PEER EXPERIENCE AND REFLECTIVE LEARNING (PEARL)

URBAN INITIATIVES
Under
JNNURM

Volume 6

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Government of India

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Volume 6

Team Members

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Preface

Initiated in December 2005, the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) is an integrated reform-driven, fast track planned development of cities with a focus on efficiency in urban infrastructure services delivery mechanism and accountability of Urban Local Bodies (ULBs) towards citizens.

JNNURM is an ambitious programme of the Government of India to bring about improvements in the existing urban service levels and urban infrastructure in a financially sustainable manner. The primary objective of the programme is to create economically productive, efficient, equitable and responsive cities. The sectors that qualify under this scheme include of water supply, sewerage and sanitation, drainage, solid waste management, traffic and transportation facilities and housing infrastructure. Further, special projects including urban transit systems, urban expressways, sea-links and other sectors of similar nature are also covered under this scheme. In order to access funds through the mission, the state government and the cities seeking assistance require committing to a set of reforms covering various areas of urban management and good governance.

The goal of preparing a series of Documents on Innovative Practices under the Peer Experience And Reflective Learning (PEARL) Programme, is to collect, analyse, summaries, share and publish urban initiatives taken in by ULBs with a hope that these practices, ideas and concepts presented prove useful to anyone who is engaged in managing development projects. The purpose of these case-studies is to document the innovations taking place in the Urban Governance sector. These can also serve as a brief reference or guide on how some organizations have implemented these practices in different states of India. This only gives basic information and cannot be considered as complete research report of documentation of Best Practices.

We express our sincere thanks to all Individuals, organizations, and NGOs that have contributed and shared the information with us during the preparation of the sixth volume of the Urban Initiatives Report under PEARL Project.

Prof. Usha Raghupathi
Officiating Director & Professor
NIUA
Acknowledgement

The Urban Initiatives Documentation, Volume Six is the result of teamwork and a consultative process in which representatives from the urban local bodies and the urban sector worked together to create and obtain authentic initiatives documents and develop alternatives to unavailable documentation. Our warmest thanks go to the documentation working team and all those who volunteered their time and expertise to this PEARL project. This documentation would not have been possible without their dedication and hard work.

The team would like to extend its sincere thanks to the Ministry of Urban Development for extending their kind support and help to PEARL project. We are grateful to Dr. Sudhir Krishna, Secretary (Urban Development), for his guidance and constant supervision for the project. Sincere acknowledgments are also due to Ms. Nisha Singh, Joint Secretary & Mission Director, JNNURM, Ministry of Urban Development, for her valuable inputs, guidance and cooperation in making the project a success. We would also like to extend our sincere appreciation and thanks to Ms. B. P. Sridevi, Director, Ministry of Urban Development, for her constant support and guidance.

Special thanks and gratitude are also due to the Contributors, for providing necessary information and data. We acknowledge the contributions from: Dr. B. R. Ambedkar, Dr. Guruprasad Mohapatra, DR. M. R. Ravi, Dr. P. Ulaganathan, Mr. Abhijit Mahamulkar, Mr. Ashish Sharma, Mr. Ashok Chaudhary, Mr. Balaji N. Khatgaonkar, Mr. Dilip Kudale, Mr. Manish Sharma, Mrs. Sanjam Cheema, Ms. Preeti Mathur, Prof. H.M. Shivanand Swamy, Shri Sanjay Kumar Shukla, Shri. Narendra Prakash Singh, Shri. R. Vikram Singh and Shri. Yogesh Shah.

We would also like to acknowledge the support put in by Prof. V.K.Dhar, ex-Coordinator, PEARL Project and Ms. Nilanjana Dasgupta Sur, Senior Research Fellow, NIUA for editing, compiling and designing this documentation. The entire work was immensely benefitted by the guidance and strategic support provided by Prof. Chetan Vaidya, ex-Director NIUA and Prof. Usha Raghupathi, Officiating Director & Professor, NIUA.

Dr. Debjani Ghosh
PEARL Project Coordinator
# List of Abbreviations

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<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>A J L</td>
<td>Ahmedabad Janmarg Limited</td>
</tr>
<tr>
<td>A M C</td>
<td>Ahmedabad Municipal Corporation</td>
</tr>
<tr>
<td>A P S R T C</td>
<td>Andhra Pradesh State Road Transport Corporation</td>
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<tr>
<td>A S C I</td>
<td>Administrative Staff College of India</td>
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<tr>
<td>A T C S</td>
<td>Area Traffic Control System</td>
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<tr>
<td>A T P</td>
<td>Any time payment</td>
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<tr>
<td>B O T</td>
<td>build-operate-transfer</td>
</tr>
<tr>
<td>B P L</td>
<td>below poverty-line</td>
</tr>
<tr>
<td>B P R</td>
<td>Business Process Reengineering</td>
</tr>
<tr>
<td>B R T S</td>
<td>Bus Rapid Transport System</td>
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<tr>
<td>C D P</td>
<td>City Development Plan</td>
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<tr>
<td>C E P T</td>
<td>Center for Environment Planning and Transport, University</td>
</tr>
<tr>
<td>C F C</td>
<td>Citizen Facilitation Center</td>
</tr>
<tr>
<td>C M P</td>
<td>Comprehensive Mobility Plan</td>
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<tr>
<td>C O E</td>
<td>Centre of Excellence</td>
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<tr>
<td>C R M</td>
<td>Customer Relationship Management</td>
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<tr>
<td>C S M C</td>
<td>Central Sanctioning and Monitoring Committee</td>
</tr>
<tr>
<td>C S R</td>
<td>Corporate Social Responsibility</td>
</tr>
<tr>
<td>D J B</td>
<td>Delhi Jal Board</td>
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<tr>
<td>D M A</td>
<td>Direct Memory Access</td>
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<tr>
<td>D P R</td>
<td>Detailed Project Report</td>
</tr>
<tr>
<td>E P C</td>
<td>engineering, procurement and construction</td>
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<tr>
<td>F S I</td>
<td>Floor Space Index</td>
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<tr>
<td>G I S</td>
<td>Geographical Information System</td>
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<tr>
<td>G P R S</td>
<td>General packet radio service</td>
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<tr>
<td>G S K</td>
<td>“Grahak Seva Kendra”</td>
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<tr>
<td>G V M C</td>
<td>Greater Vishakhapatnam Municipal Corporation</td>
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<tr>
<td>H D A</td>
<td>Haldia Development Authority</td>
</tr>
<tr>
<td>H W M L</td>
<td>Haldia Water Management Limited</td>
</tr>
<tr>
<td>I G I A T</td>
<td>Indo-German Institute of Advance Technology</td>
</tr>
<tr>
<td>I H S D P</td>
<td>Integrated Housing and Slum Development Programme</td>
</tr>
<tr>
<td>I P T S</td>
<td>Integrated Public Transport System</td>
</tr>
<tr>
<td>I R</td>
<td>Good Industrial Relation</td>
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<tr>
<td>I T M S</td>
<td>integrated transit management system</td>
</tr>
<tr>
<td>I T S</td>
<td>Intelligent Transport System</td>
</tr>
<tr>
<td>J C T S L</td>
<td>Jaipur City Transport Services Limited</td>
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<tr>
<td>J N A</td>
<td>Jamshedpur Notified Area</td>
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<tr>
<td>J N N U R M</td>
<td>Jawaharlal Nehru National Urban Renewal Mission</td>
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<tr>
<td>J U S C O</td>
<td>Jamshedpur Utilities and Services Company</td>
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<tr>
<td>K N N</td>
<td>Kanpur Nagar Nigam</td>
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<tr>
<td>L A N</td>
<td>Local Area Network</td>
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<tr>
<td>L E D</td>
<td>light-emitting diode</td>
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<tr>
<td>L M C</td>
<td>Lucknow Municipal Corporation</td>
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<tr>
<td>L R T S</td>
<td>Light Rail Transit System</td>
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<tr>
<td>Acronym</td>
<td>Full Form</td>
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<tr>
<td>M E D D</td>
<td>Municipal e-Governance Design Document</td>
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<tr>
<td>M I D C</td>
<td>Maharashtra Industrial Development Corporation</td>
</tr>
<tr>
<td>M L D</td>
<td>million gallons per day</td>
</tr>
<tr>
<td>M T W V S</td>
<td>motorized two-wheel vehicles</td>
</tr>
<tr>
<td>N A B L</td>
<td>National Accreditation Board for Testing and Calibration Laboratories</td>
</tr>
<tr>
<td>N I C</td>
<td>National Informatics Centre</td>
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<tr>
<td>N R W</td>
<td>non revenue water</td>
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<tr>
<td>O &amp; M</td>
<td>operation and management</td>
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<tr>
<td>P C I C</td>
<td>PCMC Infrastructure Company Limited</td>
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<tr>
<td>P C M C</td>
<td>Pimpri-Chinchwad Municipal Corporation</td>
</tr>
<tr>
<td>P H E D</td>
<td>Public Health and Engineering Department</td>
</tr>
<tr>
<td>P I U</td>
<td>Project Implementation Unit</td>
</tr>
<tr>
<td>P M C</td>
<td>Project Management Consultant</td>
</tr>
<tr>
<td>P P P</td>
<td>Public-Private-Partnership</td>
</tr>
<tr>
<td>P T C</td>
<td>PVUSA Test Conditions</td>
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<tr>
<td>P W C</td>
<td>Price Waterhouse Coopers</td>
</tr>
<tr>
<td>R O W</td>
<td>Right of Way</td>
</tr>
<tr>
<td>R S R T C</td>
<td>Rajasthan State Road Transport Corporation</td>
</tr>
<tr>
<td>R U I D P</td>
<td>Rajasthan Urban Infrastructure Development Program</td>
</tr>
<tr>
<td>S A P</td>
<td>System Analysis and Program Development</td>
</tr>
<tr>
<td>S J S R Y</td>
<td>Swarna Jayanti Shaheri Rojgar Yojna</td>
</tr>
<tr>
<td>S M S</td>
<td>short-message-services</td>
</tr>
<tr>
<td>S P V</td>
<td>special purpose vehicle</td>
</tr>
<tr>
<td>S T C</td>
<td>Standard Test Conditions</td>
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<tr>
<td>S W M</td>
<td>Solid Waste Management</td>
</tr>
<tr>
<td>T D R</td>
<td>Transfer of Development Rights</td>
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<tr>
<td>T O P</td>
<td>Techno-community Outreach Programme</td>
</tr>
<tr>
<td>T P M</td>
<td>Total Preventive Maintenance</td>
</tr>
<tr>
<td>U I D S S M T</td>
<td>Urban Infrastructure Development Scheme for Small and Medium Towns</td>
</tr>
<tr>
<td>U L B S</td>
<td>Urban Local Bodies</td>
</tr>
<tr>
<td>U M C</td>
<td>Ulhasnagar Municipal Corporation</td>
</tr>
<tr>
<td>U M T A</td>
<td>Unified Metropolitan Transport Authority</td>
</tr>
<tr>
<td>V U D A</td>
<td>Vishakhapatnam Urban Development Authority</td>
</tr>
<tr>
<td>W T P</td>
<td>Water Treatment Plant</td>
</tr>
</tbody>
</table>
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Introduction

Background

With the launch of the Jawaharlal Nehru National Urban Renewal Mission (JNNURM), capacity building efforts received a significant boost in terms of scale as well as scope. The ongoing capacity building interventions have been wide ranging and comprehensive in terms of the components addressed and in a major part have focused on provision of technical assistance, training and knowledge support to enable implementation of programmes and related components. However, the absorptive capacity of the Urban Local Bodies (ULBs) were limited and beset with inherent demand side constraints. The experience highlights the inability of states and cities to implement capacity building programmes at a scale and pace that will make a significant difference to the way in which our cities are governed and large scale programmes are implemented as a result of which the cities are not in a position to bring about a quantum shift in the delivery of services. In view of the extension of JNNURM (Phase II), there is a scope for implementing the capacity building programmes so that there is a marked improvement in implementation of the projects on the ground.

There is a need to focus on small and medium size towns in terms of capacity building and handholding support. The programme needs to be focused on the need for developing different models for different sizes of cities depending upon their specific requirements.

Therefore, engagement with stakeholders on capacity development, assessment of knowledge needs, development of templates, a web-enabled framework covering all capacity building related initiatives, sensitization of political executives, documentation of best practices, encouragement of national and international exposure trips, evolving PPP arrangements for capacity building, handholding support, induction and training of ULB personnel, etc. need to be focused in the second phase of JNNURM.

PEARL Programme

Peer Experience and Reflective Learning (PEARL) programme is for sharing knowledge on planning and implementation of urban reforms and projects in mission cities under JNNURM.

Continuing the on-going activities undertaken in previous three years under the PEARL Programme, the objective of the fourth year is to continue and add on the support to JNNURM – Phase I, develop sustained mechanisms for knowledge sharing network on urban development/management through peer learning, develop knowledge support for small & medium cities, develop knowledge products, experiential learning, support capacity building and hand holding programs, etc.

PEARL Activities

This programme has achieved various milestones till date:

- The National Workshops act as a forum for promoting stakeholder interaction and advocacy for various issues those are of direct relevance to the agenda of the Ministry at the national level.
- About nine PEARL Group Workshops have been held where representatives from the 65 JNNURM Cities have participated.
- Exposure Visits provide a platform for experiential learning for the participating cities. Exposure Visits have been carried out for Municipal Councilors, Officials and Mayors to Ahmedabad, Pune and Pimpri-Chinchwad, Mysore and Bangalore, Nanded Waghala Municipal Council and so on.
- PEARL website is operational and linked with JNNURM website. It is a one-stop-shop for matters related to JNNURM. This portal is a single point of contact for municipal queries and their resolutions. It has got features like e-discussion forum, urban advertisements, news / events, publications, IEC materials, help-desk and so on. New features like e-group; online e-directory and a gradation
system for urban initiatives have also been developed under the project.

- Research and documentation of urban initiatives involves publication of five volumes of Urban Initiatives Report.
- Dissemination of knowledge products like PEARL Newsletters and flyers/brochure are regularly being published and disseminated to urban stakeholders.
- Under Cities Alliance support to the programme, thematic documentation of good practices (from Indian cities) for assimilation and transfer of specific knowledge among Indian cities is being undertaken. Documentation of Global Best Practices for knowledge dissemination is also being carried out.
- Knowledge Needs Assessment Report that looks at organisation development issues within an organisation and identifies areas specifically around flow of information within it, knowledge sharing within and outside the organisation (peer-to-peer learning), identifies skill gaps within the organisation has been published.

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The term knowledge transfer is too restrictive in terms of the innovative practice of knowledge exchange. This enables knowledge transfer between two cities, where one city learns from the other and vice-versa.

As part of the PEARL activities, five documents on urban initiatives from mission cities have been published under PEARL (Annexure 2 to 6). These include good initiatives under water supply, solid waste management, sewerage/drainage, roads/flyovers, public transport system sectors, besides urban reforms and PPP. These reports stand as an important source for horizontal learning among mission cities.

The sixth volume of the “Urban Initiatives” Report is a tribute to many successfully completed projects under JNNURM from different service sectors. The documentation is expected to display the indispensable work being carried out by the cities to make them more livable and healthy for the future to come. These are structured in the standard format as developed under PEARL that includes the process, results achieved, sustainability, lessons learnt, recognition, and replicability of the urban initiatives (Annexure 7).
WATER SUPPLY

National Institute of Urban Affairs (NIUA), New Delhi
Title of Best Practice: Design, Development, Operations & Maintenance of Water Supply System in Haldia

State/City: Kolkata, West Bengal
BP Code: SSS-WS-PPP-3065-0113

Previous Status

Haldia is a port and industrial town located about 120 km from Kolkata, West Bengal. Haldia Development Authority (HDA) established in 1980 comprises of Haldia Municipality, adjoining industrial areas and township surrounding the municipality. Water supplied to Haldia was owned and managed by Public Health and Engineering Department (PHED) until 1993. Although, the government transferred the entire water supply system to HDA, but PHED still continued to manage the bulk production, treatment, storage, distribution to industrial customers and bulk distribution to municipality and townships. The planning area of HDA was extended to 761 sq. km. from 326 sq. km. recently for facilitating the provision of basic infrastructure such as electricity, roads, water supply, sanitation and other social infrastructure.

Proliferation of population and industrialization considerably boosted the demand for water services in Haldia planning area. The water supply system under the HDA and the PHED faced a number of inefficiencies causing inadequate water quantity and quality issues leading to a large number of problems like inadequate operation and maintenance, high breakdown and frequent service interruptions, high non-revenue water (NRW), inadequate safety focus, inadequate quality assurance process, frequent customer complaints, etc. Moreover other problems like absence of preventive maintenance, plant and employee safety, poor housekeeping leading to low employee morale and productivity, etc. also existed.

Figure 1: Initial Situation of Haldia Water Supply System (A-J)
New Approach

HDA now has assigned the responsibility of the operation and management (O&M) of the existing 113.5 million gallons per day (MLD) water treatment plant (WTP), service of tube well of 13.62 MLD capacity and existing network to a private operator. The private partner was also assigned the responsibility of construction of new 113.5 MLD water treatment plant in 2 equal modules and subsequent O&M of the plant. This would lead to expansion of capacity of treatment to meet the future requirements. HDA made efforts in this direction since 2004 and held extensive consultations with various private operators. HDA agreed to contract with Haldia Water Management Limited (HWML), a company registered under the Public-Private-Partnership (PPP) model in July 2008.

HWML is a special purpose vehicle (SPV) of Jamshedpur Utility and Services Co. (JUSCO) and Ranhill Utilities BerHDAA, Malaysia. JUSCO is the lead partner in the SPV project and HDA concession granted for 25 years. As per the contract:
- Concessionaire was responsible to construct a new WTP of 25 MGD in two equal modules of 12.5 MGD each for meeting the future water requirement.
- Operation and maintenance of the existing and the new water facility to be carried out by concessionaire as per the set guidelines.
- Concessionaire to pay a fixed license fee to HDA for the entire concession period on monthly basis.
- Tariff to be notified by HDA with a min of 3% year by year increase.
- HDA to develop new pipe network up to customer premises for supply of treated water as per the requirement.
- Replacement and Renovation expenditure of 10 crore in the first five years, equally shared by HDA and HWML.
- The entire facility shall revert back to HDA at no cost, on the expiry of the concession period.

The other special features of the project were:
- Market Risk shared through revenue share mechanism and not through minimum off takes guarantee.
- Bid Parameter: Net Present Value of Annual License Fee Quoted for first 10 years, discounted at 12%. Fee for 11th Year to be highest quoted in the first 10 years.
- The Distribution Network: to be constructed by HDA.
- Project facility: No mortgage.
- Water charges collected in the name of HDA.
- Depreciation: Benefit of depreciation of capital structures to build--operate-transfer (BOT) operator.
- The existing 25 MGD water treatment plant, boosting stations, pipe network, etc. were handed over to HWML.
- Existing employees to be absorbed by PPP partner: No loss of employment. Therefore, existing 221 workforces were handed over to HWML.
- All the existing water consumers were notified by HDA.
- Land was handed over to HWML for the construction of new WTP of 25 MGD capacity.

Goal of the Project

- Desire to bring improvements in terms of plant efficiency, NRW, maintenance practices, water quality, customer satisfaction and increase in revenue generation as per the potential.
- Skill development in water management and professional orientation.
- To mobilize private sector expertise and private sector fund for capacity augmentation to meet the future water demand.

Implementation Strategies

The implementation process involved:

1. **Understanding the Plant and Equipments:**
   - Daily management, critical equipments along with the key people were given special focus for better and faster understanding.
   - Basic cleaning, lubrication, condition monitoring and re-alignment of equipments were enforced immediately as the first preventive maintenance initiative.
   - Several operational instructions, equipments, monitoring and maintenance check list, data collection plan and basic safety guidelines were enforced.

2. **Condition and Performance Assessment of Equipments:**
   - The condition and performance assessment of all the equipments and plant was carried out.
The condition grading assessment was based on Integrity, safety, durability and efficiency on 1 to 5 scales.

The performance grading assessment was based on reliability, capability, environmental and aesthetic on 1 to 5 scales.

**Box 1: Gradation System**

A grading system is on a 1 to 5 scale; where 1 = good and 5 = poor.

- Grade 1: Assets are fully serviceable
- Grade 2: Assets exhibit minor reliability and maintenance problems
- Grade 3: Assets display shortcomings in criteria concerned with efficiency of operations that do not significantly hamper normal operations.
- Grade 4: Assets display shortcomings that have the potential to develop into major operational problems.
- Grade 5: Assets fail to meet criteria concerned with fundamental issues that would render the asset incapable of performing to satisfactory standards and service levels under normal operating conditions.

3. **Renovation and Replacement Plan:**

- After detailed study of the plants, its operation philosophy, bottleneck and the equipment condition, five years renovation and replacement plan were finalized and first year plan executed. This was the first major step to revamp the infrastructure.
- The safety requirements of different facilities including the scrubber system for chlorine safety was planned and implemented.

4. **Maintenance Plan:**

- A comprehensive maintenance plan was designed for the different plants and equipments.
- Maintenance philosophy designed as per the criticality of the process and condition grading of different equipments.
- Periodic cleaning, lubrication, alignment, overhauling, inspection and tightening schedule was made and implemented.
- Spares planning initiated for minimizing the down time.

5. **Construction of New Water Treatment Plant (WTP):**

- HWML invested Rs 88.0 crores for the construction of new WTP on BOT basis.
- Construction of the new WTP started after getting the unencumbered land in May 2009.
- The Plant is designed with the latest technology of DAF Trucks Ltd., Lamella Clarifiers and Plate Settlers provided by RANHILL.
- Most of the units like Intake Jetty, Raw Water PH, Settled Water PH, clear water PH, revo plus filtration system etc. were installed.

**Figure 2: New Water Treatment Plant at Haldia (A-D)**

6. **Non-Revenue Water (NRW) Reduction Plan:**

- A comprehensive NRW reduction plan made and implementation started in phased manner.
- All the visible leaks identified and repaired especially all the leaking air release valves;
tap less public hydrants and old persistent leaks were handled.

- Direct Memory Access (DMA) was created to monitor the losses in the specific areas. Several flow meters installed for proper NRW monitoring.
- Several illegal connections identified and actions taken in the direction of regularization and disconnections.
- Preventive leak survey schedule implemented for the entire network.
- Accuracy of the customer flow meters ensured by calibrations and regular preventive maintenance.

7. Wage Agreement with the Union:

- An historic tripartite wage agreement signed with the “Thika Mazdoor Union” and the contractors in presence of the Deputy Labour Commissioner.
- All statutory requirements fulfilled as well as the genuine demands of the Union were met. This worked as a major step in the direction of confidence building with the workers.
- Union agreed to cooperate fully for the deployment of different improvement initiatives at the plant.
- Several contentious issues like transfer of workers, wage escalation, etc. were settled amicably.

8. Established Laboratory:

- A new state of art laboratory was established with all the required testing facilities.
- Laboratory fully equipped for testing of the water quality parameters as per IS 10500.
- Staffs were trained as per the requirements of the modified laboratory.
- A robust sampling plan was implemented to get the representative samples from the customer end as well as the in process samples.
- Laboratory meets all the provisions of the National Accreditation Board for Testing and Calibration Laboratories (NABL) accreditation.

9. Training and Development Plan:

- Required skill for every position was worked out and ‘skill gap’ analysis of the existing workforce was conducted.
- Different training modules were made for the required skills.
- Specialized training provided for all the specialized activities to all the positions and officials.

10. Special Focus on Safety:

- Most of the unsafe conditions in different plants were identified and eliminated.
- Special safety provisions/ alarms were provided for most of the critical areas.
- All cranes and chain pulley were tested and necessary maintenance done.
- Process for regular monitoring of all the unsafe acts and unsafe conditions put in place and necessary mitigation plan adopted.
- Focused safety training with safe work procedure to all workers and contractors were provided.

11. Good Industrial Relation (IR) Practices:

- Provident Fund / Employees’ State Insurance / Bonus / Leave / uniforms / increments etc. were implemented.
- Puraskar Awards, Best Kaizen Awards, etc. were announced for the best employee.
- Other incentives like visit to other plants, rest rooms, ergonomically suitable sitting places, clean toilets, etc. were implemented.
- Regular formal meeting with union representative and mass communication meeting with workers were carried out.

12. Customer Management System:

- JUSCO ‘Grahak Sewa Kendra’ was inaugurated and consumers were communicated.
- Reasonable Service Level Guarantees were implemented for different nature of complaints.
- Memorandum of Understanding was signed with the important industrial consumers for further improvement in services.
- Regular interaction with all the key consumers implemented.
- Technical and Expert Assistance provided to key consumers on water related issues.
- Customer satisfaction survey conducted by a third party (AC Nielsen) and action plan made for improvement in customer satisfactions.
- Visible improvement noticed in the customer satisfaction in two years of operations.
- Free water provided to poor community through public hydrants at strategic
locations. More than 100 public hydrants provided.
- Awareness on environment protection and water conservation is being propagated through structured plan.
- Free medical camps organized at some remote villages around Geonkhali WTP.
- Community need assessment conducted in the villages around Geonkhali WTP and plan made for Corporate Social Responsibility (CSR) activities. Talks with other group companies are on for joint CSR activities.
- Assistance provided to local college and school students for training.

Outcome of the Project
- Understanding different plants, equipments, pipe network, manpower and the customers need.
- Condition and performance analysis of all the equipments done.
- Finalized the immediate and long term Renovation and Replacement plan for the whole utility.
- Construction of new 25 MGD water treatment plant in two modules started.
- Comprehensive maintenance plan for different facilities and equipments.
- NRW Reduction plan made and deployed with immediate as well as long term actions for NRW reduction.
- New Wage agreement with Mazdoor Union.
- Establishing a latest state of art Laboratory compatible with National Accreditation Board for Testing and Calibration Laboratories requirements.
- Training and development of employees.
- Special focus on safety with 100% enforcement of PPEs.
- Implementing several good Industrial Relations practices for employee’s motivation.
- Total Preventive Maintenance (TPM) launched.
- JUSCO customer care, for single window customer complaint management.
- Corporate social responsibility established.

Achievements/ Results
- Increase in Revenue generation.
- Significant improvement across all segments
- Improvement in terms of water availability

The top 10 industrial customers and the commercial customers were more satisfied.
- Availability of Water Supply in terms of Number of Hours (2010 Vs. 2009)
- Maximum improvement perceived in terms of customer service, followed by water quality
- Pressure of supply needs to be improved to increase the overall satisfaction levels

Impact of the Reform
- Enabling environment for private operator to manage the system.
- Single agency functional co-ordination between “Private Partner” and Water Board, etc.
- Provision to be made in the agreement for mandatory review of financial performance of the “Private Partner” in case of variation into the demand pattern as projected in the concession agreement.
- Flexibility in the structure of concession fees to be made compatible for “Private Partner” for sustainability and viability of business during tenure.
- Timely release of funds linked to proportionate contribution by Urban Local Bodies (ULBs) in case of JNNURM funded projects.
- Responsibility matrix w.r.t compliance of various statutory provisions applicable for the concerned scheme to be detailed and finalized in the PPP model to avoid problems at a later stage.
- Incentives for efficient performance to deputed ULBs.
**Fig 4: Improvement in all sectors of Water Supply in Haldia (A-D)**

<table>
<thead>
<tr>
<th>A. Water Availability (2010 Vs. 2009)</th>
<th>B. Water Produced</th>
<th>C. Water Supply in terms of Number of Hours (2010 Vs. 2009)</th>
<th>D. Non-Revenue Water</th>
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**Fig 5: Improvement after implementation of Project at Haldia (A-L)**

<table>
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<th>B. Clean and Safe Plants</th>
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</tr>
</tbody>
</table>
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Title of Best Practice:
Water Recycling Plants for Improving Water Availability

State/City: Delhi
BP Code: SSS-WS-##-0610-0113

Previous Status

Delhi Jal Board (DJB) is the primary service provider of water supply and sewerage services in Delhi. Even though Delhi has access to adequate availability of water as well as sufficient wastewater treatment capacity, the actual service delivery is sub-optimal. The service level in the sector therefore suffered from serious deficiencies which needed to be addressed urgently. These included:

- **Gaps in Service delivery of Water Supply** – bulk supply uncertainty; intermittent and inequitable supply, significant Non Revenue Water, absence of bulk metering, ineffective customer metering, and inefficient operations

- **Gaps in Service delivery – Sewerage** – inadequate coverage of sewer network, silted sewer lines, routine overflow of untreated wastewater into drains, underutilized treatment capacity, interconnection of sewer lines and storm water drains.

- **Operational** – lack of infrastructure and operational records; inadequate “crisis” maintenance.

- **Institutional** – significant overlap in the role of policy formulation, service delivery and regulation, lack of adherence to service standards, inefficient customer interface, lack of performance orientation, inadequate use of Information Technology and MIS, inadequate service provision to the poor.

- **Financial** – very low tariff and low cost recovery forcing DJB to rely on excessive loan assistance from the Government, high costs, particularly energy usage.

The obvious manifestation of the above situation was poor reliability, increased health risks due to inadequate water supply and management of wastewater, huge coping costs and low customer satisfaction.

New Approach

DJB is responsible for piped water supply of 820 million gallons per day (MGD) of water from surface sources and ground water abstraction (tube wells and ranney-wells) yielded 820 MGD which was still inadequate to meet the requirement.

With this inadequate water supply; DJB took up an initiative to reduce water losses by installing recycling plants to conserve water lost in water treatment plants (WTP). The rationale and immediate need for the initiative was the demand-supply gap, raw water shortage, challenges in negotiating with neighboring states for raw water, etc. It was deemed essential therefore to conserve available water. It was estimated that around 7%-8% of raw water was lost through backwash water being lost. The initiative was therefore aimed at recovering backwash water and clarifier sludge using innovative technologies and partnership models and supplying the water thus recovered to previously unserved outer areas of Delhi.

Goals of the Project

The key objective of the initiative was to reduce loss of water and receive 100% recovery of backwash water/clarifier sludge.
Implementation Strategies

The DJB took up the installation of water recycling plants to recover backwash water and sludge. While for the newly commissioned plant at Sonia Vihar, the facility for recycling of backwash water and sludge was inbuilt. For Haiderpur, Bhagirath and Wazirabad plants two separate recycling facilities were attached to the existing plant. The 200 MGD plant at Haiderpur featured a 16 MGD recycling plant to recover all waste water using centrifugal action to separate sludge from water and the water thus recycled is treated with poly aluminum chloride /alum coagulant while the sludge is disposed in the landfill.

The Wazirabad plant of 120 MGD capacity recovers 11 MGD (100%) of the waste water. The plant uses a pulsator clarifier, a patented technology which is energy efficient. Coagulated water flows into the pulsator clarifier which comprises a vacuum created to enable the water level to rise. The pulsators remove particles and clarified water is collected evenly from the sludge “blanket” thus created. Frequency of pulsing is adjusted according to the turbidity of water. The plant is automated through the operation of a supervisory control and data acquisition system. The recycling facilities were outsourced following a competitive bidding on a design-build-operate basis and operation and maintenance is the responsibility of the operator.

Outcome of the Reform

- Choice of appropriate technology and management to achieve the same
- Selection of technology to treat backwash water and sludge in the five plants based on research and discussions and decision on technology options suited to the specificities of the existing plant
- Saving of all backwash water and from the clarifier sludge estimated at 50 MGD
- Attention to safety regulations
- Use of energy efficient technology
- Regular monitoring on the basis of key performance indicators such as power, sludge, water quality among others and
- Resultant increase in availability of supply.

Achievements/ Results

- Reduction in coping costs.
- Positive fiscal impact on the state finances in the medium to long term since the project envisages gradual phasing out of subsidies from the Government.
Broader access to adequate water supply on a reliable basis would also benefit industrial consumption and thus support economic development.

Other indirect economic benefits such as increase in value of real estate in areas with adequate access to water supply and sewerage services, increase in employment, increase in income from tourism.

City wide improvement in quality of services.

Improved equity and security of bulk supply.

Upgraded water transmission system.

Reduced health risks with better quality monitoring.

Improved operational efficiency.

Continuous water supply and improved sewerage services to around 12% of DJB’s connections.

Significant reduction in non-revenue water.

Improved cost efficiencies and staff productivity.

100% customer metering.

Improved customer satisfaction and revenue collection.

Improved service levels to the poor.

Improved capacity utilization of the Sewerage Treatment Plants.

Reduced pollution and contamination of River Yamuna.

Possible improvement in water quality and improved health and hygiene due to reduction in overflows to drains and cross contamination by sewer lines.

Better control and management of environmental issues due to effective monitoring.

Improved efficiency.

Enhanced staff productivity through training across all levels.

Increased motivation of DJB employees through performance incentives.

Improved accountability and transparency of operations.

Improved customer interface.

**Sustainability**

This technology has resulted in water recovery estimated at 50 MGD, very pertinent to Delhi which does not have its own source of water. The capital cost was approximately Rs. 90 crore with a running cost of approximately Rs. 50 lakh per MGD per year. The cost involved is justified considering the inadequate availability of raw water. This pioneering effort has been large scale and has succeeded in “institutionalizing” the practice of recovering and recycling backwash water. The technology is also MIS enabled for better monitoring and effective performance. It may be noted that the technology can be adapted to other conditions and water utilities. Further, corresponding measures in the distribution network are being undertaken to ensure the recycled water reaches the consumer.

**Impact of the project**

It is noteworthy that four out of five plants are fully operational and the fifth is to be commissioned shortly. It has been possible to recover 50 MGD of water. The supply of water to outer Delhi areas has been possible due to increased availability of water from the savings achieved. The Sonia Vihar and Wazirabad plant are fully automated and the Haiderpur plant is partially automated.

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Title of Best Practice: 
**Customer Driven Initiatives in the Area of Billing and Collections**

State/City: Jamshedpur, Jharkhand  
BP Code: SSS-WS-PPP-1279-0113

**Previous Status**

Jamshedpur Township was established in the early 1900 to support the requirements of Tata Steel. Since its inception, Town Division Unit of Tata Steel managed urban services in the Tata Township in Jamshedpur Notified Area (JNA). In August 2003, the town division spun-off and Jamshedpur Utilities and Services Company (JUSCO) as a wholly-owned subsidiary of Tata Steel was formed and incorporated under the Companies Act 1956.

JUSCO became operational in 2004 and took over responsibility of municipal services including supply of potable drinking water to the citizens through direct service connections and public water points in its 64 sq. km. area with a population of 7.00 lakh. It supplies 170 million liters per day (MLD) of water on an average, which vary from 160 MLD during the winter season (November – April). The average per capital supply is very high at 205 liters per capita per day (residents of township maintain huge gardens and free supply of water resulted in high consumption). This supply is supported through an infrastructure set-up comprising river pump house, water treatment plant, water towers (19 in 7 locations), distribution network (around 680 km), etc. The service provider’s stakeholders include Tata employees as well as the general population including the slum population.

**Fig 8: Number of Customers & Water Customers in Garden Areas under JUSCO, (2006-2010) (A-B)**

However, JUSCO faced challenges due to a number of factors. Owing to JUSCO’s monopolistic nature, the entity lacked a system of inducting new customers, transparency, query resolution and bill complaint framework indicating feeble customer focus. Moreover, the billing system was outdated and led to approximations. Inefficient tracking of bill distribution and an inaccessible customer collection counter widened the communication gap between customers and JUSCO.

**New Approach**

JUSCO therefore, embarked on a customer driven initiative acting as a catalyst in molding the company into a customer centric organization. JUSCO initiated the JUSCO “Grahak Seva Kendra” (GSK) which is the
Customer Relationship Management (CRM) wing for utility billing and collection.

Meter/bill/connections are tracked through software database and are monitored within stringent Service Level Guarantees (SLGs) against each complaint and workflow tracking is also part of the initiative. Under the scheme, repository of letters from customers received centrally are scanned and tracked.

**Goals of the Project**

The objectives of these customer driven initiatives were to:

- Assimilate customer focus within its vision.
- Implement enterprise resource planning (ERP) for billing.
- Strengthen the process of bill delivery.
- Establish a system of robust communication to customers.
- Establish a system of collection in satellite areas.
- Improve collection of dues.

**Implementation Strategies**

The GSK performs the following functions under categories of:

- Connection management
- Bill generation with checks and balances.
- Monitoring of bill distribution system.
- Customer enquiry handling.
- Follow-up/monitoring of outstanding dues to minimize cycle time of payment.
- Coordination with other departments.

JUSCO representatives also visit new customers upon first billing and explain about tariff, methodology of calculation of the bill, payment procedures, etc. New customers are provided with a welcome card with a JUSCO branded pen.

A facility wherein customers could view the bill recipient’s name and date of receipt in addition to their bill information over the internet was introduced. The facility is also being used over the intranet by the customer helpdesk at JUSCO so as to respond to bill receipt queries by customers, performance of the bill distribution agency (outsourced) is monitored through the software.

Mobile numbers of customers are captured at all customer touch points like collection counter, helpdesk, etc. and are entered into the System Analysis and Program Development (SAP) database. Critical information like bill amounts, due dates, payment reminders, etc. and even greetings on festivals are relayed through the internet to customers via short-message-services (SMS). This facility became quite popular with the customers. There have been quite a number of instances where customers have volunteered information about changes in contact details.

**Fig 9: Flow Chat of Bill Generation in SAP – ISU, JUSCO, Jamshedpur**
For the benefit of customers residing at far-flung areas, a JUSCO representative visits these areas on predetermined dates and collects cheques from customers. Customers are informed about the date and time of the mobile collection van in their area via the SMS channel.

Any time payment (ATP) machine has been installed as a pilot project to accept cheques from customers and issue a receipt against the cheque deposited. ATPs are open from 6:00 am to 10.00 pm seven days of the week, making it convenient for customers to pay their bills.

Trained personnel are present at the ATPs during its working hours to aid customers to operate the system. These have been installed at four locations across the city. JUSCO plans to set up such machines at strategic locations in Jamshedpur.

Implementation of the customer-driven initiatives as depicted above has provided JUSCO with an ideal platform to improve the outstanding payment follow-up measures such as focused follow-up of customers to whom an SMS has been sent and defaulted payment beyond the due date. Regular feedback is also taken from customers through frequent outbound calls from JUSCO.

**Achievements/ Results**

In order to standardize the bill generation for accuracy, audit-traceability, adoption of best-practices, JUSCO implemented SAP IS-utilities software in July 2009 which proved advantageous to the entity in many ways:

- Multiple-in-process check points in the software process largely reduced the errors in billing at the time of meter reading entry as well as final bill preparation. On an average 50 critical bills are scrutinized every day before releasing them for delivery to the customer.
- Timely automatic preparation and delivery of bills to the customers.
- Bills released for customers in groups—hence it is convenient for JUSCO to plan and allocate manpower accordingly.
- Increased transparency in billing.
- Allows for group as well as personalized service SMSs for the customers.

JUSCO has also initiated a system of regular orientation and programmes. The staff is thoroughly trained in regard to their approach and behavior with customers. There are also frequent customer contact programmes wherein the customers are informed about the various utilities and also awareness about conservation and proper usage of resources.

**Outcome of the Reform**

Service delivery improved tremendously. More than 60% of the new customers were given new connections within 60 days. Over 90% of the bills were delivered with SLG.

With the increased efficiency in billing, there is a drop in the complaints and queries about the bills over the past months. Presently, about 50% of the enquiries are about the bill amount, 25% about non-receipt of bills and 25% about discrepancy in the billed amounts.

**Fig 10: Orientation Programmes for JUSCO Staffs (A-B)**
Sustainability

JUSCO plans to take these initiatives to the next level to make it more sustainable. Some steps that JUSCO plans to take in this direction are:

- ITZ cash card for bill payments.
- Two way SMS for customer feedback.
- ATP machines at strategic locations across the city.
- Awareness campaigns for saving water.

Impact of the project

The Implementation of the initiatives has certain well marked effects. The timely delivery of the bills to the customers went up to 90%. The collection efficiency of JUSCO has also increased considerably.

Replicability

The best practice initiatives have already been implemented in Haldia. JUSCO also intends to take these best-practice initiatives to all new business locations that it goes to. Some of the initiatives have already been rolled out at Sector V, Salt Lake, Kolkata and Mysore where JUSCO has won the contract for operation, maintenance and distribution of water.

Fig 11: Status of Bill Delivery since August 2010 and Collection Efficiency, JUSCO (A-B)

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Title of Best Practice:
Dhangadra Nagar Palika’s Successful Effort to Maintain its Clean City

State/City: Dhangadra - Gujarat
BP Code: SSS-SW-###-0880-0113

Previous Status

Dhangadra Municipality was formed during the regime of Raja Mansingh (1869-1900 BC). During this period, measures for city development such as cleanliness and beautification, town planning, new roads, markets, fire brigade services, registration of births and deaths, taxes etc were initiated, which continued till Independence. But after the creation of Saurashtra state in 1948, nine wards were created and the first municipality elections were held in 1949.

Currently, Dhangadhra Municipality has 12 wards and 36 members. According to the Census of 2001, the total population of Dhangadhra is 70663 and currently it has the status of B category Municipality.

During the period of Raja Ghanshyam Singh in 1911, the functioning of Dhangadhra Municipality was optimum. During this period, the beautification and cleanliness works were initiated by the Nagarpalika. Thereafter in the regime of Raja Ajay Singhji, specific attention was given to keep the main roads and streets of the city clean. The king himself used to inspect the cleanliness of the city, riding on a horse. The staff and the citizens therefore remained alert and avoided dirt on the streets. Thus the city had always maintained an eye for cleanliness.

Figure 12: Nirmal Gujarat – City Cleaning Drive (A-D)
New Approach

To continue with this tradition, the current municipality through effective use of human resource has initiated a process to keep the city clean and beautiful.

Currently, Dhangadhra Municipality is responsible for disposing solid waste from 18,000 properties of 12 wards, public roads and streets, gardens and other public places. For this work, the Nagarpalika has 66 permanent sweepers and 135 sweepers on daily wages.

Due to limited human resource, inadequate planning and lack of clarity of responsibilities, led to irregular collect of waste in the area. This resulted in piling of solid waste. In addition, the Nirmal Gujarat Initiative of the Government of Gujarat also led the municipality to emphasize on door-to-door collection of solid waste. This also increased the workload. So the Nagarpalika decided to plan in such a way that the available human resource is optimally utilized.

Figure 13: Nirmal Gujarat - Door-to-door Solid Waste Collection (A-D)

Implementation Strategies

To keep the 12 wards of the city clean, the Dhangadhra Nagarpalika initiated efforts at two levels. The first was to utilize the current human resource optimally and the second was to create awareness and solicit people's participation.

* Feasibility of the work and planning of Human Resource

At first, the places for disposal of solid waste were identified. They were:

- Door-to-door collection from 18000 residential and commercial properties.
- Cleaning the main roads, streets, gutter line and public places like gardens, toilets, hospitals, etc.
- Disposing waste collected in dust bins.

In this way, above mentioned places were identified for solid waste disposal and cleanliness of the city. First, the Nagarpalika
distributed the cleanliness work for the 12 wards of the city. Ten workers for each ward were appointed. They were entrusted with the responsibility of collection of solid waste from the residential and commercial properties, cleaning of streets and gutters as well as public toilets of their respective wards. The timings of cleaning work by these 120 workers were fixed, twice in a day. The door-to-door collection is done during 7.00-11.00 AM and cleaning work is done during 2.00-6.00 PM. Other workers were allocated the responsibility of cleaning the streets and gutters.

**Figure 14: Cleaning the Public Toilets**

In order to maintain regularity in the daily cleaning work so as to avoid the problems of accumulation of dirt, a cleanliness drive is initiated in one ward every Thursday on a rotation basis. For this, apart from the workers engaged in cleaning of public places, 2 workers are taken additionally from each ward to from a team of 100 workers. This team does the cleaning of roads and streets, gutters, toilets and urinals. In this way every three month, each ward is specially cleaned through this drive.

* Work for public awareness

After planning for human resource for waste disposal, in the second phase the Nagarpalika initiated activities to solicit people’s partnership and enhance their awareness. The activities implemented by the Nagarpalika are mentioned below:

- Writing slogans in each ward
- Organizing rallies of school children
- Organizing interactive activities like plays, rallies through the organizations involved in development activities of the city.

- Organizing morning walks (Prabhat Pheri) to enhance awareness of citizens.
- Involving citizens and leaders in the cleanliness drives.
- Organizing health camps and fairs.

**Figure 15: Public Awareness through Slogans**

In this way, the citizens were also made aware regarding health and hygiene issues to ensure effective implementation of the mechanisms created by the Nagarpalika for solid waste disposal.

**Outcome of the Reform**

Through proper planning and optimum utilization of available human resource, the Nagarpalika can address the issue of cleanliness and beautification of the city without depending on external spruces. Appropriate direction and proper planning is the need of the hour.

**Achievements/ Results**

Through effective management of the available human resource, the Nagarpalika was able to develop an effective cleanliness mechanism without additional expenses:

- 100% door-to-door collection of solid waste has been established and the segregation work has also been initiated.
- Open dumping places have been cleared.
- Cleaning the city at night has been more effective as compared to the work at day time.
- 19 of the 45 waste stands have been closed and the transport cost to take this waste directly out of the city has been reduced and the dirt around these 19 stands has been reduced.
• Enhanced awareness in the citizens has lead to reduced dumping of waste on the roads. During the year 2007-2008 the fine for dumping of waste on public roads was Rs. 38,000/- which reduced to only Rs.4800/- during April-December 2008.

Sustainability

The effort made by the Dhangadra Municipality is sustainable as they have planned for optimal utilization of available human resource. There is no dependency on external resources. In addition, activities to enhance public awareness have also been implemented. So this professional planning will certainly lead to results in the long run.

In this approach, the Nagarpalika has emphasized on two aspects, optimal use of available human resource and people’s awareness. So the current municipality can make use of the available resources and plan to collect and dispose solid waste and thereby make their cities clean and beautiful just as Dhangadra Nagarpalika did. Enhancing public awareness is equally important to sustain this initiative.

Figure 16: Changing Scenarios after Implementation of the Project (A-C)

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Title of Best Practice:
Construction of BRTS Stretch from RTO to Pirana

State/City: Ahmedabad - Gujarat
BP Code: SSS-PT-PPP-0812-0113

Previous Status

The city of Ahmedabad, founded in 1411 AD as a walled city on the eastern bank of the river Sabarmati, the commercial capital of Gujarat is now the seventh largest metropolis in India and the largest in the state. Ahmedabad city covers an area of 466 sq.kms and accommodates about 6 million people. There are about 2.2 million vehicles registered in the city. Car and 2-wheelers ownership rates are about 50 and 115 per 1000 persons. There are about 60000, 3-wheelers plying on the city roads.

The city with its well integrated Landuse and transport system, functions in an efficient manner. The average trip length is about 5.6 kms and travel times are about 18 minutes. Road fatalities are among the least (235 in 2011) which are comparable to that of developed countries.

The city with its special focus on transit, took several initiatives to augment transport supply, both in quality and quantity terms. Augmenting fleet, fuel switch for Integrated Public Transport System (IPTS) and introduction of Bus Rapid Transport System (BRTS) are major initiatives. Janmarg – BRTS, a JnNURM project is the first full BRTS of the country and has become a popular mode choice for people of Ahmedabad.

New Approach

Janmarg, BRTS in Ahmedabad consists of several components designed to function together so as to generate superior services, which are comparable with other world class mass rapid transit systems. BRTS Ahmedabad is a fast, reliable, secure, high capacity service, which also has a distinct identity. The system has been in operation for the past two years and carries about 135000 passengers daily with fleet of 82 buses (incl. 11 AC buses) over 45 kms of BRTS network with commercial speeds over 24 kms per hour.

The bus stations are located on the median. Average spacing is in the range of 500-600 meters apart. Stations have been provided for ticketing, display, audio systems and other support infrastructure. The stations are accessed at-grade through signalised zebra crossing. They are accessible to the physically challenged. Off-board ticketing system is in place. Stations have facility for docking 4 numbers of buses (2 up and 2 down). The bus stations are designed such that docking is perfect with the gap between bus and station not exceeding 4 inches. The station doors are synchronised with bus doors and are operated through a switch under the control of bus operator (driver).

By the year end, it is expected that another 10 kms will be added to the operational corridor.
taking the BRT corridor length to a total of 55 kms. Operational fleet is likely to increase to 125 buses.

The services are managed by Ahmedabad Janmarg Limited (AJL), a special purpose vehicle. The services are operated between 6:00 am and 11:15 pm. At present five routes are operational with peak headways ranging from 5 min to 10 min. The BRTS trunk segment has cumulative peak headway of 142 sec.

**Key Features:**

* Connectivity to important origins and destinations - The proposed BRT network connects the important origins and destinations and transit points like Railway stations, regional bus terminals, university areas, industrial areas, residential (Lower Income Group, Middle Income Group, Economically Weaker Section) and commercial hubs of the city and recreational public spaces like Kankaria lake front that is recently pedestrianised.

* Low income and low accessibility zones - The corridor also provides connectivity to the lower income housing areas and increases accessibility for the lower and middle income groups.

* Public Private Partnership (Arrangements in AJL) - The Ahmedabad Janmarg, during this two year period, has successfully delivered the BRTS using several indigenously developed methods and innovations. The rating of the system by public has been in the range of 8 to 9.5 out of 10 points. The emphasis of this submission is on bus procurement, operations and maintenance through PPP. The model has been studied for adoption by several other cities including Surat and Delhi.

**Figure 19: BRT Network - Accessibility to important origin and destinations and transit points**

![Diagram of proposed integrated transport system of Ahmedabad (13 km operational)](image)
Goals of the Project

The main goal was to redesign the city structure and transport systems towards greater accessibility, efficient mobility and lower carbon future. The vision focuses on:

- Reducing need for travel
- Reducing the length of travel
- Reducing automobile dependence

Implementation Strategies

The implementation model of the BRTS Ahmedabad rests on four principles, namely (i) Project ownership by the City Government, (ii) local control, (iii) partnership with local institutions and (iv) maximum use of private sector

* Project Ownership by City Government

The BRTS in Ahmedabad is an initiative of the local city Government, namely the Ahmedabad Municipal Corporation (AMC) and is recognised and accepted as such. The ownership, implementation and operations is the responsibility of the AMC. While this is not completely unique, urban transport as a function in India has traditionally not been handled by local city Governments. Ahmedabad itself though has long been an exception, where the Ahmedabad Municipal Transport Service has served the city's transport needs since independence. This tradition has translated automatically into an acceptance of the role of the local Government when it came to the BRTS. The seamless integration of the physical site on which the BRTS is situated, and the service itself, can be attributed to a significant part to this common ownership. This is in contrast to many other cities where the tradition of parastatals being responsible for the urban transport function has led to new parastatals being created for specialised bus services like the BRTS.

* Local Control

Another feature of the implementation model was the creation of a Special Purpose Vehicle in the form of AJL. The AJL, a 100% subsidiary of the AMC, while being under complete local control, was allowed for required flexibility of decision making. With the presence and active participation of both the Mayor and the head of the local opposition on the Board, it did so without abandoning the democratic process.

* Partnership with Local Institutions

Another feature of the implementation model was the AMC's partnership with the local institution, namely Center for Environment Planning and Transport (CEPT) University, as its principal consultant. Not only it accentuated the sense of local involvement, it also allowed a local institution to strengthen its own knowledge base and expertise in a key area like Urban Transport. As a result of this partnership, CEPT University was able to successfully argue for, obtain and develop as one of the four Centers of Excellence in the Urban Transport.

* Maximum use of Private Sector

While taking up the responsibility of the ambitious project, the AMC was well aware of certain organisational limitations. The legacy of public ownership combined with the complex task of managing the urban chaos of a city had, like similar organisations across the country, allowed it little time over the years for institutional strengthening. Thus while the SPV structure allowed fair amount of flexibility, building an organisation with in-house strengths to run a modern transport system was recognised as being either too costly in employee legacy costs, or requiring more time that could be afforded.
This led to a conscious decision to bring in private sector labour, expertise and entrepreneurship in all possible functions, starting from simple outsourcing assignments, to more complex forms of PPP through appropriate contractual structures. While certain risks are not yet passed on the private sector (e.g. market or traffic risk) and is still on the public sector, it is done only in cases where it is felt that the private sector industry is not mature enough to assume these risks at this stage of the project. However many risks such as procurement, technology, design etc are passed on. AJL achieved a fair bit of success in these attempts in the end, though not without its own share of setbacks.

Other important principals of the BRTS Model were:

* Use of IT Applications

The network connects central city with traffic generators such as transit terminals, markets, industries and institutions. It uses integrated transit management system (ITMS) extensively including the following major components:

- Passenger information system,
- Vehicle tracking system (Geographical Information System (GIS) / General packet radio service (GPRS) based)
- Electronic Fare collection system
- Area Traffic Control System (ATCS), Traffic signal management

Extensive use of IT applications provides useful data for efficient monitoring and operations. Janmarg has made effective use of Intelligent Transportation Systems in order to constantly maintain the benchmark of operations and service quality. Efficient use of intelligent transport (IT) system provided high quality, reliability and rapid bus based mass transit system that is first of its kind in India. Comprehensive planning of the usage and type of technology has ensured the system to be successful in providing rapid mobility for the people of Ahmedabad. Two control centers equipped with IT infrastructure has been made operational to closely control and monitor Janmarg operations (bus and Traffic).

* Passenger Information System

Passenger information systems like announcement systems in buses, light-emitting diode (LED) display systems in every bus and bus shelters provides the expected time of arrival and other necessary information to the passengers. LED display and Audio announcement system in buses inform about the details of next bus stop arrival. Other information related to public conduct, cautionary measures on-board, etc. are also communicated to passengers on board through this.

**Figure 21: Passenger Information System**

* Vehicle tracking system (GIS / GPRS based)

Specially designed buses equipped with GPRS device and the technology allows the vehicles to be tracked. Automatic vehicle tracking system provides real time tracking for all the buses in operations and are monitored closely from the central control room of Ahmedabad Janmarg Ltd. The buses now operate at a frequency of around 145 sec. headway.

Extensive use of IT systems with BRT system characteristics like segregated bus lanes, level boarding etc. saves travel time and make the system more competitive with other modes. It also provides data that improves efficiency of operations. Adherence to schedule of individual trip of buses is ensured each and every time. Vehicle speeds are monitored and controlled/ increased based on site specific situations like bus bunching locations, accident affected areas etc. Bus breakdowns (if any) can be immediately tracked and responded to by the technician.

Various reports of monitoring are generated on daily, weekly and monthly basis that allow for continuous planning of BRT operations.
Punctuality report highlights performance of buses, system operators (drivers) and system reliability.

Trip detail report highlights actual and scheduled bus (in kms.) travelled. Missed trip data, in case of bus breakdown (if any) is also recorded in this report. Quality of bus operations is maintained and penalties are accounted based on this monitoring.

In case of disaster, Janmarg can receive immediate information and can work out disaster recovery on time.

Electronic Fare Collection

Off-board fare collection ensures that the ticketing happens before one enters the bus shelters. Closed system of operations, off-board fare collection, at-level boarding-alighting reduces delays. Smart cards are being introduced in the system to reduce the time consumption for ticketing process further and increase passenger flows in and out of the system.

Passenger details report highlights boarding-alighting data for each station that is recorded on real time and hence can generate O-D matrix at every bus station across all timelines of day. This data is extremely useful for continuous planning of supply and demand. Apart from this, a lot of critical information mentioned below is availed through electronic fare collection system:

- Revenue per passenger
- Trip length
- Average trip length
- Link analysis leading to estimation of Peak Hour Peak Direction Traffic (PHPDT)
- Passenger travelled (in kilometers)
- Volume of passenger inflow and outflow at every station (boarding-alighting)

Area Traffic Control System (ATCS), Traffic signal management

Encumbrance free operation of BRTS buses in exclusive lanes is a predominant feature of this system. Physical barriers of BRTS lanes by means of median, railing and landscaping is providing necessary segregation but faster mobility is possible through advance engineering technology.

For this purpose BRTS corridors and specially designed intersections will be managed by Traffic Signals. All the bus shelters and pedestrian crossings are also having similar signal system to increase safety of bus commuters and pedestrians. All installed signals differ with customary traffic signals as it has intelligent system for operation and it is known as Area Traffic Control System - ATCS. Ahmedabad Municipal Corporation has introduced such system for 93 (65 BRTS and 28 non BRTS) intersections.

In the BRTS operational network, there are 52 open intersections which are controlled by ATCS, and further enhance the efficiency of BRTS operations. This ensures smooth movement of vehicles at the junctions and adheres to constant vigilance.

Intersection Management

Geometrics of all intersections of BRTS corridor are designed based on traffic pattern, available RoW, location of intersections in overall road network and Phase wise execution of BRTS corridors. As mentioned above all have traffic signals to control and manage BRTS Buses and mix traffic too.

Principal aspects of designing these traffic signals system is increase mobility and reduce delay at intersection. This is possible only if no. of phases in each signal cycle will be minimized. For the same purpose segregated phase of BRTS buses in signal cycle has been eliminated for the intersections having BRTS for two arms only (i.e. Intersections where two BRTS corridors are meeting each other, separate signal phase for BRTS buses will be there). This will also provide lesser delay for mix traffic. For each intersections signal cycle length, nos of phases etc are designed by using state of the art technology SYNCHRO 6.0.

Figure 22: BRT Area Traffic Control System
Service Enhancement and Reliability through ITS Intervention – Janmarg Experience AJL through its ITMS initiative has brought in several innovative solutions leading to safer, faster and reliable transit services to its commuters. The solutions range from wireless station door operations by driver, RFID based docking system, real-time networked systems for ticketing. Real-time GPS based vehicle tracking system enabling Passenger Information System.

The integrated systems allow transit managers to plan and manage transit services in a highly efficient manner. This is primarily achieved by the analysis of data carried out at central control centre through specialized reporting structures which analyze data in multiple dimensions leading to feedback and decision support capabilities extended to transit management.

Major components of ATCS include:

- Traffic Signal Controller
- Vehicle Detectors (Through Embedded sensors)
- Communication Network
- ATCS Application Software
- Central Control System (operational)
- Signal synchronization

**Figure 23: BRTS Corridor – Before and After (A-C)**

<table>
<thead>
<tr>
<th>Before</th>
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<tbody>
<tr>
<td><img src="image1" alt="Before A" /></td>
<td><img src="image2" alt="After A" /></td>
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<tr>
<td><img src="image3" alt="Before B" /></td>
<td><img src="image4" alt="After B" /></td>
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<tr>
<td><img src="image5" alt="Before C" /></td>
<td><img src="image6" alt="After C" /></td>
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</tbody>
</table>
Outcome of the Initiatives

- Janmarg is the first full BRTS system in India operated as a closed system. ‘Networks and not corridors’ and ‘connect busy places and avoid busy roads’ have been basic principles for selecting 90 km long network. The network connects central city with traffic generators such as transit terminals, markets, industries and institutions.

- Integrated transit management system: It uses ITMS. IMTS includes transit signal management, smart card integration, passenger information system, GIS on the buses.

- Level boarding alighting: Dedicated right of way for the buses and stations with level boarding saves travel time for the buses and make the system more competitive with the auto travel.

- Complete streets: BRTS streets are complete streets with dedicated bus lanes, cycle tracks, pedestrian facilities, personalised vehicles and optimum parking. It enhances quality of life for all citizens.

- Disabled friendly: For people with disability, access to BRTS stations is now easier with ramps, level boarding and better buses.

- Trail run of BRTS was conducted over three month period. The major objective of trial runs was to allow the passengers to understand the system and its applications. During trial runs, 14 buses with 6 min. frequency for 6 hours in the morning and 5 hours in the evening. Around 18,000 to 20,000 passengers were used the service daily.

- Public private partnership - Bus procurement and operations through private participation on gross cost contract.
Achievements and Results

- Improved air quality: Reduction in RSPM level from 198 microgram /m³ to 82 microgram /m³ by 2008
- Increased Public Transport Patronage
- Regular transit (AMTS) from 3,20,000/day in 2005 to 8,34,000 in 2010
- Accessible BRT with 34.5 Kms exclusive corridor 16 hour operation, with 45 buses, trial run- 18670 passengers/day increased ridership to 83000 per day. (women, old aged and physically challenged seem to patronage the system more!).
- Peek BRT Commercial speeds of 25-27 kms/hour
- Safer Streets (The city of Ahmedabad ranks very high on road safety account with annual road fatalities being less than 200. Comparable figures for other cities are: Surat-267, Bangalore-840, Hyderabad-424, Delhi>2500, London-204 and Singapore-190
- Well lit, quality pedestrian and NMT facilities along 40 kms of phase-1 BRT corridor, signalized pedestrian crossings every 200 meters
- Changed work culture leading to efficiency PPP
- Better traffic management

Sustainability

- Services are operational during 6 am 11pm
- 45 buses are being operated and each bus travel for 232 kms/day
- Ridership doubled during these four months (from 17-18000 passengers/day in the first month to 37-43000 in the 4th month and 80-83000 in the 12th months.)
- Commercial speeds went up from 24 kmph to 27 kmph during peak hour
- Revenue per bus increased from Rs. 3800 per bus per day to over Rs. 10000 per bus per day (more than double that of regular transport service)
- Large mode shift has taken place. More than 57% BRTS users are new bus users.
- Earlier they were using 3-wheelers (25%), 2-wheelers (15%), Car (8%) and walking and bicycling (10%).

Impact of the Initiatives

- Reliability: 83% of arrivals were on time. 4% arrived before time and 13% delayed.
- Reduction in accidents
- Major reduction in accidents on the corridor has been observed. On an average 3-4 minor accidents in Ahmedabad involve BRTS buses. There were 7 fatalities involving BRTS buses during two years of operation. 113 minor accidents occurred during two year period.
- Driver training and retraining and safety audits are undertaken periodically.
- Reduction in greenhouse gas emissions
- Average speeds went up from 16 to 24 for both bus and other users.
- Modal shift in favour of BRTS (of the current BRTS users about 45% are from non-bus modes)
- motor cycles - 13%, cars - 2.8%, 3-wheelers - 21%)
- New network distributes traffic to keep trip length short
- CO2 reduction - 15%
- Reduction in air and noise pollution
- Air quality, despite increase in number of vehicles, has remained under the norm along BRTS corridors mainly due to change in composition of vehicles.
- Reduction in: - PM-18% - NOX-20%
- Reduction in energy consumption
- Fuel Consumption: Ratio of fuel consumption of AMTS and BRTS buses per passenger kms is 1:0.65. Environmental benefits are evident.
- Any other benefits
- System wide impacts include relief from congestion, improved safety, maximization of the ridership serving the needs of the poor, to provide opportunities for transit-oriented development/ promote compact city, and enable integration with other modes.
- Ridership went up from 17000 /day in the first week to 135000 in the last week.
- With start of Feeder to central city, ridership is expected to go up to 1, 60,000/day.
- All sections of the population use BRTS
- Project outline with key features
- Before implementation - AMTS buses operating over 195-210 kms with an average passenger of 975 per bus per day
with a revenue per bus @ 3450/-. About 25% subsidy is to be given by AMC.

- After implementation BRTS buses operating over 260 kms with an average passenger of 1700-2000 per bus per day with revenue per bus @ 10000/- per day. All bus and bus operating costs are recovered up to 95%.

- Estimated cost/actual cost on completion
- PPP components have brought about 60 Crores of investment from private sector.

### Box 2:

<table>
<thead>
<tr>
<th>Contribution By</th>
<th>% Share</th>
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<tbody>
<tr>
<td>Centre</td>
<td>35% contribution from Govt. of India</td>
</tr>
<tr>
<td>State</td>
<td>15% contribution from Govt. of Gujarat</td>
</tr>
<tr>
<td>Urban Local Body</td>
<td>50% contribution from AMC, Ahmedabad</td>
</tr>
</tbody>
</table>

- PPP Model - Nine elements of which bus and ITS are important
- Bus Procurement, Operations and Maintenance
- Integrated Information System including Automatic Ticket ingrained Vehicle Tracking System

- Supply and Service Contracts for Bus Station Sliding Doors
- Supply and Service Contracts for Turnstiles and flap barriers.
- House Keeping and Cleaning of Bus Stations
- Management of Pay and Park facilities
- Lease of Advertisement Rights
- Development and Maintenance of Landscape
- Maintenance Contracts for Bus Stations (Civil Works), Lighting of Bus Stations and Corridor, Monitoring and Maintenance of BRTS Corridor (Civil works)

### Recognition

- MoUD Awards: The Best Mass Transit Project under JNNURM for the Year 2008-09.
- 2010 Sustainable Transport Award
- Award for Outstanding Innovation in Public Transport-2010, instituted by the International Transport Forum (ITF) and the International Association of Public Transport (IATP).
- “Best new innovation project” award under Jawaharlal Nehru National Urban Renewal Mission (JnNURM) for Excellence in urban transport for the year 2010.
- International award for “PTX2 Knowledge and research award 2010” to CEPT-CoE and “Daring ambition 2010” to JANMARG - Ahmedabad BRTS At UITP annual convention, Dubai.

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Title of Best Practice:
Bus Rapid Transit System

State/City: Vishakhapatnam - Andhra Pradesh
BP Code: SSS-PT-PPP-0103-0113

Previous Status

Visakhapatnam (Vizag) is second largest city of Andhra Pradesh with an area of 550 km². It is primarily an industrial city, apart from being a port city. It is also home to the Eastern Naval Command. Vizag is a cosmopolitan mix of people from various parts of the country. The city doubled its population from 1990–2000 owing to a large migrant population from surrounding areas and other parts of the country coming to the city to work in its heavy industries. As of 2001 India census, Visakhapatnam had a population of 1,329,472.

Currently, about 4.5 lakh registered vehicles ply on the city roads in Vizag City, 90% of which are cars and motorized two-wheel vehicles (MTWVs). The demand for travel is predicted to grow to 16 and 28 lakh trips per day by 2011 and 2021 respectively. Similar to other UAs, in the near-future road capacity is going to be a major constraint for mobility in Visakhapatnam. Transport network in the city will not only require expansion but widening and strengthening of the existing road network. The city’s transport master plan has identified and planned a phase-wise implementation of mass public transport systems.

As a precursor to the detailed corridor design effort, a Detailed Project Report (DPR) was prepared which identified eight corridors of about 100 km for BRTS implementation. Given the rate at which the city is growing as a commercial, industry, and tourism hub set along the coastline of the Bay of Bengal, the proposal to develop and implement a comprehensive BRT system is justified.

The available travel trends from the past studies and the ‘Feasibility Study of BRTS in Vizag convened by Administrative Staff College of India (ASCI) has been studied. The trends suggest that the traffic volume on roads has been growing at the rate of about 5% p.a. It is expected that the traffic will, generally, continue to increase at the same rate for the next 20 years.

The New Approach

While several mass transport options are available, BRT systems are chosen with the specific intent to balance the cost aspect with the appropriate method of delivering quality public transport services in the city. Amongst the domain of high capacity public transport systems available world-over, it has been concluded that the transport demand forecast on the major travel corridors in Visakhapatnam can be managed by a medium capacity public transport system such as a Light Rail Transit System (LRTS) or BRTS with dedicated bus lanes.

Given the rapid growth of the country and increasing urbanization of UAs, strengthening of traffic and transportation systems in the nation and especially UAs will be a key challenge. Visakhapatnam is also experiencing immense growth and is on the horizon of launching itself as a major economic and commercial centre in the state and the nation. Keenly aware of the growth aspects, GVMC have been proactively addressing the needs of the city by adopting a comprehensive approach to plan, augment and streamline transport demand and supply.

Consistent with its philosophy to develop a viable and sustainable transport system for the city, GVMC has endeavored to augment the supply of mass transport services at an affordable cost, and provide impetus to riding on public transport thereby encouraging personalized vehicles to shift modes. The city has been actively working towards creating a sustainable inter-modal transportation system.

Goals of the Project

- To provide all possible options to plan the system with the commuter’s perspective a decision has been made not to compromise with space requirements for dedicated bus, motorized Vehicle (MV), Non-motorized Vehicle (NMV) lanes and safety aspects of pedestrian traffic.
- To augment transport supply at an affordable cost to the citizens.
• To prepare a comprehensive parking plan in place and will be implemented with control on demand and fiscal measures.

**Figure 25: BRTS Corridors in Visag**

**Implementation Strategies**

**Strategy Used to Achieve the Desired Goals**

* Project design features are detailed below:
  * Min 30 m section at mid-block section;
  * 36 section at stations / junctions;
  * Dedicated bus lane, 7.0 m (2 x 3.5 m);
  * 3.4 m. wide passenger platform with shelter;
  * 2 x 3.25 m MV lane, 2 x 2.5 m NMV lane, minimum 2.0 m wide sidewalk on both sides;
  * Placement of stations - mostly near side junctions, few at mid block sections based on demand and spaced at a distance of 500 to 700 m;
  * Additional right turning (MV) lane at junctions;
  * Provision of bus passing lane at some stations;
  * Safe crossing facilities of bus passengers along zebra crossings and foot-over-bridges;
  * Adequate depot and terminal facilities; and
  * Safe dispersal and integration measures.
The key aspects of the bus rolling stock and technology features are outlined below:

- Standard 60 seat low floor urban bus (12mt. length) is recommended to be introduced gradually and initially existing fleet of Andhra Pradesh State Road Transport Corporation (APSRTC) will be utilized.
- To save cost, partial low floor buses may be introduced.
- Outline of Information Technology and Automatic Fare Collection System identified and is planned to be introduced later after sufficient trials are conducted.

- First Phase, 2 corridors were prioritized i.e. Standard Test Conditions (STC) and PVUSA Test Conditions (PTC). The combined cost of prioritized 2 corridors (PTC and STC, Tunnel) is Rs. 452.93 Crores.
- The Project was approved by the Central Sanctioning and Monitoring Committee (CSMC), MoUD, Gol on 18-05-2007.
- The Detailed feasibility report was proposed as per the guidelines of National Urban Transport Policy, Ministry
Activities Implemented

Right from conceptualization and detail design of the BRTS in Vizag, GVMC has been proactively considering and promoting all important aspects for successful completion of the project. Be it the stakeholder consultations, public advisory and quality assurance - all aspects have been dealt with in detail. GVMC has BRTS cell in place and consultants, engineers, contractors all work in a healthy atmosphere to find the best possible solutions for achieving the ultimate objective of producing a world class mass transport system.

The EPC contract modes has paved the way for PMC consultants to have a close look at the design offered by the contractors' and these are being debated, discussed, fine tuned to be more useful in terms of implementation, operational ease and practicality. The design process is vetted through quality assurance procedures embedded in the design and built contracts through clearly demarcated deliverables and timelines.

The GVMC has laid emphasis on project quality and plans have been made to make the project a true success as perceived by the riding community and the general public. The city is best suited for BRTS. The services of Project Management Consultants have been taken to ensure successful implementation. Quality Assurance and Quality Control of all aspects (road design, BRTS elements, construction, integration and operations) including management of project construction and execution are being perceived with great detail. A qualified team of professionals is in place to serve as GVMC’s extended arm in ensuring project success.

Challenges / Constraints Encountered

The key concerns in the project are the land and property acquisitions required to produce a row of 30 m especially on PTC. At the bus stations along the PTC and STC we will require about 36 m ROW to construct bus bays. Therefore, primary issue is to availability of minimum row to achieve segregation of traffic on the corridors. Nature of compensation and re-settlement issues have been finalised first in consultation with affected public and their representatives. The co-ordination of various civic agencies and departments including GVMC, Vishakhapatnam Urban Development Authority (VUDA), APSRTC, BSNL, Traffic

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* Figure 28: Bus being operated at the BRTS Corridor
Police, etc. is essential for effective implementation. The major issues to be reckoned are utility diversions and addressing the drainage. The traffic management and diversion during construction will need the services of Local Traffic Police in Vizag. The major constraints on STC are the strategic locations of village settlements at Simhachalem, where property acquisition is rather difficult. Alternatives will need to be addressed and frozen.

These concerns have been addressed with minute’s details at the ground zero level. Environmental and social issues have been addressed in the detail. Promotion of public understanding and fruitful solutions of developmental problems such as local needs and those of road users were discussed. In addition to discussing problems and prospects of resettlement, several stakeholders were consulted through focused group discussions and individual interviews.

*Figure 29: Metro Bus Service Shelter, JCTSL 2010 (A-B)*
Discussions were also held to understand their local transport needs and to achieve speedy implementation of the project with involvement of people. Nature and loss of structures, which are likely to be affected, were identified. It was this effort that took the project forward towards successful implementation. The main reason being the minimum land availability was ensured for bus lanes, MV, NMV and pedestrian sidewalks.

Experts from a wide spectrum of the society began discussing the concerns of some BRTS implementations in the country. While every new project is expected to experience some level of friction during initial stages, adequate efforts are underway to mitigate any adverse effects from the implementation of Vishakhapatnam BRT system for the following reasons:

- In a majority of instances across the world, project ‘success’ or ‘failure’ can quickly begin as a perception and soon turn into a reality. Such a perception is created due to the ability of the implementing agency to properly and adequately publicize information about on-going projects. Technically better projects have failed in many instances due to not providing adequate project information to the general public.
- It is anticipated that Vishakhapatnam, BRTS will not experience concerns because GVMC has been actively engaging the public through the social assessment study and wide publication in the news media.
- A second issue is with regard to proper planning of projects such as BRTS. Vishakhapatnam has been actively conceptualising, planning, and designing the project for over 2 years and is pursuing the implementation aspect with diligence. It is recommended that GVMC continue to brief the elected representatives and provide information that the project had been thoroughly planned by taking into consideration the current and projected travel demand in the city.
- Projects that have ‘take-away’ lanes from the general purpose traffic, i.e., from the ‘existing’ lane geometry for BRTS dedication – mostly 7 meters – are considered an inappropriate strategy. Such an action is considered not only negative in terms of further constraining currently depleted capacity but also invites public anger. Vishakhapatnam BRTS does the opposite by not only widening the roadway for dedicating two lanes to BRTS but also improving opportunities for pedestrianisation and junction improvements. It is suggested that GVMC use this as a reason for seeking added right-of-way, thereby not taking away lanes from the general public but adding to public convenience, while removing buses out of general purpose lanes.
- Projects where the proposed BRT systems are for short lengths / short segments experience concerns. Any BRT system should be a multimodal effort with several interchange points to feeder services. Vishakhapatnam BRTS is proposed along 20km and 18km continuous stretches and therefore, provides a viable length of road segment for effective implementation. It is recommended that GVMC mention this key aspect since such a proposition is not only financially sustainable but also physically implementable.
- Systems that have developed in a very short duration may have caught the people by surprise thus adding to the syndrome ‘we did not hear or know about this problem.’ Vishakhapatnam BRTS is likely to not experience this problem because GVMC has already been informing the media and the general public about project progress; and social assessments have been educating the directly impacted citizens about project issues including seeking feedback and opinion; and above all, construction activity will invariably raise public awareness about project aspect.

**Outcome of the Initiatives**

The progress of the implementation can be deemed satisfactory since its inception. The construction of BRTS infra commenced by Dec 2008 and since then we have been able to complete about 10 km each on PTC and STC corridor.

As part of development essential infrastructure facilities on the corridors, GVMC proposes to develop about 25 Foot-over Bridges integrated with modern Bus Shelters (a total of 76 shelters) for the safe movement of commuters at crossings, interchanges, boarding and alighting.

In order to leverage limited resource of GVMC it is proposed to develop the above Fob’s and Bus Shelters on Public Private Partnership (PPP) Model dividing them in to three to four bid packages. The other advantages of the PPP model include:
• The development under PPP model will provide a quality infrastructure with state of the art facilities and bring substantial saving in the capital investment of Government/GVMC.
• Construction, operation and maintenance risks will be transferred to the selected developers.

GVMC would get the revenue share from the selected developers during concession period, in case a particular bid package works out to be commercially viable proposition.

**Figure 30: Metro Bus Service Shelter, JCTSL 2010**

• As per the PPP model, the scope for the selected developer(s) would include the following major project components/activities:
  - Implementing (financing, designing and executing) the proposed Modern Bus Shelter and Foot Over Bridges on BRTS Corridor on BOOT model, Vishakhapatnam
  - Operating and maintaining the facilities for the given Concession Period.
  - Transferring the facilities to GVMC after Concession Period.
• The selected developer(s) will have advertisement rights on the project facilities they create during the entire concession period. Capital cost (debt servicing) and O&M costs would be met from the revenues they receive from the advertisement. Based on requirement, locations of the Bus Shelters and Foot Over Bridges are finalised.
• Based on the traffic intensity including pedestrian movement, the project components of the facilities (i.e. with lift or without lift) are decided.
• Based on advertisement potential, the facilities (locations) are grouped in to individual bid packages.
• Request for Proposals (RFP) would be invited from short-listed bidders for selection on competitive basis. The bid parameter for selection would be concession period quoted.

**Achievements and Results**

The success of public transport initiative in Vizag will result in large number benefits accruing to public directly or indirectly, when the project is made operational in about one year’s time. In all cities in India supply effective public transport has been a forgone and travel
and mobility needs are exclusive in the hands of private vehicles and para-transit services. We are largely unprepared to tackle severe traffic congestion, air pollution, accidents and loss of sense of community.

BRTS Vizag will create a high quality public transport to enhance the mobility pattern and demonstrate that people and community come first. It will increase the modal split in favor of public transport – being the ultimate strategy of the Government of India (MOUD) to promote public transport in the country. The other benefits can quantified at a later date when the system is operational. BRTS will reorganise road space with the segregated MV, NMV and dedicated bus lanes and will enhance road capacity utilisation factors. Dedicated bus lanes will promote public transport and discourage use of private vehicles.

BRTS corridor will cater to all modes of road transport. Also systematic movement of traffic in dedicated lanes ensures smooth flow, frictionless travel, and savings in travel time / cost, minimize accidents and enhances safety. The provision of exclusive segregated NMV lane will promote safety to slow moving vehicles and planned and protected sidewalk facilities will guide the pedestrian safely. The key sustainability indicators will be protection of environmental conditions, energy savings, readiness of people to shift to PT, reduction in road accidents etc.

Sustainability

The annual operational and maintenance cost of the system per annum will be about Rs 25 crore by year 2011 and 39 crore for year 2021. The expected ridership on the PTC and STC corridor will 1.85 lakh by year 2011 and 3.15 lakh by year 2031 passengers daily. The estimated bare box revenue will be about 73 crore per annum by year 2011 and will increase to 125 crore by year 2021. In addition to this about Rs 5 crore per annum can be generated through advertisement rights. Being the Government funded capital intensive project, the operational viability is expected to be sound as the project IRR comes to healthy 41%. This implies that project is operationally quite viable and not only the rolling stock (buses), but other systems (fare collection system and intelligent transportation systems) can also be financed from the fare box revenue and even after that there will be enough in the kitty of SPV - VUTCL to maintain the fixed infrastructure efficiently.

Since an internal rate of return (IRR) of 15% is considered a reasonable proposition to attract investors for financing rolling stocks, a proportion of total revenue is enough to give this kind of return for successful rolling stock concession and maintaining the BRTS infrastructure in efficient conditions.

The profitability of the project was critically analyzed based on variation in the rolling stock cost – impact of +20% and the variation in the project revenue (on account of ridership, fare level and other incomes) of the project. The operational would not be effected even with negatively side sensitivity of key variables under reasonable scenario. The project IRR will off course be very sensitive to the revenue fluctuations. GVMC has taken advance actions on implementing the part of BRT infra like bus stations; grade separated pedestrian facilities, ‘off-street’ parking on PPP mode.

Impact of the project

- The project has been discussed in the MOUD progress review meetings and seminars many times. The project was presented in the international seminar conducted by Indo-German Institute of Advance Technology (IGIAT) and Gayatri College of Engineering, Vizag - promoted and sponsored by;
- Federal Transit Administration (FTA), Washington;
- German Technology for Technology Cooperation (GTZ); since the venue was Vizag, the delegates visited the BRTS corridors and showed keen interest in the project. The project was discussed in many forums in the seminar and received wide publicity and attention.

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Title of Best Practice: 
Public Transport Services through Bus Rapid Transit System and Modern City Buses

State/City: Jaipur - Rajasthan
BP Code: SSS-PT-PPP-2447-0113

Previous Status

Jaipur, the 'pink city of India', is the capital of Rajasthan. It is situated in north-eastern part of the State is surrounded by the districts of Alwar, Sikar, Bharatpur and Dausa. Jaipur is known as one of the first planned cities of India. It had a population of 2.32 million in 2001.

The increased social and economic status of the residents coupled with the inadequacy of public transport system has encouraged the residents to own personalized mode of transport. The data on growth trend of vehicles show that personalized modes such as two wheelers and cars are growing at a much higher rate. Growth of cars is found to be 11.6% and growth of buses 2.3% in 2003-04. Overall vehicular growth has been observed as 9.4%. The public transport system in Jaipur comprises only 6.32% of the total number of vehicles; and caters to only 13% of person trips. When compared with the desirable level of modal split, it was found that the share of mass transport in Jaipur is well below the desired range (50-60%) as per a 2007 MoUD study.

The share of personalized transport and Para-transit is already well above the optimal range creating big constraint for achieving the desired development profile of the city. It works as a catalyst for air quality deterioration, road congestion and reduced journey speeds, wastage of scarce fuels, besides sub-optimal utilization of infrastructure and other resources. The major problems faced by the citizen were:

• Being the only metropolitan city of Rajasthan, the city of Jaipur has a 2.32 million population as per 2001 census, an average annual growth rate of 4.35% and load on transport infrastructure under distress.
• The share of personalized vehicles (2-wheelers, cars and jeeps) increased from 76% in 1985 to 85% in 2003.
• Existing public transport system is characterized by overcrowding, poor reliability, and long journey / waiting period. Also this system is not able to cater to the population and routes of the city.
• There is only a public transport system in the city, which has a fleet of 260 buses of standard size. Most of them are old buses, which are operated by Rajasthan State Road Transport Corporation (RSRTC). Private transport companies are operating mini buses numbering over 1800, which are unsafe, uncomfortable and unreliable, apart from having an ad-hoc operating method.
• 10% annual growth rate of private vehicle ownership in city.
• Pre-feasibility study has estimated the travel demand by 2017 to 4.6 lakhs trip per hour with Public Transport (PT) share of 25-42%.
• Most of the city arterial roads have reached their capacity and have no scope of further widening.

The New Approach

In view of the above, the State Government has planned Bus Rapid Transit System (BRTS), Modern Bus Service and Metro Rail project as Mass Rapid System (MRS) projects for Jaipur. Jaipur Development Authority is the nodal agency for planning and implementation of BRT infrastructure in Jaipur. The BRTS project in Jaipur is being developing and implementing through a Special Purpose Vehicle i.e. Jaipur City Transport Services Limited (JCTSL). M/s PDCOR Jaipur is the overall Project Management Consultant for the project and M/s Consulting Engineering Services Private Limited is technical consultant for infrastructure design.

In order to plan for an efficient and sustainable public transport system in the city, the Rajasthan Urban Infrastructure Development Program (RUIDP), funded by ADB, had initiated a study in August 2005. The study was carried out by PDCOR Ltd with an
objective to plan and develop an Urban Mass Transit System for Jaipur. The scope of work at the study was as under:

- Conducting various primary surveys including traffic surveys, household surveys, road inventory and willingness to pay survey;
- Establishment of the Urban Travel Demand Model;
- Evaluate Alternative Alignments options;
- Recommend suitable Transit System;
- Estimate the Ridership on the Proposed Corridor;
- Examine the Sensitivity of Ridership; and
- Suggesting an implementation framework.

The Final Report of the Study was submitted to RUIDP in March, 2006 and the project was transferred to Jaipur Development Authority in May 2006. As a part of the study, an Urban Travel Demand Model for the city was developed to forecast the trip pattern of the city residents. The traffic forecasts generated from the model, developed for this study, indicate that in case of do-nothing scenario, the traffic conditions will only worsen in future years. The total daily-motorized passenger trips generated in Jaipur in year 2005 is about 27 Lakhs out of which only 18 percent are performed on Public Transportation. More than half of the total motorized trips are performed on two wheelers. The projected travel demand, after taking in to consideration the future settlement pattern and employment clusters, showed significant passenger movement in the east-west and North-South direction.

The total travel demand in the study area by 2021 will be about 62 Lakhs Trips. The road network of Jaipur cannot carry such a large volume of trips as the major arterial roads are presently operating beyond theirs capacities. The existing level of services across major roads is presented below:

In light of all this, it was proposed that there is an urgent need to plan and develop an efficient transportation system in the city which will be safe, comfortable, cost effective, sustainable and also blend with the existing heritage character of the city and will not adversely affect it.

As per the Master Plan of BRTS total 138 km of corridor length has been identified for the system. The project is proposed to be taken in three phases. In first phase, a corridor length of 46.7 km has been selected on priority basis for implementation purpose. Phase-I corridors connect North-South and East-West ends of the City and fulfill major transport needs of the city.

The estimated cost towards the development of road infrastructure for the first phase of BRTS, Jaipur was Rs 587.00 crores (block cost). MoUD, GoI on September 2006, approved the project in principle, for funding under JNNURM. As per the approval given on 20th July 2007, the estimated cost was Rs. 479.60 crores.

* North-South Corridor

**Package I** (C-Zone Bypass to Pani Pech via Sikar Road) of 7.1 km length, having 22 bus stations and Right of Way (ROW) of 40-50 m, with low to medium side friction and light street parking, 9 major intersections with low congestion level, 22, 1 religious structure, connects large residential, and industrial areas and thus have potential for high traffic generation. The construction of this passageway was completed in late 2009 and recently buses have started plying on this corridor.

**Package-II** (Pani Pech to Sanganer Airport via Tonk Road) of about 16 km length has row of 20-40 m, 17 major intersections and medium to high side friction, with 1 existing ROB and 1 existing flyover. An additional length of 2.2 km was added later from Laxmi Mandir Crossing (Tonk Road) to Bais Godam via Ram Bagh Circle. Package -II is divided into Package-IIA and Package-IIB.

**Package-IIA** has 13 Staggered Bus Stops, 3 Island Bus Stops and one Island Bus Station. However, Package-IIB has 21 Staggered Bus Stops, 1 Staggered Bus Station, 1 Island Bus Stop and 2 Island Bus Stations. The study is to cover how best to connect BRTS with Railway Station and Sindhi Camp bus stand.

* East-West Corridor

**Package-III** Transport Nagar to Ajmer bypass crossing via Ajmer Road, of about 13.35 km (sanctioned length), having row of 18-35 m and 14 major intersections on route has very high congestion level along the corridor. This Package is also divided into Package-III-A and Package-III-B. Package-III-A has 31 Staggered Bus Stops while Package-III-B has 8 Staggered Bus Stops and 2 Island Bus Stops. It serves institutional, commercial, walled city, and
residential areas of the city. JDA is developing the corridor. The BRT lanes being in the center of carriageway, the existing overhead electrical lines in the median of the roads have been relocated.

Considering the parking demand and adequacy of ROW along the BRT corridors, on the street parking has been proposed at a number of locations. Service roads of 5.5 m width have been proposed depending upon the ROW available. Spacing the bus stops at an average distance of 500 - 700 meters has been proposed on the BRT corridor (Annex II).

In addition to above, bus shelters handling large commuter volumes and feeder bus services have been planned. The shelters will provide additional facilities, viz. Off-board ticketing, passenger information etc. besides those at the stops.

**Figure 31: The BRTS at Jaipur, Rajasthan**

**Key Features**

- **Salient Features**
  - Low floor buses with manual transmission and inbuilt Passenger Information System;
  - Route rationalization for mini buses;
  - Non-Motorized Vehicle (NMV) tracks along the BRT route;
  - Foot over Bridges provided at mid-block bus stops;
  - No exclusive phases for buses and NMV at junctions;
  - Free left turns at crossing for pedestrians;

- Separate contracts for bus operators;
- Advertisement cum corridor Management;
- Closed System with direct services;
- Railing has been provide on both sides of the BRT corridor to avoid accidents; and
- Rumble strip has been provided to segregate the BRT, up and down bus movement (wherever the median cannot be provided).

- **Intelligent Transport System (ITS)**
  - Passenger information system (PIS) is planned for 'on-board' application, GIS
based system is suggested for vehicle tracking, operations monitoring, 'off-board' PISO.

- System used for data acquisition and process, bill payments and MIS.
- The service quality attributes like punctuality, reliability, vehicle productivity, etc. are also monitored.
- Manually steered and optically guided system is planned to be used for bus guidance and alignment with the platform.
- Automatic Fare Collection.

* Bus Stops / Shelters / Stations

Bus stops/shelters on the BRT corridor have been constructed on By JDA. The details are given below:

- Bus Stops are 35.0 m long and 3.0 wide.
- Bus Stations are 54.0 m long and 3.5 M wide.

These bus stops are planned in such a manner, by which both, up and down lane of BRT Buses can be served with ease.

- Bus stops are planned aesthetically beautiful with adequacy of light and ventilation. The structures are made of Mild Steel Circular Pipes.
- Lots of space is provided in these bus stops for advertisement, which can be a source of collection of revenue.

* Services and Operation

Considering all relevant factors and for providing universal accessibility, the destination oriented service design (Direct) is envisaged where the BRT vehicles, are proposed to operate beyond the BRT corridor up to the high traffic nodes in mixed traffic. The railway station and the bus terminal and other major traffic generating points are planned to be serviced by direct BRT services. The BRT operations are spread over a period of nearly 18 hrs (0530 hrs to 2330 hrs) with on an average; the operational headway is 2 to 4 minutes.

Table 1: Width of Bus, Motorized and Non-motorized Vehicle Lanes

<table>
<thead>
<tr>
<th>Bus Lane</th>
<th>Motorized Lane</th>
<th>NMV Lane</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle side 3.5m wide</td>
<td>7.0 m to 9.0 m</td>
<td>2.0 to 2.5m</td>
</tr>
</tbody>
</table>

Figure 32: Typical Cross Section for 32.0 mt Row
Goals of the Project

- Provision of bus based public transport system in the city.
- Bus priority initiatives: Priority at the junctions, dedicated lanes for the buses.
- Operation of the state of the art and commuter friendly low floor buses.
- Provision of passenger information system through various applications of Intelligent Transport System (ITS).

Implementation Strategies

The State Government has already constituted Unified Metropolitan Transport Authority (UMTA) under the chairmanship of Hon’ble Chief Minister on 16th August 2008. Role of different agencies in Jaipur BRTS is as follows:

* Activities Implemented:

- Conduct of feasibility study for identification of an Efficient Transport System (ETS) for Jaipur.
- Securing approval of DPR from MoUD, GoI under JNNURM
- Formation of dedicated teams in JDA for design and implementation of BRT corridor.
- Packaging of the total corridor length for implementation purpose.
- Formation of a Special Purpose Vehicle (SPV) “JCTSL” to control, regulate and operate the BRT buses.
- Challenges/Constraints Encountered and how it was conquered.
- Required RoW is not available in old city. Most of the roads have less than 30 m. width and corridor requirement is more than 30 m width.
- The average speed of traffic within Walled City is a low of 15-20 kmph. It leads to environmental pollution, accidents and parking problems in City.
- Fears of accident and lack of awareness may lead to unacceptability of the project amongst the public.
- Already existing mini buses are operating on 36 routes and carry about 4.5 lac passengers daily. Fear of losing passengers and profits, mini bus operators and their Route Associations are opposing BRTS.
-Multiplicity of function of government and other working authorities. Expanding economic growth is providing a base for the development of newly emerging upper and middle income classes, demanding access and mobility.
Figure 34: BRTS Corridors, Jaipur

Figure 35: Aerial View of North-South Corridor, Jaipur
Challenges / Constraints Encountered

- Re-routing of 1800 mini buses;
- Lack of understanding of BRT elements by contractor;
- Inadequate RoW on few sections;
- Land acquisition delays the implementation process and land acquisition issues;
- Unavailability of lands for provision of parking near bus stops;
- Unacceptability of one way traffic movement;
- Shopkeepers / property owners habitual to free on-street parking (as they consider it as their right);
- Shifting of existing utilities services;
- Monopoly of bus manufacturers;
- Low floor buses are costly to operate and procure; and
- Financial sustainability of overall operational.

Outcome of the Initiatives

- The BRTS operating on all road corridors having a demand ranging between 2000 Person per Hour per Direction (PPHPD) and 20,000 pphpd and also its lead to considerable reduction of journey times in order to carry out commuters productive activities.
- At large level use of public transport system lead to less air pollution in the city and further it will reflect in the citizen’s health.
- Cost effectiveness in terms of saving in fuels, affordable for users, profitable for private operators, and economically feasible for state.
- Promote continuous improvement in service and guarantee of service quality.
- The study has estimated share of Private Vehicles, Public Mass Transport and IPT will be respectively 30%, 60% and 10%.

Achievements and Results

It may be seen from the above that in the project has been executed successfully and resulted in paradigm shift in urban transport scenario of urban areas of Jaipur. The project has initiated some changes, viz. improvement in travel speed (17 Km in 18 minutes at 25 Km/hr), reduction in accidents (reduced by 12.65 %), reduction in green house gas emission (complying with BS-III emission norms), reduction in noise pollution (as engine is fitted at rear of buses), increase in service frequency (7 to 15 minutes), more geographical coverage (grid system for route designing), reduction in energy consumption etc.

All these changes make the project successful. The reasons for the success are attributed to planning and design: technical inputs like, low floor buses, AC buses, next vehicle display board / system, GPS, on board stop announcement, signal priority on specific signals and ticket system-prepaid / automated.

- Corridor Planning and Design part;
- Technological Inputs like:
  - Low floor Buses;
  - AC Buses;
  - Next Vehicle display Board/System;
  - Automatic Vehicle Location Information System through GPS;
  - On Board Stop Announcement;
  - Signal Priority on specific signals; and
  - Ticket System-prepaid / Automated.
Sustainability

Financial partners are MoUD, GoR, JDA and JCTL. Total capital cost in terms of input (funding pattern): Central Government–50%, Government of Rajasthan–20%, JDA (BRTS Corridor) and JCTSL (purchase of buses)–30%. In order to meet the operational losses from new buses, GoR has constituted a dedicated Urban Transport Fund (UTF) which includes the Advertisement charges, fare charges and property development cost. The Government has also decided to fund an amount of ₹ 10 Crore per annum to City level Transport Fund. In the meantime, the State Government is actively considering other possible streams for this fund.

Semi-low floor and low floor modern city buses are plying on 10 radial and circular routes covering the entire city. These buses also operate on 7.1 km Pilot BRTS corridor which is exclusive for these buses. RSRTC, the State owned unit has been roped in to operate the buses on mutually agreed terms and conditions.

Impact of the project

The successful execution of project has resulted in a paradigm shift in urban transport scenario of the city. Slowly but gradually the required changes in the urban transport pattern of the city can be observed.

The project has lead to improvements, which are summarized below:

- Improvement in Travel speed: The bus travels 7 km in about 18 min, leading to a speed of about 25 km/hr.
- Reduction in accident: The statistics shows that number of accidents has been reduced by 12.65%.
- Reduction in green house gas emissions: The engines of the Modern City buses are complying with BS-III emission norms, which resulted in significant reduction in pollution.
- Reduction in noise pollution: Buses with rear engine are purchased which reduces noise pollution.
- Service Frequency: Buses are operating at a frequency ranging from 7 to 15 minutes. Consequently commuter satisfaction is greater.
- Geographical Coverage: The grid system of Jaipur covers the entire urban area for the BRTS corridor. On JCTSL routes, with one change only, passenger can reach any part of the city.
- Reduction in energy consumption: Savings in energy (fuel) consumption on account of less no. of vehicles on road and decongestion.
- Increase in Overall Capacity of Public Transport Services: 220 rear engine semi low floor (650mm) buses have been introduced in the city for the commuters.
- Color Coding: Each route is assigned a particular shade of color for ease in identification.
- Flat Fare: It is the first city to introduce single flat fare system. The cost per passenger trip is reduced.
- Shifting Pattern of Users: Since July, 2010 ridership on buses has been considerably increased from 55,000 to 200,000.
- Level boarding into city buses from 400mm height BRTS bus stops.
- Staggered BRTS bus stops reduce the effective walking distance for bus commuters.

Figure 38: Schematic Representation of BRT and MRT Interchange

Replicability

In the Master Plan 2025 a provision has been kept for integration of land use with public transport system. Proposed transport system (BRTS, city bus system and Metro) will also strengthen the connectivity of future growth area and satellite towns.

The Government of Rajasthan has approved the Jaipur Metro Rail Project to be executed.
by SPV called Jaipur Metro Rail Corporation Limited incorporated on 1st January 2010. The DPR has been prepared by DMRC Limited. Phase-I of the project is proposed to be implemented in two Stages:

**Stage-I:** The civil work including the Permanent way and electrification for the Line from Mansarover to Chan pole of about 9.25 Kms to be done by Delhi Metro Railway Corporation (DMRC) Limited on turnkey basis.

An agreement for this has been executed on 05-08-2010 between JMRC and DMRC.

**Stage-II:** Proposed to be executed on PPP basis. A total work of about 25 Kms metro rail line and the operation and maintenance of the entire project will be executed. The process of selection of consultants for the purpose, on the guidelines of the Ministry of Finance and Planning Commission - GOI, has been started.

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Title of Best Practice:
Innovation in Urban Transport - Bus Rapid Transit System

State/City: Pimpri Chinchwad - Maharashtra
BP Code: SSS-PT-PPP-1670-0113

Previous Status
The city of Pimpri-Chinchwad is situated northeast of Pune, 160 kms from Mumbai, the capital city of Maharashtra. It is predominantly an industrial area, which has developed during the last four decades. Industrialization in Pimpri-Chinchwad area commenced with the establishment of Hindustan Antibiotics Limited in 1956. The establishment of the Maharashtra Industrial Development Corporation (MIDC) in 1961-62 considerably facilitated industrial development in the area.

The city has seen tremendous growth in the last few years owing to its proximity to the IT hub of Pune. The existing road network is unable to address the expected future growth of city. Currently there are more than five lakh registered vehicles plying on the roads of Pimpri-Chinchwad Municipal Corporation (PCMC). A steep increase in the ownership of private vehicles has been observed over the last five years.

Moreover, the current public transport (buses) is not able to address immediate as well as future demands of commuters within the city as well as those traveling to nearby Pune city. With two-wheelers having a modal share of 68%, roads are congested in many important locations. For example, PCU count on old NH-4 ranges from 6,000 to 10,600 PCU’s on Old NH-4.

Presently, the use of roads in PCMC is driven by the industrial clusters in the area. This might change with the development of IT sector in the overall region, along with the Pune area. It has also been observed that some industries are moving out of the city limits leading to a change of the land-use of their estates from industrial to residential or commercial. All these factors impact the transportation profile of PCMC.

The public transportation system in Pimpri-Chinchwad has not been able to provide the best services to its citizens. This has lead to steep increase in private ownership of vehicles, especially motorized two wheelers. Poor connectivity and poor frequency of public transport has also encouraged large size auto rickshaws (seven-seater) to ply along the main corridors in the city, which has lead to a thriving para-transit mode of transport. These factors are leading to congestion of roads in the city. In order to have an efficient public transport system, it has become necessary to also have physical infrastructure with high levels of service.

There is urgent need to address the main issues of patronage of public transport, poor level of service of the road network in PCMC and future traffic congestion on city roads caused by private vehicles. To address most of these urban transport problems being faced by PCMC currently and those anticipated in the future, a Comprehensive Mobility Plan (CMP) has been undertaken, which proposes a bus based rapid transit system spread across the city of Pimpri-Chinchwad along a road network with high levels of service.

The two main components of the CMP were - Traffic study and Land-use study. By integrating the traffic study along with the land-use planning and undertaking a detailed analysis of demand on high-density corridors, the following information was arrived at using the traffic model. It presents the demand for a public transit system along important road corridors in PCMC area.

A bus-based rapid transit system suits the above magnitude of demand (about 2,000 PHPDT), and therefore, a BRT system has been proposed in the CMP. The proposed BRT system addresses immediate needs of reduction in traffic congestion at many locations in the city. It also addresses long term needs of an efficient public transport system for the growing city of Pimpri-Chinchwad.

The New Approach
The city is still in the growing phase and a transportation and land-use study was undertaken which recommended a well-planned public transport system. This includes improvement of existing road network of the
city. Based on the PHPDT arrived at from the traffic study, a bus-based public transport system has been proposed.

The road structure within PCMC was also analysed as part of this study for its hierarchy, continuity and topology and it was observed that the existing road network of PCMC is highly fragmented at primary and secondary levels. Through this study, PCMC is proposing to improve its existing road network and also provide a public transportation system in the form of a BRT system along its major roads. The proposed BRT system consists of a network of corridors across PCMC area. The corridors have been selected based on criteria such as travel demand, hierarchy of road, existing bus-routes.

A detailed feasibility report was prepared which was approved by MoUD for grant of funds to the project under JNNURM. The report uses a transit-oriented city development planning approach where the transportation needs of the city have been integrated with urban planning. The project envisages improvement of the road network in the city.

### Table 2: The road network from east-west corridor

<table>
<thead>
<tr>
<th>S. No</th>
<th>Road Name</th>
<th>Length Proposed (km)</th>
<th>Proposed RoW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1 Corridors (Trunk Routes)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Aundh-Ravet Road</td>
<td>14.4</td>
<td>45.0</td>
</tr>
<tr>
<td>2</td>
<td>Old NH-4</td>
<td>14.6</td>
<td>61.0</td>
</tr>
<tr>
<td>3</td>
<td>Telco Road</td>
<td>12.0</td>
<td>61.0</td>
</tr>
<tr>
<td>4</td>
<td>Dehu-Alandi Road</td>
<td>14.5</td>
<td>45.0</td>
</tr>
<tr>
<td>5</td>
<td>Nashik Phata to Moshi Road</td>
<td>10.4</td>
<td>61.0</td>
</tr>
<tr>
<td>6</td>
<td>Hinjewadi to Dehu-Alandi Road</td>
<td>13.3</td>
<td>30.0</td>
</tr>
<tr>
<td>7</td>
<td>Kalewadi-KSB Chowk-Dehu Alandi Rd</td>
<td>13.2</td>
<td>45.0</td>
</tr>
<tr>
<td>8</td>
<td>Vishrantwadi/Pune-Alandi</td>
<td>11.6</td>
<td>60.0</td>
</tr>
<tr>
<td>9</td>
<td>Nashik Phata to Waked</td>
<td>7.8</td>
<td>45.0</td>
</tr>
<tr>
<td>10</td>
<td>Kiwale to Bhakti Shakti</td>
<td>11.8</td>
<td>30.0</td>
</tr>
<tr>
<td>Level 2 Corridors (Feeder Routes)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Hinjewadi to Tata motors</td>
<td>10.3</td>
<td>30.0</td>
</tr>
<tr>
<td>12</td>
<td>Bhakti Shakti to Tailade</td>
<td>11.3</td>
<td>45.0</td>
</tr>
<tr>
<td>13</td>
<td>Pradhikaran</td>
<td>10.6</td>
<td>45.0</td>
</tr>
<tr>
<td>14</td>
<td>Road Parallel to Aundh-Ravet</td>
<td>8.4</td>
<td>30.0</td>
</tr>
</tbody>
</table>

PCMC has a road network of about 1300 kms and proposes a high quality public transport system in the form of BRTS. These corridors will have road widths of 45 m - 60 m and will comprise dedicated lanes for bus-based mass transit, separate lanes with grade separators for through traffic, service lanes for local traffic, underpasses, walkways for pedestrians and separate lanes for bicycles. State-of-the-art buses of international standards will ply on the dedicated bus lanes with five minute frequencies during peak hours.

### Goals of the Project

- To provide better public transport facilities to commuters through a BRT system
- To improve service levels of road infrastructure in the city
- To address requirements of next 30 years

### Implementation Strategies

An area of 100 m on either side of the above corridors has been designated as BRT corridor zone. No street-side parking will be allowed in the BRT Corridor zone. The development Control Rules in this zone have been modified to provide 100% extra parking, which includes 25% provision for public parking to be managed by PCMC. In addition, hawker zones will be designated; transit interchanges and wireless Internet connectivity will be provided. Work has been completed for NH-4 Corridor (Mumbai-Pune Highway). Work is under progress for Aundh-Ravet Road, Kalewadi-KSB Chowk – Dehu Alandi Road and Nashik Phata to Waked.

* Strategy Used to Achieve the Desired Goals

- Increasing carrying capacity through widening and improve riding quality through strengthening of existing roads.
- New roads to cater to missing links and developing areas and present the urban face of the city.
- Efficient, safe and accessible mass transportation system for entire region.
- PCMC plans to interact with operators of intermediate public transport modes (auto-rickshaws).
- Higher order infrastructure for attracting densification in 100 meter either side of zone:
  - 24/7 water supply
  - 100% sewerage provision
  - Dust Bin free zone
- Road design in identified zone:
  - Service lanes for mobility of local traffic
  - Provision for pedestrians – under pass, walk ways
  - Provision for non motorized vehicles – cycle track
- Facilities for vehicle parking in zone:
  - 100% extra parking;
  - 25% to be handed over to PCMC for public parking
- Others facilities:
  - Wi-Fi connectivity
  - Hawker zones
- Awarded contract on PPP basis for road furniture through advertising rights offered for 5 year on specific period:
  - Bus stops
  - Public toilets
  - Landscaping
  - General Maintenance

Figure 39: Map Identified road corridors in Urban Mobility Plan for improvement

![Map of identified road corridors](image)

Figure 40: Road Designs in identified Areas (A-B)
Activities Implemented to Achieve the Desired Goals

Detailed Project Reports have been prepared for improvement of road corridors, which include dedicated lanes for a BRTS. A number of experts in the field were consulted before designs were finalized. One of the project corridors has already been commissioned while the others are under implementation. PCMC has also formulated an Urban Transport Fund (UTF) which will ensure that the ULBs contribution to capital expenditure is addressed smoothly.

Main Features of the Approach:
- Does not release additional Floor Space Index (FSI) in the city; only realigns the FSI from other zones to BRT Corridor.
- Will protect the value of TDR and make it more attractive hence encourages implementation of DP.
- PCMC can plan higher order infrastructure in BRT corridor and facilitate focused service provision by densification.
- Ensures the attractiveness of mass transit and protection to environment.

Public Private Partnership for Road Furniture
- Awarded contract on PPP basis for road furniture like Bus stops; Public toilets; Landscaping; and General Maintenance.
- Advertising rights offered for 5 years on specific locations on Mumbai Pune road-12 kms.

New Approach of Revenue Generation

Pimpri Chinchwad Municipal Corporation (PCMC) has developed a unique financing model for the development of BRTS corridors. Through this model, PCMC has created a new revenue stream along with dovetailing of specific incomes into an Urban Transport Fund (UTF) that is managed by PCMC Infrastructure Company Limited (PCIC). PCIC will construct, operate and maintain the BRTS corridors through funds generated by the UTF. PCIC has been formed to construct BRTS corridors in a focused manner and to leverage the UTF to borrow from The World Bank – Sustainable Urban Transport Program, Asian Development Bank’s non sovereign funding and term loans from domestic financial institutions for funding the construction of BRTS corridors (Annexure VIII for Innovative Funding Model of PCMC).

A zone of 100 meter on either side of the corridor designated as BRT influence zone / BRT Corridor Zone. Revenue sources accorded to the UTF from BRT Corridor Zone:
- Revenue Ceiling FSI raised to 1.80 from existing 1.0.
- Allowed Transfer of Development Rights (TDR) from other zones to BRT corridor on payment of premium.
- Other incomes like advertisement, incremental property tax, lease rentals on utilities.
- Total Income potential of BRT Corridors – Rs. 2945 Crores.

Challenges / Constraints Encountered

The project is under initiation and the completed BRTS is not yet fully implemented. One infrastructure road corridor completed with lots of financial constraints with cost escalation.
Outcome of the Initiatives

- Hassle free travel on the roads and effective transportation system with easy access to everyone.
- One corridor has been completed for NH-4 (Mumbai - Pune highway) in October 2008.
- Work is under progress for Aundh-Ravet Road.
- Work orders have been given for Kalewadi-KSB Chowk-Dehu Alandi Road and Nashik Phata to Waked.
- The urban transport fund is operational and it is budgeted to earn an income of ` 80 crores in the current financial year 2010 – 11.
- PCIC is operational and it is currently augmenting its operations.
- PCMC has tied up 43.703 Million US$ of borrowings from the World Bank under the Sustainable Urban Transport Program.
- PCMC is in an advanced dialogue with the Asian Development Bank for a line of credit aggregating to 100 Million US$ under the Non Sovereign funding route for the PCIC.
- PCMC along with PCIC is currently constructing 60 kms of BRTS corridors, forming the first phase of urban mobility projects as per PCMC’s Comprehensive Mobility Plan. About four BRTS corridors have been approved by the JNNURM.

Achievements and Results

- Financial sustainability exists in the project.
- Project linked with the Urban Mobility Plan and will lead to future development of the city.
- Detailed planning and design concept / plan have been considered by Municipal Corporation.

Sustainability

- The road network designed to cater to future growth patterns of the city.
- PCMC’s own sources of finances.
- PCMC has created Urban Transport fund – Revenues from advertisement, parking and revenue from additional development rights (TDR) are part of the urban transport fund.
- PCMC has approached World Bank for borrowing funds and the same has been sanctioned.

Figure 43: BRTS Corridor after implementation of the project

Impact of the project

- In view of the inadequate public transport, increasing number of private as well as para-transit transport modes leading to congestion on the roads of the city, a Comprehensive Mobility Plan was prepared, which proposes a bus rapid transit system along a road network with high level of services. This system / project envisages road network from east - west corridors in two level corridors, i.e. level 1 Corridor having 10 trunk routes and level 2 has four feeder routes.
- These corridors will have road widths of 45 to 60 meters and will comprise dedicated lanes for bus-based mass transit, separate lanes with grade separators for through traffic, service lanes for local traffic, underpasses, walkways for pedestrians and separate lanes for bicycle. The project is PPP based in which public is represented by PCMC Infrastructure Company, a SPV, to prepare plan, construct, operate and maintain the BRTS corridor. The funds are generated by the Urban Transport Funding which premium on loading of Transfer of Development Right (TDR) is a robust source of revenue. Pune Mahanagar Parivahan Mahamandal Ltd. (PMPML) is responsible for managing facilities and services (operating buses).
- Contracts on PPP basis have been awarded for road furniture, viz. bus stops, public toilets, landscaping and general
maintenance. Advertisements have been offered for 5 years on specific locations on Mumbai-Pune road (12Kms).

- At present, the project is under implementation stage, one corridor has been completed for NH-4 in October 2008, with lots of financial constraints with cost escalation. It is expected that the city will have hassle free travel on the BRT corridors with effective transportation system.

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Title of Best Practice:
Construction of BRTS Stretch from RTO to Pirana

State/City: Ahmedabad - Gujarat
BP Code: SSS-PT-PPP-0812-0113

Previous Status

The city of Ahmedabad, founded in 1411 AD as a walled city on the eastern bank of the river Sabarmati, the commercial capital of Gujarat is now the seventh largest metropolis in India and the largest in the state. Ahmedabad city covers an area of 466 sq.kms and accommodates about 6 million people. There are about 2.2 million vehicles registered in the city. Car and 2-wheelers ownership rates are about 50 and 115 per 1000 persons. There are about 60000, 3-wheelers plying on the city roads.

The city with its well integrated Landuse and transport system, functions in an efficient manner. The average trip length is about 5.6 kms and travel times are about 18 minutes. Road fatalities are among the least (235 in 2011) which are comparable to that of developed countries.

The city with its special focus on transit, took several initiatives to augment transport supply, both in quality and quantity terms. Augmenting fleet, fuel switch for Integrated Public Transport System (IPTS) and introduction of Bus Rapid Transport System (BRTS) are major initiatives. Janmarg – BRTS, a JnNURM project is the first full BRTS of the country and has become a popular mode choice for people of Ahmedabad.

New Approach

Janmarg, BRTS in Ahmedabad consists of several components designed to function together so as to generate superior services, which are comparable with other world class mass rapid transit systems. BRTS Ahmedabad is a fast, reliable, secure, high capacity service, which also has a distinct identity. The system has been in operation for the past two years and carries about 135000 passengers daily with fleet of 82 buses (incl. 11 AC buses) over 45 kms of BRTS network with commercial speeds over 24 kms per hour.

The bus stations are located on the median. Average spacing is in the range of 500-600 meters apart. Stations have been provided for ticketing, display, audio systems and other support infrastructure. The stations are accessed at-grade through signalised zebra crossing. They are accessible to the physically challenged. Off-board ticketing system is in place. Stations have facility for docking 4 numbers of buses (2 up and 2 down). The bus stations are designed such that docking is perfect with the gap between bus and station not exceeding 4 inches. The station doors are synchronised with bus doors and are operated through a switch under the control of bus operator (driver).

By the year end, it is expected that another 10 kms will be added to the operational corridor.
taking the BRT corridor length to a total of 55 kms. Operational fleet is likely to increase to 125 buses.

The services are managed by Ahmedabad Janmarg Limited (AJL), a special purpose vehicle. The services are operated between 6:00 am and 11:15 pm. At present five routes are operational with peak headways ranging from 5 min to 10 min. The BRTS trunk segment has cumulative peak headway of 142 sec.

Key Features:

* Connectivity to important origins and destinations - The proposed BRT network connects the important origins and destinations and transit points like Railway stations, regional bus terminals, university areas, industrial areas, residential (Lower Income Group, Middle Income Group, Economically Weaker Section) and commercial hubs of the city and recreational public spaces like Kankaria lake front that is recently pedestrianised.

* Low income and low accessibility zones - The corridor also provides connectivity to the lower income housing areas and increases accessibility for the lower and middle income groups.

* Public Private Partnership (Arrangements in AJL) - The Ahmedabad Janmarg, during this two year period, has successfully delivered the BRTS using several indigenously developed methods and innovations. The rating of the system by public has been in the range of 8 to 9.5 out of 10 points. The emphasis of this submission is on bus procurement, operations and maintenance through PPP. The model has been studied for adoption by several other cities including Surat and Delhi.

Figure 19: BRT Network - Accessibility to important origin and destinations and transit points
Goals of the Project

The main goal was to redesign the city structure and transport systems towards greater accessibility, efficient mobility and lower carbon future. The vision focuses on:

- Reducing need for travel
- Reducing the length of travel
- Reducing automobile dependence

Implementation Strategies

The implementation model of the BRTS Ahmedabad rests on four principles, namely (i) Project ownership by the City Government, (ii) local control, (iii) partnership with local institutions and (iv) maximum use of private sector

* Project Ownership by City Government

The BRTS in Ahmedabad is an initiative of the local city Government, namely the Ahmedabad Municipal Corporation (AMC) and is recognised and accepted as such. The ownership, implementation and operations is the responsibility of the AMC. While this is not completely unique, urban transport as a function in India has traditionally not been handled by local city Governments. Ahmedabad itself though has long been an exception, where the Ahmedabad Municipal Transport Service has served the city's transport needs since independence. This tradition has translated automatically into an acceptance of the role of the local Government when it came to the BRTS. The seamless integration of the physical site on which the BRTS is situated, and the service itself, can be attributed to a significant part to this common ownership. This is in contrast to many other cities where the tradition of parastatals being responsible for the urban transport function has led to new parastatals being created for specialised bus services like the BRTS.

* Local Control

Another feature of the implementation model was the creation of a Special Purpose Vehicle in the form of AJL. The AJL, a 100% subsidiary of the AMC, while being under complete local control, was allowed for required flexibility of decision making. With the presence and active participation of both the Mayor and the head of the local opposition on the Board, it did so without abandoning the democratic process.

* Partnership with Local Institutions

Another feature of the implementation model was the AMC's partnership with the local institution, namely Center for Environment Planning and Transport (CEPT) University, as its principal consultant. Not only it accentuated the sense of local involvement, it also allowed a local institution to strengthen its own knowledge base and expertise in a key area like Urban Transport. As a result of this partnership, CEPT University was able to successfully argue for, obtain and develop as one of the four Centers of Excellence in the Urban Transport.

* Maximum use of Private Sector

While taking up the responsibility of the ambitious project, the AMC was well aware of certain organisational limitations. The legacy of public ownership combined with the complex task of managing the urban chaos of a city had, like similar organisations across the country, allowed it little time over the years for institutional strengthening. Thus while the SPV structure allowed fair amount of flexibility, building an organisation with in-house strengths to run a modern transport system was recognised as being either too costly in employee legacy costs, or requiring more time that could be afforded.
This led to a conscious decision to bring in private sector labour, expertise and entrepreneurship in all possible functions, starting from simple outsourcing assignments, to more complex forms of PPP through appropriate contractual structures. While certain risks are not yet passed on the private sector (e.g. market or traffic risk) and is still on the public sector, it is done only in cases where it is felt that the private sector industry is not mature enough to assume these risks at this stage of the project. However many risks such as procurement, technology, design etc are passed on. AJL achieved a fair bit of success in these attempts in the end, though not without its own share of setbacks.

Other important principles of the BRTS model were:

* Use of IT Applications

The network connects central city with traffic generators such as transit terminals, markets, industries and institutions. It uses integrated transit management system (ITMS) extensively including the following major components:

- Passenger information system,
- Vehicle tracking system (Geographical Information System (GIS) / General packet radio service (GPRS) based)
- Electronic Fare collection system
- Area Traffic Control System (ATCS), Traffic signal management

Extensive use of IT applications provides useful data for efficient monitoring and operations. Janmarg has made effective use of Intelligent Transportation Systems in order to constantly maintain the benchmark of operations and service quality. Efficient use of intelligent transport (IT) system provided high quality; reliability and rapid bus based mass transit system that is first of its kind in India. Comprehensive planning of the usage and type of technology has ensured the system to be successful in providing rapid mobility for the people of Ahmedabad. Two control centers equipped with IT infrastructure has been made operational to closely control and monitor Janmarg operations (bus and Traffic).

* Passenger Information System

Passenger information systems like announcement systems in buses, light-emitting diode (LED) display systems in every bus and bus shelters provides the expected time of arrival and other necessary information to the passengers. LED display and Audio announcement system in buses inform about the details of next bus stop arrival. Other information related to public conduct, cautionary measures on-board, etc. are also communicated to passengers on board through this.

Figure 21: Passenger Information System

* Vehicle tracking system (GIS/ GPRS based)

Specially designed buses equipped with GPRS device and the technology allows the vehicles to be tracked. Automatic vehicle tracking system provides real time tracking for all the buses in operations and are monitored closely from the central control room of Ahmedabad Janmarg Ltd. The buses now operate at a frequency of around 145 sec. headway.

Extensive use of IT systems with BRT system characteristics like segregated bus lanes, level boarding etc. saves travel time and make the system more competitive with other modes. It also provides data that improves efficiency of operations. Adherence to schedule of individual trip of buses is ensured each and every time. Vehicle speeds are monitored and controlled/ increased based on site specific situations like bus bunching locations, accident affected areas etc. Bus breakdowns (if any) can be immediately tracked and responded to by the technician.

Various reports of monitoring are generated on daily, weekly and monthly basis that allow for continuous planning of BRT operations.
• Punctuality report highlights performance of buses, system operators (drivers) and system reliability
• Trip detail report highlights actual and scheduled bus (in kms.) travelled. Missed trip data, in case of bus breakdown (if any) is also recorded in this report. Quality of bus operations is maintained and penalties are accounted based on this monitoring.
• In case of disaster, Janmarg can receive immediate information and can work out disaster recovery on time.

* Electronic Fare Collection

Off-board fare collection ensures that the ticketing happens before one enters the bus shelters. Closed system of operations, off board fare collection, at-level boarding/alighting reduces delays. Smart cards are being introduced in the system to reduce the time consumption for ticketing process further and increase passenger flows in and out of the system.

Passenger details report highlights boarding-alighting data for each station that is recorded on real time and hence can generate O-D matrix at every bus station across all timelines of day. This data is extremely useful for continuous planning of supply and demand. Apart from this, a lot of critical information mentioned below is availed through electronic fare collection system:

• Revenue per passenger
• Trip length
• Average trip length
• Link analysis leading to estimation of Peak Hour Peak Direction Traffic (PHPDT)
• Passenger travelled (in kilometers)
• Volume of passenger inflow and outflow at every station (boarding-alighting)

* Area Traffic Control System (ATCS), Traffic signal management

Encumbrance free operation of BRTS buses in exclusive lanes is a predominant feature of this system. Physical barriers of BRTS lanes by means of median, railing and landscaping is providing necessary segregation but faster mobility is possible through advance engineering technology.

For this purpose BRTS corridors and specially designed intersections will be managed by Traffic Signals. All the bus shelters and pedestrian crossings are also having similar signal system to increase safety of bus commuters and pedestrians. All installed signals differ with customary traffic signals as it has intelligent system for operation and it is known as Area Traffic Control System – ATCS. Ahmedabad Municipal Corporation has introduced such system for 93 (65 BRTS and 28 non BRTS) intersections.

In the BRTS operational network, there are 52 open intersections which are controlled by ATCS, and further enhance the efficiency of BRTS operations. This ensures smooth movement of vehicles at the junctions and adheres to constant vigilance.

* Intersection Management

Geometrics of all intersections of BRT corridor are designed based on traffic pattern, available RoW, location of intersections in overall road network and Phase wise execution of BRTS corridors. As mentioned above all have traffic signals to control and manage BRTS Buses and mix traffic too.

Principal aspects of designing these traffic signals system is increase mobility and reduce delay at intersection. This is possible only if no. of phases in each signal cycle will be minimized. For the same purpose segregated phase of BRTS buses in signal cycle has been eliminated for the intersections having BRTS for two arms only (i.e. Intersections where two BRTS corridors are meeting each other, separate signal phase for BRTS buses will be there). This will also provide lesser delay for mix traffic. For each intersections signal cycle length, nos of phases etc are designed by using state of the art technology SYNCHRO 6.0.

* Figure 22: BRT Area Traffic Control System
Service Enhancement and Reliability through ITS Intervention – Janmarg Experience AJL through its ITMS initiative has brought in several innovative solutions leading to safer, faster and reliable transit services to its commuters. The solutions range from wireless station door operations by driver, RFID based docking system, real-time networked systems for ticketing, Real-time GPS based vehicle tracking system enabling Passenger Information System.

The integrated systems allow transit managers to plan and manage transit services in a highly efficient manner. This is primarily achieved by the analysis of data carried out at central control centre through specialized reporting structures which analyze data in multiple dimensions leading to feedback and decision support capabilities extended to transit management.

Major components of ATCS include:

- Traffic Signal Controller
- Vehicle Detectors (Through Embedded sensors)
- Communication Network
- ATCS Application Software
- Central Control System (operational)
- Signal synchronization

Figure 23: BRTS Corridor – Before and After (A-C)
Outcome of the Initiatives

- **Janmarg** is the first full BRTS system in India operated as a closed system. ‘Networks and not corridors’ and ‘connect busy places and avoid busy roads’ have been basic principles for selecting 90 km long network. The network connects central city with traffic generators such as transit terminals, markets, industries and institutions.

- Integrated transit management system: It uses ITMS. IMTS includes transit signal management, smart card integration, passenger information system, GIS on the buses.

- Level boarding alighting: Dedicated right of way for the buses and stations with level boarding saves travel time for the buses and make the system more competitive with the auto travel.

- Complete streets: BRTS streets are complete streets with dedicated bus lanes, cycle tracks, pedestrian facilities, personalised vehicles and optimum parking. It enhances quality of life for all citizens.

- Disabled friendly: For people with disability, access to BRTS stations is now easier with ramps, level boarding and better buses.

- Trail run of BRTS was conducted over three month period. The major objective of trial runs was to allow the passengers to understand the system and its applications. During trial runs, 14 buses with 6 min. frequency for 6 hours in the morning and 5 hours in the evening. Around 18,000 to 20,000 passengers were used the service daily.

- Public private partnership - Bus procurement and operations through private participation on gross cost contract.

*Figure 24: Increment in Ridership of BRT, Model Shift to BRTS and Purpose of Trips (A-C)*
Achievements and Results

- Improved air quality: Reduction in RSPM level from 198 microgram /m3 to 82 microgram /m3 by 2008
- Increased Public Transport Patronage
- Regular transit (AMTS) from 3,20,000/day in 2005 to 8,34,000 in 2010
- Accessible BRT with 34.5 Kms exclusive corridor 16 hour operation, with 45 buses, trial run- 18670 passengers/day increased ridership to 83000 per day. (women, old aged and physically challenged seem to patronage the system more!).
- Peek BRT Commercial speeds of 25-27 kms/hour
- Safer Streets (The city of Ahmedabad ranks very high on road safety account with annual road fatalities being less than 200. Comparable figures for other cities are: Surat-267, Bangalore-840, Hyderabad-424, Delhi>2500, London-204 and Singapore-190
- Well lit, quality pedestrian and NMT facilities along 40 kms of phase-1 BRT corridor, signalized pedestrian crossings every 200 meters
- Changed work culture leading to efficiency PPP
- Better traffic management

Sustainability

- Services are operational during 6 am to 11pm
- 45 buses are being operated and each bus travel for 232 kms/day
- Ridership doubled during these four months (from 17-18000 passengers/day in the first month to 37-43000 in the 4th month and 80-83000 in the 12th months.)
- Commercial speeds went up from 24 kmph to 27 kmph during peak hour
- Revenue per bus increased from Rs. 3800 per bus per day to over Rs. 10000 per bus per day (more than double that of regular transport service)
- Large mode shift has taken place. More than 57% BRTS users are new bus users.
- Earlier they were using 3-wheelers (25%), 2-wheelers (15%), Car (8%) and walking and bicycling (10%).

Impact of the Initiatives

- Reliability: 83% of arrivals were on time. 4% arrived before time and 13% delayed.
- Reducing in accidents
- Major reduction in accidents on the corridor has been observed. On an average 3-4 minor accidents in Ahmedabad involve BRTS buses. There were 7 fatalities involving BRTS buses during two years of operation. 113 minor accidents occurred during two year period.
- Driver training and retraining and safety audits are undertaken periodically.
- Reduction in greenhouse gas emissions
- Average speeds went up from 16 to 24 for both bus and other users.
- Modal shift in favour of BRTS (of the current BRTS users about 45% are from non-bus modes)
- Motor cycles - 13%, cars - 2.8%, 3-wheelers - 21%
- New network distributes traffic to keep trip length short
- CO2 reduction - 15%
- Reduction in air and noise pollution
- Air quality, despite increase in number of vehicles, has remained under the norm along BRTS corridors mainly due to change in composition of vehicles.
- Reduction in: PM-18% - NOX-20%
- Reduction in energy consumption
- Fuel Consumption: Ratio of fuel consumption of AMTS and BRTS buses per passenger kms is 1:0.65. Environmental benefits are evident.
- Any other benefits
- System wide impacts include relief from congestion, improved safety, maximization of the ridership serving the needs of the poor, to provide opportunities for transit-oriented development/ promote compact city, and enable integration with other modes.
- Ridership went up from 17000 /day in the first week to 135000 in the last week.
- With start of Feeder to central city, ridership is expected to go up to 1, 60,000/day.
- All sections of the population use BRTS
- Project outline with key features
- Before implementation - AMTS buses operating over 195-210 kms with an average passenger of 975 per bus per day
with a revenue per bus @ 3450/-. About 25% subsidy is to be given by AMC.

- After implementation BRTS buses operating over 260 kms with an average passenger of 1700-2000 per bus per day with revenue per bus @ 10000/- per day. All bus and bus operating costs are recovered up to 95%.

* Estimated cost/actual cost on completion

* PPP components have brought about 60 Crores of investment from private sector.

<table>
<thead>
<tr>
<th>Box 2: Contribution By</th>
<th>% Share</th>
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</thead>
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<tr>
<td>Centre</td>
<td>35% contribution from Govt. of India</td>
</tr>
<tr>
<td>State</td>
<td>15% contribution from Govt. of Gujarat</td>
</tr>
<tr>
<td>Urban Local Body</td>
<td>50% contribution from AMC, Ahmedabad</td>
</tr>
</tbody>
</table>

* PPP Model - Nine elements of which bus and ITS are important
  - Bus Procurement, Operations and Maintenance
  - Integrated Information System including Automatic Ticket ingrained Vehicle Tracking System
  - Supply and Service Contracts for Bus Station Sliding Doors
  - Supply and Service Contracts for Turnstiles and flaps barriers.
  - House Keeping and Cleaning of Bus Stations
  - Management of Pay and Park facilities
  - Lease of Advertisement Rights
  - Development and Maintenance of Landscape
  - Maintenance Contracts for Bus Stations (Civil Works), Lighting of Bus Stations and Corridor, Monitoring and Maintenance of BRTS Corridor (Civil Works)

**Recognition**

- MoUD Awards: The Best Mass Transit Project under JNNURM for the Year 2008-09.
- 2010 Sustainable Transport Award
- Award for Outstanding Innovation in Public Transport-2010, instituted by the International Transport Forum (ITF) and the International Association of Public Transport (IATP).
- “Best new innovation project” award under Jawaharlal Nehru National Urban Renewal Mission (JnNURM) for Excellence in urban transport for the year 2010.
- International award for “PTX2 Knowledge and research award 2010” to CEPT-CoE and “Daring ambition 2010” to JANMARG - Ahmedabad BRTS At UITP annual convention, Dubai.

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Title of Best Practice:
Bus Rapid Transit System

State/City: Vishakhapatnam - Andhra Pradesh
BP Code: SSS-PT-PPP-0103-0113

Previous Status

Vishakhapatnam (Vizag) is second largest city of Andhra Pradesh with an area of 550 km². It is primarily an industrial city, apart from being a port city. It is also home to the Eastern Naval Command. Vizag is a cosmopolitan mix of people from various parts of the country. The city doubled its population from 1990–2000 owing to a large migrant population from surrounding areas and other parts of the country coming to the city to work in its heavy industries. As of 2001 India census, Vishakhapatnam had a population of 1,329,472.

Currently, about 4.5 lakh registered vehicles ply on the city roads in Vizag City, 90% of which are cars and motorized two-wheel vehicles (MTWVs). The demand for travel is predicted to grow to 16 and 28 lakh trips per day by 2011 and 2021 respectively. Similar to other UAs, in the near-future road capacity is going to be a major constraint for mobility in Visakhapatnam. Transport network in the city will not only require expansion but widening and strengthening of the existing road network. The city’s transport master plan has identified and planned a phase-wise implementation of mass public transport systems.

As a precursor to the detailed corridor design effort, a Detailed Project Report (DPR) was prepared which identified eight corridors of about 100 km for BRTS implementation. Given the rate at which the city is growing as a commercial, industry, and tourism hub set along the coastline of the Bay of Bengal, the proposal to develop and implement a comprehensive BRT system is justified.

The New Approach

While several mass transport options are available, BRT systems are chosen with the specific intent to balance the cost aspect with the appropriate method of delivering quality public transport services in the city. Amongst the domain of high capacity public transport systems available world-over, it has been concluded that the transport demand forecast on the major travel corridors in Visakhapatnam can be managed by a medium capacity public transport system such as a Light Rail Transit System (LRTS) or BRTS with dedicated bus lanes.

Given the rapid growth of the country and increasing urbanization of UAs, strengthening of traffic and transportation systems in the nation and especially UAs will be a key challenge. Visakhapatnam is also experiencing immense growth and is on the horizon of launching itself as a major economic and commercial centre in the state and the nation. Keenly aware of the growth aspects, GVMC have been proactively addressing the needs of the city by adopting a comprehensive approach to plan, augment and streamline transport demand and supply.

Consistent with its philosophy to develop a viable and sustainable transport system for the city, GVMC has endeavored to augment the supply of mass transport services at an affordable cost, and provide impetus to riding on public transport thereby encouraging personalized vehicles to shift modes. The city has been actively working towards creating a sustainable inter-modal transportation system.

Goals of the Project

- To provide all possible options to plan the system with the commuter’s perspective a decision has been made not to compromise with space requirements for dedicated bus, motorized Vehicle (MV), Non-motorized Vehicle (NMV) lanes and safety aspects of pedestrian traffic.
- To augment transport supply at an affordable cost to the citizens.
To prepare a comprehensive parking plan in place and will be implemented with control on demand and fiscal measures.

**Figure 25: BRTS Corridors in Vizag**

![BRT Corridors in Vizag](image)

**Implementation Strategies**

Strategy Used to Achieve the Desired Goals

- Project design features are detailed below:
  - Min 30 m section at mid-block section;
  - 36 section at stations / junctions;
  - Dedicated bus lane, 7.0 m (2 x 3.5 m);
  - 3.4 m wide passenger platform with shelter;
  - 2 x 3.25 m MV lane, 2 x 2.5 m NMV lane, minimum 2.0 m wide sidewalk on both sides;
  - Placement of stations - mostly near side junctions, few at mid block sections based on demand and spaced at a distance of 500 to 700 m;
  - Additional right turning (MV) lane at junctions;
  - Provision of bus passing lane at some stations;
  - Safe crossing facilities of bus passengers along zebra crossings and foot-over-bridges;
  - Adequate depot and terminal facilities; and
  - Safe dispersal and integration measures.
The key aspects of the bus rolling stock and technology features are outlined below:

- Standard 60 seat low floor urban bus (12mt. length) is recommended to be introduced gradually and initially existing fleet of Andhra Pradesh State Road Transport Corporation (APSRTC) will be utilized.
- To save cost, partial low floor buses may be introduced.
- Outline of information Technology and Automatic Fare Collection System identified and is planned to be introduced later after sufficient trials are conducted.
- First Phase, 2 corridors were prioritized i.e. Standard Test Conditions (STC) and PVUSA Test Conditions (PTC). The combined cost of prioritized 2 corridors (PTC and STC, Tunnel) is Rs. 452.93 Crores.
- The Project was approved by the Central Sanctioning and Monitoring Committee (CSMC), MoUD, GoI on 18-05-2007.
- The Detailed feasibility report was proposed as per the guidelines of National Urban Transport Policy, Ministry
of Urban Development and Government of India.

- Administrative Sanction was accorded by the Government of Andhra Pradesh.
- Greater Vishakhapatnam Municipal Corporation (GVMC) invited Project Management Consultant (PMC) for BRTS exclusively in two phases in June 2007: Phase I: Detailed Engineering Report along with the tender process i.e. bid process management, and Phase 2: Construction supervision and Quality Assurance.
- Consultancy for PMC was finalized on 29-08-07 with M/s. SREI Infrastructure Finance Limited (Lead Consultant), and Letter of Agreement was issued with M/s McCormick Rankin International, Canada and M/s CRAPHTS Consultant (India) Pvt. Ltd, Haryana.
- The consultant submitted the Estimates, bill of quantities and Tender Documents for the prioritized corridors (PTC and STC) for getting approval of NIT from the Committee headed by the Engineer-in-Chief.
- The tenders were floated for the above corridors under engineering, procurement and construction (EPC) system with 2 years defect liability period. The tenders for the above corridors were finalized in the committee headed by the Principal Secretary Ministry of Urban Development.
- PTC corridor was approved by the Government of Andhra Pradesh and STC Corridor was approved for the M/s.GVR Infra Projects Ltd, Hyderabad. Agreements were concluded with GVMC by the said firms. Field surveys, investigations, designs have been completed and construction work is in progress for 10 km segments each on PTC and STC.

*Activities Implemented*

Right from conceptualization and detail design of the BRTS in Vizag, GVMC has been proactively considering and promoting all important aspects for successful completion of the project. Be it the stakeholder consultations, public advisory and quality assurance – all aspects have been dealt with in detail. GVMC has BRTS cell in place and consultants, engineers, contractors all work in a healthy atmosphere to find the best possible solutions for achieving the ultimate objective of producing a world class mass transport system.

The EPC contract modes has paved the way for PMC consultants to have a close look at the design offered by the contractors’ and these are being debated, discussed, fine tuned to be more useful in terms of implementation, operational ease and practicality. The design process is vetted through quality assurance procedures embedded in the design and built contracts through clearly demarcated deliverables and timelines.

The GVMC has laid emphasis on project quality and plans have been made to make the project a true success as perceived by the riding community and the general public. The city is best suited for BRTS. The services of Project Management Consultants have been taken to ensure successful implementation. Quality Assurance and Quality Control of all aspects (road design, BRTS elements, construction, integration and operations) including management of project construction and execution are being perceived with great detail. A qualified team of professionals is in place to serve as GVMC’s extended arm in ensuring project success.

*Challenges / Constraints Encountered*

The key concerns in the project are the land and property acquisitions required to produce a row of 30 m especially on PTC. At the bus stations along the PTC and STC we will require about 36 m ROW to construct bus bays. Therefore, primary issue is to availability of minimum row to achieve segregation of traffic on the corridors. Nature of compensation and re-settlement issues have been finalised first in consultation with affected public and their representatives. The coordination of various civic agencies and departments including GVMC, Vishakhapatnam Urban Development Authority (VUDA), APSRTC, BSNL, Traffic...
Police, etc. is essential for effective implementation. The major issues to be reckoned are utility diversions and addressing the drainage. The traffic management and diversion during construction will need the services of Local Traffic Police in Vizag. The major constraints on STC are the strategic locations of village settlements at Simhachalem, where property acquisition is rather difficult. Alternatives will need to be addressed and frozen.

These concerns have been addressed with minute’s details at the ground zero level. Environmental and social issues have been addressed in the detail. Promotion of public understanding and fruitful solutions of developmental problems such as local needs and those of road users were discussed. In addition to discussing problems and prospects of resettlement, several stakeholders were consulted through focused group discussions and individual interviews.

Figure 29: Metro Bus Service Shelter, JCTSL 2010 (A-B)
Discussions were also held to understand their local transport needs and to achieve speedy implementation of the project with involvement of people. Nature and loss of structures, which are likely to be affected, were identified. It was this effort that took the project forward towards successful implementation. The main reason being the minimum land availability was ensured for bus lanes, MV, NMV and pedestrian sidewalks.

Experts from a wide spectrum of the society began discussing the concerns of some BRTS implementations in the country. While every new project is expected to experience some level of friction during initial stages, adequate efforts are underway to mitigate any adverse effects from the implementation of Vishakhapatnam BRT system for the following reasons:

- In a majority of instances across the world, project ‘success’ or ‘failure’ can quickly begin as a perception and soon turn into a reality. Such a perception is created due to the ability of the implementing agency to properly and adequately publicize information about on-going projects. Technically better projects have failed in many instances due to not providing adequate project information to the general public.
- It is anticipated that Vishakhapatnam, BRTS will not experience concerns because GVMC has been actively engaging the public through the social assessment study and wide publication in the news media.
- A second issue is with regard to proper planning of projects such as BRTS. Vishakhapatnam has been actively conceptualising, planning, and designing the project for over 2 years and is pursuing the implementation aspect with diligence. It is recommended that GVMC continue to brief the elected representatives and provide information that the project had been thoroughly planned by taking into consideration the current and projected travel demand in the city.
- Projects that have ‘take-away’ lanes from the general purpose traffic, i.e., from the ‘existing’ lane geometry for BRTS dedication - mostly 7 meters - are considered an inappropriate strategy. Such an action is considered not only negative in terms of further constraining currently depleted capacity but also invites public anger. Vishakhapatnam BRTS does the opposite by not only widening the roadway for dedicating two lanes to BRTS but also improving opportunities for pedestrianisation and junction improvements. It is suggested that GVMC use this as a reason for seeking added right-of-way, thereby not taking away lanes from the general public but adding to public convenience, while removing buses out of general purpose lanes.
- Projects where the proposed BRT systems are for short lengths / short segments experience concerns. Any BRT system should be a multimodal effort with several interchange points to feeder services. Vishakhapatnam BRTS is proposed along 20km and 18km continuous stretches and therefore, provides a viable length of road segment for effective implementation. It is recommended that GVMC mention this key aspect since such a proposition is not only financially sustainable but also physically implementable.
- Systems that have developed in a very short duration may have caught the people by surprise thus adding to the syndrome ‘we did not hear or know about this problem.’ Vishakhapatnam BRTS is likely to not experience this problem because GVMC has already been informing the media and the general public about project progress; and social assessments have been educating the directly impacted citizens about project issues including seeking feedback and opinion; and above all, construction activity will invariably raise public awareness about project aspect.

Outcome of the Initiatives

The progress of the implementation can be deemed satisfactory since its inception. The construction of BRTS infra commenced by Dec 2008 and since then we have been able to complete about 10 km each on PTC and STC corridor.

As part of development essential infrastructure facilities on the corridors, GVMC proposes to develop about 25 Foot-over Bridges integrated with modern Bus Shelters (a total of 76 shelters) for the safe movement of commuters at crossings, interchanges, boarding and alighting.

In order to leverage limited resource of GVMC it is proposed to develop the above Fob’s and Bus Shelters on Public Private Partnership (PPP) Model dividing them in to three to four bid packages. The other advantages of the PPP model include:
• The development under PPP model will provide a quality infrastructure with state of the art facilities and bring substantial saving in the capital investment of Government/GVMC.

• Construction, operation and maintenance risks will be transferred to the selected developers.

GVMC would get the revenue share from the selected developers during concession period, in case a particular bid package works out to be commercially viable proposition.

Figure 30: Metro Bus Service Shelter, JCTSL 2010

As per the PPP model, the scope for the selected developer(s) would include the following major project components/activities:

- Implementing (financing, designing and executing) the proposed Modern Bus Shelter and Foot Over Bridges on BRTS Corridor on BOOT model, Vishakhapatnam
- Operating and maintaining the facilities for the given Concession Period.
- Transferring the facilities to GVMC after Concession Period.

The selected developer(s) will have advertisement rights on the project facilities they create during the entire concession period. Capital cost (debt servicing) and O&M costs would be met from the revenues they receive from the advertisement. Based on requirement, locations of the Bus Shelters and Foot Over Bridges are finalised.

Achievements and Results

The success of public transport initiative in Vizag will result in large number benefits accruing to public directly or indirectly, when the project is made operational in about one year's time. In all cities in India supply effective public transport has been a forgone and travel
and mobility needs are exclusive in the hands of private vehicles and para-transit services. We are largely unprepared to tackle severe traffic congestion, air pollution, accidents and loss of sense of community.

BRTS Vizag will create a high quality public transport to enhance the mobility pattern and demonstrate that people and community come first. It will increase the modal split in favor of public transport – being the ultimate strategy of the Government of India (MOUD) to promote public transport in the country. The other benefits can quantified at a later date when the system is operational. BRTS will reorganise road space with the segregated MV, NMV and dedicated bus lanes and will enhance road capacity utilisation factors. Dedicated bus lanes will promote public transport and discourage use of private vehicles.

BRTS corridor will cater to all modes of road transport. Also systematic movement of traffic in dedicated lanes ensures smooth flow, frictionless travel, and savings in travel time / cost, minimize accidents and enhances safety. The provision of exclusive segregated NMV lane will promote safety to slow moving vehicles and planned and protected sidewalk facilities will guide the pedestrian safely. The key sustainability indicators will be protection of environmental conditions, energy savings, readiness of people to shift to PT, reduction in road accidents etc.

Sustainability

The annual operational and maintenance cost of the system per annum will be about Rs 25 crore by year 2011 and 39 crore for year 2021. The expected ridership on the PTC and STC corridor will 1.85 lakh by year 2011 and 3.15 lakh by year 2031 passengers daily. The estimated bare box revenue will be about 73 crore per annum by year 2011 and will increase to 125 crore by year 2021. In addition to this about Rs 5 crore per annum can be generated through advertisement rights. Being the Government funded capital intensive project, the operational viability is expected to be sound as the project IRR comes to healthy 41%. This implies that project is operationally quite viable and not only the rolling stock (buses), but other systems (fare collection system and intelligent transportation systems) can also be financed from the fare box revenue and even after that there will be enough in the kitty of SPV - VUTCL to maintain the fixed infrastructure efficiently.

Since an internal rate of return (IRR) of 15% is considered a reasonable proposition to attract investors for financing rolling stocks, a proportion of total revenue is enough to give this kind of return for successful rolling stock concession and maintaining the BRTS infrastructure in efficient conditions.

The profitability of the project was critically analyzed based on variation in the rolling stock cost – impact of +20% and the variation in the project revenue (on account of ridership, fare level and other incomes) of the project. The operational would not be effected even with negatively side sensitivity of key variables under reasonable scenario. The project IRR will off course be very sensitive to the revenue fluctuations. GVMC has taken advance actions on implementing the part of BRT infra like bus stations; grade separated pedestrian facilities, ‘off-street’ parking on PPP mode.

Impact of the project

- The project has been discussed in the MOUD progress review meetings and seminars many times. The project was presented in the international seminar conducted by Indo-German Institute of Advance Technology (IGIAT) and Gayatri College of Engineering, Vizag - promoted and sponsored by;
  - Federal Transit Administration (FTA), Washington;
  - German Technology for Technology Cooperation (GTZ); since the venue was Vizag, the delegates visited the BRTS corridors and showed keen interest in the project. The project was discussed in many forums in the seminar and received wide publicity and attention.

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Title of Best Practice:
Public Transport Services through Bus Rapid Transit System and Modern City Buses

State/City: Jaipur - Rajasthan
BP Code: SSS-PT-PPP-2447-0113

Previous Status

Jaipur, the ‘pink city of India’, is the capital of Rajasthan. It is situated in north-eastern part of the State is surrounded by the districts of Alwar, Sikar, Bharatpur and Dausa. Jaipur is known as one of the first planned cities of India. It had a population of 2.32 million in 2001.

The increased social and economic status of the residents coupled with the inadequacy of public transport system has encouraged the residents to own personalized mode of transport. The data on growth trend of vehicles show that personalized modes such as two wheelers and cars are growing at a much higher rate. Growth of cars is found to be 11.6% and growth of buses 2.3% in 2003-04. Overall vehicular growth has been observed as 9.4%. The public transport system in Jaipur comprises only 6.32% of the total number of vehicles; and caters to only 13% of person trips. When compared with the desirable level of modal split, it was found that the share of mass transport in Jaipur is well below the desired range (50-60 %) as per a 2007 MoUD study.

The share of personalized transport and Para-transit is already well above the optimal range creating big constraint for achieving the desired development profile of the city. It works as a catalyst for air quality deterioration, road congestion and reduced journey speeds, wastage of scarce fuels, besides sub-optimal utilization of infrastructure and other resources. The major problems faced by the citizen were:

- Existing public transport system is characterized by overcrowding, poor reliability, and long journey / waiting period. Also this system is not able to cater to the population and routes of the city.
- There is only a public transport system in the city, which has a fleet of 260 buses of standard size. Most of them are old buses, which are operated by Rajasthan State Road Transport Corporation (RSRTC). Private transport companies are operating mini buses numbering over 1800, which are unsafe, uncomfortable and unreliable, apart from having an ad-hoc operating method.
- 10% annual growth rate of private vehicle ownership in city.
- Pre-feasibility study has estimated the travel demand by 2017 to 4.6 lakhs trip per hour with Public Transport (PT) share of 25-42%.
- Most of the city arterial roads have reached their capacity and have no scope of further widening.

The New Approach

In view of the above, the State Government has planned Bus Rapid Transit System (BRTS), Modern Bus Service and Metro Rail project as Mass Rapid System (MRS) projects for Jaipur. Jaipur Development Authority is the nodal agency for planning and implementation BRT infrastructure in Jaipur. The BRTS project in Jaipur is been developing and implementing through a Special Purpose Vehicle i.e. Jaipur City Transport Services Limited (JCTSL). M/s PDCOR Jaipur is the overall Project Management Consultant for the project and M/s Consulting Engineering Services Private Limited is technical consultant for infrastructure design.

In order to plan for an efficient and sustainable public transport system in the city, the Rajasthan Urban Infrastructure Development Program (RUIDP), funded by ADB, had initiated a study in August 2005. The study was carried out by PDCOR Ltd with an
objective to plan and develop an Urban Mass Transit System for Jaipur. The scope of work at the study was as under:

- Conducting various primary surveys including traffic surveys, household surveys, road inventory and willingness to pay survey;
- Establishment of the Urban Travel Demand Model;
- Evaluate Alternative Alignments options;
- Recommend suitable Transit System;
- Estimate the Ridership on the Proposed Corridor;
- Examine the Sensitivity of Ridership; and
- Suggesting an implementation framework.

The Final Report of the Study was submitted to RUIDP in March, 2006 and the project was transferred to Jaipur Development Authority in May 2006. As a part of the study, an Urban Travel Demand Model for the city was developed to forecast the trip pattern of the city residents. The traffic forecasts generated from the model, developed for this study, indicate that in case of do-nothing scenario, the traffic conditions will only worsen in future years. The total daily-motorized passenger trips generated in Jaipur in year 2005 is about 27 Lakhs out of which only 18 percent are performed on Public Transportation. More than half of the total motorized trips are performed on two wheelers. The projected travel demand, after taking in to consideration the future settlement pattern and employment clusters, showed significant passenger movement in the east-west and North-South direction.

The total travel demand in the study area by 2021 will be about 62 Lakhs Trips. The road network of Jaipur cannot carry such a large volume of trips as the major arterial roads are presently operating beyond theirs capacities. The existing level of services across major roads is presented below:

In light of all this, it was proposed that there is an urgent need to plan and develop an efficient transportation system in the city which will be safe, comfortable, cost effective, sustainable and also blend with the existing heritage character of the city and will not adversely affect it.

As per the Master Plan of BRTS total 138 km of corridor length has been identified for the system. The project is proposed to be taken in three phases. In first phase, a corridor length of 46.7 km has been selected on priority basis for implementation purpose. Phase-I corridors connect North-South and East-West ends of the City and fulfill major transport needs of the city.

The estimated cost towards the development of road infrastructure for the first phase of BRTS, Jaipur was Rs 587.00 crores (block cost). MoUD, GoI on September 2006, approved the project in principle, for funding under JNNURM. As per the approval given on 20th July 2007, the estimated cost was Rs. 479.60 crores.

* North-South Corridor

**Package I** (C-Zone Bypass to Pani Pech via Sikar Road) of 7.1 km length, having 22 bus stations and Right of Way (ROW) of 40-50 m, with low to medium side friction and light street parking, 9 major intersections with low congestion level, 22, 1 religious structure, connects large residential, and industrial areas and thus have potential for high traffic generation. The construction of this passageway was completed in late 2009 and recently buses have started plying on this corridor.

**Package-II** (Pani Pech to Sanganer Airport via Tonk Road) of about 16 km length has row of 20-40 m, 17 major intersections and medium to high side friction, with 1 existing ROB and 1 existing flyover. An additional length of 2.2 km was added later from Laxmi Mandir Crossing (Tonk Road) to Bais Godam via Ram Bagh Circle. Package -II is divided into Package-IIA and Package-IIB.

**Package-IIA** has 13 Staggered Bus Stops, 3 Island Bus Stops and one Island Bus Station. However, Package-IIB has 21 Staggered Bus Stops, 1 Staggered Bus Station, 1 Island Bus Stop and 2 Island Bus Stations. The study is to cover how best to connect BRTS with Railway Station and Sindhi Camp bus stand.

* East-West Corridor

**Package-III** Transport Nagar to Ajmer bypass crossing via Ajmer Road, of about 13.35 km (sanctioned length), having row of 18-35 m and 14 major intersections on route has very high congestion level along the corridor. This Package is also divided into Package-IIIA and Package-IIIB. Package-IIA has 31 Staggered Bus Stops while Package-IIB has 8 Staggered Bus Stops and 2 Island Bus Stops. It serves institutional, commercial, walled city, and
residential areas of the city. JDA is developing the corridor. The BRT lanes being in the center of carriageway, the existing overhead electrical lines in the median of the roads have been relocated.

Considering the parking demand and adequacy of ROW along the BRT corridors, on the street parking has been proposed at a number of locations. Service roads of 5.5 m width have been proposed depending upon

the ROW available. Spacing the bus stops at an average distance of 500 - 700 meters has been proposed on the BRT corridor (Annex II). In addition to above, bus shelters handling large commuter volumes and feeder bus services have been planned. The shelters will provide additional facilities, viz. Off-board ticketing, passenger information etc. besides those at the stops.

*Figure 31: The BRTS at Jaipur, Rajasthan*

**Key Features**

- **Salient Features**
  - Low floor buses with manual transmission and inbuilt Passenger Information System;
  - Route rationalization for mini buses;
  - Non-Motorized Vehicle (NMV) tracks along the BRT route;
  - Foot over Bridges provided at mid-block bus stops;
  - No exclusive phases for buses and NMV at junctions;
  - Free left turns at crossing for pedestrians;

- Separate contracts for bus operators;
- Advertisement cum corridor Management;
- Closed System with direct services;
- Railing has been provided on both sides of the BRT corridor to avoid accidents; and
- Rumble strip has been provided to segregate the BRT, up and down bus movement (wherever the median cannot be provided).

- **Intelligent Transport System (ITS)**
  - Passenger information system (PIS) is planned for 'on-board' application, GIS
based system is suggested for vehicle tracking, operations monitoring, 'off-board' PISO.
• System used for data acquisition and process, bill payments and MIS.
• The service quality attributes like punctuality, reliability, vehicle productivity, etc. are also monitored.
• Manually steered and optically guided system is planned to be used for bus guidance and alignment with the platform.
• Automatic Fare Collection.

* Bus Stops / Shelters / Stations
Bus stops/shelters on the BRT corridor have been constructed on By JDA. The details are given below:
• Bus Stops are 35.0 m long and 3.0 wide.
• Bus Stations are 54.0 m long and 3.5 M wide.
• These bus stops are planned in such a manner, by which both, up and down lane of BRT Buses can be served with ease.
• Bus stops are planned aesthetically beautiful with adequacy of light and ventilation. The structures are made of Mild Steel Circular Pipes.
• Lots of space is provided in these bus stops for advertisement, which can be a source of collection of revenue.

• Bus-Queue-Shelters, on PPP format, would be constructed in the city through the loan assistance under Rajasthan Urban Development Fund, Government of Rajasthan.

* Services and Operation
Considering all relevant factors and for providing universal accessibility, the destination oriented service design (Direct) is envisaged where the BRT vehicles, are proposed to operate beyond the BRT corridor up to the high traffic nodes in mixed traffic. The railway station and the bus terminal and other major traffic generating points are planned to be serviced by direct BRT services. The BRT operations are spread over a period of nearly 18 hrs (0530 hrs to 2330 hrs) with an average; the operational headway is 2 to 4 minutes.

**Table 1: Width of Bus, Motorized and Non-motorized Vehicle Lanes**

<table>
<thead>
<tr>
<th></th>
<th>Bus Lane</th>
<th>Motorized Lane</th>
<th>NMV Lane</th>
</tr>
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<tbody>
<tr>
<td>Middle side 3.5 m</td>
<td>7.0 m to 9.0 m</td>
<td>2.0 to 2.5m</td>
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Figure 32: Typical Cross Section for 32.0 mt Row
**Goals of the Project**

- Provision of bus based public transport system in the city.
- Bus priority initiatives: Priority at the junctions, dedicated lanes for the buses.
- Operation of the state of the art and commuter friendly low floor buses.
- Provision of passenger information system through various applications of Intelligent Transport System (ITS).
- Packaging of the total corridor length for implementation purpose.
- Formation of a Special Purpose Vehicle (SPV) “JCTSL” to control, regulate and operate the BRT buses.
- Challenges/Constraints Encountered and how it was conquered.
- Required RoW is not available in old city. Most of the roads have less than 30 m. width and corridor requirement is more than 30 m width.
- The average speed of traffic within Walled City is a low of 15-20 kmph. Its lead to environmental pollution, accidents and parking problems in City.
- Fears of accident and lack of awareness may lead to unacceptability of the project amongst the public.
- Already existing mini buses are operating on 36 routes and carry about 4.5 lac passengers daily. Fear of losing passengers and profits, mini bus operators and their Route Associations are opposing BRTS.
- Multiplicity of function of government and other working authorities. Expanding economic growth is providing a base for the development of newly emerging upper and middle income classes, demanding access and mobility.

**Implementation Strategies**

The State Government has already constitution of Unified Metropolitan Transport Authority (UMTA) under the chairmanship of Hon’ble Chief Minister on 16th August 2008. Role of different agencies in Jaipur BRTS is as follows:

* Activities Implemented:

- Conduct of feasibility study for identification of an Efficient Transport System (ETS) for Jaipur.
- Securing approval of DPR from MoUD, Govt. under JNNURM
- Formation of dedicated teams in JDA for design and implementation of BRT corridor.
Figure 34: BRTS Corridors, Jaipur

Figure 35: Aerial View of North-South Corridor, Jaipur
Challenges / Constraints Encountered

- Re routing of 1800 mini buses;
- Lack of understanding of BRT elements by contractor;
- Inadequate RoW on few sections;
- Land acquisition delays the implementation process and land acquisition issues;
- Unavailability of lands for provision of parking near bus stops;
- Unacceptability of one way traffic movement;
- Shopkeepers / property owners habitual to free on-street parking (as they consider it as their right);
- Shifting of existing utilities services;
- Monopoly of bus manufacturers;
- Low floor buses are costly to operate and procure; and
- Financial sustainability of overall operational.

Outcome of the Initiatives

- The BRTS operating on all road corridors having a demand ranging between 2000 Person per Hour per Direction (PPHPD) and 20,000 pphpd and also its lead to considerable reduction of journey times in order to carry out commuters productive activities.
- At large level use of public transport system lead to less air pollution in the city and further it will reflect in the citizen’s health.
- Cost effectiveness in terms of saving in fuels, affordable for users, profitable for private operators, and economically feasible for state.
- Promote continuous improvement in service and guarantee of service quality.
- The study has estimated share of Private Vehicles, Public Mass Transport and IPT will be respectively 30%, 60% and 10%.

Achievements and Results

It may be seen from the above that in the project has been executed successfully and resulted in paradigm shift in urban transport scenario of urban areas of Jaipur. The project has initiated some changes, viz. improvement in travel speed (17 Km in 18 minutes at 25 Km/hr), reduction in accidents (reduced by 12.65 %), reduction in green house gas emission (complying with BS-III emission norms), reduction in noise pollution (as engine is fitted at rear of buses), increase in service frequency (7 to 15 minutes), more geographical coverage (grid system for route designing), reduction in energy consumption etc.

All these changes make the project successful. The reasons for the success are attributed to planning and design: technical inputs like, low floor buses, AC buses, next vehicle display board / system, GPS, on board stop announcement, signal priority on specific signals and ticket system-prepaid / automated.

- Corridor Planning and Design part;
- Technological Inputs like:
  - Low floor Buses;
  - AC Buses;
  - Next Vehicle display Board/System;
  - Automatic Vehicle Location Information System through GPS;
  - On Board Stop Announcement;
  - Signal Priority on specific signals; and
  - Ticket System-prepaid / Automated.
Sustainability

Financial partners are MoUD, GoR, JDA and JCTL. Total capital cost in terms of input (funding pattern): Central Government – 50%, Government of Rajasthan – 20%, JDA (BRTS Corridor) and JCTSL (purchase of buses) – 30%. In order to meet the operational losses from new buses, GoR has constituted a dedicated Urban Transport Fund (UTF) which includes the Advertisement charges, fare charges and property development cost. The Government has also decided to fund an amount of `10 Crore per annum to City level Transport Fund. In the meantime, the State Government is actively considering other possible streams for this fund.

Semi-low floor and low floor modern city buses are plying on 10 radial and circular routes covering the entire city. These buses also operate on 7.1 km Pilot BRTS corridor which is exclusive for these buses. RSRTC, the State owned unit has been roped in to operate the buses on mutually agreed terms and conditions.

Impact of the project

The successful execution of project has resulted in a paradigm shift in urban transport scenario of the city. Slowly but gradually the required changes in the urban transport pattern of the city can be observed.

The project has lead to improvements, which are summarized below:

- Improvement in Travel speed: The bus travels 7 km in about 18 min, leading to a speed of about 25 km/hr.
- Reduction in accident: The statistics shows that number of accidents has been reduced by 12.65%.
- Reduction in green house gas emissions: The engines of the Modern City buses are complying with BS-III emission norms, which resulted in significant reduction in pollution.
- Reduction in noise pollution: Buses with rear engine are purchased which reduces noise pollution.
- Service Frequency: Buses are operating at a frequency ranging from 7 to 15 minutes. Consequently commuter satisfaction is greater.
- Geographical Coverage: The grid system of Jaipur covers the entire urban area for the BRTS corridor. On JCTSL routes, with one change only, passenger can reach any part of the city.
- Reduction in energy consumption: Savings in energy (fuel) consumption on account of less no. of vehicles on road and decongestion.
- Increase in Overall Capacity of Public Transport Services: 220 rear engine semi low floor (650mm) buses have been introduced in the city for the commuters.
- Color Coding: Each route is assigned a particular shade of color for ease in identification.
- Flat Fare: It is the first city to introduce single flat fare system. The cost per passenger trip is reduced.
- Shifting Pattern of Users: Since July, 2010 ridership on buses has been considerably increased from 55,000 to 200,000.
- Level boarding into city buses from 400mm height BRTS bus stops.
- Staggered BRTS bus stops reduce the effective walking distance for bus commuters.

Figure 38: Schematic Representation of BRT and MRT Interchange

Replicability

In the Master Plan 2025 a provision has been kept for integration of land use with public transport system. Proposed transport system (BRTS, city bus system and Metro) will also strengthen the connectivity of future growth area and satellite towns.

The Government of Rajasthan has approved the Jaipur Metro Rail Project to be executed
by SPV called Jaipur Metro Rail Corporation Limited incorporated on 1st January 2010. The DPR has been prepared by DMRC Limited. Phase-I of the project is proposed to be implemented in two Stages:

**Stage-I:** The civil work including the Permanent way and electrification for the Line from Mansarover to Chan pole of about 9.25 Kms to be done by Delhi Metro Railway Corporation (DMRC) Limited on turnkey basis. An agreement for this has been executed on 05-08-2010 between JMRC and DMRC.

**Stage-II:** Proposed to be executed on PPP basis. A total work of about 25 Kms metro rail line and the operation and maintenance of the entire project will be executed. The process of selection of consultants for the purpose, on the guidelines of the Ministry of Finance and Planning Commission - GOI, has been started.

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Title of Best Practice:
Innovation in Urban Transport - Bus Rapid Transit System

State/City: Pimpri Chinchwad - Maharashtra
BP Code: SSS-PT-PPP-1670-0113

Previous Status

The city of Pimpri-Chinchwad is situated northeast of Pune, 160 kms from Mumbai, the capital city of Maharashtra. It is predominantly an industrial area, which has developed during the last four decades. Industrialization in Pimpri-Chinchwad area commenced with the establishment of Hindustan Antibiotics Limited in 1956. The establishment of the Maharashtra Industrial Development Corporation (MIDC) in 1961-62 considerably facilitated industrial development in the area.

The city has seen tremendous growth in the last few years owing to its proximity to the IT hub of Pune. The existing road network is unable to address the expected future growth of city. Currently there are more than five lakh registered vehicles plying on the roads of Pimpri-Chinchwad Municipal Corporation (PCMC). A steep increase in the ownership of private vehicles has been observed over the last five years.

Moreover, the current public transport (buses) is not able to address immediate as well as future demands of commuters within the city as well as those traveling to nearby Pune city. With two-wheelers having a modal share of 68%, roads are congested in many important locations. For example, PCU count on old NH-4 ranges from 6,000 to 10,600 PCU’s on Old NH-4.

Presently, the use of roads in PCMC is driven by the industrial clusters in the area. This might change with the development of IT sector in the overall region, along with the Pune area. It has also been observed that some industries are moving out of the city limits leading to a change of the land-use of their estates from industrial to residential or commercial. All these factors impact the transportation profile of PCMC.

The public transportation system in Pimpri-Chinchwad has not been able to provide the best services to its citizens. This has lead to steep increase in private ownership of vehicles, especially motorized two wheelers. Poor connectivity and poor frequency of public transport has also encouraged large size auto rickshaws (seven-seater) to ply along the main corridors in the city, which has lead to a thriving para-transit mode of transport. These factors are leading to congestion of roads in the city. In order to have an efficient public transport system, it has become necessary to also have physical infrastructure with high levels of service.

There is urgent need to address the main issues of patronage of public transport, poor level of service of the road network in PCMC and future traffic congestion on city roads caused by private vehicles. To address most of these urban transport problems being faced by PCMC currently and those anticipated in the future, a Comprehensive Mobility Plan (CMP) has been undertaken, which proposes a bus based rapid transit system spread across the city of Pimpri-Chinchwad along a road network with high levels of service.

The two main components of the CMP were - Traffic study and Land-use study. By integrating the traffic study along with the land-use planning and undertaking a detailed analysis of demand on high-density corridors, the following information was arrived at using the traffic model. It presents the demand for a public transit system along important road corridors in PCMC area.

A bus-based rapid transit system suits the above magnitude of demand (about 2,000 PHPDT), and therefore, a BRT system has been proposed in the CMP. The proposed BRT system addresses immediate needs of reduction in traffic congestion at many locations in the city. It also addresses long term needs of an efficient public transport system for the growing city of Pimpri-Chinchwad.

The New Approach

The city is still in the growing phase and a transportation and land-use study was undertaken which recommended a well-planned public transport system. This includes improvement of existing road network of the
city. Based on the PHPDT arrived at from the traffic study, a bus-based public transport system has been proposed.

The road structure within PCMC was also analysed as part of this study for its hierarchy, continuity and topology and it was observed that the existing road network of PCMC is highly fragmented at primary and secondary levels. Through this study, PCMC is proposing to improve its existing road network and also provide a public transportation system in the form of a BRT system along its major roads. The proposed BRT system consists of a network of corridors across PCMC area. The corridors have been selected based on criteria such as travel demand, hierarchy of road, existing bus-routes.

A detailed feasibility report was prepared which was approved by MoUD for grant of funds to the project under JNURM. The report uses a transit-oriented city development planning approach where the transportation needs of the city have been integrated with urban planning. The project envisages improvement of the road network in the city.

Table 2: The road network from east-west corridor

<table>
<thead>
<tr>
<th>S. No</th>
<th>Road Name</th>
<th>Length Proposed (km)</th>
<th>Proposed RoW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1 Corridors (Trunk Routes)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Aundh-Ravet Road</td>
<td>14.4</td>
<td>45.0</td>
</tr>
<tr>
<td>2</td>
<td>Old NH-4</td>
<td>14.6</td>
<td>61.0</td>
</tr>
<tr>
<td>3</td>
<td>Telco Road</td>
<td>12.0</td>
<td>61.0</td>
</tr>
<tr>
<td>4</td>
<td>Dehu-Alandi Road</td>
<td>14.5</td>
<td>45.0</td>
</tr>
<tr>
<td>5</td>
<td>Nashik Phata to Moshi Road</td>
<td>10.4</td>
<td>61.0</td>
</tr>
<tr>
<td>6</td>
<td>Hinjewadi to Dehu-Alandi Road</td>
<td>13.3</td>
<td>30.0</td>
</tr>
<tr>
<td>7</td>
<td>Kalewadi-KSB Chowk-Dehu Alandi Rd</td>
<td>13.2</td>
<td>45.0</td>
</tr>
<tr>
<td>8</td>
<td>Vishrantwadi/Pune Alandi</td>
<td>11.6</td>
<td>60.0</td>
</tr>
<tr>
<td>9</td>
<td>Nashik Phata to Waked</td>
<td>7.8</td>
<td>45.0</td>
</tr>
<tr>
<td>10</td>
<td>Kiwale to Bhakti Shakti</td>
<td>11.8</td>
<td>30.0</td>
</tr>
<tr>
<td>Level 2 Corridors (Feeder Routes)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Hinjewadi to Tata motors</td>
<td>10.3</td>
<td>30.0</td>
</tr>
<tr>
<td>12</td>
<td>Bhakti Shakti to Tailwade</td>
<td>11.3</td>
<td>45.0</td>
</tr>
<tr>
<td>13</td>
<td>Pradhikaran</td>
<td>10.6</td>
<td>45.0</td>
</tr>
<tr>
<td>14</td>
<td>Road Parallel to Aundh-Ravet</td>
<td>8.4</td>
<td>30.0</td>
</tr>
</tbody>
</table>

PCMC has a road network of about 1300 kms and proposes a high quality public transport system in the form of BRTS. These corridors will have road widths of 45 m - 60 m and will comprise dedicated lanes for bus-based mass transit, separate lanes with grade separators for through traffic, service lanes for local traffic, underpasses, walkways for pedestrians and separate lanes for bicycles. State-of-the-art buses of international standards will ply on the dedicated bus lanes with five minute frequencies during peak hours.

Goals of the Project

- To provide better public transport facilities to commuters through a BRT system
- To improve service levels of road infrastructure in the city
- To address requirements of next 30 years

Implementation Strategies

An area of 100 m on either side of the above corridors has been designated as BRT corridor zone. No street-side parking will be allowed in the BRT Corridor zone. The development Control Rules in this zone have been modified to provide 100% extra parking, which includes 25% provision for public parking to be managed by PCMC. In addition, hawker zones will be designated; transit interchanges and wireless Internet connectivity will be provided. Work has been completed for NH-4 Corridor (Mumbai-Pune Highway). Work is under progress for Aundh-Ravet Road, Kalewadi-KSB Chowk – Dehu Alandi Road and Nashik Phata to Waked.

* Strategy Used to Achieve the Desired Goals

- Increasing carrying capacity through widening and improve riding quality through strengthening of existing roads.
- New roads to cater to missing links and developing areas and present the urban face of the city.
- Efficient, safe and accessible mass transportation system for entire region.
- PCMC plans to interact with operators of intermediate public transport modes (auto-rickshaws).
- Higher order infrastructure for attracting densification in 100 meter either side of zone:
  - 24/7 water supply
  - 100% sewerage provision
  - Dust Bin free zone
• Road design in identified zone:
  - Service lanes for mobility of local traffic
  - Provision for pedestrians – under pass, walk ways
  - Provision for non motorized vehicles – cycle track
• Facilities for vehicle parking in zone:
  - 100% extra parking;
  - 25% to be handed over to PCMC for public parking
• Others facilities:
  - Wi-Fi connectivity
  - Hawker zones
• Awarded contract on PPP basis for road furniture through advertising rights offered for 5 year on specific period:
  - Bus stops
  - Public toilets
  - Landscaping
  - General Maintenance

Figure 39: Map Identified road corridors in Urban Mobility Plan for improvement

Figure 40: Road Designs in identified Areas (A-B)
Activities Implemented to Achieve the Desired Goals

Detailed Project Reports have been prepared for improvement of road corridors, which include dedicated lanes for a BRTS. A number of experts in the field were consulted before designs were finalized. One of the project corridors has already been commissioned while the others are under implementation. PCMC has also formulated an Urban Transport Fund (UTF) which will ensure that the ULBs contribution to capital expenditure is addressed smoothly.

Main Features of the Approach:
- Does not release additional Floor Space Index (FSI) in the city; only realigns the FSI from other zones to BRT Corridor.
- Will protect the value of TDR and make it more attractive hence encourages implementation of DP.
- PCMC can plan higher order infrastructure in BRT corridor and facilitate focused service provision by densification.
- Ensures the attractiveness of mass transit and protection to environment.

Public Private Partnership for Road Furniture
- Awarded contract on PPP basis for road furniture like Bus stops; Public toilets; Landscaping; and General Maintenance.
- Advertising rights offered for 5 years on specific locations on Mumbai Pune road - 12 kms.

New Approach of Revenue Generation

Pimpri Chinchwad Municipal Corporation (PCMC) has developed a unique financing model for the development of BRTS corridors. Through this model, PCMC has created a new revenue stream along with dovetailing of specific incomes into an Urban Transport Fund (UTF) that is managed by PCMC Infrastructure Company Limited (PCIC). PCIC will construct, operate and maintain the BRTS corridors through funds generated by the UTF. PCIC has been formed to construct BRTS corridors in a focused manner and to leverage the UTF to borrow from The World Bank - Sustainable Urban Transport Program, Asian Development Bank’s non sovereign funding and term loans from domestic financial institutions for funding the construction of BRTS corridors (Annexure VIII for Innovative Funding Model of PCMC).

Challenges / Constraints Encountered

The project is under initiation and the completed BRTS is not yet fully implemented. One infrastructure road corridor completed with lots of financial constraints with cost escalation.
Outcome of the Initiatives

- Hassle free travel on the roads and effective transportation system with easy access to everyone.
- One corridor has been completed for NH-4 (Mumbai – Pune highway) in October 2008.
- Work is under progress for Aundh-Ravet Road.
- Work orders have been given for Kalewadi-KSB Chowk-Dehu Alandi Road and Nashik Phata to Waked.
- The urban transport fund is operational and it is budgeted to earn an income of `80 crores in the current financial year 2010 – 11.
- PCIC is operational and it is currently augmenting its operations.
- PCMC has tied up 43.703 Million US$ of borrowings from the World Bank under the Sustainable Urban Transport Program.
- PCMC is in an advanced dialogue with the Asian Development Bank for a line of credit aggregating to 100 Million US$ under the Non Sovereign funding route for the PCIC.
- PCMC along with PCIC is currently constructing 60 kms of BRTS corridors, forming the first phase of urban mobility projects as per PCMC’s Comprehensive Mobility Plan. About four BRTS corridors have been approved by the JNNURM.

Achievements and Results

- Financial sustainability exists in the project.
- Project linked with the Urban Mobility Plan and will lead to future development of the city.
- Detailed planning and design concept / plan have been considered by Municipal Corporation.

Sustainability

- The road network designed to cater to future growth patterns of the city.
- PCMC’s own sources of finances.
- PCMC has created Urban Transport fund – Revenues from advertisement, parking and revenue from additional development rights (TDR) are part of the urban transport fund.

- PCMC has approached World Bank for borrowing funds and the same has been sanctioned.

**Figure 43: BRTS Corridor after implementation of the project**

Impact of the project

- In view of the inadequate public transport, increasing number of private as well as para-transit transport modes leading to congestion on the roads of the city, a Comprehensive Mobility Plan was prepared, which proposes a bus rapid transit system along a road network with high level of services. This system / project envisages road network from east – west corridors in two level corridors, i.e. level 1 Corridor having 10 trunk routes and level 2 has four feeder routes.

- These corridors will have road widths of 45 to 60 meters and will comprise dedicated lanes for bus-based mass transit, separate lanes with grade separators for through traffic, service lanes for local traffic, underpasses, walkways for pedestrians and separate lanes for bicycle. The project is PPP based in which public is represented by PCMC Infrastructure Company, a SPV, to prepare plan, construct, operate and maintain the BRTS corridor. The funds are generated by the Urban Transport Funding which premium on loading of Transfer of Development Right (TDR) is a robust source of revenue. Pune Mahanagar Parivahan Mahamandal Ltd. (PMPML) is responsible for managing facilities and services (operating buses).

- Contracts on PPP basis have been awarded for road furniture, viz. bus stops, public toilets, landscaping and general
maintenance. Advertisements have been offered for 5 years on specific locations on Mumbai-Pune road (12Kms).

- At present, the project is under implementation stage, one corridor has been completed for NH-4 in October 2008, with lots of financial constraints with cost escalation. It is expected that the city will have hassle free travel on the BRT corridors with effective transportation system.

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URBAN
REFORMS

National Institute of Urban Affairs (NIUA), New Delhi
Title of Best Practice:
Capacity Building of Human Resources at Kanpur Municipal Corporation

State/City: Kanpur -Uttar Pradesh
BP Code: URF-##-###-2857-0113

Previous Status
Kanpur is one of the oldest industrial townships of North India. It has a metropolitan area of over 1,640 square kilometers having an approximate population of 3 million inhabitants in its area. It is administratively divided into 6 zones and 110 wards with an average ward population range of 19000 to 26000.

Over the past few years the city has developed to an important centre and a major infrastructural city. Kanpur Nagar Nigam (KNN), the Urban Local Body and one of the JNNURM mission cities, has huge manpower strength of regular employees and contract / outsourcing employees rendering citizen services in the areas.

KNN has recently established a Centre of Excellence (COE) at it's main Administrative Building to cater the training / Capacity Building requirements of the KNN staff which may be extended to other municipal corporation/ municipalities in future. Prior to establishment of the COE in KNN, the employees serving under various cadres and categories were hardly supported by capacity building programme for improvement of their skills in the areas of both technical and personality development. As a result, the services rendered by the KNN staff members were not up to the expectations of the citizens.

The tardy rate of city development, the gap between the City Development Plan (CDP) and the developmental activities and absence of positive factors influencing the citizen satisfaction levels, have given scope for introspection of the Administration of KNN to introduce HRD centre for conducting Capacity Building (training and development) programmes, and other Human Resource Development activities internally within the system.

The New Approach
The inception of the COE in KNN with the primary objective of employee skill improvement through providing necessary professional support to the Administration in terms of training and development to employees and other related activities, initially had to face the challenge of identifying the required inputs such as physical infrastructure for the training centre, the areas of technical and non-technical skill improvement training modules, appropriate resource persons and their remuneration structure, all the budgetary support for the capital and revenue expenditure of the training centre, besides a resistance to change in the organizational culture and climate.

The COE established by KNN to cater the training / Capacity Building requirements of the KNN staff covers three kinds of Administrative Reforms:
- Human Resource Development and Personnel Management
- Internal Systems and Processes
- Citizens Interface systems and Processes

The courses that are covered are Human Resource Development, Financial Management (DEAS, Budgeting etc), Municipal Laws, IT & e-Governance, Solid Waste Management / Sanitation, City Environmental Planning & Management, Change Management, Communication & Soft Skills, Personality Competencies, & Attitudinal Development, Team Building & Conflict management, Leadership, Effectiveness & Motivational Skills, Organisational Training Induction / Orientation, Technical, Computer Skills, Skill upgradation training programme i.e. Drafting skills, Citizen Interface Skills, Quality Management, etc.

Goals of the Project
Provide knowledge and skills to KNN Officers and Staffs required to perform the job effectively.

Implementation Strategies
The implementation process involved several steps. They are:
• Finalization of Training Curriculum: Training curriculum has been prepared with different modules.

• Training needs Analysis: Training needs have been identified at each departmental level and Training Calendar has been prepared which is part of Capacity Building Plan.

• Selection of agencies to provide training: The Agencies selected for providing training to the KNN staff are Dr. Gaur Hari Singhania Institute of Management & Research, Kanpur; Speakwell Life style Institute, Kanpur; New Horizons Pvt Ltd., Kanpur; UPTRON India Limited, Kanpur; ASCI, Hyderabad; ESCI, Hyderabad; IIPA, New Delhi; AIILSG, Mumbai; etc. Project Management Unit staff has been providing training in-house and out-station training was provided to KNN officers/staff.

• Conducting In-house and outstation training: Several workshops and training programmes have been organised in-house for different e-Governance Modules and Arc GIS 9.2 modules at regular interval by consultant appointed for development of respective software (NIIT) and Project Implementation Unit (PIU) team. Accounting staff are being trained by the FLC. KNN is also sending its staff members for different training workshops conducted on Public-Private-Partnership (PPP), Urban Management, service level benchmarking, change management, contract management etc.

Outcome of the Project
• Qualitative and fast services
• Courtesy towards Citizens

Achievements and Results
• Inauguration of KNN Centre of Excellence (COE).
• Computer Literacy Training: A Batch of 30 officials has been trained for Computer Literacy.
• Communication Skill Training: A Batch of 20 officials was trained for one month on communication skill training, who also attended the second batch of “City Manager’s” Training at ASCI, Hyderabad.
• “City Manager’s” Capacity Building Training Programme: First batch of 20 KNN Officials attended capacity building training programme at ASCI, Hyderabad.
• A batch of 25 officers for Advance Level e-Learning Workshop on knowledge partner for e-Horizons was also conducted.

Figure 44: Different Human Resource Development Initiatives at KMC (A – E)
A. Inauguration of KNN CENTRE FOR EXCELLENCE on Dated 27th July, 2011
B. Computer Literacy Training

C. Communication Skill Training

D. “City Manager’s” Capacity Building Training Program
E. A Batch of 25 Officers for Advance Level e-Learning Workshop Knowledge Partner e-Horizons

Sustainability

- To achieve the above said outcomes, it's required to train and enhance the skills of KNN Officers / Staffs'. For this purpose, Capacity Building DPR and Training calendar have been prepared at KNN level; Training needs have been identified at each departmental level and regular and ongoing training shall be provided to all KNN staffs/officials.
- Training Centre “KNN Centre for Excellence” has been established in KNN premises where In-house training has been initiated.
- Selection of agencies has been identified and Memorandum of Understanding signed to provide constant in-house and out station training to KNN officers /staff.
- Human Resource Development Officer has been appointed under PIU for the purpose.

Impact of the project

- Performance Appraisal Award: Performance Appraisal Award is being given by respective HOD / AMC/ MC based on the staff performance. One Role of honor for 10 best Inspectors of revenue collection was unrolled by Principal Secretary, Urban Development Department, Government of Uttar Pradesh (UP).
- Staff /Corporator Motivation/Orientation Program at Municipal Corporation are regularly carried out.
- Employee Consultation: Monthly meetings with staff unions are being conducted regularly.
- Discussions with various Urban Local Body (ULB) departments: Regular discussions were conducted with various departments at KNN level and with different parastatal departments/ agencies at state level like the Jal Nigam, UP PWD, UP Irrigation Deptt, UP Power Corporation Environment Deptt., Finance Deptt., Transport Deptt., Forest Deptt., Housing Deptt./Parastatal, DUDA, JALKAL, etc.
- PPP Projects: Following PPP projects are being implemented to provide best services to Citizen like Solid Waste Management, O&M of streetlights, O&M of parks, etc.
- 24 Cyber Café have been authorized to provide the Municipal e-services and Community Participation Projects.
- Urban Management: Prepared and designed Course Curriculum for Urban Management. KNN is going to start the Urban Management course in Kanpur City to get best offices in the Municipal services.
Figure 45: Performance Appraisal Awards by KMC (A – B)

A. Roll of Honor Mentioning 10 BEST Revenue Inspectors being unrolled by Principal Secretary Sri D.S. Mishra at Kanpur

B. Ten Best Tax Collectors Awarded on Their Performance in Year 2010-11

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Title of Best Practice:
e-Governance System for City Administration

State/City: Kanpur – Uttar Pradesh
BP Code: URF-##-##-2857-0113-1

Previous Status
Kanpur City is located in the State of Uttar Pradesh in India. The total land area of Kanpur is about 340 sq. km, and the population is about 2.8-3.0 million. One of the main problems of the Kanpur Nagar Nigam (City Corporation) and Kanpur Jal Sansthan (Kanpur Water Company) has been the extremely low tax revenues. Consequently, the city has been in constant struggle to meet the inevitable challenges brought about by a distressing combination of burgeoning population and poor social infrastructure in the area.

In order to better understand the challenges that confront KNN, Reforms are being carried out at two levels, one at the level of the KNN and the other at the level of the State.

The New Approach
For better and improved administrative system within the city limits, KNN is in the process of commissioning an IT company for introduction of e-governance in KNN. The work process involved the following steps:

* Developed Infrastructure for the hardware requirement with:
  - Establish 5 Xeon server Rack servers on the KNN server room for different purpose like Database Server, Database Back Up server, One Application Server on Windows Server 2007 and Another on Linux, Proxy and Mail Exchange Server.
  - Established the Networking within 6 Zones through Radio-Frequency IDentification Link and 1 gigabits per second (GBPS) layer switches.
  - Lease Line with BSNL/Railtel for Internet Connectivity and State Wide Area Network.

* Procure Software:
  - Integrated Software from e-Governments Foundation Bangalore who are specialized in municipal Domain.
  - Oracle /Sql server user License.
  - Arc View /Arc SDE software for GIS editing.

* Defined a Project Plan for:
  - System Analysis
  - Data Migration
  - User Testing
  - End User Training
  - System Go live

* Defined Post Implementation and monitoring Strategy.

Goals of the Project
The major goals for implementing the e-governance system were:

* To provide to the citizens of Kanpur, easy access to the information and better services of the corporation.
* To eliminate discretionary human interface in the decision making processes while dealing with public.
* To reduce files, process data and make the decision process faster and efficient.
* To raise resources for KNN in order to make the system of administration sustainable.

Implementation Strategies
A. Appointment of State Level Technology Consultant as State Technology Advisor:

Initially Price Waterhouse Coopers (PWC) has done “as-is” survey. Subsequently IIT Kanpur was appointed and submitted the ULB level DPR of each UIG City for e-Governance.

Subsequently, the Ministry of Urban Development, made changes in directives and issued new guidelines in December 2009 and directed each state to prepare the state level uniform e-Governance architecture.

With regards to this, UD department of GoUP appointed IIT Kanpur as State Level Technology Consultant in 2009 with Kanpur Nagar Nigam (KNN) as lead ULB for testing and trial of state wide e-Governance platform.
State Level DPR has been approved to in February, 2011. National Informatics Centre (NIC) has been given responsibility for implementation of DPR and development of different e-Governance modules as per the approved DPR, along with capacity building proposals.

B. Preparation of Municipal e-Governance Design Document (MEDD) on the basis of National Design Document as per NMMP:

Municipal e-Governance design documents have been prepared and are part of State Level common DPR which was approved.

Figure 46: e-Governance Integrated System at Kanpur Nagar Nigam

Figure 47: Kanpur Nagar Nigam Hardware, Networking Infrastructure and Server Room (A-C)
C. Assessment of MEDD against National e-Governance Standards:

Assessment of MEDD has already been done as per the National e-Governance standards and is Part of State Level DPR which has already been approved by GOI.

D. Finalization of Municipal e-Governance implementation Action Plan for the city:

- Initially, e-Governments Foundation, Bangalore was selected through tendering process to implement the 15 modules prepared under the scheme.
- Later, the responsibility of implementation of the revised DPR was given to NIC.

E. Undertaking Business Process Reengineering (BPR) prior to migration to e-governance systems:

- Defined Stakeholder Committee for success of e-Governance System. Municipal Commissioner is the chairman of the committee.
- Defined a Administrative Coordinator for the e-Governance Cell. Additional Municipal Commissioner is taking the responsibility of this.
- Defined a Techno Functional Coordinator for the e-Governance Cell. Information Technology Officer is taking the responsibility of this activity.
- Defined a Nodal Officer of each module, KNN has identified the functional rich and computer literate person as Nodal officer for the module. Along with the Nodal officer of the module, two additional people are responsible for providing timely training to the staff.
- KNN has outsourced six computer trainers for six zones who are available throughout the office time and are responsible for training the staff and help them in running the software application.
- Computer operators have been given the responsibility to verify the transactions like online transaction through payment gateway, ECS verification, etc.
- Relocation and integration of zones has already been done as part of BPR. It has been connected through LAN / RFID at HQ 5 Xeon.
- Servers have been placed for maintaining Database Server /Application Server /GIS Server / Mail Exchange Server / Back Up server, etc.

F. Appointment of Software Consultant(s) / agency for development, deployment and training:

The e-Government Foundation, Bangalore had been appointed as the software consultant / development Agency which is the Municipal ERP implementation company having expertise in municipal domain and has worked for more than 200 ULBs across the country. The web based application has been implemented on Java Language and Oracle Database. The Agency has been given contract for implementation and 3 years handholding support post implementation. State Level Implementation responsibility has been given to NIC as per approved DPR.

G. Exploring PPP option for different e-Governance Services:

At present, 29 private “Cyber Citizen Points” have been authorized by KNN to provide Municipal e-services to citizens.

H. Implementation of e-Governance Modules:

Software modules are being used for payroll & employee information system, property tax collection, birth & death registration, Trade License and citizen grievance monitoring. Tally was being used for double entry accounting system. SWM software has been developed and is being used by Private Partners.

1. Property Tax: Computerized/online Bills are being generated on the basis of GIS based Property tax System. IS database has been already integrated with Property tax system and is also being updated with identified new properties. Bill generation and receipt can be generated through the Property tax software. Property tax software is linked with the KNN’s website. User can make self assessment and view tax calculation method for his property and can see outstanding due and make online payment through the website. Multiple Payment option through Zonal Offices has been developed. Online payment gateway and Cyber Citizen Points available for ease in payment. Various Analytical reports for MIS are generated. Identified new properties are regularly used to link with GIS database.
2. Accounting: Accounting was being done at Tally ERP. Nine accounting software following DEAS has been developed. As integrated software for accounting application is already developed by e-Governments foundation, KNN has tested the application and migration of master data (chart of account, etc.) has been done. Training to different functionaries/personals has been given and migration schedule is defined.

3. Water Supply and Other Utilities: Water Billing is being done at Jalkal through software given by UP Electronics Corporation. Payment system is integrated with billing module, making various MIS reports to be generated through the system. Tally is being used as accounting software. Chart of Accounts of Jalkal have been integrated with KNN Chart of Accounts while Jalkal using the same software. Connectivity with KNN Server through RFID is given to Jalkal to share the Property Tax/Accounting Database and other applications.

4. Birth & Death Registration: A web based application is being used. Every zone has system to issue the Death and Birth Certificates. Birth and Death data has been digitized since 1971.

5. Citizen’s Grievance Monitoring: Web based software and desktop based software is being used for grievance redressal at Head Quarters and Zonal offices along with Help Lines.
6. Personnel Management System: All Employees data has been entered into the application; the data is being updated regularly.

Figure 52: Services provided by GHMC after OSRT

7. Procurement and Monitoring of projects:
   - The e-Procurement: e-Tendering is done through KNN website.
   - Project Ward Works: Software procured and is under customization as per KNN need.

8. Building Plan Approval: Kanpur Development Authority has developed software to apply for online building plan approval, although approval mechanism is manual. KNN has developed system for recording the new building plan data while issuing NOC for future use in property tax assessment.

9. Health Programs:
   - Licenses: Software for Food License is in use.
   - Solid Waste Management (SWM): SWM Project has been implemented on PPP basis. Garbage collection details, location wise assignment of sanitation staff, assigning of routes to SWM vehicles and staff through application software is a part of SWM project which has been implemented. Presently concessionaire provides MIS of above activities.

10. Software for legal Monitoring System Developed and is being used Other than three systems:

The Asset Management System, Estate Management System and File Tracking Systems are under development. Exclusive municipal website (http://kmc.up.nic.in/) is developed and hosted at NIC Lucknow.

Figure 53: Services provided by GHMC after OSRT

Outcome of the project

1. Property Tax:
   - Citizen are provided with facility to enter the property detail at KNN web portal for self assessment of property
   - Facility for payment of property tax through KNN web portal using payment gateway.
   - Collection of tax through Cyber Citizen Points.
   - GIS based property tax system automatically identifies all the properties that are not accessed /billed.
   - System can calculate demand against property based on the predefined attributes.
   - Geographical mapping for identification of properties that are not assessed is also available.

2. Accounting:
   - All accounting attributes like chart of accounts, department, function, fund, schemes are codified as per UP MAM.
   - Standardisation of coding has enabled consolidated computerized reports.
   - Standardization of forms, applications, prerequisites and process are developed.
   - Standardisation of Workflow for approval/rejection process by authority/Hierarchy.
   - Accrual based Double Accounting Systems implemented.
3. Personal Management System:
   - Standard Personal Information System.
   - Provision to maintain increment, promotion, demotion, transfer, retirement, nominee, leave accounting, loan and advances.
   - Standard Payroll, Pension, Provident Fund management.
   - Automatic calculation of employee Paybill, Pension and Provident Fund using predefined formula.
   - PIS integrated with accrual based double entry accounting module for monthly disbursement of salary, pension to employees' bank account, etc.

4. Procurement:
   - Provision for Internal / Purchase Indent through Integrated Web Based Inventory Management/Procurement System.
   - Provision for e-Tendering through Web Portal.
   - After Bid evaluation Purchase Order can be generated through system and through material inward / outward entry stock ledger that is automatically maintained.
   - Material/Service procured when billed automatically impact on Integrated Double Entry Accounting System.

5. Birth and Death Registration:
   - Provision for e-Filing of Registration over KNN Web portal.
   - Provision has been made for the empanelment of Hospital, Maternity Homes and Cyber Citizen Point for registering Birth and Death cases.
   - Ward wise employees register directly details of cases by themselves.
   - The certificate delivered to citizen within 24 hrs duly signed by signatory authority.
   - 24x7 online service is available.
   - Computerized document collection and management.

6. Citizen Grievance Redressal:
   - Service Delivery mechanism defined and implemented.
   - Citizen is able to file complaint through KNN web portal.
   - Complaints are categorized and responsibility is defined for each category.
   - Citizen can enter specific information like Name, Address, Complaint Category and details on web portal.
   - SMS reached with complaint number as acknowledgment to citizen.
   - Citizen can see the status of complaint by entering his complaint number on web portal.
   - Concern Officer is informed through SMS and e-mail notification.
   - Officer/Employee can modify the status as per the progress of the complaint by himself.

Achievements and Results

* Defining the Stockholders Committee under chairmanship of Municipal Commissioner.
* Successfully planed the capacity building for staffs through multiple training sessions.
* Created IT Cell under Additional Municipal Commissioner.
* Defined Module wise Nodal Officer and implementation team.
* Analyse risk and resistances and their solutions implemented immediately.
* Procured hardware and established networking successfully.
* Evaluate Software available in Municipal Domain.
* Procure software.
* Performed GAP analysis
* Data Collection
* Data Cleaning
* Data Migration
* Perform User Acceptance
* End User Training
* Go Live
* Post Implementation Support and system monitoring.

Sustainability

* Developed a committee for stakeholder to ensure the sustainability of Reforms.
* Monitoring plan is developed for each module to monitor the handle issues and solution.
* Escalation matrix is formed on organizational structure model.
* Support system is developed based on three level issues:
  - System Hardware and Infrastructure.
  - Capacity Building through regular training in “KNN Center for Excellence” specially made for the success of e-Governance where Computers and application usage run throughout the office hours.
  - Handholding support to Data Entry Operators through a team of six e-Governance Trainer and two e-Champions.
Software related issues are being taken care by the Software Vendor on AMC basis.

* An IT cell of seven Persons is formed under the Additional Municipal Commissioner to monitor the reform sustainability.
* Module wise Nodal Officer has been given the responsibility to monitor the issues of the project.
* Capacity Building of citizen is being developed through internet, hoardings, Newspapers and Cyber Citizen Points.

**Impact of the project**

Each step of Project Life Cycle was innovative specially GIS mapping with property and approach to develop integrated web based software so that it can be accessed from remote locations like Municipal hospitals, wards offices, etc. New Initiative has been taken to implement document Management system for unique file numbering and tracking and Legal case management system for organizing the legal case monitoring.

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Tel. No.-0512-2551416,
Fax No.-0512-2531662
Title of Best Practice: 
e-Inclusive Urban Planning

State/City: Madhya Pradesh  
BP Code: URF-##-###-1500-0113

Previous Status

Madhya Pradesh is the second largest state in the country (9.4% of the country's geographical area) with a population of 60.35 million (about 6% of the country's population). It is also one of the fastest growing states of the country with population growth rate of 24.3% during the period 1991-2001 which is significantly higher than the all-India rate of 21.3% during the same period.

There are 360 urban centres in the state, which comprise of 14 Nagar Palika Nigam (Municipal Corporations), 96 Nagarpalik Parishad (Municipal Council), and 250 Nagar Panchayats. Rate of urbanisation in Madhya Pradesh is fastly reaching the National average of 28%. It is expected to cross the 30% mark in another 15 years. Urbanization and globalization has lead to economic, social, and political transformation in many States of India. While this ongoing transition poses numerous challenges, it also offers significant opportunities to accelerate economic growth and improve the overall quality of life for its citizens. Whether this potential is realized depends critically on how Indian cities are managed. Strengthening urban management, through better planning, is therefore a key area by which cities can meet the challenges of urban development.

Madhya Pradesh is urbanising at a fast rate and the urban local bodies of the State are facing the challenge of meeting the requirements of the growing population with limited technical and financial resources. GoMP with the support of Government of India and other multilateral agencies has initiated a number of programmes to meet the growing demands of infrastructure and service delivery. These are the GoI schemes: Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT) and Integrated Housing and Slum Development Programme (IHSDP), the GoMP initiated DFID funded MPUSP, which links reform with investment in infrastructure for the poor etc. Other than this there are several programmes that have been initiated by the GoI and GOMP.

After the assessment of the performance of the ULBs and their capacity for exploiting the above said resources it was felt that a city development vision is essential, not only for accessing GoI/GoMP funding but also for providing a strategic framework for converging and co-ordinating various development inputs towards positioning the city on a sustainable planned development path.

The New Approach

Recognizing the growing phenomenon of urbanization, Government of India launched JNNURM in the year 2005. In order to frame-out the planned development of the cities and also to make the cities sustainable the preparation of City Development Plan (CDP) was made mandatory by the Govt. of India.

The concept of CDP preparation was further debated in Madhya Pradesh and the need of CDPs was highly recognized. The matter was taken up at the highest level of Government and it was decided to not restrict the CDP preparation to the Million plus cities but to also extend it to all the 360 Municipalities of the State. It was also decided by the State Govt to provide funds for it and to engage leading consultants for this job. Madhya Pradesh is the first state in the country where urban development plans are being made on such a large scale. One of the key feature in this process is the formulation of plans through consultative approach. The historic initiative of the State Govt. has almost taken up its final shape. The development plans of 96 cities of the state are completed and would get final approval from the concerned ULBs by the month of December while those of ten municipal corporations would get completed by March 2011. By the year 2013-14, development plans of all the civic bodies in the state will be completed.

Robust step of GoMP for City Development Plans of 106 cities:

* Considering above, the Govt. of Madhya Pradesh decided to get prepared the City
development plans for all the towns through its own budgetary provisions. Hon'ble Chief Minister of Madhya Pradesh, Shri Shivraj Singh Chauhan and Hon'ble Minister Urban Administration and

* Development, GoMP Shri Babulal Gaur took keen interest in the project and preparation of CDP's of all remaining Corporations and all Municipal Councils was taken up in July 2009.

* While the CDP preparation for Municipal Corporation was initiated under the GoMP- DFID partnership project

* “UTTHAN”, the CDP preparation work for Nagar Palikas and historically important towns was undertaken by the State Govt. itself. Special attention was given on religious and historic towns (despite of their small population).

Fig. 54: UTTHAN – the CDP preparation drive

Goals of the Project

As a part of its commitment to transform the State into “Swarnim Madhya Pradesh” and in order to achieve the desired goals, the Government of Madhya Pradesh proposed to facilitate:

* planned development
* facilitate investments for making the State slum-free;
* Social development and
* Strengthen the existing policies.

However, the specific objectives of the project were:

* The CDP will scale up existing urban development and poverty alleviation schemes within a comprehensive and coherent strategic planning framework in order to ensure optimal benefit from available resources for the citizens of the ULBs.

* The CDP should aim to catalyse new thinking and provoke debate through a consultative stakeholder driven process.

* The vision and strategic thrusts of the CDP will be built around the lessons and findings of a comprehensive and rigorous stakeholder consultation and documentation process.

* It is expected that the CDP will serve the requirements of the UIDSSMT and IHSDP programmes as well as JNNURM and other development schemes.

* The CDP will generate specific priority actions and projects that can be the basis for mobilizing funding from diverse sources.

Implementation Strategies

A. Inception/RFP

The CDP preparation exercise was initiated in the month of July, 2009. The most important single factor was strong, committed consultants. In fact, it was well understood that the client should be vigorously involved in and dedicated to the project before the first consultant walks through the door. Selecting the consultant team was one of the most important decisions in implementing CDP project. Thus, it was decided to call the consent of highly qualified and leading firms which were empanelled under JNNURM.

Other than the empanelled firms an RFP was floated to select other interested planning firms (for technical evaluation). Thus, the selection of consultants was based upon two criterions:

1. Technical evaluation based upon RFP and
2. Consent of consultants empanelled under JNNURM.

The RFP was floated at the national level for interested companies and consent from the JNNURM empanelled interested companies were called. State got a tremendous response from planning firms/ agencies and received consent from 18 JNNURM empanelled firms and Technical proposals from 36 firms. Following a rigorous selection process 21 companies (out of 36) was selected and 17
JNNURM empanelled firms were found interested.

B. Cities / Consultants

Table 3: Cities allotted to different Companies in MP

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Company Name</th>
<th>Name of allocated City</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EGIS India Consulting engineers Pvt. Ltd., New Delhi (BCEOME Societie)</td>
<td>Khargone Badwaha Maheshwar*</td>
</tr>
<tr>
<td>2</td>
<td>LEA Associates South Asia Pvt Ltd., New Delhi</td>
<td>Shivpuri Chanderi Orchha *</td>
</tr>
<tr>
<td>3</td>
<td>Infrastructure Professionals Enterprise (P) Ltd., New Delhi</td>
<td>Dhar Manawar Pithampur</td>
</tr>
<tr>
<td>4</td>
<td>DHV India Pvt. Ltd., New Delhi (MDP Consultants Pvt. Ltd.)</td>
<td>Pandurana Dongar Parasiya Malajkhand</td>
</tr>
<tr>
<td>5</td>
<td>CRISIL Ltd., New Delhi</td>
<td>Mandsaur J aora Mahidpur</td>
</tr>
<tr>
<td>6</td>
<td>JPS Associates (P) LTD., Delhi</td>
<td>Guna Raghogar Narsinghgarh</td>
</tr>
<tr>
<td>7</td>
<td>ILFS, Infrastructure Development Corporation Ltd., Hyderabad</td>
<td>Itarsi Sivani Malwa Harda</td>
</tr>
<tr>
<td>8</td>
<td>ICT Pvt. Ltd. New Delhi</td>
<td>Bhind Gohad Porsa</td>
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<tr>
<td>9</td>
<td>Community Consulting India Pvt. Ltd., Chennai</td>
<td>Nagda Khachrod Badnagar</td>
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<tr>
<td>10</td>
<td>Ernst &amp; Young Pvt. Ltd., Gurgaon</td>
<td>Chhindwara Seoni Junrdev</td>
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<tr>
<td>11</td>
<td>Feedback Ventures Pvt. Ltd., Gurgaon</td>
<td>Betul Amala Multai*</td>
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<td>12</td>
<td>ICRA Management Consulting Services, New Delhi</td>
<td>Hoshangabad Pipriya Mandideep</td>
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<td>13</td>
<td>Shrishti Urban Infrastructure Development Ltd., New Delhi</td>
<td>Ganjbasoda Bina - Etawa Khurai</td>
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<td>14</td>
<td>Datamation Research Analyst, Delhi</td>
<td>Damoh Hatta Garhakota</td>
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<td>Sehore Shujalpur Shajapur</td>
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<td>16</td>
<td>Groupe SCE india Pvt. Ltd., Bangalore</td>
<td>Datia* Tikamgarh Dabra</td>
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<td>Darashaw &amp; Company Pvt. Ltd., Mumbai</td>
<td>Berasia Kolar Morena</td>
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<td>18</td>
<td>STEM Banglore</td>
<td>Begumganj Raisen Ambah</td>
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<tr>
<td>19</td>
<td>Rudhrabhishek Enterprises Pvt. Ltd. (REPL), Lucknow</td>
<td>Umaria Dhanpuri Sabalgarh</td>
</tr>
<tr>
<td>20</td>
<td>Voyants Solutions Private Limited, Gurgaon, (Haryana)</td>
<td>Anuppur Amarkantak*</td>
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<td>21</td>
<td>SAI Consulting Engineers Pvt. Ltd</td>
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<td>Aarvee Associates Architects Engineers &amp; Consultants Pvt. Ltd., Hyderabad</td>
<td>Kotna Pasan</td>
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<td>23</td>
<td>Meinhardt Singapore Pvt. Ltd., Noida(UP)</td>
<td>Saani Damua</td>
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<td>24</td>
<td>All India Institute of Local Self Government, Ahmedabad</td>
<td>Mandla * Nainpur</td>
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<td>25</td>
<td>CEPT University, Ahmedabad &amp; Development Pro,Bhopal</td>
<td>Jhabua Allrajpur</td>
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<td>26</td>
<td>Senes Consultants India Pvt. Ltd., Mumbai</td>
<td>Sanawad Nepanagar</td>
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<td>27</td>
<td>Creative Circle, Nagpur</td>
<td>Balaghat Waraseoni</td>
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<td>28</td>
<td>N K BUILDCON Pvt. Ltd., J aipur</td>
<td>Neemuch Agra</td>
</tr>
<tr>
<td>29</td>
<td>ICICI Winfra Ltd., Kolkata</td>
<td>Panna* Chitrakut*</td>
</tr>
<tr>
<td>30</td>
<td>Infotech Geospatial (India) Ltd., Hyderabad</td>
<td>Sarangpur Baiora</td>
</tr>
<tr>
<td>31</td>
<td>DDF Consultants Private Limited, New</td>
<td>Rehal Deori</td>
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</tbody>
</table>

| National Institute of Urban Affairs (NIUA), New Delhi |
C. Implementation Process

The implementation process involved the following steps:

1. Preparation of RFP, CDP toolkit and recruitment of Monitoring and management cell (City Managers' Association M.P. was nominated)
2. Selection of Consultants based upon technical evaluation and consent (of JNNURM empanelled firms)
3. Orientation workshops for Consultants and ULBs officials
4. Monitoring (Formation of separate website for better information dissemination and transparency)
5. Review
   - State level Review of all the CDPs at 2 stages
   - Appraisal of CDP reports at every stage
   - District level review by a committee headed by District collector
   - City level review by ULB and Council
6. Approval and consultancy fee payments
   - All the payments are being done only after the appraisal of stage wise reports
   - All the payments are being done through interbank-transfer (RTGS)
Website www.mpcdp.com for information dissemination and CDP progress monitoring Website also gives information on status of CDP report, appraisal and payment status of consultancy fees Regular updation of Web-site is done Immediate and constant interaction with the consultants through e-mail.

**Fig 55: Municipal Dues Collection**

D. The Consultative Approach

The CDPs were conceptualized on the basis of following:
1. Consultative approach
2. Inclusive urban planning

* The formulation of CDPs involved 5 workshops at the city level and 2 workshops at the Stat level. The stakeholders and local populace was involved in each stage of the CDP preparation process.

* In order to make the stakeholders aware of planning process an orientation workshop was organized.

* The sectoral analysis and existing infrastructure analysis of the town was presented before the Stakeholders.

* The stakeholders were asked to formulate a vision statement for their town Sectoral strategies and proposals were also discussed with the local populace.

* Special emphasis has been given on urban poor sector. JNNURM’s 7 point charter has been considered for the same.
* JNNURM’s toolkit for Heritage cities has also been Considered

**Fig 56: Municipal Dues Collection (A-B)**

**Outcome of the Project**

The solution is successfully implemented for Ist Phase of preparation of development plan for 110 ULBs. The Ist Phase of preparing the development plans is a huge task & the solution is replicated for lInd phase of CDP preparation for 270 ULBs of Madhya Pradesh.

The region of impact is largely limited to Madhya Pradesh, but the Project implementation & Monitoring Portals are available worldwide. The consultants/private agencies appointed are from all over the world & they are also using it to review their progress.

**Achievements and Results**

Subsequent to the initiative the following results were achieved:

* City Development Plans of 96 cities are in the process of finalization by the concerned ULBs by December,2010
* CDPs of 10 Municipal Corporations under Project UTTHAN would get finalized by March 2011
* City Investment Plan and Financial Operating Plan as have been proposed under the CDPs shall be transformed into action
* 96 ULBs covered under this exercise now have “to the scale map” of their town.
* Required investment for three phases i.e. 2010-2015, 2015-2025 and 2025-2035 has been assessed in respect of every city.
* Possible financing options and implementation mode and agencies have been identified (various financing options like PPP along with community participation).
* Status of Urban reforms and timelines for their achievement have been defined.
* Awareness among the citizens for planned development of their cities.
* Tremendous public participation in workshops.

**Figure 57: Media Coverage (A-B)**

**Sustainability**

The Project is totally sustainable. As all the information contained in the Project is database driven & can be updated at any point of time. It requires minimal input & can be scaled as we have already adopted the model for 270 towns for IInd Phase of CDPs.

**Impact of the project**

ULBs and consultants conducted extensive consultation with different types of stakeholders. At the time of individual discussions and the workshops, the stakeholders discussed and articulated several factors that should be taken into consideration while formulating the vision. Vision statements for some of the cities are as below:

* Develop Chanderi as an international tourist town by conserving and promoting heritage of the town and as an international centre for cottage industry of Chanderi saree.
* Mandsaur - A Clean Green Education City.
* To transform Mahidpur into a vibrant regional transport hub and pollution free city, through urban renewal and infrastructure development.
* To establish supremacy of Dabra in Gwalior district for agro based trade, industries and transportation activities with self-sufficiency in health and education for its citizens in an environmentally sustainable manner. Chitrakoot NP aspires to be an internationally recognized destination for spiritual and wellness tourism and a prominent center of learning and culture, where active promotion of sustainable tourism by the local government and administration shall be balanced with policies and programmes aimed at boosting local economic development along with generation and strengthening of livelihood based on sustainable use of locally available resources.

**Replicability**

The investment identified would act as a benchmark for budgeting. The GoMP is preparing a policy to implement Projects identified. The demand-gap analysis, Project prioritization & sectoral investment identified by the solution would be great help to formulate the scheme (for collectors & commissioners). The entire maps available online act as baseline data for GIS Mapping.
& Household Survey Project piloted in 26+14 towns of Madhya Pradesh. The product is being replicated for 270 more cities of MP.

**Figure 58: Awards Received**

**CDP focuses on**

- Water Supply
- Recreation
- Solid Waste Management
- Sewerage & Sanitation
- Health
- Education
- Housing
- Urban Poor
- Heritage, Tourism & Environment
- Traffic & Transport
- Urban Reforms

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Telephone: +91 755 2552356  
Email: commuadmp@mpurban.gov.in
Title of Best Practice:
Improvement in e-Governance System

State/City: Maharashtra - Ulhasnagar
BP Code: URF-##-###-1681-0113

Previous Status
Ulhasnagar, a refugee township, of the minority Sindhi community, that came into existence soon after the Partition of India in 1947, has grown into a large city with a population of 4,72,943 as per the 2001 census, and is a hub of activity with considerable retailing and small-scale industrial functions. The town covers an area of 13 square kilometers. The Ulhasnagar Municipal Corporation (UMC), since its inception in 1996, has been making consistent efforts to improve the quality of its services. Some of the problems faced by UMC as well as the citizens are mentioned below:

1. Citizens had to visit UMC headquarter for payment of dues.
2. Dues were being recovered almost manually.
3. Dependency on Manpower.
4. Frequent encounter with errors.
5. Slower transactions.
6. Lack of awareness for vital aspects for determination of water and other taxes.
7. Time consuming process of reconciliation.
8. Consumer handling cost.
9. Short recovery of funds.
10. Detailed Auditing.
11. Prone to Misappropriation.
12. Limited use of Technology.

Therefore, UMC has undertaken e-governance initiatives to improve efficiency, transparency and accountability at the Government-citizen interface. UMC has designed innovative interfaces to make it easier for citizens to access the services and established 11 numbers of Multi-utility KIOSK Centers at various locations in the city to improve the delivery of municipal services and collection of taxes through Information and Communications Technology.

By using these technologies, the project has enabled instant access to all the civic services. These services include online payment of municipal dues like Property Tax & Water Supply Bills, online submission of building plans in AutoCad Format and water tap applications, facility for instant issuance of birth and death certificate, online registering as well as forwarding and disposal of complaints and grievances. UMC has also outsourced call center activity for speedy redressal of complaints and 24x7 accesses.

The backbone of this setup is a local area & wide area network connected through Broad Band VPN. This network is web enabled to provide citizen access to multiple services through a utility driven web site. For the citizens who do not have access to the Internet, fully computerized Multi-utility KIOSK Centers on the network have been created, delivering the same set of services. Property Tax, Water Tax and other bill payments are received through these centers and KIOSK machines. Cash, Cheque and Card payments options are available. The Centers are installed Near Railway Stations, Gardens, Market places to attract the citizens for availing various services and payment of Tax Dues. Citizens can pay tax bills, water bills through these machines. Duplicate copies of the bills can also be made available to citizens through these Kiosks.

The CFC – KIOSK Centers are single point contact area for the citizens to avail the various ULB Services. Citizens can get the services at door-steps and frequent visiting places like Railway Stations, Gardens and Markets etc.

New Approach
UMC has decided to implement e-Governance solution as per guidelines of NMMP under JNNURM. UMC is optimistic on proposed e-Governance solution will make a visible and long-term impact on the administration and in implementing Service Level Benchmark for various Citizen Services. Software Modules to be implemented are Birth & Death, Complaint Redressal System, Water Billing and Accounting Module, Market Trade License Module, Integrated Citizen Facilitation Center (CFC), Accounts Module, Town Planning Department Services Module, Cess Module, Projects monitoring & Works management, Comprehensive GIS and IT Infrastructure
Strengthening. Priority is given to implement revenue generating and citizen centric modules in the initial stages. IT Infrastructure fulfills the needs regarding Application, Web, GIS, and Database Servers. Storage Area Network, Backup LTO24, Fiber Backbone, L3 Switches and Managed networking. IT Security includes Firewalls, Antivirus and implementation of security policy across UMC.

**Goals of the Project**

The goals of the project were:

* Information dissemination.
* Strengthen the tax & water management process of levy, collection, grievance and administration.
* Reach out to the community at their doorsteps.
* Reduction in human intervention.
* Work towards paperless administration.
* Build a more responsive, techno savvy and informed staff.
* Educate Citizens about municipal functioning and civic responsibility.
* Improvement of recovery

**Implementation Strategies**

The processes began with the policy decision for SMART Governance by the General Body of UMC. The UMC had formed a Think Tank comprising of the stakeholders to undertake initiatives for Citizen Connect. Think Tank periodically reviewed the automation process to evaluate and streamline it. The deliberations in Think Tank meetings resulted in the conceptualization of the “Techno-community Outreach Programme” (TOP).

* Identification of the technology and software to be used:

Kiosks, Interactive Voice Response System, Short Message Services and Mobile were identified as the initial tools for TOP Identification of strategic locations for the establishment of Kiosks, invitation of tenders and finalizing suitable agency, and process of implementation etc. Later, creation of awareness materials like Posters, handbills, Audio cassettes and video films; Identification of channels for Awareness generation like Cable, Website, Hoardings, Billing network and telephone networks and Staff Training are other tools for TOP Identification strategy.

* Awareness to citizens:

Phase-wise awareness drive was conducted in identified networks. Almost hundred thousand residential and commercial units were reached through at least one medium of awareness.

* Phase-wise implementation of the process:

Phase-wise implementation of the ongoing process of automation, with Kiosks, Website, Interactive Voice Response System (IVRS), short messaging Service (SMS) and Mobile telephony in four progressive stages were conducted. This was followed by outsourcing of Bill distribution.

A. Implementation of Activities covered under the project

* Computerization: The Municipal Corporation has fully computerized its Property tax affairs and has given a unique identity comprising of nine digit numeric number to each property in the city. The same is printed in bold letters on the property tax bill. Property holders are advised to store the same either in their mobiles or any other convenient mode.

**Figure 59: IT Application used for Tax Collection (A-B)**
* Web services: In case, the property holders do not remember the nine digits Unique ID they can visit the UMC website www.umc.gov.in and search by name or other attributes. The facilities made available on the website are:
  1. Know your dues
  2. Print your property tax bill
  3. Print your last tax paid receipt.

Once the tax payer identifies the amount payable, the following three options are available to him for payment:

1. Payment through ITz Cash card
2. Payment through Credit Card
3. Payment through Bank account.

* Integrated Voice response System (IVRS): Just Dial 2708830. Select your choice of language i.e. English or Marathi. Press your Nine Digit Property Number on your telephone instrument. Follow the instructions of the operator. Citizen gets the outstanding amount of tax and can even pay the same through credit card.

* SMS service: The nine Digit Property Number is send to a service number. Within minute’s amount payable along with several other attributes of property such as area, type of construction and use of property will appear on the mobile screen. Previously these attributes were hidden and kept in back office. Now property holder can cross check and if any of the attributes recorded are improper he can write to the department which will be rectified immediately.

* "Mahapalika Aapke Dwar": Under the initiative “Mahapalika aapse Dwar” four citizen facilitation centre (CFC) have been opened at four ward offices of the city viz: Yatri Niwas, Goal Maidan, VTC sports complex and Netaji Garden. Simultaneously Seven kiosks have been put up at following places:
  1. Near Sadhu Bela High school
  2. Sapna garden
  3. Ulhas railway station
  4. Venus cinema junction
  5. Sobhraj garden
  6. Kurla camp road
  7. UMC head Quarter Bldg.

At kiosk centers machines like ATM have been fixed for payment of property tax. Now people don’t have to come to Municipal head quarter for payment of tax.

* Recovery of Tax dues through “Personal Digital Assistance” (Mobiles): The conventional system of issue of manually prepared Tax Receipts while making door to door visit by Tax collectors is going drastic change. In the general Body meeting held on 20-5-2010 Hi-Tech Mobiles along with Blue tooth connected Printers were distributed by Mayor and Dy.Mayor to the tax collectors. The PDA is on line securely connected with the data.
base server placed at Head quarter. Tax collector during door to door visit can access the data base server through his log in ID and password. The PDA has bar code reader which reads the code printed on the bill and reflects the details including amount payable on the mobile screen. In case the property holder does not have Bill, then nine digit number is sufficient to recall the details from server. The property holder can go through the details and make the payment. The amount paid gets credited in the ledger of property holder immediately. Beside the cashier while sitting at the head office could also make out as to how much amount has been collected by each of the tax collector during the day. The system therefore eliminates the possibility of temporary or permanent misappropriation otherwise possible in manual system. It also enhances the faith of property holder which in turn will result in improvement in recovery.

**Figure 62: IT Application used for Tax Collection**

*Online Building Plan Scrutiny:* Building plan scrutiny software is implemented at UMC. The plans are in-warded at Citizen Facilitation Center in the form of Softcopy i.e. AutoCad Drawing File. The Development Control Rules are parameterize p in the software. The AutoCad Drawings submitted by the Architects are exported in the Application Software. The Building Plan is scrutinizes automatically and compared with Development Control Rules Provisions. Within few minutes the Building Plan gets scrutinize as per DC Rules and Permission granted in specified time. The Developer / Architect / Owner need not to wait for 90 days to obtain the Building Permissions. The Plan Scrutiny is automatically made through software considering DC Rules. And Permission will be immediately granted.

**Figure 63: IT Application used for Tax Collection**

*HRMS for Human Resource Administration:* UMC has to perform various administrative functions like Recruitment, Service Books, Employee Database from date of Appointment, Annual Confidential Report (Appraisal), Leave Management / Transfers / Confirmation / Trainings / Suspensions /Punishments / Increments, Tax, Salary Processing / Pension Management / P.F. Management Etc., HRMS for Human Resource Administration system has implemented on Software as Services Model. Saving on manpower used for calculating attendance, salary, PF, Pension. Employees are provided with login IDs for applying on line leaves, checking leave balance, salary slips, increments, attendance.

**Figure 64: IT Application used for Tax Collection**
GIS for controlling unauthorized constructions: Geographical Information System is used for controlling unauthorized constructions. UMC obtain a good high resolution Satellite image like “Quickbird” for the area. The UMC has 13 square kilometers. Use the base Map (DPMap) and divide the entire area into a grid of 1 square kilometer. In each of the square thus formed erect long life granite pillar marker. These are erected in Govt properties, Municipal Schools, Public Buildings etc for monumental effect and also the underlined prevention of any vandalism. This ground survey also validates the Map by “eye to the ground” verification. The pillars establish ground truthing Lat-Long references. Digitize the Satellite map and superimpose the DP Map. This will yield the property foot prints, each of these will get a Unique GIS-ID. Repeat the ground survey by visiting each property, determine the attributes of the property and add them as points of reference in the GIS. The control on unauthorized constructions will be possible through GIS. The satellite image will be procured yearly and horizontal irregularities will be identified.

E Procurement & Works Management System: E-Procurement is the purchasing of goods and services using the internet. It covers full life cycle of purchasing (indent to receipt of goods), connects buyers and suppliers through electronic exchange of tenders, contracts, POs, invoices etc. E-procurement combines the use of internet technology with best practices to streamline the purchasing process and reduce costs.

Outcome of the project

The Ulhasnagar Municipal Corporation has outsourced installation, operation & maintenance of CFC/KIOSK with zero capital investment for a period of 10 years and agreements executed.

Outsourced Billing ensures time-to-time reaching of education programmes to consumers. The agreements have been executed for 3 years. The agreements entered into covers all the relevant aspects, which ensure sustainability.

The UMC has tied up with HDFC Payment Gateway, Bill junction & Itz Cash Card Limited with no cost involved.

The Mobile & its services being easily available with masses ensure use of facilities of SMS/IVRS.

All the Centers are online connected with main server. Hence all the process & transactions are online real time value of transactions are as follows:

Table 4: Total Property Tax Collection

<table>
<thead>
<tr>
<th>Location</th>
<th>Total tax collected</th>
<th>1 April 09 - 31 March 10</th>
<th>1 April 10 - 31 March 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>VTC Ground</td>
<td>61,68,856.00</td>
<td>1,48,86,121.00</td>
<td></td>
</tr>
<tr>
<td>Netaji Garden</td>
<td>1,01,65,152.00</td>
<td>2,77,86,899.00</td>
<td></td>
</tr>
<tr>
<td>Yatri Garden</td>
<td>31,84,296.00</td>
<td>1,24,11,258.00</td>
<td></td>
</tr>
<tr>
<td>Golmaidan</td>
<td>57,77,129.00</td>
<td>1,37,80,376.00</td>
<td></td>
</tr>
<tr>
<td>Venus Chowk</td>
<td>47,68,472.00</td>
<td>1,59,73,491.00</td>
<td></td>
</tr>
<tr>
<td>Sapna Garden</td>
<td>27,47,137.00</td>
<td>1,17,75,568.00</td>
<td></td>
</tr>
<tr>
<td>Shobraj Garden</td>
<td>6,30,700.00</td>
<td>1,34,16,241.00</td>
<td></td>
</tr>
<tr>
<td>Sadhubela Chowk</td>
<td>0.00</td>
<td>49,84,920.00</td>
<td></td>
</tr>
<tr>
<td>Gurunanak Chowk</td>
<td>0.00</td>
<td>49,94,388.00</td>
<td></td>
</tr>
<tr>
<td>UNR Station</td>
<td>63,94,311.00</td>
<td>31,20,367.00</td>
<td></td>
</tr>
<tr>
<td>UMC HQ</td>
<td>6,34,01,552.00</td>
<td>13,39,49,975.00</td>
<td></td>
</tr>
<tr>
<td>UMC HQ</td>
<td>21,56,02,040.00</td>
<td>13,20,918.00</td>
<td></td>
</tr>
<tr>
<td>No. of TAX Payers Visited</td>
<td>21,110</td>
<td>38,917</td>
<td></td>
</tr>
</tbody>
</table>

Figure 65: IT Application used for Tax Collection
Table 5: Total Water Tax Collection

<table>
<thead>
<tr>
<th>Location</th>
<th>Total Tax Collected</th>
<th>1 April 09 - 31 March 10</th>
<th>1 April 10 - 30 March 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>VTC Ground</td>
<td>27,79,643.00</td>
<td>63,28,989.00</td>
<td></td>
</tr>
<tr>
<td>Netaji garden</td>
<td>41,70,798.00</td>
<td>1,02,37,056.00</td>
<td></td>
</tr>
<tr>
<td>Yatri garden</td>
<td>12,73,801.00</td>
<td>44,79,166.00</td>
<td></td>
</tr>
<tr>
<td>Golmaidan</td>
<td>26,10,834.00</td>
<td>60,65,403.00</td>
<td></td>
</tr>
<tr>
<td>Venus chowk</td>
<td>21,55,910.00</td>
<td>63,10,864.00</td>
<td></td>
</tr>
<tr>
<td>Sapna garden</td>
<td>9,60,337.00</td>
<td>39,40,331.00</td>
<td></td>
</tr>
<tr>
<td>Shobraj garden</td>
<td>2,55,817.00</td>
<td>44,40,965.00</td>
<td></td>
</tr>
<tr>
<td>Sadhubela chowk</td>
<td>0.00</td>
<td>22,96,791.00</td>
<td></td>
</tr>
<tr>
<td>Gurunanak chowk</td>
<td>0.00</td>
<td>17,47,732.00</td>
<td></td>
</tr>
<tr>
<td>UNR STN</td>
<td>34,98,156.00</td>
<td>13,85,826.00</td>
<td></td>
</tr>
<tr>
<td>UMC HQ</td>
<td>1,35,46,978.00</td>
<td>2,72,61,230.00</td>
<td></td>
</tr>
<tr>
<td>UMC HQ</td>
<td>2 44,53,189.00</td>
<td>2,47,648.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3,57,05,463.00</td>
<td>7,47,42,001.00</td>
<td></td>
</tr>
<tr>
<td>No. of TAX Payers Visited</td>
<td>21,110</td>
<td>38,917</td>
<td></td>
</tr>
</tbody>
</table>

Achievements and Results

* Multiple modes of access for information & payment: Kiosks, Web Site, Interactive Voice Response System (IVRS), SMS and Mobile telephony
* Ease in access: consumers made payments through CFC/Kiosks established at various locations in City.
* Improvement in collection.
* Reduction in manpower: No new appointments are being made on the posts becoming vacant due to retirement or any other reason. This will ultimately result in saving of establishment expenditure.
* Reduction in dependency on manpower: In 2009-10 more than 20000 consumers made payments through CFC/KIOSK. In 2010-11 around 33000 consumers made payment through CFC/KIOSK.
* Outsourcing of Bill distribution resulted in timely distribution of bills, detection of around 250 number of un-assessed & under-assessed properties resulting in additional demand of Rs. Six Lacs in the first year. In second year till date around 225 properties have been detected and additional demand to the tune of Rs.20 lacs is expected.
* Vital aspects such as Type of construction, Area and Use of the property to which water charges and property tax are related are reflected on the bill.
* Lesser Misappropriation cases: Due to use of technology payment is immediately credited in the ledger of consumer. Simultaneously it gets deposited in municipal treasury. It eliminates the role of employees who are always prone to these things.
* Limited role of Audit: Audit of revenue receipts is unending task for the department of Municipal Chief Auditor. Use of Atomisation eliminates the possibility of misappropriation, which results in lesser burden on audit.

Budgetary Implications

* Public Private Partnership: The Ulhasnagar Municipal Corporation has outsourced installation, operation & maintenance of CFC/KIOSK with zero capital investment for a period of 10 years and agreements executed.
* The UMC has tied up with HDFC Payment Gateway, Bill junction & Itz Cash Card Limited with no cost involved.
* The Mobile & its services being easily available with masses ensures use of facilities of SMS/IVRS.

Sustainability

* The department staffs are trained for operations of PDA, IVRS, SMS, etc.
* Citizens capacity building through A.V massage on Cable Network.
* Under the Tax payers Education programme cartoon videos are prepared demonstrating the operation of kiosk, use of SMS, IVR and other services. These are played regularly on the cable network.
* The Municipal Corporation in the financial year 2010-2011 has recovered an record amount of Rs. 54 crores which is 62 % more in comparison to previous year recovery of 33 crores. With the introduction of above reforms corporation will go miles ahead.
Impact of the project

* Availability of services 10 hours in a day from KIOSK, via SMS, IVRS & Internet and even on holidays.
* Use of Technology by masses: use of innovative methods ultimately lead to increased faith in technology means adopted by other departments such as MSEDCL, Telephone and LIC premiums etc.
* Better consumer satisfaction: Complaints pertaining to discrepancy in levy of charges have reduced considerably.
* Services are now available to Citizens of their nearest points saving in traveling cost of the citizens.
* Citizens can now interact with UMC through web site, SMS, IVRS, & Call Centers (24X7). Call Center is established to resolve grievances.
* 24X7 Call Center, UMC Web Site, SMS, PDA & IVRS is easily accessible to citizens.
* Facility for online download of forms is provided on website.
* Distance required to travel to citizens for availing various services is less than few hundred meters.
* Availability of services 10 hours in a day from KIOSK, via SMS, IVRS & Internet and even on holidays.

Replicability

e - Governance under JNNURM by UMC is going for replication by Mira Bhayander Municipal Corporation in Maharashtra.

Contact for Details:

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Citizen Facilitation Center,
Head Office, Ulhasnagar - 3
Phone Off: 0251- 2720150
E-mail: cfc@umc.gov.in
Title of Best Practice:  
Property Tax Reforms

State/City: Uttar Pradesh - Lucknow  
BP Code: URF-####-###-2858-0113

Previous Status

Before 2006, Lucknow Municipal Corporation (LMC) had the Area-based System or Unit Value System of Property Tax collection, which links rental values to the locational usage and structural qualities of the building. The main issues to be addressed while considering this property tax reform were three fold:

(a) Tax structure and related legal issues  
(b) Tax administration and  
(c) Policy and Institutional issues.

The New Approach

The property taxation of LMC now stands transposed on GIS Applications Platform with the online Property Tax Management System. Enhancement of Property Tax net, imposition of new demand and more than two-fold increment in property tax revenues in the Financial Year 2009-10 have been the notable outcomes as under:

* GIS based property database and online Property Tax Management System:  
  ▪ Procurement of 0.6 M resolution Satellite Maps sourced from NRSA of the geo-grid of LMC boundaries.  
  ▪ Geo-referencing of the satellite image, GPS land mapping of all the plot/property  
  ▪ Plot and property survey at Zonal and Ward and Mohalla levels for under the 26 defined property-types, instituting unique property identification numbering system as per GIS, matching former property numbers of the municipal registers and preparation of revised assessment list.  
  ▪ Enumeration of Annual Rental Value of the property as per the Revised Monthly Rental Rate adopted in March 2010.  
  ▪ GIS linked MIS Application Software and development of desktop applications for property database and tax management system.  
  ▪ Mainframe/servers at the LMC Head Quarters (HQ), system hardware setup and LAN networking of the Zonal Offices.

* Citizen friendly tax payment system with the on-line 33 e-Suvidha citywide centers for demand verification and collection/recovery.  
* Training of LMC personnel at the HQ and Zonal levels.

* Unique Property Identification System in accordance with the GIS Applications:  
  ▪ A Unique Property Identification System linked with the GIS compatible Lat-Long base now stands incorporated in the Property Tax Management System as under:  
  ▪ The house renumbering is now based on the LMC administrative set up of Zones, Wards, Mohallas and P lots.  
  ▪ All properties renumbered in a sequential manner.  
  ▪ Provisions made to include new mutations and subdivisions to a property number.

Implementation Strategies

The Scope of work mentioned above could be categorized into two broad components based on requirements of the LMC as under -

* GIS Survey and Property Database  
* Unique Property Identification System in accordance with the GIS Applications  
* Web Linked Property Tax Management System Application

As a part of the Property Tax reform, LMC envisaged development of an online web and GIS application based property tax enumeration, information and payment/recovery system. The scope of this work covered the following area for the major activities:

* Procurement of 0.6m resolution satellite maps sourced from National Remote Sensing A of the entire geo-grid area within the LMC boundaries.
* Geo-referencing of the satellite image, GPS land mapping of all the plot/property details as well as the various urban infrastructure features.
* Conducting plot and property survey at Zonal and Ward and Mohalla levels for all the identified properties under the 26 defined property-types. The base maps of the Six Zones are appended as under:

**Figure 67: IT System Architecture (A-F)**

<table>
<thead>
<tr>
<th>A. Base Map Zone 1</th>
<th>B. Base Map Zone 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Base Map Zone 1" /></td>
<td><img src="image2" alt="Base Map Zone 2" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C. Base Map Zone 3</th>
<th>D. Base Map Zone 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image3" alt="Base Map Zone 3" /></td>
<td><img src="image4" alt="Base Map Zone 4" /></td>
</tr>
</tbody>
</table>
* Instituting unique property identification numbering system as per GIS.
* Recording of property details, matching former property numbers existing in the registers and preparation of revised assessment list.
* Enumeration of Annual Rental Value of the property as per the Revised Monthly Rental Rate adopted in March 2010 through dedicated software.
* Development of desktop applications for property database and tax management system.

**Figure 68: IT System Architecture**

- Installation of mainframe/servers at the LMC HQ, system hardware along with the peripherals and networking upto all the Zonal Offices through Local Area Network (LAN).
- Citizen friendly networking of tax payment system with the on-line 33 E-Suvidha citywide centers for demand verification and collection/recovery of property tax.
- Training of LMC personnel at the HQ and Zonal levels.
- Enumeration of property details: unique property identification index as per GIS; Conducting plot and property survey at Zonal and Ward levels for all the enumerated properties; matching former property numbers; preparation of assessment list; new demand evaluation as per the new Annual Rental Rate and generation of new demand notice.
- Conducting plot/property level survey for every property unit.
GIS linked MIS Application Software and Development of desktop applications for property database and tax assessment.

Installation of mainframe.servers at the HQ, system hardware and networking upto all the Zonal Offices through LAN along with the peripherals.

Training of LMC Personnel at the HQ and Zonal levels.

Renumbering of properties with unique premises number and fixing of house number plates.

Figure 69: AASTHI MIS Website (A-B)

Table 6: Code Numbering System

<table>
<thead>
<tr>
<th>Division Head</th>
<th>Number of Digits</th>
<th>Description of the Code Numbering System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone</td>
<td>2</td>
<td>Zone Number, number in between 01 to 06</td>
</tr>
<tr>
<td>Ward</td>
<td>3</td>
<td>Word Number, number between 001 to 110</td>
</tr>
<tr>
<td>Mohalla</td>
<td>2</td>
<td>Mohalla Number, number between 01 to 99</td>
</tr>
<tr>
<td>Plot/Floor</td>
<td>5</td>
<td>Plot/house/flat/Floor Number, number between 00001 to 99999</td>
</tr>
<tr>
<td>Plot Sub-Division</td>
<td>2</td>
<td>Plot Sub-Division Addendum Number, number in between 01 to 99</td>
</tr>
</tbody>
</table>

* Unique Property Identification System in accordance with the GIS Applications

The old system of numbering of the properties lacking systematic numbers, as also the new areas/colonies developed by the Lucknow Development Authority, Housing Board or the Builders and Developers having local numbering demanded urgent attention for adoption of a Unique Property Identification System linked with the GIS compatible Lat-

Long base now stands incorporated in the Property Tax Management System as under:

* The house renumbering is based on the organization of the LMC set up of Zones, Wards, Mohallas and Plots. Besides provision has been made to include new mutations and subdivisions to a property number.

* All properties including the vacant plots are assigned with a new unique number for Lucknow City sequentially in the following manner:

* Implementation

GIS based database and Property Tax Management System with the Unique Property Identification System in accordance with the GIS Applications was initiated for about two years back and has been implemented over a period of about last fifteen months.

Outcome of the project

* New Properties added in the tax net: Implementation of GIS applications based Property Tax Management system has resulted in identification of new properties in the city incrementing the property tax net from 3.02 Lac to 4.13 Lac properties.

* Property Tax Revenue Appreciation: The reform implementation has resulted in more than twofold appreciation of the
property tax Revenue of Lucknow Municipal Corporation.

* Enhanced service coverage and curtailment in service delivery time
  - Reduction of time in resurveying the area and mapping.
  - Time saving in tax enumeration and demand assessment.
  - Enhanced property tax net coverage.
  - Citizen initiated online or form fill/file SAS of residential properties
  - Transparency and faster service delivery
  - Application of GIS mapping in urban infrastructure planning
  - Introduction of GIS linked accrual based evaluation system
  - Postal delivery systematized.
  - New numbering system will be useful in various demographic and geo spatial surveys such as :
    - Delimitation of LMC Wards
    - Backward survey, BPL survey, census etc.
    - Utilities and service connections/ leak detection etc.
    - Planning and revenue generation.
  - Each property has the unique address mapped with GIS database, easy traceability through GIS Map.
  - The Numbering system is linked with the GIS database for search/find through GPS enabled devices.

* Improvement in beneficiary feedback
  - Online Citizen Accessibility through LMC website.
  - On-line feedback system available for the citizens.
  - Property location/property information search system introduced.
  - Improvement in measurable indicators and up gradation of service level benchmarking.
  - Development and integration of GIS based city mapping.
  - Property (attribute data) and GIS (spatial data) available online.

* Simplification of operations and management procedures
  - Property tax enumeration system in local/global language system in citizen friendly Hindi and English syntax.
  - Ward wise/ Road wise monthly rental rates introduced for enumeration of property tax of the residential properties on the website for SAS.
  - Statistical Analysis System (SAS) form and ward wise monthly rental rates matrix for enumeration of property tax for residential property available online on the LMC website.
  - Ward wise/area circle rates of property used for the enumeration of property tax for non-residential property is available on-line on the LMC website.
  - Zone wise, Ward wise and plot/property wise maps of urban civic infrastructure details of highways, roads, lanes, by lanes, railway lines, canals, water bodies, parks, offices, institutions, hotels, hospitals, police stations, schools, etc available on GIS database.
  - Citizen friendly networking of the system with the 33 E-Suvidiha citywide on-line centers for demand identification and collection of property tax.

**Figure 70: AASTHI MIS Website**

* Increased efficiency of the processes and effectiveness of outcomes
  - Reduction of time in survey, mapping, identification of new/amended properties.
  - Minimization of resource span and time in tax enumeration.
  - Upgraded understanding of property tax enumeration.
  - User friendly application for day to day tax management
  - Web application for hassles free Tax enumeration and payments
  - Creation of GIS based spatial property database
  - Map based tracking of property tax defaulters
- Improvement of revenue generation efficiency.
- Planning and improvisation of revenue generation.
- Delimitation of LMC Wards
- Ward wise Backward Population Survey, BPL (Below Poverty Line) Survey
- For planning design, implementation, operation and management of Urban Infrastructure Governance and BSUP projects in JNNURM Program.
- Each property has a unique address and is mapped with GIS database, so that any property can be easily traceable through GIS Map.
- The Numbering system can be further mapped with GPS information for location searching through GPS enabled devise.

Achievements and Results

The achievements and results can be understood from the following table given below:

Table 7: Reforms Status Statement

<table>
<thead>
<tr>
<th>Name of Reform</th>
<th>Completion Target as per MoA</th>
<th>Milestones completed</th>
<th>Reform Status Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Enhancing coverage of property tax regime to all properties liable to tax</td>
<td>No time line</td>
<td>In progress</td>
<td>85.2% coverage done</td>
</tr>
<tr>
<td>B Elimination of exemptions</td>
<td>2007-08</td>
<td>-</td>
<td>Relates to State Govt.</td>
</tr>
<tr>
<td>C Migration to Self-Assessment System of property Taxation.</td>
<td>Yes</td>
<td>SAS for the residential buildings is already implemented for others it is in the adoption stage at the State Level.</td>
<td></td>
</tr>
<tr>
<td>D Setting up a non-discretionary method for determination of property tax.</td>
<td>Yes</td>
<td>UAM (Unit Area Method) is being implemented for Residential Properties.</td>
<td></td>
</tr>
<tr>
<td>E Use of GIS based property tax system</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F Selection of appropriate consultant</td>
<td>2007-08</td>
<td>Yes</td>
<td>UPDESCO had been appointed as core consultant in 2007 and M/s FA Geocad Systems Ltd, Noida has been appointed as the implementation consultant firm.</td>
</tr>
<tr>
<td>G Preparation of digital property maps for municipality.</td>
<td>2008-09</td>
<td>Yes</td>
<td>1:1000 &amp; 1:10000 scale maps prepared for mapping and planning purposes with ward as unit.</td>
</tr>
<tr>
<td>H Verification of digital maps and preparation of complete data base of properties.</td>
<td>2008-09</td>
<td>Yes</td>
<td>Verification done by survey teams. Renumbering of properties is being done continuously.</td>
</tr>
<tr>
<td>IV</td>
<td>Administration of property tax using GIS database and related application</td>
<td>2009-10</td>
<td>Yes</td>
</tr>
<tr>
<td>V</td>
<td>Mechanism for periodic updating of GIS database</td>
<td>2009-10</td>
<td>Yes</td>
</tr>
<tr>
<td>F</td>
<td>Next scheduled/anticipated revision of guidance values</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>G</td>
<td>Periodicity for the revision of guidance values</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Periodicity to be adopted</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>ii</td>
<td>Deadline for adoption</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>H</td>
<td>Establish tax payer education programmed setting up a website for property tax issues/FAQ etc</td>
<td>2007-08</td>
<td>Yes</td>
</tr>
<tr>
<td>I</td>
<td>Preparation of ready Reckoner</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>ii</td>
<td>Local camps for clarification of doubts and assistance in the filling out forms</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>iii</td>
<td>Setting up a website for property tax issues/FAQs etc</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>J</td>
<td>Establishment of dispute resolution system</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>K</td>
<td>Rewarding and acknowledging honest tax payers</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>L</td>
<td>Achievement of 85% collection ratio for target coverage ratio for current year</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>M</td>
<td>Achievement of 90% collection ratio for current demand target collection ratio for current year.</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>N</td>
<td>Improvement in collection arrears</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>O</td>
<td>Any other reforms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Cash prizes</td>
<td></td>
<td>Yes</td>
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<tr>
<td>ii</td>
<td>Mobile property tax collections</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>iii</td>
<td>Collection through Debit interface/credit card</td>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Sustainability**

The measures adopted and instituted for ensuring sustainability of the reform are as under:

* The details of the newly constructed/amended properties updated through citizen self declaration and field reporting of LMC staff.
* The database of the building plans received for no Objection Certificate from the Lucknow Development Authority is being maintained for the cross checking addition/amendment of the properties.
* The newly identified/amended properties updated in the GIS system and zonal officer assesses/verifies the ARV and issues the demand notice.
* Being a revenue generating activity the system is financially sustainable.
Impact of the project

1. Reform innovations enabling citizen interaction
   * Creation of GIS based spatial property database accessible for ease of tax enumeration and processing of citizen friendly self assessment system through website or self-declaration on printed form.
   * Time saving in filling/filing of the forms in the either process through online dedicated website/link or the offline SAS Form.
   * Citizen response generative property tax enumeration in the either process enabling data/information entry and enumeration in a stepped manner through online dedicated website/link or the offline form filling/filing that provide the guidance and support details.
   * Reduction of time in survey, mapping, identification of new/ amended properties
   * Tax payer under PT Net. of LNN can calculate ARV and generate demand through online Software.
   * Dedicated and secure website developed, updated and maintained by NIC.
   * Online property tax payment through dedicated secured payment gateways through Master/VISA credit cards, debit cards and Internet banking.

2. Reform innovations in enhancing transparency and accountability
   * Online property tax details, records and demands etc accessible at the mainframe/servers at the HQ, through LAN networking up to all the Zonal Offices, and above all at the e-Suvidha citizen service centers.
   * Citizen friendly network of Taxpaying system with the 33 e-Suvidha citywide
   * On-line centres for demand note generation and collection/recovery of property tax
   * LMC tie-up with Information Technology Department of GoUP
   * Dedicated and secure website developed, updated and maintained by NIC

Fig. 71: Interactive Citizen Centric Web Portal – e-Suvidha (A-D)
* Online property tax payment through dedicated secured payment gateways through Master/VISA credit cards, debit cards and Internet banking.

**Figure 72: E-Governance Center, Lucknow Nagar Nigam (A-C)**

A. E-Governance Center, Lucknow Nagar Nigam

B. HelpDesk at Lucknow Nagar Nigam

C. Service Delivery Desk, e-Governance Center, Lucknow Nagar Nigam
Contact for Details:

Shri. Narendra Prakash Singh
Commissioner
Lucknow Municipal Corporation
Lucknow Nagar Nigam
Lucknow, Uttar Pradesh
Phone: 0522 – 2202570 (Extn. 203)
Mobile: 9415008423
Title of Best Practice:
Implementation of Community Participation Law

State/City: Karnataka - Mysore
BP Code: URF-###-###-1425-0113

Previous Status

The Government of India under the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) scheme envisages for Community Participation Fund (CPF) project where in the community contribution is either 10% or 5% depending on whether the area comes under normal or backward area respectively.

The maximum cost of the project could be Rs 10 lakhs per year for each community. The guidelines permit the Area Sabhas to give out the Community Participation Fund to the community. Since Area Sabha could not be formed without amendments made in the Karnataka Municipal Act, a decision was taken to form electoral booth level areas to be identified as Area Sabhas.

Need for Community Participation

* Communities have little capacity to participate in administration.
* A platform is not available earlier to this initiative for active participation
* Need for communities to participate in the discussions with involvement of all concerned stakeholders was strongly felt.
* Create a space for effective participation and contribute in improving their living environment.
* Catalyze the process of community participation by creating a "Participatory Incubator" - collective decision making.
* Setting up mechanisms for interface with urban local body / elected representatives.
* Urban local bodies form a vital part of the democratic machinery
* Providing innovative and effective urban governance to the citizens is top priority as on day.
* Mysore is one among the ‘C’ category cities selected by Ministry of Urban Development (MoUD), for renewal of urban city.
* City development plan (CDP) for Mysore city prepared by Mysore City Corporation has been approved by MoUD.

New Approach

Mysore City Corporation (MCC) Initiative

* As Amendment to Karnataka Municipal Corporation (KMC) Act is required for creating Area Sabhas, Booth level areas were identified to form citizen committees.
* Steering committee was constituted in the month of October 2007 for preparing guidelines for formation of citizen committees.
* 686 citizen committees were setup.
* Nine members were formed to be part of each citizen committee

Implementation Strategies

* Formation of Citizen Committee
A steering Committee was constituted in the month of October 2007 for preparation of guidelines for formation of Citizen Committee. The broad guidelines for the formation of the Citizen Committee were as follows:

  - A six to nine member committee consisting of 2/3rd (voluntaries) of the citizen who comes forward on their own and 1/3rd (invitees) filled by MCC shall form to become a Citizen Committee. The invites are not voluntaries. In this 1/3rd women participation and 1/3rd with minimum SSLC qualification is a must. The 9 member should be in the following age group. 18-25 one member, 26-30 one member, 31-40 one member, 40-50 one member, 50-60 two members, more than 60 two member.
  - There should not be more than one member from the same family.
  - The citizen should serve the society as a voluntary and shall devote quality time for social service.
  - There should be Leader and Deputy Leaders elected among each committee.
  - The terms of the committee shall be 5 years.
  - The committee shall meet every fortnight chaired by the leader or any person authorized by the leader.
  - More than 50% quorum shall be in the committee meeting.
According to the guidelines, 686 Citizen Committees are set up in the city, and 9 members are identified for each committee, which includes leaders and deputy leaders.

- Awareness
  - A two-month awareness campaign was conducted between 1st November 2007 to 31st December 2007.
  - A massive conclave was arranged on November 24th 2007 to enlighten the elected representatives in respect of community participation and the formation of citizen committees.
  - The Conclave was presided by Heads of various Religious Maths and Castes.
  - During the conclave, the citizens, elected representatives, and religious leaders pledged to strive towards the formation of citizen committees.
  - A two-day workshop to elected representatives on reforms was conducted by resource persons of Administrative Staff College of India (ASCI) during 11th and 12th December.
  - Calling for applications to become members of Citizen Committee.
  - Advertisements were issued by the Mysore city corporation in various leading local newspapers.

Application forms in the ratio of 1:3 were made available in the Central office and nine zonal offices.

- Activities of Citizen Committees
  - Leaders and Deputy Leaders of the committee along with Self Help Groups (SHG’s) educated to promote SWM.
  - To involve in Community Participation Fund (CPF) project formulation and sanction, Implementation and Monitoring.
  - Each committee provided with 10 pre-addressed postcards to communicate the problems in the area.
  - Regular meetings by SDO with booth committees to know the requirements.

- Booth committees strengthened by providing:
  - Fogging Machine.
  - Bleaching Powder.
  - Saplings for a forestation.

- Booth committees strengthened by providing:
  - Guppy and Gambazia fish to control mosquito menace.

- Bacteria Culture treatment introduced in UGD treatment.
- Involving in regularization of unauthorized water connection & disconnection of default consumers.

- Booth committees were involved in:
  - UID & Census Program.
  - Maintaining Parks through Neighborhood committee
  - Identifying Homeless People.
  - Informing new slums coming up

- Collection of funds
  - The worshipful Mayor and Deputy Mayor, Commissioner, ward Corporator, Officers and Committee Members made padayatra and door to door approach was done to collect the contribution. Simultaneously, needs of the area were also identified by enquiring with the citizens.
  - The local Philanthropically Societies, different Organization; Associations were also individually met for the cause.

- Deposition of funds
  - Though Community Participation fund guidelines provide for collection and deposit of contribution after the project approved. The Mysore City Corporation decided to have upfront collection and deposit. Accordingly a joint account is opened in the name of Zonal Asst. Commissioner and respective Citizen Committee Leaders in the Nationalised Bank and the collected amount is deposited in this account.

**Outcome of the project**

- Details of CPF Projects

**Table 8: Total Property Tax Collection**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Details</th>
<th>No’s</th>
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</thead>
<tbody>
<tr>
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<td>Projects submitted to GOI</td>
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</tr>
<tr>
<td>2</td>
<td>Projects Approval by GOI</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>Projects Approved by MCC</td>
<td>40</td>
</tr>
</tbody>
</table>
Achievements and Results

Figure 73: Improvement in the 21st and 22nd J. P. Nagar Main Park

Figure 74: Improvement in the 24th J. P. Nagar “D” Block, Main Park

Figure 75: Improvement in the 13th and 14th J. P. Nagar “D” Block, Main Park
Contact for Details:

DR. M. R. Ravi  
Commissioner  
Mysore City Corporation,  
New Sayyaji Rao Road  
Mysore-570024  
Phone: 2418803/2418802  
Mobile: 9449529434  
email: comm_mcc@yahoo.co.in
Title of Best Practice:
Saving Environment and Creating New Employment Opportunities at Siddhpur Nagarpalika

State/City: Gujarat - Siddhpur
BP Code: ENV-1.4-0882-0113

Previous Status

Plastic, with its numerous utilities has become a part of our daily lives. Its use in day-to-day activities has increased tremendously for use in packaging, carrying, utilities and toys. However, evidence also indicates that, use of low quality plastic is hazardous from a health and environment viewpoint. The Government has therefore banned use of plastic below 20 micros for consumer use. Despite the ban, its manufacture and use continues unchecked.

Since cities are central for market sources, production and use of such plastic bags is more in the cities. The city municipalities have been legally entrusted with the powers to control the production, sale and use of such plastic bags. As a part of this legal power, the Siddhpur Nagarpalika has launched a new initiative under the legal powers to regulate the production, sale and use of plastic bags, a step towards making Siddhpur an environment friendly city.

The New Approach

As any other place, plastic bags were commonly used to store and supply purchases to consumers at shops and vendors in Siddhpur. As a consequence, there was an increase in the plastic contents of solid waste. The decomposing of solid waste slowed down. Despite the powers with the Siddhpur Nagarpalika, there was no clear strategy to regulate the production and sale of plastic bags below 20 micros.

Siddhpur Nagarpalika, therefore, took some major steps in this direction. To begin with they identified the source of supply of plastic bags. It was discovered that most of the wholesale supply was from traders outside the city. A second group of local traders supplied these bags to local population. The local shop keepers and Lori owners therefore formed the second cadre of suppliers. The third group was traders who came from outside the city for door-to-door sales. Measures to curb the sales and use of harmful plastic bags were discussed, thoroughly. The officers of the Siddhpur Nagarpalika decided to form teams and monitor the three groups, check the quality of the bags, identify harmful bags for recycling and penalize the trader on the spot.

Figure 76: Shakhi Mondals at Sidhpur

This strategy was implemented in September 2007, wherein, the staff strictly monitored the three groups, identified harmful bags and sent them for recycling and penalized the traders - a fine ranging from Rs.50 to Rs.5000/- This strategy had a desired impact and the municipality has been able to stop the sale and usage of plastic bags below 20 micros of plastic. Alternatives to the plastic bags below 20 micros were also being considered.

Implementation Strategies

Strategy

While the Siddhpur Nagarpalika staff continued a strict vigil, it became difficult to continuously monitor the plastic bag use, with limited staff capacity. There was a need to raise public consciousness and develop sustainable alternatives to limit the use of plastic bags. At this point, the Swarna Jayanti Shaheri Rojgar Yojna (SJR Y), which is an employment scheme for the people living below poverty-line (BPL), was implemented. This scheme was implemented by Siddhpur
Nagarpalika in 2001. Under this scheme women from 3060 BPL families were organized to form women’s groups called Sakhi Mandals. A total of 47 Sakhi Mandals comprising 517 women members have been formed till date. Based on the success of savings and credit of this group, using the revolving funds from the scheme as well as bank loans, Siddhpur Nagarpalika provided vocational training and funds to these groups for various activities such as bamboo wicks making, jardosi work, diamond tikki, driving and computer operations. Siddhpur Nagarpalika has demonstrated commendable work under this scheme and has been awarded at the state level.

The successful implementation of SJSRY by the Siddhpur Nagarpalika paved way to curb the use of plastic bags. Production of paper bags through the SJSRY scheme was also encouraged to replace plastic bags. The following steps were taken towards the production of paper bags:

* Identification and selection of beneficiaries

50 members living below poverty line and interested in paper bag production were identified.

* Skill building

Training on paper bag making for two batches of 25 members each was organized by Siddhpur Nagarpalika under the SJSRY.

**Figure 77: Preparation of Paper Bags as alternative to Plastic Bags (A-B)**

* Formation of Sakhi Mandals

In course of the training programme, Sakhi Mandals were formed as a framework for paper bag making. Each member contributed Rs.100/- towards the savings.

* Pre feasibility survey

A sample bag prepared by the group was taken by a team of Siddhpur Nagarpalika officials and Sakhi Mandal members to check the feasibility of paper bags. Shopkeepers, vendors were contacted and their feedback solicited on the design, quality, size, material, strength and their wholesale requirements. Based on this survey, the production of paper bags was initiated by Sakhi Mandal.

* Raw material in wholesale

The members decided to purchase raw material in wholesale from the nearby towns and cities.

* Production Management

Various responsibilities were charted out and each member took the responsibility of certain production aspect. The members took these responsibilities on a rotation basis.

* Costing

Based on the use of raw material, labor, management cost, marketing cost and profit
margin, the members priced the bags at Rs. 54/- per kg as against Rs.120/- per kg for the plastic bags. The margin was Rs.62/- per kg. Currently, Sakhi Mandals are manufacturing paper bags for provision stores to store goods weighing 250 grams to 2 Kilograms. The mandal has initiated manufacturing bags from magazines for fruit bags, medicine shops and envelops for courier companies and so on.

* Marketing

To support the group in marketing the paper bags, Siddhpur Nagarpalika organised a meeting of the members with the Government offices, city traders, courier companies and other buyers. Based on this discussion, the members, on rotation, procure orders and manage supplies.

**Outcome of the Initiatives**

The main purpose of this initiative was to curb use of harmful plastic bags and prevent environmental pollution.

* Through strict enforcement of the law, Siddhpur Nagarpalika was able to reduce the use of plastic bag below 20 micros to a negligible amount and the use of black colored plastic bags has been completely abolished.

* Introduction of paper bags as a sustainable alternative has also lead to increased employment opportunities.

* It is easier to destroy solid waste for Siddhpur Nagarpalika in absence of any plastic bag.

* People’s health has been protected from the hazards of plastic bag use.

**Sustainability**

The main objective of this initiative was to stop the use of plastic bags which were harmful to the environment, strategically, by not limiting to the use of law but by providing appropriate alternatives. This approach benefits both the manufacturer and the buyer; therefore it leads to gainful supplementary employment opportunities. Since a systematic framework for implementation has been created, this will be sustainable for a long time.

Plastic bags, harmful to the environment are used almost everywhere. Taking cue from the Siddhpur Nagarpalika, if other municipalities also adopt a comprehensive approach, they will be able to curb the use of plastic bags and make their cities environment friendly.

**Impact of the Initiatives**

Through this effort, women living in BPL families have obtained supplementary employment. Currently 3 groups of a total of 30 members are engaged in paper bag making. The member gets Rs. 15/- for preparing one kilo of paper bags. On an average one member can make paper bags from 2 kilograms to 8 kilograms in a day. In this way, she earns Rs.30-120/- per day.
Contact for Details:

Shri. Yogesh Shah  
Chief Officer  
Dhangadra Municipality  
Dist: Surendranagar  
Ph: 02754-281253, 282988
ANNEXURES

National Institute of Urban Affairs (NIUA), New Delhi
Annexure 1:

INDIA URBAN PORTAL (www.indiaurbanportal.in)
PEARL Website:

Under JNNURM

NIUA has set up a PEARL website “India Urban Portal” www.indiaurbanportal.in that is operationalized and linked with JNNURM website. India Urban Portal is a knowledge collaborative platform that enhances the availability of quality urban information on best practices, projects, reforms, innovations etc. carried out in the selected cities under JNNURM. The goal is to provide portal to urban information and to create a network, community and resource.

The purpose of the portal is to improve access to information thus facilitating the knowledge-sharing and collaborating process. The portal will serve as an urban information and interactive center serving the informational needs of various communities of users. The site is user-friendly having standardized metadata, controlled vocabularies, and qualified sources to describe information. It contains:

- Best Practices / Projects - Sector wise projects and best practices are listed here.
- Organisations - this section provides links to the Central Government Organisations, Urban Local Bodies, Development Authorities, NGOs, Research Organisations and International Organisations etc.
- Data Resources - This section provides information on useful resources like policies, laws, maps, statistics and data related to urban India. The section is constantly being enhanced.
- About JNNURM - This section provides information on JNNURM i.e. urban reforms, project status, latest update etc.
- PEARL Newsletter, Publications, Daily news; Activities under PEARL programme, Gallery (contains video clip of the good practices and others) are also available.

Among many features that have been added on India Urban Portal, this is one of the most significant one. Discussion forum India Urban Portal is a shared space by members to discuss, exchange ideas, strategies and be of assistance to each other on a regular basis. The initiator of discussion thread can apply ‘forum lock’ on a topic when they want the thread closed. A Help Desk for JNNURM Cities was set up for urban managers and associated sector professionals. Tracking of Urban Advertisements is uploaded on website on fortnightly basis. The website has new features of e-Discussion Form, e-Group and other IEC Material.
All the partners contributing to the flow of urban information are invited to join us in the integrated cooperation effort with suggestions, Informations to be put up in the site, news, events, Informations on projects, best practices, etc. Please mail us at Dr. Debjani Ghosh and Ms. Nilanjana Dasgupta Sur.

Post News and Events:

India Urban Portal's goal is to provide an entryway to urban information and to create an urban information network, community, and resource that will provide qualified, trusted, and verifiable information and contacts.

Contribute to the flow of urban information by submitting/posting any current news/updates/events/seminars/workshops/meetings related to the urban field via e-mail to dghosh@niua.org and nsur@niua.org.

There are three types of member registrations (type of membership will be decided by the Administrator of the website) which provide the user with a different level of access of the website. These memberships are:

1) Premium Members: They can download as well as upload communication materials, upload Best Practices, Papers, Documents, Tenders, communication materials, create their own e-group, directly access helpdesk, take part in forums etc. These privileged members are mainly the people from the Municipal Corporations from the Mission Cities.

2) Guest Members: These members have got the right to only download communication materials from the website and also take part in the Discussion Forums. They can only browse the Helpdesk. These members are mainly the people from the Government, International Organisations, National Organisations, Non Governmental Organisations, Students, Others, etc.

3) Domain Members: These members are from the Administration who are responsible for administering the website.

Please give details on your organisation and contacts.
It is heartening to note that cities are eager to showcase their achievements, share and learn from one another. In this context, PEARL has already documented four volumes of urban initiative report, based on the urban initiatives carried out by mission cities. This is the fifth volume of "Urban Initiatives" Report taken out on the eve of the anniversary celebrations for the flagship programme year 2011. The documentation is expected to display the indispensable work being carried out by the cities to make them more livable and healthy for the future to come. These are structured in the standard format as developed under PEARL that includes the process, results achieved, sustainability, lessons learnt, recognition, and replicability of the urban initiatives.

The details of the initiatives are also available on [www.indiaurbanportal.in](http://www.indiaurbanportal.in)

The following best practices covered in the report are:

- Composting of Municipal Solid Waste through PPP Model – Ahmedabad, Gujarat
- Decentralized Waste Water Treatment System (DEWAT) in Kachhpura, Agra, Uttar Pradesh
- Bombay First - Mumbai, Maharashtra
- Public-Private Partnership for Inclusive and Sustainable Development of Thane City, Maharashtra
- Jalandhar City Bus Service, Punjab
- Jabalpur City Bus Service, Madhya Pradesh
- Reforming Agra by Re-imagining through Slum Up-gradation, Uttar Pradesh
- Jhansi Jan Suvidha Kendra – Jhansi, Madhya Pradesh
- Offsite Realtime Monitoring System (OSRT) - Greater Hyderabad Municipal Corporation, Andhra Pradesh
- m-Governance: An Efficient Way to Meet Citizen’s Expectations – Rajkot, Gujarat
- Development of Software for Computerized Tax Administration at Upleta Municipality, Gujarat
- Aasthi - GIS Based Property Tax Information System – State of Karnataka

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Fax: +91-11-24617513
Website: [www.niua.org](http://www.niua.org), [www.indiaurbanportal.org](http://www.indiaurbanportal.org)
Annexure 3:

"Urban Initiatives" Vol - 4

The "Urban Initiatives" Report highlights some of the laudable and creditable work being done by the cities in India. This issue cuts across various sectors related to Urban Management such as water supply, sewerage, solid waste management, public transport, heritage, urban poor, urban reforms, etc. These are structured in the standard format as developed under PEARL that includes the process, results achieved, sustainability, lessons learnt, recognition, and replicability of the urban initiatives.

The details of the initiatives are also available on www.indiaurbanportal.in

The following best practices covered in the report are:

- An Innovative IT Solution for Improving Urban Water Supply Management through Supervisory Control and Data Acquisition (SCADA): The Case of Vijayawada Municipal Corporation, Andhra Pradesh
- Sustainable Water Supply Operations through 100% Metering and Billing, Online Payment Collections & Supply Management of Water Districts through Supervisory Control and Data Acquisition (SCADA), Pimpri Chinchwad, Maharashtra
- Water Supply in Gas Affected Areas in Bhopal, Madhya Pradesh
- Sewerage Project at Jaipur City, Rajasthan
- Electricity Generation from Sewage Treatment Plant at Vadodara City, Gujarat
- Pal and Palanpore Water Supply and Sewerage System in Surat City, Gujarat
- Protecting a Canal from Garbage Dumping and Ensuring Quality Drinking Water to Slum Dwellers, Madurai, Tamil Nadu
- Gorai Dumping Ground – An Urban Rejuvenation Project, Mumbai, Maharashtra
- Solid Waste Management at Nashik City, Maharashtra
- Implementation of Solid Waste Management in Thideer Nagar Slum, Madurai, Tamil Nadu
- Bhubaneswar - Puri Public Transport System, Orissa
- Integrated Infrastructure Development of Slum & Poor Locality, Bhopal, Madhya Pradesh
- Establishing Slum Information Centre for Slum Dwellers under Community Participation Fund under JNNURM, Madurai, Tamil Nadu
- Efficient Health Care Management System through Service to Urban Poor, Pimpri Chinchwad, Maharashtra
- Capacity Building through HRD Practices in Greater Visakhapatnam Municipal Corporation (GVMC), Visakhapatnam, Andhra Pradesh
- Community participation in the functioning of Urban Local Bodies in Hyderabad, Andhra Pradesh
- E-Governance Reforms, Surat, Gujarat
- Implementation of Enterprise Resource Planning (ERP) Solution, Common Service Center & MIS Reforms, Kurali, Punjab
- Stakeholder Participation Process for preparing Detailed Project Reports (DPRs) under JNNURM, Panaji, Goa
- Living Heritage Streets at Bhubaneswar City, Orissa

To obtain a copy Contact:
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National Institute of Urban Affairs (NIUA)
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Telephone: +91-11-24643576(Director), 24617517, 24617543, 24617769, 24643284
Fax: +91-11-24617513
Website: www.niua.org, www.indiaurbanportal.org
"Documentation of Best Practices" Vol. 3 is an initiative to highlight some of the admirable and creditable work being done by the Urban Local Bodies (ULBs) in the Mission Cities. The documentation is expected to serve as a source of learning and sharing of experiences. This third best practices report is another stepping stone in the process that covers the success stories of various state ULBs from Andhra Pradesh, Gujarat, Haryana, Karnataka, Maharashtra, Orissa, Punjab, Uttar Pradesh and West Bengal. These are select Best Practices that are structured in the standard format as developed under PEARL. This covers a brief summary, key dates, situation before, the new approach, strategy to develop the initiative, the process, results achieved, sustainability, lessons learnt, recognition and replicability.

Last few years saw an increase in activities on the project front under JNNURM. Success stories of cities which have demonstrated improvement in urban services and financial management have been documented in this report. Some of the successes stories which needs mention are Gorakhpur Municipal GIS Development, Mehsana Property Tax Collection System, Kolkata Water Supply and Underground Parking Systems, Puri and Amritsar’s Solid Waste Management System, Nanded and Bhubaneswar’s Urban Renewal, and so on.

The details of the best practices are available on www.indiaurbanportal.in

The following best practices are covered in the report:

- Solid Waste Management through Bio-Composting: Puri, Orissa
- Vending Zones at Bhubaneswar, Orissa
- Improved Collection and Transportation of Municipal Solid Waste through PPP: Amritsar, Punjab
- Automated Parking System: Bangalore, Karnataka
- Fleet Expansion/Modernization Programmes of City Public Transportation: Bangalore, Karnataka
- Payroll System in Bruhat Bangalore Mahanagara Palike: Bangalore, Karnataka
- GIS for Property Tax in Bruhat Bangalore Mahanagara Palike: Bangalore, Karnataka
- Transport Services on PPP Basis: Rajkot, Gujarat
- Cost effective housing for the Urban Poor: Ahmedabad, Gujarat
- Mehsana Nagarpalika initiates PPP for Property Tax Collection: Mehsana, Gujarat
- Planning to Reduce Impact of Disaster: Surat, Gujarat
- Fund Your City - A PPP Initiative For Urban Infrastructure Development: Hyderabad, Andhra Pradesh
- Preparation Process for Draft Development Plan: Kolkata, West Bengal
- Initiatives under Urban Renewal at Nanded Waghala City Municipal Corporation: Nanded, Maharashtra
- Trade License in Bruhat Bangalore Mahanagara Palike: Bangalore, Karnataka
- Water Supply and Sewerage Project, Salt Lake (Sector V): Kolkata, West Bengal
- Bore Well Automation: Faridabad, Haryana
- PPP Model for Underground Car Parking System: Kolkata, West Bengal
- Initiatives for the Urban Poor: Mumbai, Maharashtra
- Municipal GIS - Gorakhpur Experience: Gorakhpur, Uttar Pradesh

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Website: www.niua.org, www.indiaurbanportal.org
“Documentation of Best Practices” Vol - 2

This publication is the second report designed to document Urban Reforms initiated under JNNURM. These are select Best Practices that are structured in the standard format as developed under PEARL. This covers a brief summary, key dates, situation before, the new approach, strategy to develop the initiative, the process, results achieved, sustainability, lessons learnt, recognition and replicability.

The motivation has been to focus on Best Practices in Urban Reforms at State and City Level. This includes case studies from State level (Karnataka, Andhra Pradesh, Orissa, and Tripura) to ULB levels (Ahmedabad, Surat, Pimpri Chinchwad, Bangalore, Hyderabad, Kanpur and Pune) to have optimum level of convergence and synergy from JNNURM cities. Some of the case studies have also been taken up from other cities, which makes this documentation much more enriched in achieving the desired goal of PEARL.

The details of the best practices are also available on www.indiaurbanportal.in

The following best practices are covered in the report:

- Municipal Reform Cell, Government of Karnataka
- Rationalisation of Stamp Duty, Orissa State
- Improved Financial Management of Bhubaneswar Municipal Corporation
- Accounting Reforms in Urban Local Bodies of Karnataka
- Property Taxation, Ahmedabad, Gujarat
- Property Taxation, Bangalore, Karnataka
- Property Taxation, Hyderabad, Andhra Pradesh
- Property Taxation, Kanpur, Uttar Pradesh
- User Charges for Water Supply, Pune, Maharashtra
- E-Suvridha - e-Governance Initiatives, Pimpri Chinchwad, Maharashtra
- Online Tendering Application, e-Governance Initiatives, Pimpri Chinchwad, Maharashtra
- SMS and Web-Based Complaint Monitoring System, Pimpri Chinchwad, Maharashtra
- e-Governance Initiatives, Ahmedabad, Gujarat
- GIS Survey of Moradabad Nagar Nigam, Moradabad, Uttar Pradesh
- Implementation of the Web-Based Online Building Plan Approval System, Surat, Gujarat
- Streamlining of Building Plan Approval Process, Pune, Maharashtra
- Computer - Aided Administration of Registration Department, Andhra Pradesh Government
- Registration of Property Document, Karnataka State Government

To obtain a copy Contact:
Coordinator PEARL Project
National Institute of Urban Affairs (NIUA)
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Fax: +91-11-24617513
Website: www.niua.org, www.indiaurbanportal.org
"Documentation of Best Practices" Volume 1, under PEARL is a publication designed to document Best Practices. The best practice case studies have been drawn from the PEARL website - India Urban Portal database. Each case study presents a brief summary, key dates, situation before the initiative, the strategy to develop the initiative, the process, results achieved, sustainability, lessons learnt, recognition and replicability. The document has been prepared as part of PEARL activity for peer networking and horizontal learning among mission cities. The best practices include a cross-section of categories such as Sectors/Services (Water Supply, Solid Waste Management, Sewerage/Drainage, Roads/Flyovers and Public Transport System), Urban Reforms, Public Private Partnership, Urban Poverty, Disaster Management and Environment.

The details of the best practices are also available on www.indiaurbanportal.in

The following best practices are covered in the report:

- Water Quality Monitoring System: Surat, Gujarat;
- Pilot 24X7 Water Supply Project: Nagpur, Maharashtra;
- Installation of Centralized Bio-medical Waste Treatment Facility on BOOT basis: Surat, Gujarat;
- Waste Processing Plant through Public Private Partnership: Rajkot, Gujarat;
- Door to Door Refuse/Garbage Collection System: Surat, Gujarat;
- Advance Locality Management Programme: Greater Mumbai, Maharashtra;
- Green Energy Generation from Sewerage Gas: Surat, Gujarat;
- Inter-governmental Convergence for Integrated Sewerage System: Bhubaneswar, Orissa;
- Diversion of Domestic Sewage for Improving Urban Lake Water: Bhopal, Madhya Pradesh;
- PPP for Street Lighting and Energy Conservation: Bangalore, Karnataka;
- Innovative Techniques in Construction of Footpaths: Bangalore, Karnataka;
- PPP in Street Lighting: Vijayawada, Andhra Pradesh;
- Station Area Traffic Improvement: Pune, Maharashtra;
- City Bus Service in Surat on PPP Basis: Surat, Gujarat;
- Dattak Vasti Yojana (Slum Adoption Scheme): Mumbai, Maharashtra;
- Accounting Reforms in Urban Local Bodies of Karnataka: ULBs, Karnataka;
- Ahmedabad Property Tax Reforms: Ahmedabad, Gujarat;
- Emergency Operations Centre: Mumbai, Maharashtra; and
- Idol Immersion Activities and their Management in Water Bodies: Bhopal, Madhya Pradesh.

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BEST PRACTICE FORMAT

“Peer Experience and Reflective Learning” (PEARL) under JNNURM
Best Practices Format

Key Informations about the project and instructions on filling up the form

1. About the project:

To achieve objectives of the Jawaharlal Nehru National Urban Renewable Mission (JNNURM), knowledge sharing amongst JNNURM cities in various sectors of urban reforms and city governance has emerged as a potential area for capacity building. It is felt that cities identified under JNNURM, for financing urban infrastructure and other aspects of urban development, can network amongst themselves for cross learning and sharing knowledge, hence effectively manage their cities. “Peer Experience and Reflective Learning” (PEARL) is an initiative under JNNURM to support cities to actively pursue activities in implementation of projects and reforms.

Therefore, cities with similar urban issues and character are brought together. The cities have been divided into five groups, namely, (a) Mega Cities; (b) Industrial Cities; (c) Mixed economy; (d) Heritage Cities; and (e) Cities of Environmental Importance. A Network Convener and potential Knowledge Managers (KMs) were also identified for each Group.

The main objective of PEARL is to create manageable networks between JNNURM cities for cross learning and sharing knowledge on urban reforms and city governance so that objectives of the mission can be successfully achieved to make cities more livable, economically vibrant and environmentally sustainable. The primary objective is to ensure smooth functioning of the PEARL Networks and assist the Mission Directorate in supporting and monitoring the program. Focus of PEARL activities will be on various processes and outcomes of JNNURM-projects and reforms. There is also a need to focus on the sharing of experiences on urban reforms and city governance and to sustain PEARL beyond JNNURM.

2. About the PEARL Portal and Best Practices:

The proposed PEARL website - India Urban Portal (www.indiaurbanportal.in), is the gateway to the 63 cities under JNNURM and shall be linked to the main website of JNNURM. The portal is envisaged as a ready reference to best practices in planning, projects, reforms, accessible data/ resources and other innovations. The goal is to create an information network, community and resource that will provide qualified, trusted and variable information. It will also provide the stakeholders, a knowledge-sharing platform for interaction and discussion. The website will:

a) Act as a platform to share knowledge among governments at national, state, and local levels as well as community groups and citizens in JNNURM cities;
b) Focus on linking Urban Local Bodies with community groups in the JNNURM cities;
c) Provide information on organizations, techniques, technologies, resources, innovations, best practices, etc. for the projects and reforms;
d) Support outputs of JNNURM in terms of planning and implementation of projects and reforms; and
e) Help to set up discussion forums, news, guidance, etc. among JNNURM cities.
3. **Best Practices:**

You can submit ongoing as well as past projects to this Register.

For example, such projects/programmes/reforms include local or regional projects in education, revitalisation, standardisation, community development, awareness raising, capacity building, documentation, use of new technologies, urban governance, reforms, PPP, service delivery, shelter and security of tenure, livelihood including micro credit, health and education, social development, urban mobility, etc.

4. **Methodology for selection of Best Practice:**

Step 1: Identification and selection of best practice through Form I
Step 2: Put up the collected best practice before the technical committee for approval for documentation.
Step 3: Documentation of the best practice.
Step 4: Publishing on website

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### FORM I

**General information about your Organisation**

(Fill the following queries and provide one page write up about your organisation and project as well)

<table>
<thead>
<tr>
<th>Project Contact Person:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Detailed Address of the Organization/Agency</td>
<td></td>
</tr>
<tr>
<td>Telephone No.</td>
<td>Office:</td>
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<td></td>
<td>Residential:</td>
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<td></td>
<td>Fax:</td>
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<tr>
<td></td>
<td>E-mail:</td>
</tr>
</tbody>
</table>

**Type of the Organization**

- Government
- Individual
- NGO
- Co-operatives
- Other

**Partnering agencies/individuals**

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**INFORMATION ABOUT REFORM**

(Illustrative)

<table>
<thead>
<tr>
<th>A: Context</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Title of the Reform:</td>
</tr>
<tr>
<td>2. Geographic Location:</td>
</tr>
<tr>
<td>3. Focus Area:</td>
</tr>
<tr>
<td>B: Situation before implementation of Reform</td>
</tr>
<tr>
<td>1. Describe in brief (not more than 200 words), the situation as it was before the start of the project:</td>
</tr>
</tbody>
</table>
2. What were the problems/needs addressed by the Reform?

### C. Implementation of the Reform

1. Describe the Reform in narrative form (in 500 words)
2. Goals of the Reform
3. Strategy used to achieve the desired goals
4. Activities implemented to achieve the above goals
5. Challenges/constraints encountered and how it was conquered
6. Outcome of the Reform

### D. Factors of Success

1. Describe the main successful (positive and sustainable) results/factors/conditions for the Reform

### F. Replicability

1. Is the Reform being replicated in any other region

### G. Impact of the Reform

1. Have the Reform been disseminated in any forum and have received any recognition
2. Documentation and Research work/References for the Reform, if any
3. Please enclose any photographs and resource products, paper clippings along with the entry.
4. Any other

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**PLEASE SEND THIS FORM AS AN ATTACHMENT TO:**

dghosh@niua.org, nsur@niua.org,

**OR**

Post/fax a copy to:

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**THANK YOU FOR YOUR PARTICIPATION**