17
Ajmer	31	13	29	27	27	3
Bharatpur	18	5	14	14	13	0
Bikaner	30	2	26	26	20	1
Jaipur	43	5	38	38	35	2
Jodhpur	25	4	21	19	19	2
Kota	20	8	19	19	19	1
Udaipur	21	5	18	18	16	0
Total	**188**	**42**	**165**	**161**	**149**	**9**

SUSTAINABILITY

Availability of audited accounts facilitated accurate financial analysis and reporting and helped in providing timely, relevant information for planning, decision making and control at each level of management. Further, they assisted in effective follow-up of receivables by the ULBs and proper ascertainment of payables. More importantly, it helped in meeting the objectives of the Smart Cities mission on tapping private capital by easing financial appraisals and facilitating credit rating, one of the pre-requisites for mobilizing funds through Municipal bonds.

TRANSFERABILITY

ULBs need to undertake financial transparency by ensuring that Financial Accounts are published on a war footing. Annual and Quarterly reports including audited accounts and management analysis of the same are the principal instruments that build trust and credibility.

Empanelling external chartered accountants to prepare and audit municipal balance sheets would jump-start sound financial governance in ULBs by creating a pan-India municipal fiscal landscape. The recent experience of empanelment of chartered accountants in Rajasthan suggests that at a cost of not more than Rs.100 crore a year all 4,000 plus ULBs in India can have their balance sheets audited by independent chartered accountants. Based on the experience, a Guidelines document was published for Accounting and Audit reforms in ULBs.

The experience of Rajasthan, where empanelled CAs produced audited financial statements could be the roadmap for other states across India. These would be first steps towards improving transparency in accounting processes and audits, better decision making and most importantly access to private capital.

LESSONS LEARNED

Urban local bodies need to be financially sustainable, in order to provide a good quality of life in our cities. However, in order to assess their financial health and draw up financial sustainability roadmap including tapping private capital, it is important to be able to understand the true financial position of the ULBs.

Photograph of Award Function

PROPERTY MAPPING IN URBAN LOCAL BODIES

The Commissioner & Directorate of Department of Municipal Administration, Govt. of Telangana (C&DMA) has embarked on a task to map all the properties in the urban areas along with the vacant plots, government properties and geotag them as part of Ease of Doing business . The main objective is to integrate the property information with Geo spatial data and put it in the public domain for easy access of property information. The Commissioner and Director Municipal Administration, 72 Urban Local Bodies and Indian Space Research Organization's National Remote Sensing Centre (NRSC) are the participatory agencies in the initiative.

BACKGROUND

The Commissioner & Directorate of Department of Municipal Administration (C&DMA), Govt. of Telangana in partnership with the Indian Space Research Organization's National Remote Sensing Centre (NRSC), Hyderabad has developed a special mobile application on android platform to geo-tag all the properties with the help of 'Bhuvan ', the online platform which provides images and map visualization. Field survey of properties was undertaken using the mobile app to geo-tag each property in the ULB. The entire process took three months and all the existing 12.5 lakh assessments were mapped with 18000 new / un-assessed properties also tagged. The initiative has been implemented in all the 72 Urban Local Bodies (ULBs) of the state. Prior to the initiative, citizens were not in a position to access details of their properties. The authorities of Urban Local Bodies were also not in a position to view the complete details of property at a single platform. Lots of queries and disputes were encountered at ULB level on the levy & collection of tax. On the other hand, in absence of proper data base, the ULB authorities faced revenue leakage. To bridge the gap of transparency of information and levy of correct tax, the technology intervention has been brought into place.

KEY DATES

DATES	Significance/ Achievement
19th June, 2017 to 31st October, 2017	Multiple Property information at one platform
	Use of the database for revenue improvement

ESTABLISHMENT OF PRIORITIES

In property mapping, the NRSC has provided technical support in terms of satellite maps and mobile application. The data provided by the NRSC has to be initially authorized by following hierarchical order i.e., C&DMA, Regional Directors, Municipal Commissioners, Revenue Officers and field staff. After authorization of concerned officials, the data was incorporated in the mobile application of field staff which he has to register following the decided procedures. The Revenue Officer moderated the collection of point data on day to day basis. The progress was monitored on the dashboard at the state level. The technical issues were addressed by the NRSC.

PROCESS

Data collection with the help of mobile application as a part of Survey

The mobile application is user-friendly and a server based solution which enables. The data collector to systematically record generated assets with spatial position (Longitude, Latitude and Attribute the status), time stamped with geo-tagged photograph. This mobile app provides a platform

to build a spatial database on Bhuvan Geo-platform. The user can download the mobile app from 'Bhuvan Geo-platform' using web browser in mobile by putting key in the URL. The installation procedure requires enabling of unknown source application in the android settings. The profile page consists of basic observer's parameter details such as Bhuvan User ID, Name, Mobile number and ULB. The profile filling is one-time registration activity by the observer. These parameters are tagged with each observation. The ID can be used for query/ search of individual points from the geo-spatial database. This can be used to monitor day-to-day activities of an observer on Bhuvan geo-platform. Along with above said parameters, user will be selecting the State, ULBs to download property data of the ULB to be geo-tagged. The user needs to click on registration icon and register.

Geo-tagging of the properties with the help of mobile application

The mobile app has a secured login and is accessible to only the registered users such as C&DMA, RDMA, Municipal Commissioner, Revenue officer and Bill Collectors. Each user is authorized by his supervising officer. As part of the survey process, each bill collector is designated an area in the ULB and he / she has to perform five tasks using the app which are:

1. Select the property from the assigned list and opt for house number / assessment number.

2. Capture the GPS position.

3. Take photographs of the work (two photographs) one at the front side and other at the side angle of the property at a distance within 10 meters.

4. Add information if any about the work.

5. Send the collected information. Once the user is satisfied with the information collected and the data is uploaded.

The concerned revenue officer of the ULB cross verifies the same and will accept or reject the property.

The geo-tagged properties are linked to property data base of the ULB which provides all information on the property such as name of the owner, tax details, building details, encumbrance, prohibited properties details and disputed properties to the citizen or buyer. Other than tax the details such as encumbrance, prohibited properties and disputed properties are captured with due integration of data base of registration department. The user / citizen have to just login to ULB website or C&DMA website using the property tax assessment number or house number to search for the property information. The entire process took three months period and all the existing 12.5 lakh assessments are mapped with 18000 new / un-assessed properties.

A Mobile App developed to geo-tag the Properties

Property survey at a large scale using technology was a big challenge. Training was provided by NRSC about the usage of the mobile application at various levels and a user manual was made available for trouble shooting.

The entire survey was undertaken by the field staff or bill collectors with supervision by the Revenue Inspectors, Municipal Commissioner, Regional Directors and officers at the state level through a constant monitoring. Targets for the survey and coverage of properties were set for each field staff. The process of the survey was linked to the dash board which was reviewed on daily basis. The geo- spatial survey is entirely carried out by the bill collectors. The NRSC has trained 1498 bill collectors to carry out the survey over 2 months and is extending the technical support.

MOBILISATION OF RESOURCES

The technical resources were garnered with support of NRSC who provided the technical support, the satellite maps using Bhuvan dash board for daily monitoring and the training of the field staff. On completion of the process, NRSC also helped to develop the mobile application. NRSC has integrated the property data base with 'Bhuvan'.

The property mapping is entirely carried out by the bill collectors in the ULBs in economical way by using smart phones with android applications. The entire project was implemented by the in-house staff of ULBs and no other expenditure has been incurred in the project.

RESULTS ACHIEVED

The outcome of the intervention is that 12.5 lakh properties in the 72 Urban Local Bodies (ULBs) have been mapped using this process. The geo-spatial database of properties is now available on the public domain and the citizens can view every information in detail of the property, online without visiting the ULB office. The initiative has given access to citizens to obtain online information and ensuring transparent, time bound and hassle-free services about the property information.

Further, the data base of C&DMA can be used to identify the under-assessed or un-assessed properties which would augment the revenue in terms of property tax.

SUSTAINABILITY

The initiative has resulted in easy access of information on a single click of button to the citizens about the property which is reform mandated under the ease of doing business. This would reduce the transaction time for business or individual to seek relevant information related to a property transaction. The user can access to ULB website or C&DMA website using the property tax
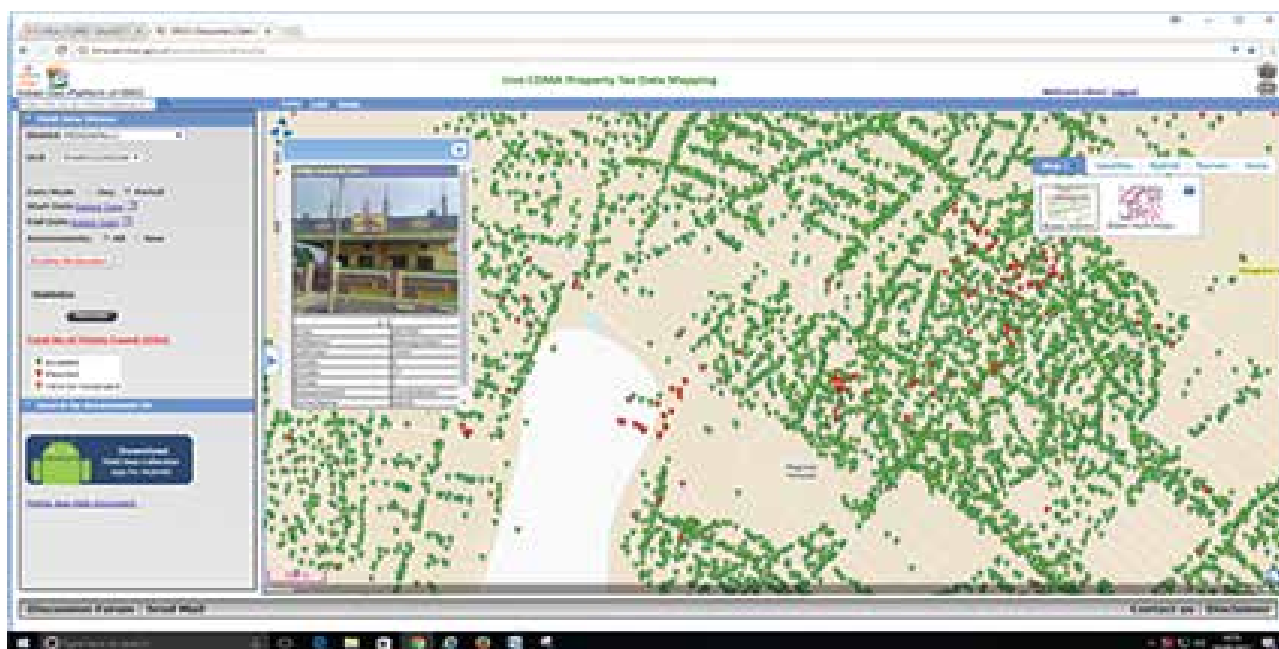
Web portal showing the tax data mapping after assessment of the properties with the help of mobile application

assessment number or house number to search for the property information. The data base could be also used development of digital door numbering for all the properties.

TRANSFERABILITY

The property mapping is very useful database and the initiative can be replicated for several urban areas. ULBs can utilize the integrated database of spatial and non-spatial information for property tax, mutations and property details. Further, based upon the success of the property mapping, the department has also planned to use the data base to identify the under-assessed or un-assessed properties which would augment the revenue in terms of property tax and vacant land tax by identifying the under assessed and un-assessed properties.

LESSONS LEARNED

In the past, no spatial database was available at the ULBs about the properties in Telangana. Access

to any information related to property such as location, encumbrance, property tax details, and disputes was cumbersome and it was a time-consuming process. The property tax information was never integrated with the property information like encumbrance, disputes since there was no convergence of information. The introduction of property mapping along with the integration of property information has helped the citizens to view the property details very easily and quickly.

Photograph of Award Function

GIS BASED REVENUE IMPROVEMENT IN URBAN LOCAL BODIES

Property Tax is one of the major sources of income for an urban local body. Due to improper levy the ULBs are generally not in a position to mitigate to meet the mandatory provisions. As per the norms, the ULBs are supposed revise the tax every five years. To improve the revenue of the ULB and make it self-sufficient it is important to find out un-assessed and under assessed properties, so that the resources are charged fairly. The Commissioner & Directorate of Department of Municipal Administration, Govt. of Telangana (C&DMA) have undertaken the project of GIS based revenue improvement in ULBs to achieve the revenue improvement by improving the property tax coverage.

BACKGROUND

In Telangana state, out of 67 ULBs , the new Municipal Tax was brought into effect in 2015 in 27 Nagar Panchayats which were upgraded from Gram Panchayat. The property tax was last revised during 2002 for residential properties and 2007 for non-residential properties. The revision for every five years was not undertaken various reasons. Further, as per the norms the new / under assessed properties were to be assessed on a monthly basis which was only done for limited number of properties against the potential. The measures by the state department undertaken to improve property tax through manual surveys of un-assessed and under assessed properties only had yielded limited results.
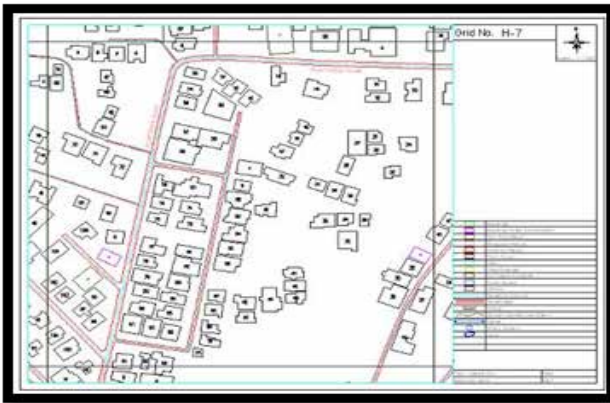
Allocation of unique Geo reference number to each property

Under the 74th Constitutional Amendment Act, it is mandated for providing basic services to the citizens residing in the Municipalities or Urban Local Bodies. As per the norms, the Urban Local Bodies are obligated to provide mandatory services and ULBs has to rely on their own sources of revenue. Henceforth, augmentation of revenue is one of primary responsibility of an Urban Local Body.

KEY DATES

DATES	Significance/Achievement
04th April, 2016	Increase of Revenue to a tune of Rs.40.00 Crores i.e. 28% incidental growth, without actually increasing rate of tax.

ESTABLISHMENT OF PRIORITIES

The orientation and training of the officials and field staff was of high priority. The Centre for Environment Development (CED), developed & provided the necessary support in training the field staff about the usage of the GIS maps. Each bill collector was assigned an area with supervisory officer. The survey data was cross verified with an existing MIS data by the field staff and special notices were issued to the property owners on the variance.

PROCESS

The GIS based property tax information survey was taken up by the Commissioner & Directorate of Department of Municipal Administration, Govt. of Telangana (C&DMA) in 34 ULBs with objective of using the geo-spatial information to be made available in the base maps. The initiative was undertaken through the Municipal officials and field staff of the respective ULBs and was trained to carry out the survey. The survey was carried out in 642091 properties and property tax has been rationalized in 195594 properties in 34 ULBs of the state. The initiative has resulted in an increase of 28% of the property tax collected by bringing the un-assessed and under assessed properties under tax.
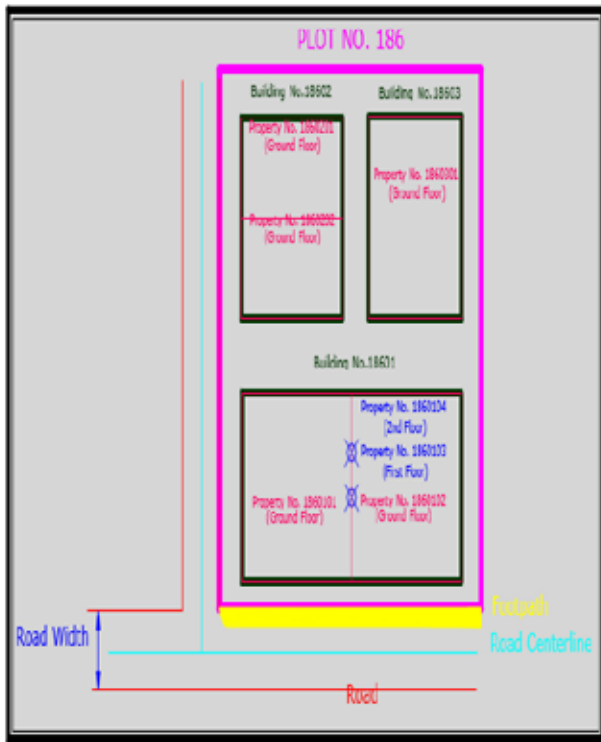
Mapping process of each plot

As per the provisions of the Municipal Act, the levy of tax on new assessments and under assessments has been carried out by drawing monthly list by the filed officer's regular basis. But, it has been observed that in manual surveys there were gaps in identification the assessment of new or under assessed properties. Instructions to ULBs from C&DMA / MA&UD department have not yielded the desired results in augmenting the property tax revenues resulting in revenue shortfall to ULBs with growing expenditure in terms increased wages, payment of power bills, running day to day administration and providing of basic services. In context of the above, it was felt highly desirable to use the GIS base maps for survey of the properties which spatially represented the property locations.

GIS Mapping: Initially satellite image of the entire municipality was obtained and the mapped with each structures of the urban area, allotted with unique geo reference numbers, so that, every structure is covered in survey and no property is over sighted.

Field Survey: Field surveyors of the relevant field were identified and trained about the questionnaire format, software usage and field survey. A team of two members was formed, with predefined area for mapping. Each team was allotted areas day wise for field data collection. This procedure eliminated accidental missing of survey and survey area. Activities were monitored in real time by supervisors from their login. Data validation was done right at the software for wrong numbers or missing fields so that the important information could be captured and in few fields where documentation was mandatory, the documental proofs were provided as evidence.

On capturing details of each property, the tax was revised for the properties wherever variation was found and the tax was levied for the properties which were un-assessed. All these details were updated in property tax module maintained by the Department. Subsequently, due process of issuing special notices and collection of tax was made. In respect of any objections, they were revised through revision petitions. After completing all the mandatory process, the tax was levied as per the norms and captured in the property module maintained by the department and also in municipal records. Since the process has been

Grid of 250 m X 250 m size was demarcated on A1 size paper with 1: 500 Scale to map the features very accurately on ground

completed without actually increasing the rate of tax, there was no résistance among the property owners.

Creation of Data Base on GIS

MOBILISATION OF RESOURCES

Under Telangana Municipal Development Project, the World Bank support was made available in order to procure the GIS maps. The Center for Environment Development, Hyderabad (CED) was involved in developing the base maps and training of the field staff to carry out the surveys using the base maps. Subsequently, training was given to field staff for carrying out survey and identification of property using the GIS maps. Training program was undertaken to all field staff.

RESULTS ACHIEVED

The revenue in tax base increased without increasing the property tax rates. The GIS based property tax survey in the 34 ULBs has resulted in an increase of 28% of the property tax by bringing the un-assessed and under assessed properties under tax net. Totally, about 195594 under assessed properties and 16355 un-assessed properties were identified and results into improvement in the revenue in terms of property tax and better financial health of ULBs as noted below:

Total assessments surveyed (nos.)	642091
Modified Assessments (nos.)	195594
Increased Tax Amount (Rs./lacs)	1619.03
No of New assessments (nos.)	16355
New Assessment demand (Rs./lacs)	382.45
Total amount increased per year (Rs./lacs)	4002.96
% increase	28

SUSTAINABILITY

The initiative has resulted in revenue increase in property tax by bringing in additional revenue from the under-assessed and un-assessed properties. It has improved the financial situation in the ULBs to meet the growing expenditure and thereby improving the cost recovery. The process adopted is transparent and the database is made available on public domain. The property tax database has been updated and demands are being raised accordingly. The database also serves as information for rationalization of user charges for water supply, solid waste management and other taxes. The capacities of the in-house field staff have been enhanced to use of the GIS based maps for revenue improvement.

TRANSFERABILITY

The use of GIS based technology has ensured proper capture of revenue apart from providing transparent information. Training the field staff for using of the technology has improved efficiency and transparency in property tax assessment. The GIS property tax can also be used as base data for collection of other taxes and extending urban services to citizens. The initiative can be easily replicated elsewhere with the availability of updated base maps on GIS platform.

LESSONS LEARNED

The process of GIS based property tax survey is one of the unique initiatives which enable to strengthen the financial resources of an urban local body. The process is done purely in transparent manner and opportunity is given to property owner through issue of special notice.

Photograph of Award Function

JANAADHAR MANGALA – INTEGRATED TOWNSHIP UNDER PUBLIC-PRIVATE-PARTNERSHIP MODEL WITH A FOCUS ON AFFORDABLE HOUSING

Gujarat International Finance Tec-City (GIFT City) is an upcoming international global financial services hub, situated in Gandhinagar, Gujarat, being developed by GIFT Company Limited (GIFTCL), a joint venture between Government of Gujarat and IL&FS. Spread across 886 acres, GIFT City is estimated to generate 30,000 job opportunities by the end of 2018. As a result, there is a need for development of a sustainable housing solution which would cater not only to the housing demand, but also take an integrated approach to ensure that the housing is affordable to the employees with all necessary amenities such as schools, hospitals and market places.

GIFTCL found its partner in Janaadhar, an affordable housing company that aims to address the housing shortage of the urban poor. GIFTCL and Janaadhar have jointly developed an Integrated Township in the Domestic Tariff Zone (DTZ) of GIFT City– Janaadhar Mangala - with a focus on affordable housing and wholesome living and facilities such as health clinic, community centre, market place, and plenty of open space. It also encourages a walk-to-work environment, and is the pilot project for IBFC's Green Building Certification for Affordable Housing Project.

BACKGROUND

Janaadhar Mangala is spread across 5.7 acres in GIFT City - Domestic Tariff Zone (DTZ). With 330 affordable housing units that cater to the housing demand of the Economically Weaker Section (EWS) and Lower Income Group (LIG) GIFT City employees, the township is expected to have a population of around 1,300, all of whom would belong to families with an annual income of less than Rs. 6 Lakhs.

KEY DATES

DATES	Significance/Achievement
January, 2016	Signing of Agreement to Lease cum Development Agreement
April, 2018	Handover of residential, commercial, and community centre

ESTABLISHMENT OF PRIORITIES

The foremost priority is to provide high quality affordable housing to the EWS and LIG employees of GIFT City and to create a sustainable and integrated environment by promoting a walk to work culture and a high quality of life by providing necessary urban infrastructure.

The Project was awarded to Janaadhar through a competitive bid process. The land is owned by GIFTCL and is leased to Janaadhar for a period of 99 years. Janaadhar was granted the development rights to develop the project and was given the responsibility to design, finance, procure, construct, operate, sell, and maintain the township. To ensure the township caters to the EWS and LIG segments, it was agreed between Janaadhar, GIFTCL, and the Government of Gujarat that the units would only be sold to employees of GIFT City who earn less than Rs 6 lakh annually, or organizations based in GIFT City who wish to provide housing to their employees.

PROCESS

GIFTCL invited proposals for the development of an integrated township within GIFT City DTZ, which would cater to the housing, social and commercial needs of its EWS and LIG employees, through a fair and transparent bidding process. The model proposed was Public Private Partnership, where development rights to land would be given to a private developer. Land would be leased to the developer on a nominal rate, since land cost makes up for a large part of the total construction cost.

Janaadhar (India) Pvt. Ltd, an affordable housing developer with a deep understanding of urban development, was awarded the tender to develop the Township. Initially, high cost of construction was making the project untenable for EWS and LIG households. To further bring down cost of

construction, the parties agreed that the cost of internal infrastructure and community centre would be borne by GIFTCL. Hence, the cost saving per unit was passed on to the EWS or LIG buyer.

The units are designed keeping in mind the affordability as well as to minimize the maintenance costs, which will be incurred by the residents.

MOBILISATION OF RESOURCES

As is the case with any affordable housing project, land is the key resource for development. Lack of availability and high costs of land often make affordable housing projects untenable for private developers. GIFTCL leased out 5.7 acres of land to Janaadhar at a nominal rate for a period of 99 years, after the latter was awarded the tender. This brought down the cost of development significantly. Janaadhar Mangala was financed, designed, and constructed by Janaadhar (India) Private Limited (JIPL). Bringing its expertise in the affordable housing segment, JIPL contributed financial, technical and human resources utilized in the development of Janaadhar Mangala.

RESULTS ACHIEVED

The Township was designed to provide affordable housing to households employed by GIFT City with the prerequisites for a high quality of life such as

Rendered images of the project

primary school, community center and market place. The market place has found significant takers willing to buy the units and set shop. Out of 51 commercial units planned, 42 are already sold out till February 2018. For the families residing in Janaadhar Mangala, staying in the township has significantly reduced the cost and time of commute to travel to and fro work. It also has improved their quality of life and given them a sense of dignity since they now own a quality home which they can call their own.

SUSTAINABILITY

The development was made feasible through a PPP model where land owned by a Special Economic Zone (SEZ) was leased out to a private developer at a nominal rate for a period of 99 years. This, along with efficient construction technology, was able to bring down cost of construction significantly. As a result, the affordable housing units are priced at just Rs. 8.7 Lakhs. Since most families opt for a bank loan, this results in a comfortable monthly EMI of less than Rs. 8,500.

There is a cap on the annual household income of the buyer of the affordable housing units. The buyer must also be an employee of an organization that owns commercial space in GIFT City. Organizations based in GIFT City are also eligible to buy housing units in Janaadhar Mangala, to provide housing to employees who cannot afford to buy their own units.

Janaadhar Mangala is the pilot project for IBFC's Green Building Certification for Affordable Housing Projects. Green measures such as minimum excavation, top soil conservation, fly ash, and China Mosaic flooring for terrace were adopted. The Township has a Rain Water Harvesting system.

GIFTCL- GIFT City is being developed by GIFTCL which realized the growing need for housing within the geographical limits of the DTZ, especially for the EWS and LIG segments. Bids were invited to attract the right partner for the development of the integrated township with a focus on affordable housing, under a Public Private Partnership model.

The Government of Gujarat has supported the development of Janaadhar Mangala by providing a friendly policy framework for approvals. Also, the

allotment of the affordable housing units to the buyers is made as per the criteria given in Gujarat Housing Board's Mukhya Mantri Gruh Yojana – the State's Affordable Housing Policy. Janaadhar Mangala shares the Central Government's vision of Housing for All. The affordable housing units are eligible for the subsidies available under the CLSS component of PMAY-U. The scheme provides financial assistance to EWS and LIG first time home buyers, which is also the target audience for Janaadhar Mangala.

Plan of 1BHK apartment

Plan of 1BHK apartment

TRANSFERABILITY

To necessitate capacity building to sustain the population that is expected to rise from the present 30 percent to an estimated 50 percent by 2030, PPP model of development should be married with other urban programmes to make housing not just affordable but also guarantee a good quality of life.

Janaadhar Mangala has been a perfect example where housing in an integrated township with necessary social & commercial amenities like school, health centre, commercial complex, etc. This approach is a win-win state of affairs to marry social responsibility with economic growth leading to a progressive and inclusive development. This model of affordable housing development can be a prototype to be replicated in the smart cities mission to efficiently support the infrastructure with integrated townships for the employees.

LESSONS LEARNED

Janaadhar is founded on principles of social responsibility towards the bottom of the pyramid modeled at tapping the market where most of the housing gap is prevalent in the country. While this cannot be spearheaded purely by private participation, the government must pool in land parcels within the city limits that have been unexploited for a long time now. Although cross subsidization has been the fashion of housing development in most metro cities, it cannot be replicated in all Tier-1 and Tier-2 cities as the appetite of the market to absorb high end products is low and the developer would end up sitting on inventory. Janaadhar Mangala has worked exceptionally well as it was a part of the SEZ where the land is owned by GIFTCL, a joint venture between Government of Gujarat and IL&FS with GIFTCL's model comforting our financial interests.

Photograph of Award Function

DIRECT BENEFIT TRANSFER – ONLINE PAYMENT SYSTEM (DBT-OPS) FOR BENEFICIARY LED CONSTRUCTION UNDER PRADHAN MANTRI AAWAS YOJANA - URBAN

Government of Odisha, through Odisha Urban Housing Mission (OUHM) which is the State Level Nodal Agency (SLNA) responsible for providing housing for all in the urban areas under Pradhan Mantri Aawas Yojana (PMAY), has undertaken a number of noteworthy initiatives. Beneficiary Led Construction (BLC) has been one of the verticals under PMAY, where the eligible beneficiaries are provided Rs.2.00 lakh in four installments for construction of houses. OUHM, in collaboration with banking partner (Axis Bank), have developed an Electronic Fund Management System (EFMS) facilitating direct transfer of financial assistance (installments) to PMAY beneficiaries through their bank accounts. Leveraging DBT-OPS mechanism, benefits go to individuals' bank accounts electronically, minimizing tiers involved in fund flow and thereby reducing delay in payment. This has led to money transfer to targeted beneficiaries, curbing pilferage and duplication. More than Rs.404 Crore has been disbursed till January 2018, through the application. Besides, the application is effectively addressing the capacity and resource issues at ULBs.

BACKGROUND

In Odisha, as per Socio Economic and Caste Census (SECC) survey, out of a total housing shortage of 6,77,277 in urban areas, about 2,00,000 households were projected to be covered under Beneficiary Led Construction (BLC) vertical of Pradhan Mantri Aawas Yojana, Urban (PMAY-U). As ULBs were least prepared to deliver this model, Government of Odisha, had taken an initiative to address issues of capacity, resources and red-tapism so that vulnerable sections could be reached and targets could be achieved within the specific timeframe.

KEY DATES

DATES	Significance/Achievement
25.12.2016	Hon. Chief Minister of Odisha launched an application enabling direct fund transfer system at OUHM and 113 ULBs.
08.02.2018	District Collectors and Municipal Commissioners were authorized to electronically transfer payment for BLC through direct benefit transfer – online payment system (DBT-OPS).

ESTABLISHMENT OF PRIORITIES

It was estimated that disbursement of payment would require 8,00,000 transactions of funds at various time periods into the bank accounts for 2,00,000 beneficiaries, as the guidelines on payment of subsidy to beneficiaries involve transfer of funds at four phases based on progress in the stages of construction. If this data was to be processed at levels of Initiator, Approver and the Bank, the data would involve multiple transactions. Thus, to curb delay, duplication and to ensure transparency in transaction, direct benefit transfer – online payment system (DBT-OPS) was considered as a top priority through which fund could be transferred directly into the beneficiary's account with the least human intervention.

PROCESS

The system was initially made to function centrally from OUHM. The software was made robust enough to handle business for the whole state. All the ULBs were made to use the platform and suggest changes suitable for easier operation and greater utility. Confidence of the beneficiaries was restored in the system through active complaint redressal mechanism. Subsequently, the Collectors have been introduced into the system as 'Approvers' of payment by decentralizing financial powers. ULBs have been transformed into facilitators. Axis Bank has been made to contribute as partnering the initiative of change. The application was accepted as a powerful tool for positive change by all the stake-holders right from the level of the beneficiary to the Government of India.

All the housing projects implemented earlier were having serious operational and functional issues due to delayed payments. There was lack of

transparency in the system and the confidence of the people in the ULBs was low. There was not much of an interaction between the State government and the ULBs. The funds released by the state government to ULBs remained unutilized and the UCs were pending for huge amounts of money even after closure of the schemes. There was no middle level institution to act as link between the State Govt. and the ULBs. The process had taken a toll on the motivation of the people to rely on the credentials and capacity of the ULBs to deliver services on housing schemes. This web-based application has not only ensured transparency in transaction of financial business, it has established coordination between all the agencies involved in implementation of the project and confidence in the poor and vulnerable people.

RESULT ACHIEVED

Payment to beneficiaries is disbursed in a T+1 day time frame. The level of motivation of the beneficiaries has been increased. Earlier they were reluctant to demolish their old houses in the fear that they might not receive the payments in time and would not be able to complete their houses, because the labourers and other workers would not wait till clearance of files in the government offices. They were also not in a position to afford the rentals for a prolonged duration affecting livelihood. Now the scenario has changed. As their confidence level raised, they participate in this endeavour of Govt. without hesitation. Their livelihood as well as state of wellness has also risen.

The ULBs have become more responsive and facilitate redressal of the grievances more enthusiastically. Their capacity to deliver has improved significantly. The application has brought all the actors into the loop and ensured seamless flow of information in real-time, ensuring complete

transparency in the process. More than Rs. 404 Crore has been disbursed till December 2017 and more than 32000 beneficiaries have come forward to avail the benefit. Submission of report, returns and UCs has improved significantly. Rectification of defects such as correction of the account number, conversion of the Jan-Dhan accounts or limited balance accounts have become easier. A lot of time, manpower and resources are being saved allowing the organizations to pay more attention to other subjects. DBT-OPS most definitely ensured cashless transaction at least in 8,00,000 cases.

MOBILISATION OF RESOURCES

Financial: The banking partner i.e. Axis Bank has borne all the expenses of developing and maintaining the software.

Technical: DBT-OPS is an web-based application featuring recommendation and approval, funds transfer tracking, real time MIS and status updates for all levels designed. It also provides the portal space for running this application.

Human Resources: OUHM has conducted several rounds of training of officials and SLTC/CLTC professionals for capacity building. The existing manpower at the ULBs, District Urban Housing Societies (DUHS), OUHM and the bank are now successfully managing the initiative.

SUSTAINABILITY

DBT-OPS is an user-friendly web-based application capable of updating and up-scaling itself from time to time depending upon the need of the user. The low technical, financial and legal support required to run the application works towards its sustainability. Since introduction of the application into the system and it is delivering the desired outcomes in a flawless manner. The application is

THE TASK
Transfer of subsidy under BLC-PMAY to 2,00,000 beneficiaries

Tx4

Difficulty becomes Four-fold
The fund is transferred in four phases to each beneficiary.
8,00,000 beneficiaries

Tx4x3

Difficulty becomes Twelve-fold
The Beneficiary data is handled at three levels
1. ULB (Initiator)
2. Approver
3. Bank
Data passes through 24,00,000 hands
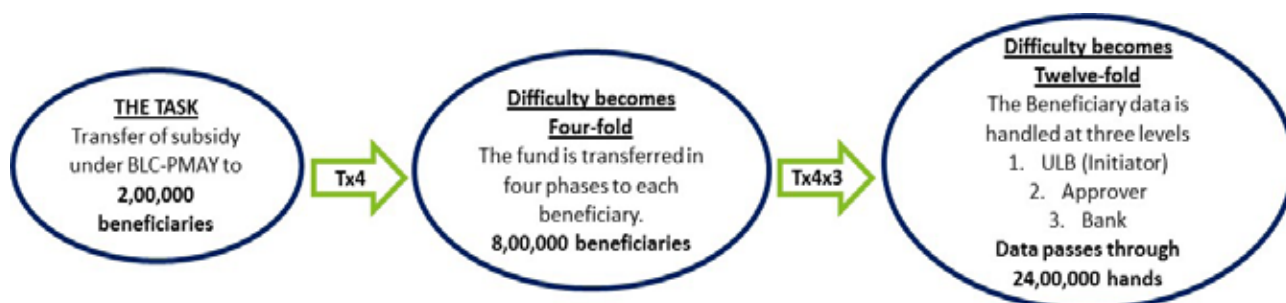
acceptable by the officials at the ULB, District and State level and transfer benefits to people and thus it is sustainable.

TRANSFERABILITY

DBT-OPS has been developed in keeping with the stated objectives of PMAY. This has successfully achieved the objectives of transparency, efficiency (capacity building) and confidence building. This has redefined the process of transaction of Govt. money. The concepts of time and resource management have been given a new perspective through this application. This application has protected the interest of the poor beneficiaries and ensured their financial and social inclusion. This module being transferable and replicable, helps all the government organizations, who intend to disburse benefits to the poor and vulnerable sections of the society. With a little intervention from the Government, the software can be either utilized in the current format or replicated with some modification at a reasonable expenditure.

LESSONS LEARNED

DBT-OPS has unfolded a range of possibilities, which remained up till now unexplored in the earlier system of fund-flow. Previously enormous amount of time was spent at the ULB level to verify and validate the primary data received from the field. Similarly, the data which was generated manually, at the level of the approver, used to be filled with the risk of human errors owing to oversight, fatigue and other attitudinal issues which was resulting into manipulation and corruption. The cumulative impact was the loss of trust of the people in the system leading to exclusion of the genuine beneficiaries.

DBT-OPS have completely done away with manual verification/ validation of data. Lot of time and human resources at different level is saved which can be used for other priority sectors. Monitoring and supervision have become robust and flow of information is now real time. Scopes of corruption and unwholesome practices have been completely eliminated. This has empowered the people and scaled down the quantum of vulnerability. The initiative has once again proved that a small intervention in the right direction can work wonders. Transparency is the key to redemption of trust of the citizens and technology is good, if leveraged to the advantage of the masses.

Photograph of Award Function

LAND RIGHTS TO SLUM DWELLERS IN URBAN AREAS OF ODISHA

A historic legislation - Odisha Land Rights to Slum Dwellers Act, 2017 has been enacted by the Government of Odisha to issue land rights to slum dwellers in 109 Municipalities and Notified Area Councils of the State. The land rights would be heritable, mortgageable but not transferable. The settlement would be on the basis of actual occupation of dwelling and on in-situ basis, up to a maximum limit of 646 sq.ft. in Notified Area Councils (NACs), 484 sq.ft. in Municipalities and maximum 323 sq.ft of land both at Municipality and NACs in case of untenable slums on relocation basis. Programme was piloted in 9 towns of Ganjam and Puri districts. Implementation has been scaled up to rest 100 towns incorporating the lessons learnt from the pilot. Housing and Urban Development (H&UD) Department is the nodal department to implement the legislation.

BACKGROUND

The demographic shift from rural to urban areas over the decades has resulted in large chunks of government land being converted into informal settlements. In Odisha as per census 2011, 23.1% of urban population (around 16 lakh) lives in slums without security of land tenure and are under constant threat of evictions. In view of this, Odisha Land Rights to Slum Dwellers Act, 2017 has been enacted by the Government of Odisha to issue land rights to slum dwellers in 109 Municipalities and Notified Area Councils of the State.

KEY DATES

DATES	SIGNIFICANCE / ACHIEVEMENT
10th Aug 2017	Odisha Land Rights to Slum Dwellers Ordinance, 2017 passed by Govt. of Odisha.
16th Sept 2017	Odisha Land Rights to Slum Dwellers Rules, 2017 notified.
16th Oct 2017	Odisha Land Rights to Slum Dwellers Act, 2017 passed by Odisha Legislative Assembly.
4th Oct 2017	1st Sensitization Workshop with Collector and other district and ULB officials of the piloted towns of Ganjam District held.
28th Oct 2017	Sensitised RDCs & Collectors on Act and Rules.
20th Oct to 24th Nov 2017	Cluster level Sensitisation Workshops (7 nos.) involving officials of 109 towns covering all 30 districts done.
23rd to 28th Oct 2017	Drone Survey conducted in around 64 slums of 9 pilot towns.
25th Oct to 3rd Nov 2017	Formed of around 62 Slum Dwellers Association (SDA) in pilot towns.
29th Jan to 9th Feb 2018	Training Programme for all Executive Officers, Tehsildar, Community Organisers & NGO representatives conducted.

ESTABLISHMENT OF PRIORITIES

Extensive interactions were carried out with various stakeholders to formulate action plans for successful implementation of the Odisha Land Rights to Slum Dwellers Act, 2017. Pilot implementation was prioritized to identify key issues and to streamline the implementation process. The standard operating procedures were notified and the responsibility was shared amongst the departments, partner agencies and the concerned ULBs for carrying out the key activities including delineation of slum boundaries, engagement of NGOs / CBOs for facilitating community mobilization, formation of slum dwellers association (SDA) for preparing list of eligible beneficiaries for approval by the Urban Area Slum Rehabilitation and Redevelopment Committee (UASRRC) and issue of land rights certificates.

MOBILISATION OF RESOURCES

A core group was formed consisting the officials from the H&UD Department, experts from PMU, representatives from partner organizations and key officials from ULBs for development of

implementation strategy. A technical agency was engaged for conducting drone survey. Key roles of the actors were as follows:

H&UD Department: Engagement of technology partners for slum mapping, fixing of slum boundaries, measuring foot-print of households by drone survey, monitoring & engagement of NGOs/ CBOs etc.

NGOs/ CBOs: Carrying out door-to-door household survey and collection of required documents, numbering & stickering of households, facilitating community dialogues, listing of eligible beneficiaries, preparation of slum re-layout plan etc.

PROCESS

Challenges: The key hurdles that the Department had to come across during the commencement of the implementation included stakeholder management and coordination, aerial drone survey of land with involvement of community members, community mobilization and participation in planning and designing slum plan convergence.

Survey of slum area by using drone

Key strategies: Key elements of the strategy were:

- Well-conceived and well-drafted legislation.
- Technology aided implementation leveraging innovative technologies like drones for survey and GIS based information system.

- Regular & direct monitoring & evaluation by the Commissioner-cum–Secretary, H&UD Department.
- Swift and effective mobilization of resources. e.g. Policy & Regulatory expert from in-house PMU was engaged in formulation of legislation and a core group of resources with diversified background was created for piloting the implementation.
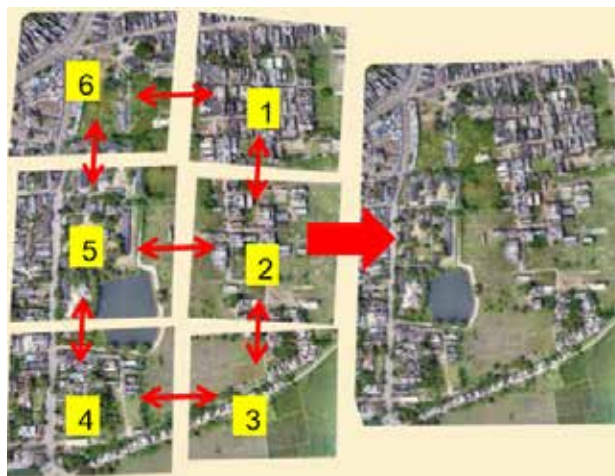
Images captured through drone survey

It was decided to pilot the implementation in 9 towns of Ganjam and Puri districts. Standard operating procedures and associated action plans were prepared in consultation with experts from Tata Trust, PMU, selected ULB officials and NGO partners. Extensive sensitization workshops were conducted with the ULB and district officials of ULBs selected for pilot implementation. The communication needs were analyzed and accordingly various IEC materials were prepared including frequently asked questions (FAQs), information brochures, documentaries and translation of acts and rules in the regional language. Both aerial drone survey and conventional field survey through revenue functionaries were experimented for demarcation and measurement of dwelling footprints. Finally, drone survey was selected as the most appropriate methodology for ensuring time-bound execution, thereby ensuring accuracy and reducing the scope for manipulation. All the stakeholders for implementation of the initiative (Commissioner-cum-Secretary, Senior officials of the Department, Sectoral Experts, District Collectors, Executive Officers of the concerned ULBs, Tehsildars, Implementing partners etc.), were brought under one forum through creation of a group for better

coordination, sharing of information, resolution of issues and supportive supervision by the department.

Pilot Intervention: Key activities in pilot intervention included engagement of NGOs for community mobilization, delineation of slum boundaries, extensive community dialogues, formation of slum dwellers association, drone survey, door to door household survey, collection of required documents, preparation of list of eligible beneficiaries, publication of the list in conspicuous places for inviting objections and suggestions, verification of the documents by the scrutiny sub-committee, incorporation of suggestions, preparation of final list of beneficiaries, approval of the list by UASRRC and finally the issue of land rights certificates to the eligible slum dwellers.

Community Involvement: The implementation started with community mobilization, continuous dialogues with slum dwellers, conducting door-to-door survey, stickering and numbering of dwellings with the help of slum dwellers. SDA was responsible for resolving dispute (if any) between the slum residents, preparing list of eligible beneficiaries and slum re-layout plan with the help of NGOs and community organizers. Special attention was given to include women members, differently abled, local leaders in the community mobilization and planning process. Further, it was mandatory to issue the certificate of the land right jointly in the name of both the spouses in case of married beneficiaries.

Urban Area Slum Redevelopment and Rehabilitation Committee

RESULTS ACHIEVED

Benefits: The legislation provides for assigning land rights to the poor slum dwellers and for redevelopment, rehabilitation and upgradation of slums to benefit approximately 2,00,000 households (approx. 16 lakhs population) living in 2500 slums across 109 towns of the state.

Till February 2018, community mobilization has been completed for more than 1,00,000 slum residents and 1075 slum dweller associations (SDAs) have been formed across the 107 ULBs. Through the pilot program, around 2000 households have received land right certificates at the State level event held on 7th May, 2018.

Expansion: The Department has initiated the expansion of the implementation in the remaining 100 towns of 30 districts in the State. Around 25 NGOs have been engaged to carry out community mobilization activities and conducting door-to-door survey in the remaining ULBs. Two days training programme which included classroom sessions and one-day field exposure to Konark (one of the pilot ULB) has been undertaken for a composite group of personnel from each ULB including the Executive Officers, Tehsildar, Community Organizers and NGO representatives. Around 520 personals in the batch of 5 participated in the training which was organized from 29th Jan to 9th February 2018. Technical agencies have also been selected for conducting drone survey in approximately 2500 slums of the State. The intervention of providing land rights to the slum dwellers is a small initiative in converting a slum to a livable habitat.

SUSTAINABILITY

The objective of the legislation is to convert slums to livable habitats and provision for assigning land rights is the first step in providing an in-situ and sustainable land tenure. For untenable settlements, relocation shall be done with the voluntary consent of slum dwellers thereby ensuring sustainability of habitation. Recently, on 7th May 2018, Govt. of Odisha has also launched Odisha Livable Habitat Mission – "JAAGA" with focus on priority infrastructure development in the slums such as piped water supply, sanitation & health facility, LED street lighting etc. in addition to affordable housing.

The money collected from slum dwellers while settling the land shall be credited to Urban Poor Welfare Fund, constituted in each ULB. Further, 25% of the municipal fund earmarked for poor shall

also be transferred to said fund that will be used for the creation of requisite infrastructure.

TRANSFERABILTY

The replication of pilot implementation has been initiated in remaining 100 ULBs of the State. The acts, rules and Standard operating procedures (SOPs) drafted in a simplistic manner acted as an enabler to successful replication. Leveraging the activities of pilot interventions including establishment of the institutional framework, partnership with implementation partners, orientation and capacity building of key stakeholders, information dissemination, technology intervention, community mobilization etc. shall help in successful replication of the initiative.

Stakeholder Training

LESSON LEARNED

A strong political will believing in inclusive growth is the motivation behind the landmark legislation.

The success of such legislation is functional upon exhaustive deliberations and formulation of effective implementation strategies. Involvement of local and state level actors with clearly defined roles and responsibilities is the instrumental to achieve success of the initiatives within defined timeframe. Identification of local level partners helped in facilitating effective community mobilization through extensive dialogues taking cognizance of local dynamics and priorities. Choice of requisite technology improves transparency, accountability and minimizes the scope of manipulation.

Effective coordination between various stakeholders is imperative for improved monitoring of the implementation. Periodic training programs including classroom sessions and field exposures shall accelerate the replication of interventions. Usage of social media tools increases the probability of success manifold.

Photograph of Award Function

URBAN RESOURCE CENTRE (URC)

Migration has become an integral aspect of urbanization. When informal sector workers migrate to urban areas, they tend to miss out many opportunities which a resident of the city is normally entitled to. Saath Charitable Trust with over a decade of experience with informal settlement dwellers realized that there is a need to connect them to various services in order to achieve betterment in their living condition. Urban Resource Centre (URC) was set up with a vision to connect them to as many benefits as they can avail with the help of emerging leadership from within the community. The center helps in the process of service facilitation by acting as a bridge between the community and relevant service provider. Impacting 1,80,000 people till date, it continues to operate through three centers in Ahmadabad and three in other states. This has helped the community members receive larger benefits such as credit, house, medical facilities, etc. leading to integrated development.

BACKGROUND

Slum residents lack awareness about the process of availing government entitlements and services they are eligible for. The Urban Resource Centers (URCs) are established in informal settlements of Ahmadabad, Jaipur, Varanasi and Ranchi for making these services accessible through one-stop center to over 40,000 households.
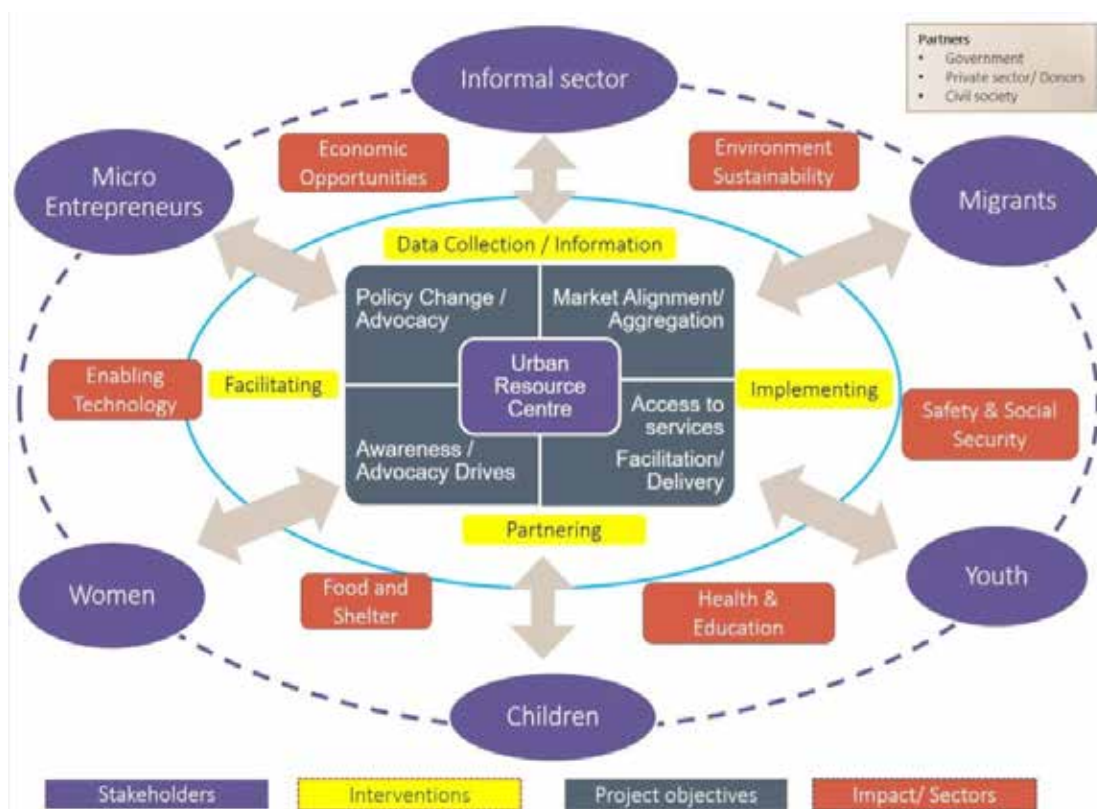
Various work fields of Urban Resource Center (URC)

KEY DATES

DATES	Significance/Achievement
2005	Urban Resource Centre conceptualized & feasibility study was conducted
2007	Urban Resource Centres piloted
2009	Operations and implementation began with one centre in Ahmadabad and scaled up to multiple centres within the city
2012	Expanded to other cities of Gujarat
2016-17	Expanded to major cities of Rajasthan, Uttar Pradesh and Jharkhand

ESTABLISHMENT OF PRIORITIES

The government services meant for the benefit of the urban poor largely remain inaccessible to the targeted population leading to greater vulnerability. Urban poor lack awareness and are unable to provide basic identification documents to become eligible for certain government schemes. This affects diverse aspects such as children's education, youth's livelihood, residents' health and hygiene, living conditions of families, etc. based on the need of the people. The Trust has identified local leaders from the community and were empowered to reach out to more people for service facilitation in collaboration with the Trust. These leaders then served as agents of change for any service requirement.

MOBILISATION OF RESOURCES

The project included field officers, data manager, project coordinator and program director. They jointly identified the people who could get benefit from the services. They facilitated and monitored the process until service was received by the individual through rigorous follow-up mechanism. The initiative was partly supported by external Foundations and partly through local contribution received from the community in lieu of services provided. Support of relevant Municipal Corporation Departments was received for service facilitation.

PROCESS

Saath works on need-based, integrated, and participatory approach. While working on Slum
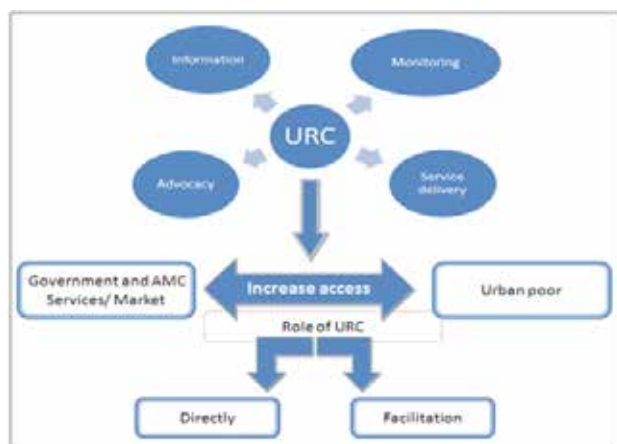
URC model showing its four major components

Networking Project, various CBOs were formed to empower the communities and address the issues with greater involvement. They were the active agents and decision makers in programme implementation. They got experience to work with multiple stakeholders such as NGOs, corporates, government, other localities, etc. Having seen the requirements being met, people used to put forth their needs of various documents and applications to the CBOs, which in turn facilitated receiving services. These CBOs, however were formed to address issues of specific localities and looked into legal implications.

In order to reach out to larger communities, the URC model was thought out for expansion, which would operate simultaneously at multiple locations with minimal formalities. Financial investment was also of utmost importance for the functionality of this initiative. Involvement of community leader and their contribution were seen as crucial aspect for its successful implementation. The URC model had four major components, i.e., information, advocacy, service delivery and monitoring, which were achieved through creation of community awareness and relationship building. The activities included regarding health awareness, check-up camps, importance of identification documents in availing different benefits, awareness on health issues, importance of education, cleanliness of the surroundings, livelihood linkages, housing facilitation, consumer rights, etc. Community played an important role through active participation at all the stages of program implementation.

Interaction with participants / clients

A team of each centre ensured process of implementation. Information dissemination and

need identification was generally done through door-to-door visit. Alternatively, community members used to visit URC centre with specific requirements. Based on the needs of that particular area, concentrated efforts were put towards service delivery. Their queries were recorded and followed up with participants to ensure whether they received the services. Their entitlements were cross checked to offer better opportunities. Monthly and quarterly monitoring meetings were organized by management team for better implementation of the program.

RESULTS ACHIEVED

As Urban Resource Centre (URC) functions at multiple facets, it upon the diverse spheres of one's life. Since its inception, it has directly impacted about 1,80,000 individuals. The more the people get benefit of the project, the larger the neighborhood gets awareness of their entitlements. More than 14,000 people participated through 235 no. of awareness and relationship building activities. It facilitated preparation of identification documents and avail of government schemes to over 37,000 individuals. 4,000 people were supported with livelihood linkages through means of job placement, skill trainings, and micro entrepreneurship training. 2,400 individuals were supported for financial inclusion through linkages for opening bank accounts, credit facilitation, and financial literacy workshops for better financial management. 3,000 households were surveyed to understand the living condition of families in informal settlement and potential families were facilitated for credit and house purchase.

These activities actively engage the residents in its process leading to active involvement and learning, which benefits the community at large through guidance and support. Also, due to multiple linkages, families could avail many more benefits and their overall living condition is improved. This was possible through greater networking opportunities as other stakeholders such as government departments, corporates and NGOs have also been involved in service facilitation. Once the family has achieved certain benefits, it capacitates other community members and leads to multitude impact. Also, they become receptive

and proactive in search for solutions if any difficulty arises in the future.

SUSTAINABILITY

For success of URC, it is important that it operates as a one-stop centre and simultaneously links up strongly with other institutions for constant synergy. It generates revenues through community contribution, which gives a sense of empowerment and strengthens their attitude towards looking out for such opportunities. Since it has strong rapport and presence in the community, it becomes an ideal place for other institutions to carry out surveys and researches through URC's strong team. This also gives livelihood opportunities for community people leading to greater community participation.

TRANSFERABILTY

Once started in cities of Gujarat, the model has been successfully replicated in informal settlements of other cities such as Jaipur, Varanasi and Ranchi. With replication, it also takes into account the need of the community in that particular region. As per normal practice, initiatives are taken for creating financial awareness and inclusion vis-à-vis providing house ownership. In order to achieve the end result, the aspects of livelihood, health & hygiene, credit facilities, documentation and awareness towards government schemes are to be given equal importance. Considering its success across a considerable no. of cities, the model expected to be expanded in other major cities of many states across the country. However, for setting up the model in other states, funding source is required until it becomes self-sustained.

LESSON LEARNED

With continuous and increased migration from rural to urban brings about continuous challenges on the field and this motivates Saath Trust to empower the informal dwellers leading to inclusivity. Each decade has its own uniqueness and challenges to address to achieve the mission of the Trust.

Through its experience during slum networking project, which aimed at improving living conditions of slums, it has realized that collaboration with multiple stakeholders such as community,

corporate, different departments of the Municipal Corporations, and other NGOs led to integrated development of the community. Also, community's active participation plays a major role in its success in terms of implementation. Consequently, based on experience of different projects, a hybrid model has been developed which looked at an integrated development that addressed people's livelihood, housing, education, governance, finance, and any other sphere for larger good. Though the revenues are generated through community contribution, the standalone model requires grant support while scaling up.

Photograph of Award Function

SEAMLESS TRANSPORT – KOCHI METRO

A Metro Rail corridor is being implemented by Kochi Metro Rail Limited (KMRL) to address the increasing travel demand of Kochi city, connecting the two satellite towns - Aluva at northeast and Petta at south-east (25.6 Km), as these two radials are originating from the Kochi city centre. KMRL is working closely with Cochin Smart City Mission Ltd., Cochin Municipal Corporation and other stakeholders. Along with the same, KMRL has taken up the mantle to resolve the congestion woes of the city due to rapid urbanization. KMRL as the interim Metropolitan Transport Authority (MTA) of Kochi, has imbibed the spirit of National Urban Transport Policy (NUTP) and taken it upon itself to achieve the vision of seamless transport for Kochi by integrating all modes of Transportation among land, rail and water. The integration is planned at four levels, institutional, physical, information and fare level integration. The objective is to promote public transport and bring the people back to the public transportation system, by offering a seamless, door-to-door transit experience.

BACKGROUND

The Greater Cochin Development Authority (GCDA) and Goshree Islands Development Authority (GIDA) have delineated the development area comprising Kochi Municipal Corporation, 9 Municipalities and 29 Panchayats. The area outside Greater Cochin Region has been considered as a part of external zones. The total area under consideration is 632 sq.km with a population of 20.01 lakh (as per Census 2011). It has been observed that the passenger share by public transport has declined by 3% every year. A total vehicular share of 4% carries 49% of the passenger trips by public transport. Whereas, personalized cars, which carry 12% of the passenger share form 27% of all vehicles.

Kochi Water Metro

Kochi Metro Rail Network

KEY DATES

DATES	Significance/Achievement
17th June 2017	Ist phase Aluva to Palarivattom
3rd October 2017	IInd phase Palarivattom to Maharajas
2nd November 2017	Vinsca Electric/Bus JDIs with KMRL
19th December 2017	JDI with UMTC and KMRL
3rd January 2018	MoU with UMTC and seven bus operators
15th January 2018	JDI with Autorickshaw Coordination Committee and KMRL

ESTABLISHMENT OF PRIORITIES

KMRL was set up in Kochi to implement the metro system. But a 25 kilometer stretch of metro could not suffice for the city's increasing transportation needs. Thus, an integrated system of all transport networks in the city was prioritized through which KMRL became the interim Metropolitan Transport Authority (MTA) of Kochi. This was followed by preparation of Comprehensive Mobility Plan, NMT Master Plan, Parking Master Plan, and Integrated Public Transport Report by Urban Mass Transit Company Limited (UMTC). Currently the backbone of public transport in the city is bus and is marred by rash driving, irrational routes, timetable and overall inefficiency. The problem has been tackled by bringing bus operators in the city under one umbrella and improving their overall efficiency. Last mile connectivity is being enhanced by making use of autos as a means of providing feeder connectivity. Pedestrian infrastructure is also given importance throughout the city with inclusive infrastructure.

PROCESS

In its initial stages, issues in land acquisitions and cost escalations were associated with the development of the metro. The cost factor of coaches was reduced considerably as the company has indigenously manufactured the components of coaches while most of the coach components for other metros in India were procured from abroad. Kochi Metro is the eighth intra-city metro rail project in the country and is the first metro to be completed in record time. The Metro received positive reviews in its use of vertical gardens on one sixth of all its pillars and the introduction of women and transgender in its workforce.

Bus operators in the city were unorganized and plying unsafely as 800 operators managed 1000 buses. This was leading to unhealthy competition and road safety issues. KMRL, after three years of consultations with bus operators and negotiations with them, managed to aggregate the majority of the operators into moving onto seven area-wise companies, which helped them streamline their operational and achieve overall efficiency and reduction in accidents. A major accomplishment is the signing of the Joint Declaration of Intent with KMRL, UMTC and 7 bus operators for fitting of GPS devices and developing a Journey Planner App along with operations control centre in association with CSML to analyse the dynamic data from buses.

Auto rickshaws were identified by KMRL to ply as feeder along the metro alignment and trunk bus routes. This led to the thought that autos can be aggregated into a single society-like unit to achieve operational efficiency, rationalization and overall improvement of standard of living for kin of auto-rickshaws drivers. A coordination committee of representative of six auto rickshaw unions was formed and several consultations have taken place with KMRL. They have been facilitated by associations with Electric Mobility Companies, Micro Financing Institutions who provided them with opportunities. Auto feeder drivers were also provided training on road safety and behavioral training.

The innovative 'Kochi One' multi-purpose smart card has been introduced which can be used across other modes of public transport in the city plus for all transactions all over the country. The Comprehensive Mobility Plan (CMP) proposed Bus Rapid Transit (BRT) corridors and bus priority corridors after traffic study and projection. Future projects include BRT along two intercity stretched of 50 km each. Both the systems will run on electric buses. The BRT project from Kodungalloor to Eramalloor has received the in principle approval from Chief Minister of Kerala and the second stretch of BRT from Poothotta to Angamali is at the pre-feasibility stage. A Public Broadcasting Service (PBS) network is also being planned in conjunction with Cochin Smart Mission Limited (CSML).

MOBILISATION OF RESOURCES

Kochi Metro is a Joint Venture Company of Government of Kerala and Government of India

KMRL to link feeder services with Kochi1 Card

with funding assistance from AFD. The Water Metro is financed by KfW loan extended to Kerala government and KMRL for the total project cost estimated to be Rs 747 crore. The technical assistance for all alternate urban transport options as well as last and first mile connectivity is being provided by Cooperation for urban mobility in the developing world (CODATU), World Resources Institute (WRI) and UMTC. Kochi Metro Rail Limited (KMRL) has agreements with the three organizations to provide handholding support in all its urban transport activities.

RESULTS ACHIEVED

Metro has reduced the travel time by 30 minutes from Aluva to Maharajas College on a typical rush hour of a working day. Also, the private bus operators have been aggregated into 7 area based operations unit, in form of Society / LLP / Pvt. Ltd. Company and they have been receiving discounts on insurance and fuel costs thereby reducing overhead costs of operation of the buses. Seven Auto Rickshaw Drivers unions have been aggregated and commenced frameworks for formation of a society and a handbook has been prepared with the assistance of Cochin University. 100 Autos have been fitted with passenger information system and about 350 auto feeder drivers have been provided Road Safety and behavioural training by KMRL in association with KILE. Kochi-1 Smart card is a 'Rupay' based transit card, which is being extended to all modes of transport within Kochi, and more than 9000 cards have been issued till date. KMRL is undertaking the implementation of Integrated Water Transport in Kochi.

Studies such as Comprehensive Mobility Plan, Master Parking Plan, Parking Policy and Integrated Public Transport for Kochi & NMT Master Plan

Metro stations to have mini shopping malls

have been undertaken with the approval (CFA) of MoHUA. 'Kerala Metropolitan Transport Authority Bill-2017' has been drafted. GPS based vehicle tracking on all buses through a cost neutral contract has been signed between KMRL, UMTC and bus societies on Dec 19th 2017. The GPS devices have been planned to be fitted to made journey planner functional. An Integrated Bus Time Table (IBTT) is under preparation on a software platform, provided by CDAC Trivandrum. Also, there are plans for a cost neutral model for retrofitting of Maruti Omni vehicle to be run as electric vehicles.

SUSTAINABILITY

Social inclusion is being ensured by engagement of all citizens groups like transgenders, Women Community Group (Kudumbasree) in metro operations. There are plans to provide skill development for kin of auto drivers through small scale jobs such as stitching, cooked meal services, couriers, etc.

Vertical gardening on metro pillars

Solar panels are being installed at all stations and the operational facility at Muttom. The installation and generation is expected to be completed by 2019, which would make up 30% of the total energy requirement for metro operations. KMRL also has vertical gardens on one-sixth of its pillars, which are manured by compost from municipal solid waste, which improve the aesthetics as well as environment.

TRANSFERABILITY

Metro rail is a tried and tested form of public transportation. With DMRC at the helm of affairs,

it can be said that Kochi Metro is a replication of Delhi Metro with contextual and technological modifications. The UMTA bill being pursued by KMRL is inspired from the National Urban Transport Policy (NUTP), which mandates an UMTA for every city with population more than a million. Though a number of cities have attempted at forming a UMTA, KMRL would be the first functional UMTA in India once the state government passes the bill. This can be replicated across all urban mass transit companies in the country. The integration of private buses and autos are being done for the first time in the country. A cost neutral model for GPS based vehicle tracking (Bus/Auto) and Journey Planner Mobile App could also be replicated.

LESSONS LEARNED

The National Urban Transport Policy (NUTP) 2006 & 2014, the Metro Sanction Order and the Tripartite Agreement with Government of India, Government of Kerala & KMRL, Technical Assistance from CODATU, a French Organization, association with WRI-India, World Bank supported, SUTP-MoHUA programme on "Building Leaders of Public Transport Planning and Management" may be termed as the drivers of the sustainable urban transport initiatives.

It needs to be observed that for Tier I cities, metro agencies are positioned at a better place to assume the responsibility of Unified Metropolitan Authority which would ensure seamless integration of public transport across the urban mobility area. The process adopted by KMRL is best suited for such cities thereby leading to the development of a sustainable set of Tier I cities.

Photograph of Award Function

INTRODUCTION AND RUNNING BI-CYCLING SHARING SYSTEM IN NEW TOWN, KOLKATA

The vision for the scheme is to develop a digitally powered environmentally friendly means of public transport that is healthy, affordable and ensures an improved quality of life in the City's natural and built environment. Cycle sharing, mainly for short-duration usage, is an efficient commuting option at local level. In an effort to reduce the number of vehicle trips made in the city, and the associated pollutant emissions, a new cashless app based dockless cycle-sharing system 'PEDL' was introduced by New Town Kolkata Development Authority (NKDA) all over New Town Kolkata within the framework of existing infrastructure in collaboration with a private partner.

BACKGROUND

In the pace of rapid urbanization and growing demand for housing and commercial spaces, New Town Kolkata is a green field city and it is created on the eastern outskirts of Kolkata to serve the dual purposes of establishing new business centers to reduce the mounting pressure on the existing Central Business Districts and for increasing housing stock supply by creating new residential units. The app based dockless cycle sharing scheme has been introduced and is running successfully all over the city of 30 sq km. area. A 'Dockless' commute refers to providing transportation from point to point without human intervention. It gives people an option of picking up a vehicle within 100 meters of a bus, metro, or train station or at a given location.

Application based dockless bicycle sharing scheme

KEY DATES

DATES	Significance/Achievement
Nov, 2017	Introduction and Operationalization of Bi-Cycling Sharing System in New Town, Kolkata having area of 30 sq.km.
Jan, 2018	Exchange of MoU between NKDA & M/S Zoom car at Bengal Global Business Summit.

ESTABLISHMENT OF PRIORITIES

The Priorities are to provide an affordable means of 24 X 7 intracity transport to all concerned, reduce carbon footprint by reducing the need for fuel based commuting options, provide digitally powered, safe late hours commuting options to the vulnerable section of the population & women, ensure last mile connectivity to the fringe areas of the city and develop an environmentally friendly means of public transport that is healthy, affordable and ensures an improved quality of life in the city's natural and built environment.

MOBILISATION OF RESOURCES

The New Town's urban mobility options got a fillip when NKDA introduced cycles on rent scheme PEDL from the month of November 2017 in a Public-Private-Partnership (PPP) mode. An Expression of Interest (EOI) was floated by NKDA calling for bids to operate cycle sharing scheme within New Town Kolkata. The technical requirements were specified within the EOI. A Memorandum of Understanding (MoU) was signed between NKDA & M/s Zoom Car, who met the technical requirements and they were allowed to operate the system with a financial involvement of Rs. 10/- per cycle per year to be paid to NKDA as license fees.

For accessing this facility the user has to walk up to the PEDL location, pay via mobile payment wallets (Rs 1/half an hour) and drop the cycle off after performing journey at any of the dockless PEDL locations strewn all across the city.

At present there are 81 dockless stations within the city and a fleet of over 400 cycles operating within the city limits making on an average 2500 trips per

day in a digitally powered app based remote control system, with the least engagement of human resources on behalf of either the city authority or the private partner. The number of such dockless stations is growing gradually due to a high demand of the service and soon it is expected that PEDL locations will be available at every 50-100 meters in a city.

PROCESS

Issues in the initiative were related to last mile connectivity, safety and security of cycles, self-service facility to book the cycles, mode of payment and maintenance of cycles. To overcome these issues, various steps were taken. Self-service virtual pickup / dropping points have been identified by introducing GPS enabled technology to track transactions related booking of cycle. Also, the entire process has been automated where no person is required at booking or dropping point. Cashless online payment option has been selected for the purpose of payment which also records transition from start to end. Cycles are made robust in design for less maintenance.

RESULTS ACHIEVED

In order to overcome the problem of last mile connectivity, battery operated vehicles, bike taxi have already been introduced in this city. Now PEDL is the latest addition. As per the guideline of Green City Mission, Govt. of West Bengal, Sustainable Public Transport – public transport

modes including public bus, metro rail, electric buses, e-three-wheelers, carpooling, bike taxi and public cycles sharing schemes may be adopted whenever appropriate. NKDA has introduced app based dockless bicycle Sharing System. The said scheme has also been recognized in Bengal Global Business Summit, 2018.

The three months transaction between November 2017 to January 2018 is detailed in the table which shows the popularity of the scheme amongst the citizens in the city:

Table: Three months Transaction

	Nov'17*	Dec'17	Jan'18	Total
Pedl Points	30	55	70	
Cycles	75	180	300	
Bookings	5300+	68000+	123000+	196300+
Users	1500+	8200+	20000+	24000+

SUSTAINABILITY

Financial Sustainability: At present, end users are paying Rs 1/- only for 30 minutes of ride.

Environmental Sustainability: There is no requirement of use of conventional energy sources in the system. Option for solar energy charging is also provided. Also, zero emission from the system results into zero carbon foot print.

Institutional Sustainability: The New Town Kolkata is a planned city and streets are wide with service roads. Apart from that, NKDA has already developed 2 dedicated cycle tracks, located at Action Area I & II. More cycle tracks are currently being developed in the city.

TRANSFERABILITY

Bike-share began in Europe in 1965 and a viable format emerged in the mid of 2000. As of June 2017, public bike share systems were available in 50 countries on five continents, including 712 cities, operating approximately 806,200 bicycles at 37,500 stations. As of May 2011, the Wuhan and Hangzhou Public Bicycle bike-share systems in China were the largest in the world, with around 90,000 and 60,000 bicycles respectively.

Indian cities are also planning to introduce bicycle sharing systems. In this regard, New Town Kolkata

NKDA decides to introduce Bicycle Sharing Scheme

SOUMITRA NANDI

KOLKATA: The New Town Kolkata Development Authority (NKDA) has decided to introduce Bicycle Sharing Scheme to provide better last mile connectivity. Users will be able to access and use bicycles from any place where any such bicycles are found parked within the periphery of NKDA and will be free to leave it at any public place within the periphery of New Town. The cycles will have an automatic locking system so chances of theft will be minimum. The users will have to pay charge to the service provider for the bicycle.

A senior NKDA official said that the scheme would be implemented by any private partner qualifying through a transparent process.

"The Expression Of Interest (EOI) for the scheme has already been floated. "We would prefer cycles with a dockless model that are GPS enabled We will only charge a minor parking fee for using any designated car parking lots," NKDA chairman Debashis Sen said.

A reasonable length of grade separated exclusive bicycle track have already been built in Action Area I (From East Enclave/Box Bridge to Eastern Highs/ Bus Terminus) and Eco Park from Gate 1 to 4 after a study was conducted by IIT Kharagpur.

NKDA will arrange vacant public spaces at different locations to park bicycles and no space will be allowed for making any structure whether permanent or temporary. The arrangement will generally be for five years.

The service provider will arrange the required number of

bicycles, manpower and other technological support to run the scheme, establish an office in its own expense in New Town and will have app-based booking system.

The state Transport department has already introduced bike taxis in New Town for last mile connectivity and it has evoked a very good response.

"New Town is a model green city in the making. We have been encouraging cycling for covering short distances. Various events in New Town and Sector 5 have been held in association with cycle federation of India and others - the latest being Corporate Cycling Competition at Sector 5. Battery operated golf carts and e-scooters/three-wheelers are also encouraged," the official said adding that Bengaluru has already introduced the sharing scheme.

has introduced the app based dockless cycle sharing system in a PPP mode all over the city.

LESSON LEARNED

Most of the cities in India lack basic road and footpath infrastructure in comparison to the cities of other developed countries. This is where cycle sharing faces its first challenge. While planning for roads, adequate emphasis must be given for designing cycle tracks on the identified roads.

The concept of bicycle sharing is relatively new in India and adequate sensitization campaigns regarding the benefits of availing cycles need to be carried out. Pricing of bicycle sharing must be affordable and competitive.

The frantic urban pace, coupled with haphazard last mile connectivity, creates a unique opportunity for Indian cycle sharing, as a cycle often provides a nimble option to bypass heavy traffic and save commute time. Coupled with the fact that cycles are incredibly cheap in India relative to other markets, there is a compelling value proposition.

Photograph of Award Function

HERMA – SUSTAINABLE HABITAT

Tribal people of the North-East India live in harmony with nature. However, with the intervention of urban modern technology, they expensive inflict between their own culture and so called urban culture resulting in disturbance of lifestyle. 'Green Rural Habitation-practice and implementation' is the main vision of NB Institute of Rural technology (NBIRT). The Institute had studied this particular problem of a tribal village of Tripura styled as Herma located at Sepahiljala district. It has tried to understood the problems related to housing, sanitation, safe drinking water and rural waste management. The unavailability of electricity and its impact on the real life was studied. Interventions were made in numerous areas like 24 x 7 lighting & safe drinking water facilities with solar power, ferro cement based community toilet construction, rainwater harvesting and rural waste processing through a low-tech landfill technology.

BACKGROUND

Herma village comprises of around 34 families belonging to tribal community. It is located at a considerable distance from the main city of Agartala. Thus, it remained deprived from the basic amenities. The disconnect helped to preserve the unique identity and culture of the region. However, it was facing the problems of safe drinking water, road connectivity, toilets and absence of proper lighting within the households in the village. The health centers are away from the village and the people are commonly dependent on quacks and other superstitious means.

KEY DATES

DATES	Significance/Achievement
10th February, 2016	Low carbon ferro cement panel houses handed over to villagers.
04th April, 2016	Installation of Micro Solar Dome as an efficient lighting device in remote areas of HERMA village
12th December, 2016	Installation of Safe drinking water system for villagers.
11th June, 2017	The Chief Minister of Tripura, announced launching of similar programmes in at least one village of each of the 54 blocks of the Tripura State.
18th August, 2017	District Collector and few Block Development officers carried out a study tour at HERMA.
20th August, 2017	ONGC officials visited the site and decided to launch similar programme in two tribal village of Tripura State through NBIRT Institute.

ESTABLISHMENT OF PRIORITIES

The targets of the project were lighting solution, safe drinking water solution, improved sanitation, recycling of the wastes, women empowerment and livelihood generation. The intervention of NBIRT in this area started with the installation of the micro solar domes on the rooftops of the villagers to illuminate their houses. The micro solar power domes provide light in the night time also by using solar power. This has benefitted by solving the problem of inactivity of tribal community after sunset as many of them were not able to take up any livelihood work in the evening or night time before intervention.
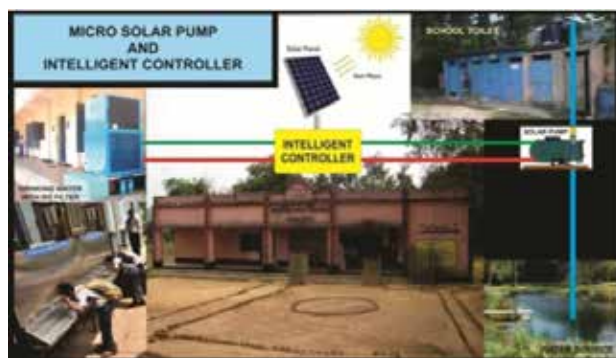
Micro Solar Pump and Intelligent Controller

Running water solution in HERMA village

Toilets lit up through micro solar dome

PROCESS

The institute had a close interaction with the people of Herma in connection with execution of various livelihood programmes in the past as well. The Institute had conducted a survey to locate this remote village on a small hill top. The socio–economic status of the villagers had been revealed during the survey. An educated tribal girl who is conversant with the local language Bengali and Kokboroke (the tribal language) was appointed as the motivator and coordinator between village and NBIRT.

Several awareness campaigns were held in the village and nearby to motivate the people. NBIRT took the help of the tribal people to become associated with them and know their problems better so as to resolve them. Local involvement of the tribal people helped NBIRT in delivering the safe drinking water from the solar water purifier in the trolleys and also for maintenance of the community toilets in Herma.

MOBILISATION OF RESOURCES

The literacy rate of Sepahijala district is almost 90 % but the scenario is not the same in the remote villages such as Herma having a population of only 130 people. They are far away from the impact of modern education. They are still dependent on superstitious measures and quacks. Their lives revolve around the religious rituals. Their livelihood is dependent on daily wage labor or farming. It was difficult task for NBIRT to mobilize the local youths to adopt the new measures of life. The modern interventions as prepared by NBIRT were not initially acceptable by the tribal community

who prefers to cocoon themselves within their community in order to retain their identity. Several awareness campaigns, interactions with local women, involvement of other tribal students to support the interventions suggested by NBIRT had helped to create awareness among the community. Several trainings were conducted for the women to earn extra income by using the electricity generated through the solar domes at homes, other than their daily routine work. The making process of ferro cement tiles and its training along with installation of micro solar domes helped to convince the villagers about the innovative intervention of NBIRT for their upliftment. NBIRT was vigilant upon the execution of the terms decided at the beginning of the project. Experts of the respective fields had often visited the site. NBIRT has convinced the villagers with the involvement of tribal educated motivators. Kakborake (the lotcal language) was used to reach out to villagers. Funds from the Government of Tripura, involvement of the block development officer and funds from CSR projects of ONGC had made the task easier for NBIRT. Department of Science and Technology, Government of India has also worked for the project.

RESULTS ACHIEVED

Today, hundred percent people of Herma village are using flush toilets provided with running water. All families have access to hygienic toilets. It is a unique provision provided for any tribal village located in North East State. All the 34 houses get safe drinking water, which is iron and bacteria free. All the families have micro solar dome installed on the rooftop which ensures 24 x 7 lighting provision. The women are able to cook food through daylight capturing unique device. All the families pay Rs. 30/- per month for all such services maintaining a transparent procedure. The revenue received in this manner goes to the green workers. The low cost construction technology (Ferro cement) has been used for construction of the community toilet blocks. Earlier, women used to go to local stream to collect a bucket of water by travelling more than an hour but now they get it at their doorstep. Herma produces huge quantity of pineapple in summer time. During this time, large amount of pineapple waste is generated. Thus, another unique feature

of the project was creating awareness among the villagers about the necessity of waste processing in a proper manner in order to keep the village clean. A sanitary landfill has been constructed in a local style to process the vegetable and fruit waste. The local people now dispose their waste in the sanitary landfill constructed in the semi engineering method.

Rural waste processing through a low-tech landfill technology

SUSTAINABILITY

A project becomes sustainable only if it gives benefits to the local people. The local tribal community is getting many benefits from the project and they are also paying for the maintenance of the activities. Moreover, local communities are the partners of the project. It is similar to municipal services being provided in urban areas in return of the municipal tax. In a similar manner, here local people get benefit and they pay to the green workers who maintain these services. Local people are also getting indirect benefits in health and hygiene. The tribal community has adopted scientific approach towards sustainability.

TRANSFERABILITY

Herma model has been a success story for the whole country. During the inauguration of the Herma Smart Village, the Chief Minister of Tripura

declared that the state government will adopt a village in all 54 blocks and replicate the similar model in it. In this model, State Government will provide fund and technical support will be given by NBIRT. ONGC has already sanctioned 3 similar projects to be implemented in Baramura tribal pockets of Tripura. ONGC has also sanctioned another scheme under their CSR fund. An NGO of Sundarban, West Bengal BTS (Baikunthapur Tarun Sangha) has signed a MOU with NBIRT to launch similar project in Sundarban for the upliftment of the tribal. Awareness is being generated in the neighboring tribal villages. The initiative has attracted the attention of local panchayats.

LESSONS LEARNED

Involvement of local people is most important in such projects. Since the inception stage, it is essential to involve community for better participation to make the project successful. For the purpose, there is necessity to train the local people. Once the community gets trained, it can become the owner of the projects. But technology based monitoring system is also important for these projects as they are located in the remote areas. Interventions by local government such as organizing study tours for the government officials is also essential for scaling up and replication of the project.

Photograph of Award Function

PUNE STREET LIGHTING PROJECT UNDER PUBLIC-PRIVATE-PARTNERSHIP MODEL

The project of Pune Municipal Corporation (PMC) aimed to replace 80000 existing conventional street lights with energy efficient LED street lighting systems integrated with a SCADA system, which was estimated to save more than 61% energy and is controlled through a dedicated command and control centre. The project was implemented on public private partnership basis, with no cost to the city. The previous light fixtures which included, T5, HPSV, metal halide, Induction Lamp were replaced with highly efficient dimmable/non dimmable LED street lights along with approx. 1900 feeder based SCADA system were installed. Operation & Maintenance of the light fitting & SCADA system have been considered for twelve years.

BACKGROUND

Pune with 40 million population is considered the cultural capital of Maharashtra. The city's total area is approximately 250 sq.km.. Earlier the city street light were installed yellow lights (sodium lamp & induction lamp) which consumes more electricity whereas having poor visibility due to less lux level, causing increase in accidents on road. Currently, 76587 no. of fittings are installed and 1500 SCADA panels are operated through the SCADA control centre and alarms are automatically generated.

Energy Efficient Smart Dimmable LED Street Lights

KEY DATES

DATES	Significance/Achievement
9th September, 2016	Work awarded
31st January, 2018	Work Completed

ESTABLISHMENT OF PRIORITIES

First, PPP project was conceived by Pune Municipal Corporation (PMC). Tata Projects Ltd. through its wholly owned subsidiary Ujjwal Pune Ltd. (UPL) came forward and accepted the challenge to convert all street Lights from high power consuming sodium lights to power saver LED street lights. UPL invested the entire amount to remove sodium lights and reinstalled energy efficient LED street lights and controlled them through centrally controlled monitoring systems (CCMS) Panels.

Before the deployment/implementation of the project, a lot of challenges were faced. It was difficult to conduct survey to locate feeder pillar and light poles covered in the particular feeder as those were installed randomly. Moreover, it was also troublesome to conduct survey due to non availability of ground staff in the respective ward offices and to get technically sound sub-contractors and suitable agency for manufacturing huge numbers of SCADA panels in a short span.

MOBILISATION OF RESOURCES

The project is one of the first of its kind in India where any Corporation brought tender on energy saving & sharing model, where the entire project financing to be done by Developer and no cost to be borne either by Corporation or citizens of Pune City. Tata Projects Ltd. through its wholly owned subsidary UPL, financed the entire Project. Return on investment was through savings of bill payment by PMC. PMC by incorporating PPP model was not only benefitted through project financing but also got maintenance support for duration of 12 years with no additional cost. UPL has brought the best of technology to remodel the street lighting system in Pune.
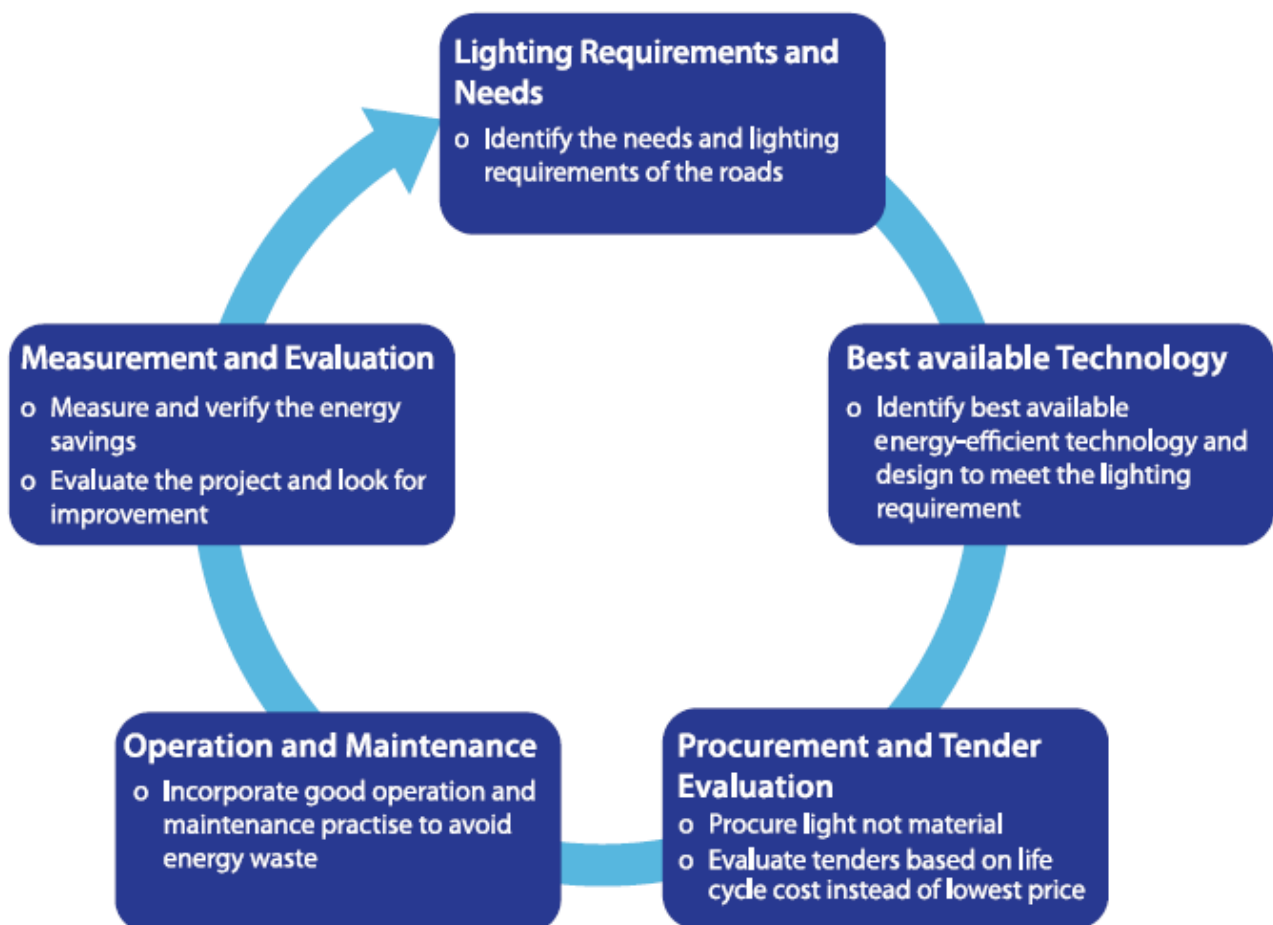
PROCESS

Initial job for UPL was to carry out complete survey of existing infrastructure and it was noted that the situation was not an ideal one. Lots of efforts were needed to make it workable. The main obstacle in replacing street lights was in parking of cranes on the side of road and replacing street lights, as roads of Pune are not wide enough and as soon as the crane was parked on the road, long traffic jams occurred, causing inconvenience to citizens. As far as possible, UPL planned to carry out work, without creating hindrances to traffic. Many a times, UPL workmen were helped by local shopkeepers and pedestrians in controlling traffic jams.

The contract was awarded to Tata Project Limited. As per the stimulation of the tender, a SPV (Special Purpose Vehicle) - Ujjwal Pune Limited (100% subsidiary of Tata Projects Limited) was formed to run the contract. A Payment Reserve Account was opened by PMC for the billing system. The entire scope of the work was distributed in two parts.

Part I – Survey of the existing poles and installation of light fixtures and designing the light fixtures as per the needs and lighting requirement of roads

Part II – Supply of the light fixtures, testing & commissioning of SCADA panel.

Lighting Requirements and Needs
o Identify the needs and lighting requirements of the roads

Best available Technology
o Identify best available energy-efficient technology and design to meet the lighting requirement

Procurement and Tender Evaluation
o Procure light not material
o Evaluate tenders based on life cycle cost instead of lowest price

Operation and Maintenance
o Incorporate good operation and maintenance practise to avoid energy waste

Measurement and Evaluation
o Measure and verify the energy savings
o Evaluate the project and look for improvement

The process used was to identify best available energy efficient technology and to design for meeting the lighting requirement. The process included procurement, installation, operation & maintenance of light fixtures, ensuring to save energy and implementation.

RESULTS ACHIEVED

Some of the major positive impacts observed are:

- Improvement in the living conditions of the community.
- Change in the involvement of the actors, organization and institutions.
- Capacity transformation of organization, community and implementing agency.
- Changes in the local, national or regional, social, economic and environmental policies.
- Changes in addressing and recognition of issues and constraints both at local, regional and state level.
- Changes and involvement of resources - financial, technical, human from national level to local level.
- Confidence built up in community, changes in behavioral attitude and responsibilities etc.

Replacement of conventional street lights with energy efficient LED lights offers savings of 30-50 % in terms of power costs. For example, the current power consumption of 14,823 KW/day could be brought down to around 6000 KW/day. The project has an energy saving equivalent to 20000 tons of coal per year. LED lights have a longer lifespan (10-20%) than conventional lights and also have provision for free replacement/ maintenance for 12 years. The illumination levels are similar or higher than the required IS 1944 facilitating a safer environment by providing better quality of white light.

Further, use of innovative and technological advanced practices has yielded many positive outcomes like ease to monitor and trouble shoot, which reduces man hours; energy saving and facilitation in Green Building concept. Control of individual street light feeder pillar remotely through GPRS communication and the entire system has been integrated with other segments of the Smart City.

SUSTAINABILITY

This project has been implemented in a PPP mode without any capital investment or additional operational expenses by Pune city. The command control centre allows centralized monitoring and control of illumination levels, remote and efficient operation of street lights, fault notification and performance monitoring. The project also provides for effective complaint tracking and redressal with toll free numbers and integration with a mobile app for citizens. These will clearly lead to energy saving of more than 51% at post deployment scenario, reduced maintenance due to long life span (approx. 50,000 hrs), useful for directing for focused

Fc.: 2.56
Ave./Min.: 2.33
Max./Min.: 5.35

Before (310 W HPS)

Fc.: 1.42
Ave./Min.: 1.80
Max./Min.: 3.30
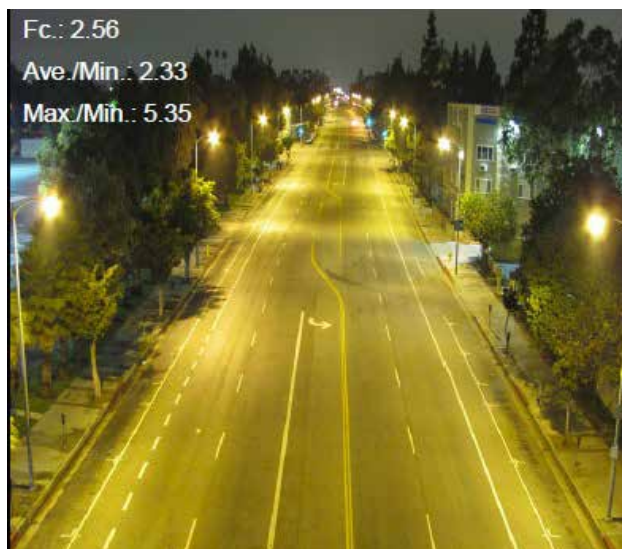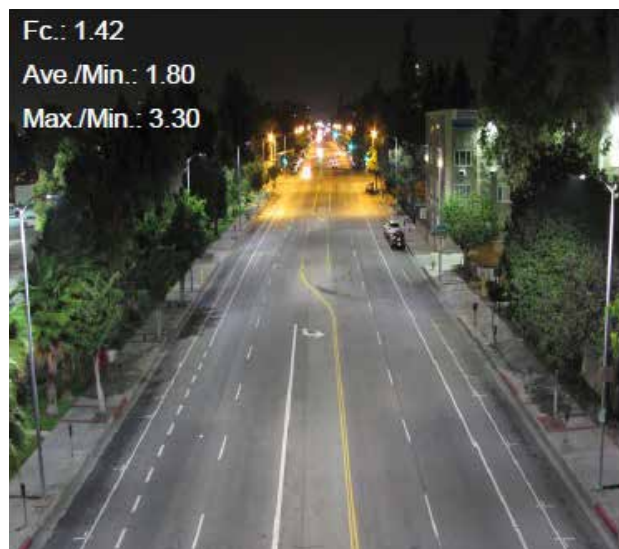
After (LED)

light on specific area i.e. no wastage of electricity because these lights can be dimmed which allows for flexibility in controlling of light level, and these lights also don't glare the view of the road users, thus improving visibility. This directly leads to savings of nearly 20 tons of coal each year needed for thermal power, reducing the carbon emissions and increasing the sustainability of the initiative.

TRANSFERABILTY

The project can be implemented in a PPP mode by any Urban Local Body (ULB) where project financing can be done by developer and no cost is to borne either by Corporation or citizens. This can be achieved by replacement of conventional street lights with energy efficient LED lights which will offer savings of 30-50 % in terms of power costs. These savings can be paid to the private partner for specific period till the project cost can be completely paid off. During this period, the operations and maintenance need to be borne by the private investor. The project can enable the entire system of any urban local body to be a part

Smart City and integrate with the other segment of the Smart City initiatives of Government of India.

LESSONS LEARNED

The project has benefitted the city and its citizens to enhance quality of life of the people through uniformly lit road in the city, reduced glare & improvement in the visibility, energy savings on large scale, cost saving in terms of maintenance as the project is easy to monitor. In turn the project has reduced man hours and has created an aesthetically pleasing atmosphere.

Photograph of Award Function

URBAN GREENING INITIATIVES IN ANDHRA PRADESH

Andhra Pradesh State Government has taken up a sensible yet bold initiative with a vision to enhance, sustain and monitor the green cover in the State by setting up a separate vertical of Andhra Pradesh Urban Greening and Beatification Corporation (APUG&BC). APUG&BC right from its inception has focused on improving the green cover across the State.

BACKGROUND

Urbanization has adversely affected the Green cover in the urban space both in the State and in the Country. Progress in the economy is threatened by the impact of climate change. Urban Heat Island (UHI) effect, waning of urban green cover, increase in carbon emissions and air pollution have further lead to deterioration of Urban environment. Augmentation of green cover is the only key initiative to defend and fight against the pollution.

Services offered by APUG & BC

Clients / Service Recipients

In order to safeguard and enhancing the existing parks, open spaces and also to develop the unutilized urban green areas across the State, Govt. of Andhra Pradesh has incorporated Andhra Pradesh Urban Greening and Beashtification Corporation (APUG&BCL) vide Govt. order Ms. No.25, MA & UD (M2) Dept. dt.11.02.2015.

KEY DATES

DATES	Significance/Achievement
11.02.2015	Corporation constituted vide G.O.Ms. No.25, MA & UD (M2)
13.04.2015	Incorporation of Andhra Pradesh Urban Greening & Beautification Corporation under Companies Act
01.03.2017	Capacity Building Programs
27.07. 2017	Research Wing Established
18.01.2018	Green Awards App under Operation
18.01.2018	Green AP Mobile App for Android and IOS platforms is under operation

ESTABLISHMENT OF PRIORITIES

The corporation has taken various initiatives for improvement of open spaces and green areas. It has established the following priorities for the next five years:-

- One major park with a minimum area of 5000 sq.mt. area should be planned in each Urban Local Body (ULB) area.
- Protection of water bodies and development / beautification of the same as tourist destination, duly improving with landscape, children play area, etc.
- Development of at least two colony parks within a period of five years in each 32 numbers of AMRUT urban local bodies.
- Green strip (shrubs) on a vacant land.
- Trees along the roads within the right-of-way and on the central verge (median).

MOBILISATION OF RESOURCES

APG&BCL has mobilized its professional and technical resources for the initiative. It has over 50 numbers of committed and dedicated high potential professionals who are well positioned. These professionals are spread across four Zonal
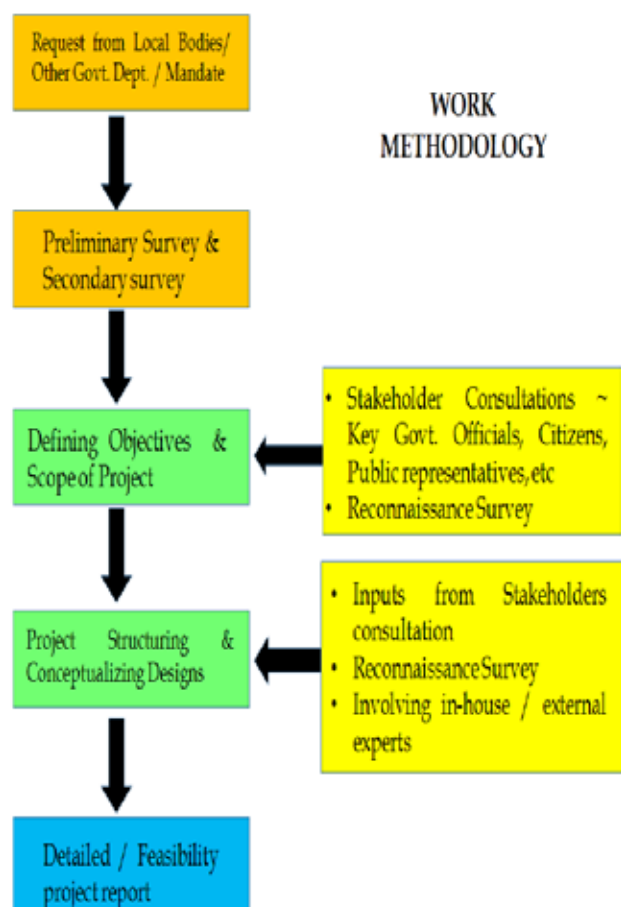
Functional Structure

IN-HOUSE

12	Engineers
12	Horticulturists
45	Horticulturists with ULBs / Temples / UDAs
6	Landscape Architects
4	Zonal Offices at Vizag, Vijayawada, Tirupati
5	Research officers

EXTERNAL RESOURCES

51	Landscape Architects
13	External advisors
28	Service providers & Executing agencies
11	Electronic Total-station Survey agencies
4	Quality control agencies
4	Tree Transplantation

offices and Head office (Vijayawada), fifty renowned National and International landscape Architects/ Architectural firms have been empanelled for the purpose and IL&FS has been appointed as advisors to support their activities.

PROCESS

APUG&BC follows a standard methodology / process for all its projects as follows:

The process is participative considering the stakeholders opinion which includes gathering information on local conditions, community level plans, citizens engagement plans and consulting public representatives. The designs are shared with local citizens well in advance so as to gain better synergy. Further, based on the project structure, the project may either be implemented by APUG&BC or the concerned local bodies or other Govt. Departments. However, APUG&BC plays a vital role in monitoring & implementing the projects as per the architectural plans and concepts.

The advisory role of APUG&BC includes the following;

WORK METHODOLOGY

Request from Local Bodies/ Other Govt. Dept. / Mandate
↓
Preliminary Survey & Secondary survey
↓
Defining Objectives & Scope of Project ← • Stakeholder Consultations ~ Key Govt. Officials, Citizens, Public representatives,etc
• Reconnaissance Survey
↓
Project Structuring & Conceptualizing Designs ← • Inputs from Stakeholders consultation
• Reconnaissance Survey
• Involving in-house / external experts
↓
Detailed / Feasibility project report

- Preparation of tender documents
- Evaluation and selection of the developer
- Monitoring of the project under implementation
- Providing / involving key experts in the projects as and when required
- Quality Control

RESULTS ACHIEVED

Comprehensive beautification and landscape designs have been taken up for about 130 Parks spread at various locations of 32 Urban Local Bodies (ULBs) under Atal Mission for Rejuvenation and Urban Transformation (AMRUT) Scheme 2015-20. Further, conceptual landscape designs for more than 589 Urban Greenery projects at various local bodies of Andhra Pradesh are completed and majority of the projects are implemented. National Highway Authority of India (NHAI) has empanelled APUG&BC for undertaking landscape plantation and beautification along National Highways duly adopting best practices. Four central nurseries have been established at Visakhapatnam, Vijayawada, Srikalahasti & Kurnool for multiplying trees, ornamental plants, palms & shrubs. Considering the

importance of green cover and shortage of skilled / semi skilled manpower, APUG&BC has undertaken skill development (training & capacity building) program in the field of landscape benefiting more than 200+ interested personnel / candidates of un employed youth. 689 no. of landscape and beautification works have been designed for 110 ULBs with an estimated cost of Rs.641.03 crores. Majority of the projects are completed, and few are under different stages of implementation.

SUSTAINABILITY

The development of parks / urban green areas aids in recreation and provides social space. It also helps in generating both direct and indirect employment in the region & state. The landscaping and development of green spaces near heritage structures/ pilgrim centers aid in enhancing the beauty of the structures/ places. APUG&BC have developed the landscape master plans for seven prominent Hindu pilgrimage centers. i.e. Simhachalam, Annavaram, Srisailam, Srikalahasti, Kanaka Durga Temple, Dwaraka Tirumala & Kanipakam. APUG&BC has been adopting environmental friendly resources by

Government Hospital, Eluru

SK University, Anantapuram

RIMS Hospital, Kadapa

Adikavi Nannaya University, Rajamahendravaram

Plantation by APUG & BC

using renewable energy sources for its power requirements in parks for illumination purpose. It has implemented water conservation techniques across all the parks being developed through drip irrigation techniques by following the concept of vertical gardens. The materials used in laying pathways and seating benches in the urban green are eco-friendly.

TRANSFERABILTY

The role of APUG&BC is to develop policies, regulatory framework, practices, legislation & strategies for developing and enhancing urban green areas and to improve quality of life in urban areas. These policies and frame work are generic in nature and can be adopted by any organization/institution pertaining to the development of urban greening.

The institutional setup can be adopted/implemented elsewhere as the current practice has already shown results and is likely to show a huge impact in the near future in the area of Urban Greening.

LESSON LEARNED

Over the last few decades, economic growth has helped to lift more than billion people out of extreme poverty. In addition, growth has come at the expense of the environment. While environmental degradation affects everyone, cities are more vulnerable to violent weather, floods, and a changing climate. Development experts, planners, policymakers and Institutions like the World Bank, Asian Development Bank, etc working on green initiatives to ensure sustainable development. The key lessons learnt from the urban greening initiative undertaken by APUG&BC are:

(i) Comprehensive "green accounting" –Improving transparency and monitoring is key for accounting green cover in the State, (ii) Governance needs attention - Regulations and planning aspect and Urban Green Policy may address the issues, (iii) Lack of skilled manpower in the field of landscape & greenery - More training programs are to be conducted (iv) Resource management - encouraging eco-friendly & local materials is responsible for sustainable and inclusive growth shift.

Shilparamam, Ananthapuramu

Municipal grounds, Proddutur

Outdoor fitness equipment established at various parks in ULBs

Park developed in Urban Local Body (ULB)

Photograph of Award Function

SYSTEM INTEGRATOR FOR RADIO-FREQUENCY IDENTIFICATION (RFID), INTERNET OF THINGS (IOT) BASED SMART BIN IMPLEMENTATION AS WELL AS REAL TIME VEHICLE TRACKING SYSTEM (RTVTS) & FUEL TRACKING SYSTEM FOR SOLID WASTE VEHICLES IN BHOPAL

Bhopal Municipal Corporation (BMC) is responsible for collecting solid waste from various wards in the Bhopal City by using its own vehicles. This project aims at equipping all the vehicles with Fuel Sensors and GPS enabled devices to track real-time movement of these vehicles at command & control centre and transforming all the waste / garbage bins into smart bins to enable automated communication and improve efficiency of garbage collection with least latency time once the bin is filled. The objectives of the project are point to point collection monitoring, verification and control, real time management of missed collection points, real-time information of waste carrying, on-road / off-road maintenance of vehicles; accurate measurement of distance transited daily, route optimization (which will help in reduction of trip time & fuel as well as to serve more locations), transparency in civic administration and addressing citizen queries through the Support Centre through Management Information System (MIS).

BACKGROUND

Bhopal is well known as the City of Lakes and also as one of the greenest urban areas in India. Bhopal is also among the first 20 cities selected in first round of Smart Cities challenge under Government of India's (GoI) Smart Cities Mission (SCM) to implement the Smart City Proposal (SCP). As per the 2011 Census, population of the City is 2371061 with municipal area of 450 sq. km.

There were several issues faced by the inhabitants of Bhopal City. One of them was the issue of domestic solid waste disposal. The waste disposal bins were shared among all residents of the area which were filling and spilling over very quickly. This unsystematic and inefficient waste management was resulting in the bins being always full with garbage. Unhygienic waste disposal practices were the root cause of illness and diseases like dengue, diarrhea, and cholera in the city.

To overcome this issue, BMC adopted the project of 'System integrator for radio-frequency identification (RFID) & Internet of Things (IoT) based smart bin implementation as well as Real time vehicle tracking system (RTVTS) & fuel tracking system for solid waste vehicles in Bhopal. At present, the waste disposal is being managed more

Earlier garbage bins in the city used to spill over due to inefficient management

Highlights of Real Time Vehicle Tracking System (RTVTS) & fuel tracking system

properly and efficiently by constantly monitoring the bin status, garbage level and movement of the solid waste management vehicles in the city. In addition, the BMC is being alerted when the bin is full or almost full, thus promoting dynamic scheduling and routing of the garbage collection. By comparing to the conventional static scheduling and routing, this dynamic scheduling and routing helps in operational cost reduction, by reduction in the number of trucks, manual labour cost and savings in transport mileage.

KEY DATES

DATES	Significance/Achievement
28th November, 2016	Notice to proceed for RTVTS
02nd November, 2017	Notice to proceed for Smart Bin Implementation

ESTABLISHMENT OF PRIORITIES

Before starting the project, SWM vehicles of the BMC were transporting the solid waste in an unorganized way leading to lack of data of on-road vehicles to assess / schedule the pick-up of waste, misuse of vehicles with no control on their routes and lack of mechanism to track distance travelled / trips undertaken. There was a lack of information for identification of location of bins & real-time status of garbage collection. There was no control whether collected garbage is dumped at dump yard or not. There used to be always a difficulty in planning and preparing status reports because of manual process. Considering all the irregularities and leakages in the transportation of solid waste by BMC owned vehicles, it was decided to undertake the installation of VTS for real time tracking of vehicles, as well as implementation of RFID & IoT based smart bin system in the city.

Tenders for selection of agency for installation of the system were called and M/s. Incubate soft tech Pvt. Ltd. was selected for the installation work on Build-Own-Operate-Transfer (BOOT) basis. After the installation of GPS tracking devices in SWM vehicles, the problem of ineffective monitoring was solved. When the GPS installations started in BMC owned SWM vehicles, the drivers of these vehicles started tampering the GPS devices so that their vehicle can't be tracked and fuel can be theft from vehicles. The necessary action was taken against such malpractices. With the help of Real Time Tracking of SWM vehicles, the performance of the drivers is also being measured in terms of fuel economy and vehicle maintenance.

PROCESS

In the first phase, to track the actual kilometers run by the vehicle and fuel consumption, all SWM vehicles were fitted with vehicle mounted GPS. A Geographical Information System (GIS) database was developed with customized GIS layer of waste
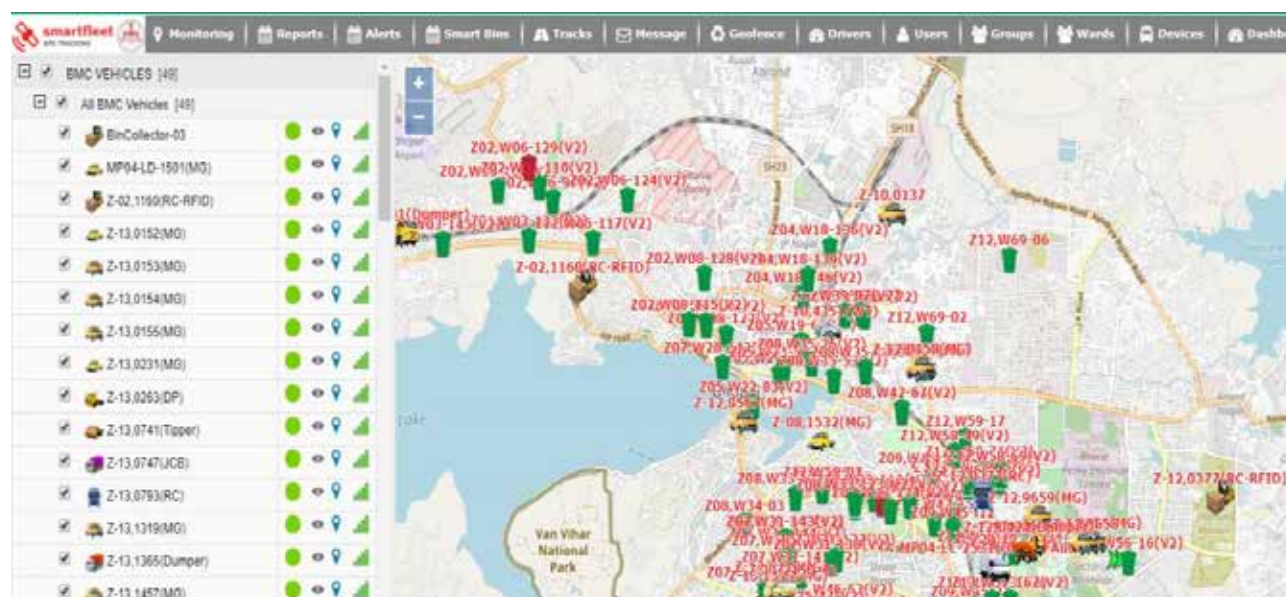
Functioning of RTVTS

/ garbage bins for tracking geographical positions of vehicles, as well as bin locations on the map with color codes for picked up and unpicked bins. The software has the provision for adding / modifying bin locations, route allocation, vehicle allocation and shift allocation. The system provides automated event logging with time stamp for events such as start and end of trip(s), stops, emergency halts, accidents, breakdown and idle times. It also provides alerts to the Central Command Center if the scheduled trip is missed, no. of trips, over speeding of SWM vehicles, unauthorized stoppage and / or non-stoppage of the vehicles at designated bins & route deviation etc. The real time tracking has enabled BMC to control fuel theft from solid waste management vehicles by effective monitoring due to Vehicle Tracking System (VTS). It has resulted into 20 % saving in fuel consumption. In the second phase of the project, the undertaking agency has to undertake the installation of Radio-Frequency Identification (RFID) tags in all designated garbage bins of Bhopal City. It will be integrated with existing GPS / RTVTS system of garbage vehicles for ensuring coordination of entire process from the existing control room. At present, the real time monitoring of SWM vehicles is being done from Control and Command Centre. It was set up for ensuring proper monitoring with dedicated staff of call centre.

MOBILISATION OF RESOURCES

The Service Level Agreement (SLA) clearly defines the levels of service which shall be provided by the service provider to end customer and BMC. The SLA is a clear set of measurable parameters against which the performance of the service provider will be measured. The service provider and BMC is maintaining a monthly contact to monitor the performance of the services being provided by the service provider. The service provider while following SLA parameters, is also providing services to the customers/ callers through the established BMC Call Centre. The SLAs are being monitored periodically. The Service Provider is providing services as per SLA matrix, which defines maximum response as well as rectification times for all kinds of infrastructure / equipment / software covered under the contract. The service provider is required to provide minimum 99.75% overall uptime for components/services, measured quarterly. The contractor needs to ensure availability of the systems as per SLA matrix. This excludes scheduled preventive maintenance. Availability is calculated on monthly basis. Availability is based on the report of system logs, equipment logs, downtime and rectification reporting etc.

Functioning of RTVTS

BMC Command Cente

RESULTS ACHIEVED

The initiative resulted in grater operational efficiency after the installation of RTVTS in SWM vehicles which led to reduction of operational expenditures, automation and optimization of daily activities, real time monitoring, data collection on route performance of fleets, generation of daily productivity. The key performance indicators were 20% reduction in collection trips, performance monitoring of the drivers which resulted in improvement in driver performance & set up a friendly competition between employees, savings on fuel costs & on vehicle repair and maintenance costs. VTS ensured regular clearance of garbage dumps and helps to achieve 'Zero Waste' status in the city.

SUSTAINABILITY

Implementation of RTVTS in SWM vehicles and RFID based smart bin in tier II city of Bhopal at a reasonable BOOT basis & with innovative mechanism on PPP model has been recognized by State Government as well as Government of India. This project with its unique system not only saved a lot of money and fuel of BMC but also with its integrated Smart bin project stopped overflowing of dustbins along roadsides and localities. This ensures clean dustbins available to common people. The project is highly appreciated and demonstrated to various other Municipal Corporations of the state for the implementation in other cities.

TRANSFERABILITY

The real time tracking enables BMC to control over fuel theft from SWM vehicles and by effective monitoring of VTS resulted into 35 % saving in fuel consumption. The project has helped in tracking the SWM vehicles on real time basis which has helped ultimately in reducing the misuse of vehicles. Planning and Route optimization has helped in reduction of trip time and in serving more locations.

Policies, regulatory framework, practices, legislation, strategies adopted in the project are easy to replicate. Decision making process is effective in assigning clear roles and duties to participatory actors and agencies. Management system that helps in mobilization of financial, technical and human resources in an efficient, transparent and accountable way.

LESSONS LEARNED

One of the major learning from the implementation of the project is that the detailed planning of various features along with its social and environmental aspect is necessary before starting the execution of the project. Citizens and media personnel shall be made aware of the project and its impact on the development of city for their active participation. It is also important to do the complete operational planning, identification of alternative sources of revenue and necessary actions need to be taken to start generating funds from these alternative streams.

Conventional garbage collection practices are causing various pollution related issues. It also requires an army of sanitation drivers who operate fleets of diesel trucks which have very poor mileage. Characteristically these waste collection practices are found inefficient because most of the revenue of corporation is used for the transportation of solid waste. Smart Bin System offers the means to have fewer trucks on the road for less time, which means less fuel consumption and less greenhouse gas emissions. Lesser number of trucks cluttering up the roads also helps to reduce noise pollution & air pollution.

Photograph of Award Function

NON–SEWERED SANITATION AND FAECAL SLUDGE AND SEPTAGE MANAGEMENT IN WARANGAL CITY

Grater Warangal Municipal Corporation (GWMC) has introduced many measures for improvement of sewerage and sanitation in the city. These include the Faecal sludge management regulation, public toilets, a sanitation resource bank, sludge treatment plant and coverage of WASH infrastructure in schools. Having achieved ODF (Open Defecation Free) it is moving towards ODF plus, which is total sanitation through safe management of faecal sludge, grey water management and behavior change communication. The city is supported by several participatory organizations – ASCI, BMGF, OICL, REL, SBI, Tide Technocrats, LEA Associates & LASA, GIZ, Egis, Rotary International, VASAVI and Firmenich.

BACKGROUND

Warangal, the second largest city of the newly formed state of Telangana is spread over 407 sq.km and has a population of 8,19,000 as per 2011 census. The city does not have underground sewerage system and depends only on on-site sanitation. Lack of adequate individual, community and public toilets was a key issue. As of 2015, 30% of the city's population was reported to be practicing open defecation and this was particularly high in areas having water bodies and slums. The sanitation service delivery in the city was suboptimal with key issues being low level of awareness and understanding about the linkage between health and sanitation, poor maintenance of public toilets, indiscriminate disposal of faecal waste in water bodies and open areas due to lack of availability of treatment systems, which has eventually led to environmental degradation.

In this scenario, the city of Warangal undertook this initiative introducing (a) operationalized Faecal Sludge Management (FSM) regulation in March 2016 (b) exclusive toilets for women (c) toilets in fuel stations in the city to be available for use by everyone and not just for employees and customers (d) more than 45 public toilets built and operated on PPP mode (e) Sanitation Resource Park to promote awareness about sanitation technologies (f) Faecal Sludge Treatment Plant with thermal technology established in the resource park (g) universal coverage of WASH infrastructure in schools (h) multifold increase in funding towards sanitation both from the city and corporates & private sector.

Sanitation Issues of the City before the initiative

KEY DATES

DATES	Significance/Achievement
July 2015 & April 2016	Award of 21 Public Toilet contracts to private operators on Design, Build, Operate, Finance and Transfer model.
25 March 2016	Feacal Sludge Management (FSM) regulation passed
25 March 2016	Sanitation help-line (S-line: 1800 425 1980) for Construction of individual household latrines and desludging operations, ICT based monitoring tools for public toilets have launched
27 October 2016 & 15 December 2016	Operationalized FSM regulations - Licensing, training for operators on personal protective equipment
8 & 9 September 2017	Received SKOCH Award order of merit Award-2017 (ODF plus and FSM) and SKOCH Swachh Bharat Gold Award
29 September 2017	City declared Open Defecation Free (ODF)
18 November 2017	Country's first Fecal Sludge Treatment Plant (FSTP) based on thermal technology inaugurated. SHE toilets (exclusive toilet for women) inaugurated. Decentralized waste water treatment plant in low income housing project launched
21st December 2017	Quality Control of India (QCI) certified Greater Warangal as ODF city

ESTABLISHMENT OF PRIORITIES

Scientific evidence on the city's sanitation situation collected by Administrative Staff College of India (ASCI) helped GWMC to prioritize steps and interventions to bring comprehensive sanitation improvements with support and participation from multiple stakeholders i.e. citizens, civic groups, Community based organizations (CBOs), traders, corporate sector (private and public), private operators, international foundations. The list of priorities formulated and implemented on the basis of issues identified are as below:

1. Stakeholder Alignment

   - Building Identity : logo, crowd sourcing ideas and funds for school sanitation
   - Political Ownership
   - Consultations with community, media and private sector

2. Enhanced Access to Sanitation

   - Process reengineering to fasten application process and subsidy flow for Individual household toilets
   - Establishment of Sanitation help-line (S-Line)

   - Construction of public toilets (PTs) on PPP mode
   - Introduction of exclusive toilets for women (SHE toilets)
   - General Public access to toilets at fuel stations
   - Enhanced quality of existing PTs
   - Construction of community toilets and toilets in schools
   - Use of ICT tools for monitoring

3. Septage Management and Decentralized Waste Water Management

   - Passing faecal sludge management (FSM) Regulations
   - Decentralized STP to treat waste water in low-income localities
   - Training of operators on safe emptying practices and use of personal protective equipment
   - Identifying suitable technology options
   - Developing PPP structures

4. Strengthening Institutions

   - Reviewing City Sanitation Plan
   - Organization development & capacity building for FSM

- Establishing a dedicated sanitation helpline
- Implementation of monitoring & evaluation framework
- Developing Sustainability plan

5. Creating Platform for Citizen to Engagement and Dialogue

- Establishing City Sanitation Taskforce
- Slum Level Federation (SLF) & Resident Welfare association (RWA) networks
- Developing Sanitation Markets & Social Entrepreneurship models

PROCESS

In a city sanitation ranking exercise carried out by the Ministry of Urban Development (MoUD) across the country in 2015, Warangal ranked 340 out of 407 cities. The performance of the city across key indicators such as access to toilets, open defecation, safe collection and treatment of faecal waste and grey water was low and the city lagged behind on a majority of output, process and outcome related indicators.

The key sanitation challenges faced by the city were inadequate access to toilets, unsafe management of faecal waste, unsafe management of waste water, weak institutional capacity, weak stakeholder engagement and lack of monitoring systems.

The city initiated the development and implementation of a Sanitation Improvement Plan (SIP) for Warangal in 2015 to achieve city wide delivery of sustainable and equitable sanitation services in accordance with the existing policy and regulatory framework. The city decided to establish city level institutional framework. This included operationalizing City Sanitation Task Force (CSTF), setting up Sanitation Area Sabhas, District Sanitation Committee and School Sanitation Task Force. A Project Management Unit was set up within GWMC to coordinate across the institutions and also to plan and implement sanitation projects. Sanitation Committees were set up in all localities and schools to ensure participation in planning and O&M.A Project Implementation Unit (PIU) consisting of members from different related wings of GWMC and chaired by Assistant Commissioner was formed to facilitate ODF.

Masons and FSM operators have been empanelled and trained. Capacities of GWMC have been strengthened to implement and monitor the usage of ICT tools developed like weekly monitoring of quality of public toilet by Sanitary Inspectors using public toilet monitoring mobile app, daily monitoring by the PMU - Citizen feedback on PTs using the feedback machines, FSM tracker app used by operators to record the desludging activities, GPS tracking of the desludging trucks, FSTP performance by the operator using mobile app and data management systems, updating the MIS data on sanitation by GWMC on a periodic basis and real time redressal of grievances by citizens, weekly monitoring of the progress of IHHL and conversion of insanitary to sanitary toilets through S-Line by GWMC.

MOBILISATION OF RESOURCES

The sanitation improvements in Warangal have been led by GWMC with technical and knowledge support from ASCI and Bill and Melinda Gates Foundation (BMGF). ASCI has been involved in conducting diagnostic, preparing detailed project reports, participating in planning initiatives, developing monitoring systems and capacity building. ASCI has set up a Project Monitoring Unit (PMU) to identify and facilitate innovations.

Private sector has actively participated in provision of public toilets, emptying and transportation services and in operations and maintenance activities. BMGF has given a grant for establishing the country's first Faecal Sludge Treatment Plant based on thermal technology. Corporates such as OICL, SBH and REL and organizations such as Rotary and Vasavi club have lent financial support to infrastructure and capacity building for school sanitation. RWAs, SLFs, and Mission for Elimination of Poverty in Urban Areas (MEPMA) were deeply involved in IHHL demand creation, funding support and monitoring the progress of construction greatly assisting GWMC in achieving ODF status.

RESULTS ACHIEVED

There has been improvement in Ministry's city sanitation ranking from 340/406 cities, 32/73 cities in Swachh Survekshan (SS) 2016 and 28/434 in 2017. City was declared Open Defecation

Free in September 2017 and Quality Control of India certified city as OD free on December 21, 2017. Public toilets on Public-Private-Partnership (PPP) and Design, Build, Finance, Operate, Transfer (construction) (DBFOT) basis have increased from 28 to 45 and demand assessment have been done and locations earmarked for another 10. Notices for conversion of insanitary toilets to sanitary toilets were served and conversions have been initiated. Also, DPR for centralized co-treatment plant (solid waste and faecal waste) has been prepared. Investment in sanitation by the state, city, corporate and private sector has increased by 500% and GWMC and other stakeholders have capacitated to take on the city's sanitation challenges.

Improved public and school toilets

Improved public and school toilets

Branding of public toilets has been introduced by way of standardized signage boards for easy recognition and four direction boards have been installed for enhancing visibility. The designs of public toilets have been improved to increase the usage rate by children and differently abled. The usage by these two categories increased from an average of 15 and zero respectively in the year 2015 to 412 and 192 in the year 2017. Country's first thermal based FSTP was inaugurated in November 2017. SHE toilets (4 PPP and 5 funded by GWMC), exclusive toilets for women have been introduced. All the 47 fuel stations allow general public to access the toilet facilities in their premises. Septage collection has been regularized and 5 electronic toilets (e-toilets) have also been introduced and are made operational. In addition, FSM data is captured and monitored regularly.

E - Toilets

SUSTAINABILITY

The sanitation interventions in the city are to implement effective FSM and sustainable non-networked options with adoption on the basis of comprehensive approach that is practical.

Customized solutions have been provided by engaging private sector with a well-defined and robust Service Level Agreements (SLA) across the sanitation value chain. The solutions and interventions have catalyzed improvements in collection, transportation, treatment and disposal/ reuse of septage and contributed to expansion of sanitation facilities to public places, slums and schools by engaging the private sector. Several detailed reports, technical studies, guidelines, robust PPP arrangements and SLA, ICT tools for monitoring, institutional structures and processes have been developed. The benefits also accrue from the strengthening of the capacity of GWMC for enhanced delivery of safe sanitation services for all. The NSS unit at GWMC ensures sustainability of various sanitation innovations led by the city.

Interior of Toilet

TRANSFERABILITY

The experience and outputs of Warangal are replicable and scalable. In fact several national and international cities have visited and learnt from Warangal experience. The successful initiative of toilets at fuel stations available for use by citizens has been incorporated in the Swachh Survekshan Guidelines and is replicated in many towns in the country. SHE toilets have been replicated throughout the state of Telangana and it has become mandatory for each city to have at least 10 SHE toilets. Mason training and operator training modules are standardized and are available for scaling up. Feedback machines introduced in public toilets in Warangal have led to National government asking all cities to follow the same. ICT applications developed are freely available and

can be readily introduced by any city for enhancing the quality. After the formulation of FSM rules in Warangal, resolution has been passed at state level in which Warangal has set as example.

Sanitation funding model through a combination of city, private sector and CSR investment can be tested for replication elsewhere. Proposals for public toilets in PPP mode with well-defined SLAs can be replicated by any city. The innovative thermal technology based FSTP and the sanitation resource park can be replicated to achieve health outcomes. Processes of reengineering approaches, institutional frameworks, and capacity building initiatives are replicable. Stakeholder engagement platforms and initiatives can be initiated for enhanced participation and ownership.

LESSONS LEARNED

Critical situations like open defecation, inadequate access to toilets, insanitary toilets and disposal of collected sludge in open lands, fields and water bodies motivated the city government in implementing innovative activities and some of the key lessons from Warangal experience can benefit other cities for FSM as well.

Activities under Faecal Sludge Management

Technology selection process, DPR preparation and earmarking of land for Fecal Sludge Treatment Plant (FSTP) should begin early in the project cycle and it should be prioritized and implemented concurrently along with other components of regulations. The land parcel identified for FSTP should preferably be within a travel distance of 10 km for the operators to ensure compliance and improve financial viability of the initiative. Capacity

Fecal Sludge Treatment Plant (FSTP) Plant

building of elected representatives, administrators including civil society organizations is a condition precedent for success of innovations in urban sanitation.

Defining Institutional arrangement for FSM by State Government could play an enabling role and define upfront responsibilities of citizens, GWMC, Pollution Control Board, civil society groups etc. Further, at the Municipal level, organizational structure and staff responsibilities should be clearly defined for success of FSM activities.

Data systems can be strengthened at Municipal level with regard to toilet coverage, toilet typology, property numbers which are disorganized and hindering effective planning of FSM. It is important to strengthen data systems using Geographic Information System (GIS) tools to enable effective planning and for introducing scheduled desludging of toilets.

Photograph of Award Function

IEC CHHATTISGARH: CHHOTA BHEEM, CAPTAIN CLEAN CAMPAIGN

The Swachh Bharat Mission (SBM) aims at behavioral change of the masses to adopt better sanitation practices. Therefore Information, Education and Communication (IEC) strategies, planning and their effective implementation are the keys to the success of Swachh Bharat Mission .The state of Chhattisgarh launched an IEC Campaign named "Chhota Bheem -Captain Clean" for better performance of ULBs in Swacchh Survekshan 2018 launched by Government of India. In this campaign, popular cartoon character named 'Chhota Bheem' was introduced as 'Captain Clean'. The vision behind launching this mission was to create awareness and create spark among the youth to adopt best sanitation practices and at the same time improve the social status of the workers involved at the grassroots level. This Campaign was launched and executed by State Urban Development Agency (SUDA) independently in all 168 Urban Local Bodies (ULBs) of Chhattisgarh State and the key role players in this mission were SBM brand ambassadors from schools, colleges, hospitals, farmers, religious preachers, local representatives etc. So far, the result of this Campaign seems to be remarkable in context with utilization, allocation and impact as per the Swacchh Bharat Mission within a limited span of time.

BACKGROUND

Chhattisgarh is divided into 168 number of ULBs amongst which around 150 ULBs are very small in size and are situated at remote locations and at the same time are prone to naxalism. Majority of the population in Chhattisgarh lacks in awareness regarding the sanitation practices. Thus the key areas focused in 'Chhota Bheem Captain Clean' Campaign was to create spark amongst the citizen in urban, rural and naxal areas, uplift and appreciate the works of sanitary workers, uplift socio-economic status of women in Self Help Groups (SHGs) and in-turn contribute to the success of Swacchh Bharat Mission. The geographical area covered by the project is 135,198 sq.km. in all 27 districts and 168 ULBs covering population of nearly 60 lakhs.

ESTABLISHMENT OF PRIORITIES

Prioritization and strategic outcomes were as follows:

- Research showed that youth contributed to the majority of population in Chhattisgarh. Thus, Chhota Bheem was selected as a brand ambassador to appeal to the young.

- To encourage public participation, various activities were organized at school, colleges, and ward level. Feedback was taken from the citizens along with immediate corrective measures so that their participation can be encouraged.

- To improve status of sanitary workers, rag pickers, tricycle drivers etc., to enhance their contribution, to appreciate and to honor them, they were designated as Captain Clean.

- Creating awareness amongst the public in most simplified manner was a key challenge. Chhota Bheem Mascots were sent in public gatherings and Nukkad nataks, rallies and workshops were organized.

Research was done in context with segregation of age groups for ground reality across the state. →	Framework for implementation of Chhota Bheem Captain Clean Campaign was formed by PMU-SUDA. →	Feedback from citizens by PIU Based on earlier SBM-IEC activities
Campaign was implemented by PIU-SUDA and SBM brand ambassadors. ←	Hoardings, leaflets, posters, video songs, radio jingles , stickers, swacchta sujhav patraks, news paper articles etc. were published ←	Strategic Activities were planned based on the feedback

KEY DATES

DATES	Significance/Achievement
01-11-2017	Launched Chhota Bheem Captain Clean Campaign during inauguration of 17th foundation day of Chhattisgarh State.
27-11-2017	Selected 9 nos. of Swacchta brand ambassadors in each ULBs.
27-11-2017	Campaigning mission started through social media of each ULB and state level Social media platforms .
30-11-2017 to 31-01-2018	Distributed handbills and dustbins, downloaded Swachhta app.
30-11-2017	Formated Swacchta committees in schools for promoting Swacchh Bharat Mission (SBM)
15-12-2017 to 31-01-2018	IEC stickers pasted on each and every households as well as on public buildings, commercial buildings etc.
10-12-2017 to 20-01-2018	Chhota Bheem Captain Clean Pathshalas programme launched for Religious preachers and Resident Welfare Association (RWAs).
15-12-2017 to 20-01-2018	Chhota Bheem Captain Clean Pathshalas campaign for farmers promoting composting fertilizer started.
15-12-2017 to 31-01-2018	Ward wise promotion of Campaign along with handbill distribution and posters by SBM brand ambassadors started.
20-12-2017 to 04-01-2018	Distributed "Swacchta Sujhav Patrak" (Comic Leaflet) for citizen feedback.
30-12-2017 to 31-01-2018	Swachhta rallies (Rath) carried out in each ULB of Chhattisgarh (total 181 rallies were carried out in ULBs of Chhattisgarh)
30-12-2017	Organized Mass Awareness rally as per the Citizens feedback from "Swachhta Sujhav Patrak"
30-12-2017	Honored Swacchhta Workers such as municipal drivers, self help groups, and public toilet care takers.
30-12-2017 to 31-01-2018	"Kaun Banega Captain Clean Competition" organized in rallies and ward wise workshops conducted.
30-12-2017 to 20-01-2018	Organized 1230 nos. of Nukkad Natak with Swacchta as a theme in 168 ULBs of Chhattisgarh .
30-12-2017 to 31-01-2018	Organized 16 nos. of Swacchta Competitions in each ULBs.

MOBILISATION OF RESOURCE

This Campaign did not require any extra input in terms of financial aspects, apart from the expenditure required for organizing the events, publicity, prize money, mascots etc. It had spread exponentially amongst the citizens and was a self-driven mission. No additional technical man power was hired or involved in this campaign. Project Management Unit (PMU) and Project Implementation Unit (PIU) of State Urban Development Agency (SUDA) carried the whole campaign in the most efficient manner single-handedly within a very shorter span of time. For making the campaign more impactful and successful, brand ambassadors were selected from schools, colleges, communities, wards etc. for successful implementation of the campaign in the most effective manner.

PROCESS

As some parts of the Chhattisgarh are prone to naxalism, taking the mission to every corner of the state was a challenging task. The IEC team was efficient in creating the awareness in these naxal areas. The team had organized various rallies, competitions etc in all those areas successfully. In Chhattisgarh, as per Census 2011, approximately 14.03 % of population was between the age group of 0 to 6 years. Around 15 % of the population is between the age group of 7-24 Years of age. Thus, total youth population contributed to about 30 % of the total population of Chhattisgarh. As per this data, SUDA aimed to attract the youth population with an iconic cartoon character 'Chhota Bheem'. Another parameter which drove the Mission

was women empowerment. SHGs comprising of women were promoted to uplift the status of women in society.

The activities carried out under Captain Clean Chhota Bheem Campaign include selection of brand ambassador, formation of social media platforms & Swachh Committees in schools in each ULB and creating awareness about the Swachhta App. By organizing 1230 no. of nukkad nataks and other competitions with Swacchhta as a theme in 168 ULBs of Chhattisgarh, swacchta workers such as municipal drivers, self help groups (SHGs) and Public Toilet Care takers were honored. Advertisements were also put up on television, radio, newspapers and hoardings.

RESULTS ACHIEVED

Approximately 45 lakh households in Chhattisgarh contributed towards source segregation. 168 nos. of ULBs became Open Defecation Free (ODF). SHGs helped to uplift the social status of Swachhta workers and changed the perception towards household waste collection. It resulted in considerable increase in number of people joining this campaign on their own. Involvement of Resident Welfare Association (RWAs), colleges, Swacchh Schools, Swacchh hospitals, Swacchh markets has improved the sanitation practices and has resulted in clean and aesthetically better premises. IEC campaigns in community and public toilets have encouraged the use of toilets. More than 2 Lakhs Swacchta Apps were downloaded within a short span of time along with the formation of Swacchta committees in schools and colleges.

SUSTAINABILITY

People's perception has considerably improved towards the rag pickers and workers who are generally involved at the grass root level. More than 7000 women started earning from this campaign. The project completely revolves around conservation of environment and deriving benefits from the waste. The waste which was earlier dumped in the low lying area is now being effectively reused and recycled. The Campaign has brought various religious communities, RWAs, public representatives and NGOs together for a mission of Swacchh Chhattisgarh.

TRANSFERABILTY

Since India is a country with majority of youth population, the project can be replicated with another popular brand ambassador with same work flow as followed by SUDA Chhattisgarh. The project can be undertaken by any institution, city, state and can also be extended at a national level.

LESSON LEARNED

The project can be implemented and executed with limited resources and in limited time frame. However, people's participation is necessary for execution and success of this project. Youth should be targeted and involved to energize such projects. Recognition and honoring of rag pickers, workers have changed the perception of public towards sanitation activities which helped in driving the mission effectively. The citizen's feedback is equally important for deciding the framework of the project. Citizens and local representatives played a key role to promote the campaign. Sanitation and cleanliness practices need not to be looked as implementation activities. Rather, it should be considered as the habits of individuals. Also, such projects need to be implemented for longer duration and not be concentrated for smaller span of time.

Photograph of Award Function

TENDER S.U.R.E - SPECIFICATIONS FOR URBAN ROADS EXECUTION

Jana Urban Space Foundation (Jana USP) authored and published the first set of guidelines for the design, procurement and execution of urban roads in India titled 'Tender SURE' (Specifications for urban road execution) in 2011. Based on its merits the Government of Karnataka allocated 200 Crores in its 2012 budget to redevelop 50 roads in Bangalore as per Tender SURE guidelines. 7 of these roads have been designed and monitored by Jana USP as a proof of concept for the Bangalore Municipal Corporation.

BACKGROUND

The common perception in India is to widen the carriageway as much as possible, in an uneven manner hoping for smoother movement of traffic which does not give actual success. The majority of the population in India does not own vehicles. It results into for short spurts of speeding due to wide roads and results in severe bottle necks on narrow roads. All other users of the roads including utilities and amenities are forced to share the left over space. In most cases, this results in all modes of movement sharing the vehicular travel lane, creating safety hazards and further adding to the chaos. Tender SURE is designed for all the users of the road as opposed to the conventional approach of Indian roads design which focus on only vehicular users. Tender SURE provides detailed street design guidelines for redevelopment of existing brown field roads in urban India and address the vicious cycle of "build poorly, cut, and rebuild poorly". It is an implementation tool providing a systematic and disciplined way to address the details of street design. Tender SURE redefines road design to make the vibrant public spaces that invite all users. The right-of-way is designed for all, not just vehicle users; with designated footpaths, safe cycle tracks and allocated areas for bus stops, parking, street furniture and vending.

KEY DATES

DATES	Significance/Achievement
2011	Tender SURE street design guidelines published.
2012	Tender SURE street design guidelines win the Volvo Sustainability Award.
2012	Rs. 200 crore announced for 50 roads to be developed as per Tender SURE in the Bangalore City Budget.
2012 - 2013	Jana USP prepared the DPR and BOQs for the upgradation of 7 roads in the CBD of Bangalore (phase 01) as per Tender SURE guidelines.
20th June, 2015	The first Tender SURE road, St. Marks Road inaugurated by the CM of Karnataka. He also announces that 50 more roads in Bangalore will be upgraded as Tender SURE roads.
2015	Bangalore City Corporation begins work on upgrading 6 more roads as per Tender SURE guidelines.
December, 2016	Tender SURE phase 01 completed resulting into transformation of 9.05 km roads in the CBD of Bangalore City.
June 2017	Bangalore's Smart City proposal approved. It is decided to upgrade 50 roads in the City Center as per Tender SURE guidelines.
June 2017	Tender SURE included in NACTO, North America's global street design guidelines for best practices.
2017	Pune Municipal Corporation adopted Tender SURE to create road standards for the City.
2017 - 2018	Tender Sure footpaths being implemented widely as a defacto standard all over Bangalore City.

2017 - 2018	Tender SURE guidelines adopted by Hubli – Dharwad Municipal Corporation and at present 4.5 km length roads under construction.
2018	Nagpur Municipal Corporation has awarded a tender of 600 crores for the redevelopment of roads in the City as per Tender SURE as part of its Smart City proposal.

ESTABLISHMENT OF PRIORITIES

In Tender SURE, the right of way is designed to allow for unhindered movement of all modes of travel and not just vehicles. It emphasizes on equitable division of the right-of-way. Uniform travel lanes from start to end allow for smooth movement of vehicles at steady speeds.

Safe continuous footpaths and designated cycle tracks allow for an increase in non-motorized movement and provide for improved last mile connectivity to public transport and commuter convenience. Ramps with clear markings provide vehicular entries to properties without disrupting pedestrian movement or forcing them to change level. Landscape strips divide motorized and non-motorized transport wherever possible. Improving walkability and maximum use of bicycle in the city was a key priority to promote a sustainable lifestyle and reduce congestion, road accidents and air pollution.

PROCESS

The seven roads which were taken up by Jana USP for redesigning had widely varying widths which caused bottle necks wherever the roads were narrow. There was almost no pedestrian infrastructure. The footpaths were broken and discontinuous forcing pedestrians to walk on the vehicular travel lanes. There was no dedicated infrastructure for cyclists. Disorganized street parking and poorly placed utilities were adding to the chaos. Due to this unscientific division of the right of

way all users of the road had to share and negotiate the same space posing a great threat to safety. A lack of coordination between service agencies also resulted in a cyclic cutting and fixing of the road without any improvement to the user experience.

Tender SURE phase 01 was a pioneer project in terms of successful inter-agency coordination between all the service providers of the city. The success of the project is a reflection of great leadership from the politicians and administrators involved. The then Chief Secretary of Karnataka chaired intermittent reviews and the Municipal Commissioner held weekly reviews with all concerned agencies (water supply and sewage, power, traffic police etc) to remove road blocks and allow for seamless integration and transition between the old systems and new.

Each of the agencies had appointed a nodal officer who had provided the supporting staff with their requirements (number of pipes, locations of chambers, connecting levels etc.) and they were helping hands to the contractor at site, especially
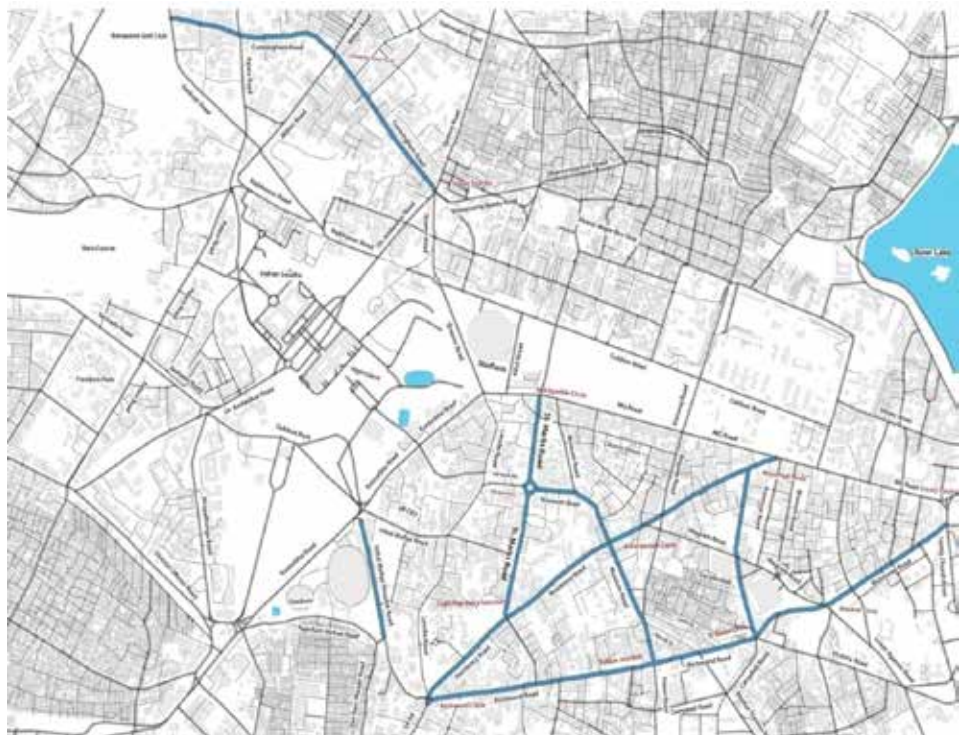
7 roads in the CBD redesigned by Jana USP, Project Tender SURE – Phase 01

with regards to the individual property connections and connection to the city's network. As a result of this all completed tender SURE roads were the first set of roads to have organized underground utilities below the footpath on both sides of the road, easily accessible via inspection chambers provided at regular intervals. All the agencies had the construction drawings and were aware of the location and levels of their assets.

Junction of St. Marks Road and Museum Road after the Initiative

Junction of St. Marks Road and Museum Road

Road Conditions before and after redesigning with the guidelines of tender S.U.R.E

MOBILISATION OF RESOURCES

Jana USP – authored Tender SURE guidelines and designed and monitored the construction of seven roads in the central business district of Bangalore. Bangalore City Corporation (BBMP) was the tendering authority and owner of the project. M/s NAPC was appointed as the Contractor by the BBMP for the construction of the project. M/s Wadia was the third party Project Management Consultants (PMC) which was hired by the BBMP for quality and adequacy check. State and City level agencies were the owners of the assets under the footpaths such as power, water, sewer, storm water and telecom. It has made the redesign and implementation process easier.

RESULTS ACHIEVED

The seven completed Tender SURE roads in Bangalore (Phase 01) have revitalized the CBD, an area with many schools and improved traffic and pedestrian movement by providing 17.5 km of comfortable, evenly paved footpaths which has led to 300 % rise in pedestrians and 5 km of safe cycle tracks. Last mile connectivity to public transport has been improved and resulted in increased ridership. No tree was cut in the redevelopment of the roads and around 223 trees were saved, and protected from vehicular traffic with 5 km of landscape strips added. The underground utilities for water, sewer, storm water, power and telecom, contained within the footpaths have been organized and connected to both individual properties and the city network. It has ended the cyclic expenditure of digging and re-digging the same roads for the repair and maintenance of underground utilities. Safety has been improved as 615 street lights have been added and all intersections were redesigned to allow for efficient movement, adequate turning radius and safe pedestrian crossings with 4 landmark intersections to reclaim 2475 sq.m. of public space in the city. Street parking has been improved by providing space for 117 four wheelers, 174 two wheelers and 46 auto rickshaws.

SUSTAINABILITY

Financial Sustainability - The organization of the utilities below the footpath on both sides with regular inspection chambers prevents the cyclic

expenditure of cutting and fixing the same roads and allows for enhancement of the user experience.

Social Sustainability – Tender SURE is designed for all users of the road as opposed to the conventional roads which focus on vehicular users only.

The right of way is designed to allow for unhindered movement of all modes of travel with designated spaces for on street parking, bus bays and utility bays. Safe continuous footpaths and designated cycle tracks allow for an increase in non-motorized movement and provide for improved last mile connectivity to public transport, reducing congestion and air pollution in the city.

Environmental Sustainability - All roads have been fitted with LED streetlights reducing power consumption. Two of the roads also have a smart monitoring system which allows for further power saving. Each of the storm water manholes have been provided with percolation pipes allowing for ground water recharge.

TRANSFERABILITY

Phase 01 of the project had focused on upgrading 7 roads in the Central Business District (CBD) of Bangalore as a proof of concept. Based on the success of these roads, Bangalore Municipal Corporation is upgrading 6 more tender SURE roads in the City. 5 of these have been completed. The State Government of Karnataka has announced that 50 more roads in Bangalore will be done as per tender SURE roads, and this is an approved project in the Smart City Proposal. Other cities and states have also shown keen interest in replicating the Tender SURE model and many of the smart cities such as Chennai, Nagpur and Davangere have included Tender SURE roads as a key project in their proposal. The MoHUA, GoI has announced that smart roads will be based on Tender SURE. One road each in Hubli and Dharwad is currently being upgraded as per Tender SURE guidelines. Both these are being designed and monitored by Jana USP.

The Tender SURE Guidelines (Volumes 1 & 2) provide detailed street design and procurement guidelines for redevelopment of roads in urban India. The volumes have been in demand by Municipal Bodies, Contractors, Design consultants, Project Management Consultants across the Country and also being used for development of their own local road projects and contracts. Tender SURE guidelines are intrinsically scalable and easily replicable. They provide solutions for urban street design in India both in terms of design and execution. The guidelines are structured to adapt to context based on design capabilities, budgetary allocations and political will.

LESSONS LEARNED

While making Tender SURE guidelines, best practices around the world were studied extensively and incorporated which are practical for Indian Scenario. The biggest lesson from project Tender SURE phase 01 is that, design is one pillar of the project and inter-agency coordination, political will and administrative leadership are the other important pillars. The importance of integration between agencies is important for better results. The biggest impact of Tender SURE is that the project has forced integration between agencies for the first time. These are new muscles that are being built

and nurtured through implementation. They will be replicated in every new city.

Photograph of Award Function

REJUVENATION OF J.M. ROAD UNDER PUNE STREET PROGRAM, INCLUSIVENESS OF URBAN STREET DESIGN GUIDELINES

The Pune Municipal Corporation (PMC) is undertaking various transportation proposals to achieve zero fatalities, increased modes share of public and non-motorized transport and reduced use of private vehicles as per the targets set by Comprehensive Mobility Plan (CMP) for Pune City. In line with the above principles, PMC has undertaken a number of initiatives in the field of sustainable transportation. The Jangali Maharaj (JM) Road Rejuvenation project is the first project under the 'Pune Streets Program' (PSP), which includes redesign of street of 100 km length in the city. The aim of the program is to create a city wide network of world-class streets, with priority for pedestrians, cyclists and public transport. The PMC has put substantial investments in its own annual budget to ensure implementation of PSP

BACKGROUND

JM road is one of the prime commercial streets in the city. It is a sub-arterial one-way street with a length of 1.9 Kilometer and right of way ranging from 24 meters to 36 meters. The street has a dense tree cover. JM Road falls in a mixed-use neighborhood and draws a huge crowd for shopping and recreation. Many city level landmarks fall on the street including a protected monument by Archaeological Survey of India (ASI), a city level auditorium and a public park. Many institutions are in the close vicinity. Before the street upgradation, the street space was unorganized and chaotic, with majority of the street space being dedicated for private vehicles. A large amount of road space was getting wasted and left unused.

ESTABLISHMENT OF PRIORITIES

Under the project, PMC set its priorities for the design. Before designing the street, the order of priority for space allocation was set in the order of pedestrians first, then cyclists, then public

transport and at last the private vehicles. Also, to re-establish its maximum use of bicycle culture, PMC has undertaken a comprehensive approach for promoting bicycles and increasing the modal share of cycling to 25% in the city. Presently, 94 km of cycle track are in existence and 824 km of cycle tracks with 798 cycle parking stations are proposed to be developed by PMC in next 3 financial years.

PROCESS

The project has been designed by 'Oasis Designs Inc', an urban design firm based in Delhi. The street has been designed from edge to edge on the 'complete streets' principle.

The street space has been organized and optimized. It has wide-shaded-continuous footpaths, cycle

Street Edge - before & after scenario

Shaded street with wide footpath, cycle track and seating

track and cycle stands, vibrant public spaces, properly designed parking bays and facilities for pedestrian comfort and convenience. Universal accessibility is an integral part of the design. The proposal also includes a bus lane for the city transport buses and a dedicated service lane. The project was implemented integrating all the existing trees & realigning of all the underground services and installing new ones to meet the future demands. The street is well lit with new street and pedestrian lights installed.

Public-Private Collaboration: The project is a fine example of Public-Private Collaboration (PPP). Initially the street edge conditions were being neglected as they fell in the private domain (front setbacks). After public consultations and negotiations, the private owners/shopkeepers in some sections agreed to gave their front margins for public use, with additional space (on both sides of the street) available with the civic authority for design. The ownership is still with the original owners but the space is available for public use. Hence the usable width of the street in some places has increased without any acquisition. The additional space was designed and added to the footpath generating a space like a plaza and also enhancing the walking & shopping experience. The shopkeepers got a clean and finished front yard, and benefitted in terms of business from the project as the redesigned plaza is attracting larger footfall.

A participatory approach has been followed throughout the process. Public consultations were conducted with citizens and elected representatives to get their opinions on the proposal. A committee consisting of NGOs, traffic police etc. has been formed by PMC for reviewing designs at various important stages. The proposal has evolved through the interactive process.

MOBILIZATION OF RESOURCES

Public Bicycle Share is included as part of a Comprehensive Bicycle Plan for Pune to link city railways, bus, BRT, proposed metro terminals, commercial, schools as well as other work places to provide for first & last mile connectivity issues. Pune Municipal Corporation has signed Memorandum of Understanding (MoU) with OFO, MobiKe, Yulu and Zoom cars till now to operate Public Bicycle sharing system in Pune City limits through their own financial resources. The city has already implemented the 1st phase of the Public bicycle sharing (PBS) system with 1,000 cycles under operation. JM road is one of the locations for the PBS system in the 1st phase.

RESULT ACHIEVED

Safety of all road users: Streets are designed to lower the speed in order to reduce the number of accidents. Dedicated spaces are provided for different road users to reduce conflict between motorized and non-motorized users.

People are using the redesigned footpaths for recreational activities

Street as a socializing space: The project has resulted in a vibrant and active street. The street has become a good place to socialize and recreate. Some offices / shop-owners used to conduct work-related meetings at the sit-outs on the footpath while people in the neighborhood use it for morning walk due to its wide footpaths and active street edges.

Reduction in pollution: Reduction in pollution to few extent has been achieved because of mode shift to "walk, cycle and bus".
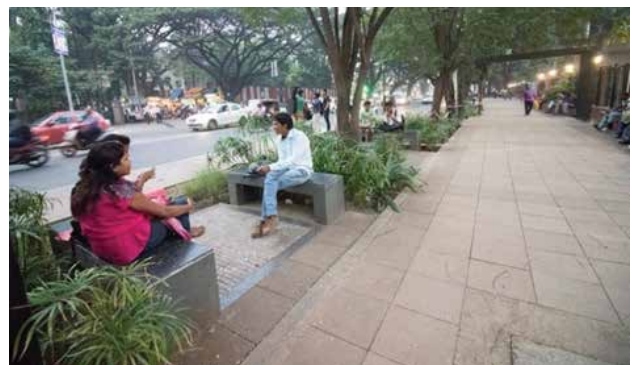
Wide-shaded footpaths with seating and landscaping

Increased business: Wider footpaths and active street edge has attracted visitors which are resulting in increase in business of the shop-owners.

Win-win for all: It has turned out to be a win-win situation for all, as all the stakeholders are satisfied including the residents (safe neighborhood street, real estate appreciation), shop-owners (increased business), street users (segregated, attractive & organized street space) and street vendors (livelihood opportunity)

SUSTAINABILITY

Environmental Sustainability: The intention of the project was to induce mode shifts to "walk, cycle and bus" which has been achieved and it is helping to reduce pollution.

Economical Sustainability: It has increased the business of the shopkeepers located next to the street. Also, the organized parking on street is generating revenue for the city over the years.

Social Sustainability: The project is socially sustainable due to its inclusive and equitable approach towards street vendors and all street users.

Institutional Sustainability: Being the pilot project undertaken, its success has given the confidence to the city authority to replicate and execute the project in other parts of the city.

Dedicated space has been provided for vendors

Integration of footpath, Seating and Cycle track

TRANSFERABILITY

The project approach can be easily replicated elsewhere in the country. Indian cities are facing similar issues of unorganized and chaotic road space, congestion and pollution. Since the inception of the project, delegates of Chennai Smart City, team from Nashik Municipal Corporation and many others have visited the site as a case study.

The project approach is based on very simple, easy to implement and universal principles. The intention is to build streets that are safe, comfortable, and convenient for people of all ages and abilities, with priority for Non Motorized Transport (NMT) and public transport. Similar approach is being adopted on the other street redesign projects in Pune under city's PSP program.

The project is in line with India's National Urban Transport Policy (NUTP) adopted in 2006. It emphasizes the importance of moving people rather than the vehicles. The Policy also emphasizes that cities need to provide better facilities for sustainable modes, such as walking, cycling, and public transport. This policy has been the motivation for sustainable transport initiatives of PMC.

A strong political will, good administrative leadership and a collaborative approach, all were equally important to make such a project successful. Building a street can be a small project for the city authority, but it can have a large impact on the daily lives of the citizens. A small investment on the design can reap large benefits, as good and sound design is the key to a successful street project.

Photograph of Award Function

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