Property Tax Innovation
Case Study of Surat City (GIS)

National Workshop on “Municipal Finance & Urban Planning”
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(Town Planner)
Surat Municipal Corporation
Content

• About Surat
• GIS Implementation
• GIS based Property tax
• Other e-Governance initiatives
About Surat City

- Surat dates back to 300 BC
- Municipality Established in 1852
- Municipal Corporation Formed in 1966
- Hazira Industrial Estate near the City
- An Environment with Peace, Alliance & Unity

- 8th Largest in India as per population
- 4th fastest growing city globally
- Termed as Economic Capital of Gujarat
- 9/10 Diamonds in the world are cut and polished here
- 40% of nations total man-made fabric & 28% of nation's total man-made fiber production

- Density: ~138 Persons/ Ha (Census-2011)
- Decadal Growth Rate: 60% to 80% (since 4 decades)
- Admin Zones: 7
- Ward Offices: 88
- Election Wards: 34
## GROWTH OF THE CITY

<table>
<thead>
<tr>
<th>Year</th>
<th>Area in Sq. Km</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1951</td>
<td>8.18</td>
<td>2,23,182</td>
</tr>
<tr>
<td>1961</td>
<td>8.18</td>
<td>2,88,026</td>
</tr>
<tr>
<td>1971</td>
<td>33.85</td>
<td>4,71,656</td>
</tr>
<tr>
<td>1981</td>
<td>55.56</td>
<td>7,76,583</td>
</tr>
<tr>
<td>1991</td>
<td>111.16</td>
<td>14,98,817</td>
</tr>
<tr>
<td>2001</td>
<td>112.27</td>
<td>24,33,785</td>
</tr>
<tr>
<td>2001*</td>
<td>326.51</td>
<td>28,77,241</td>
</tr>
<tr>
<td>2011</td>
<td>326.51</td>
<td>44,61,026</td>
</tr>
</tbody>
</table>

- Unprecedented growth in last four decades
- Decadal Growth - 60-80%
- In 2006 with the expansion of city limits, city area increased to three times

### POPULATION GROWTH
### Physical Infrastructure

<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Supply</td>
<td>8 WW, 34 WDS, 3450 km. T&amp;D network, 1250 MLD gross water supply</td>
</tr>
<tr>
<td>Drainage</td>
<td>11 STPs, 57 SPS, 1 TTP &amp; 1750 km. gravity main network</td>
</tr>
<tr>
<td>Storm Drainage</td>
<td>550 km.</td>
</tr>
<tr>
<td>Roads</td>
<td>Total 3210 kms</td>
</tr>
<tr>
<td>CC Road</td>
<td>100 kms</td>
</tr>
<tr>
<td>Asphalt Roads</td>
<td>2225 kms</td>
</tr>
<tr>
<td>Polymer Roads</td>
<td>120 kms</td>
</tr>
<tr>
<td>Micro Surfacing Road</td>
<td>18 kms</td>
</tr>
<tr>
<td>Plastic Waste Bituminous Road</td>
<td>13 kms</td>
</tr>
<tr>
<td>Bridges</td>
<td>Total 101 (+16 WIP)</td>
</tr>
<tr>
<td>River Bridge</td>
<td>10 (+ 4 WIP)</td>
</tr>
<tr>
<td>Creek Bridge</td>
<td>58 (+ 4 WIP)</td>
</tr>
<tr>
<td>Fly over Bridge</td>
<td>24 (+ 4 WIP)</td>
</tr>
<tr>
<td>Railway Over Bridge &amp; Under Bridge</td>
<td>8 (+ 4 WIP)</td>
</tr>
<tr>
<td>Subway</td>
<td>1</td>
</tr>
<tr>
<td>Street Lights</td>
<td>1,14,000+</td>
</tr>
</tbody>
</table>
## Infrastructure Overview (Social)

<table>
<thead>
<tr>
<th>Category</th>
<th>Quantity/Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schools</td>
<td>335 (MSB) 1.6 lakh students, 18 SUMAN 7500 students</td>
</tr>
<tr>
<td>Hospitals</td>
<td>2 [750 beds and 120 beds]</td>
</tr>
<tr>
<td>Health Centers &amp; Maternity Homes</td>
<td>40 [29 + 11] + 2 under NHRM RCH-2</td>
</tr>
<tr>
<td>Mobile Dispensaries</td>
<td>6</td>
</tr>
<tr>
<td>Medical College</td>
<td>1</td>
</tr>
<tr>
<td>Aanganwadi</td>
<td>1004</td>
</tr>
<tr>
<td>Gardens</td>
<td>125</td>
</tr>
<tr>
<td>Swimming pools</td>
<td>12</td>
</tr>
<tr>
<td>Sports Facility</td>
<td>7</td>
</tr>
<tr>
<td>Community Halls &amp; Party Plots</td>
<td>42</td>
</tr>
<tr>
<td>Library</td>
<td>2</td>
</tr>
<tr>
<td>Reading Rooms</td>
<td>95</td>
</tr>
<tr>
<td>Fire Stations</td>
<td>13</td>
</tr>
</tbody>
</table>
GIS Implementation
Surat Municipal Corporation (SMC) has designed, developed and implemented a Web based GIS application along with GIS database for better governance, improving operational efficiency and ease of interaction with citizens.
SMC awarded the project to Antrix corporation, GoI and its partner Scanpoint Geomatics Ltd. (SGL)

Project development duration was 18 months

Project Cost – Rs. 4.11 Crore (Rs. 3.18 crore Development Cost + Rs. 0.94 (3 yr.) support cost)

**Project Scope**

- Design of the complete project: SRS, Data Model, Bas Map creation & survey methodology
- Preparation of Geo-corrected Base Map: SMC Area – 326.51 Sq. Km. Base map creation using 0.6 m Satellite Image in 1:5000 scale and Slum survey using DGPS/Total Station in 1:500 scale.
- Data Collection (Primary & Secondary): Departmental data, Field survey for property verification.
- Web GIS Application customization for Public use and SMC departments (Town planning, Town development, Hydraulic, Sewerage and Storm Water, Road, Bridge, Slum, Property Tax)
- Testing, Installation & commissioning of GIS Project and Training
- Maintenance: 3 Years of post implementation support to SMC
Input for Base Map

- Satellite Images (0.6m quick-bird) of year 2006 and 2012 (Currently in the process to procure latest Satellite Image of 2018)
- Department existing maps: administrative boundary, TP schemes, utilities, Gamtal, village, etc. in hard copy and digital copy
- Department existing Tabular data: Property tax database, Form B/F, Plot Reservation and attributes of utilities etc.
- SMC existing e-governance applications data
Map Creation Methodology

Properties Layer integration with Satellite Image and other layers

The GIS Data model of the application included all the relevant information of various departmental layers, type, attributes and source of the data.
Layer Details

- More than 100 layers
- Town Planning Department: 36
- Town Development: 2
- Property Tax Department: 5
- Road & Transport: 19
- Hydraulic Department: 15
- Drainage Department: 7
- Storm Water Department: 4
- Solid Waste Department: 3
- Slum Department: 2
- Birth Date: 1
SMC Web GIS Application Modules
Land Information System (LIS)

LIS modules includes all the functions and data related to the town planning department.

- TP and Development Plan details
- Plot Information
- Part-print generation
- Form B/F report generation
- Reservation details
- Landuse details
Property Tax

• Mapping of individual property is done and integrated with the Property Tax System.
• Information like owner name, usage, property type, self/tenant, area, assessment value, outstanding tax amount, etc. is available for each property.
• Key Features
  • Individual property mapping
  • Integration with Property Tax System
  • Property Identification
  • Owner details with Tax information
  • Map query and Report generation through various criteria
Initially, the Pilot project was taken for the North zone, which included all types of areas like TP schemes, Non-TP, Gamtal, etc.

During the survey and integration of properties, few unassessed properties were found, and hence as instructed by the Hon. Commissioner, thorough survey for the total city area was conducted thereafter.

Divide the total city area into unique A3 size grid maps for property survey. More than 70 field surveyors along with consultant staff conducted individual property survey.

Prepared Excel data sheet by entering Tenement No against PSI Numbers for each polygon.

Integration of existing Ptax database with GIS database with unique Tenement ID & PSI (Property Survey ID) Numbers.

File Name: Cluster Id – 478D

Cluster Id
PSI
Tenement No
Survey Date
Surveyor Name
478D
19-07-2013
Mr. Amrish
478D
19-07-2013
Mr. Amrish
478D
19-07-2013
Mr. Amrish

Tenement No.: 13-B-03-0971-0-001
Owner Name 1: TUSHAR MADANLAL SHAH.
Owner Name 2: NARMADNAGAR B NO 64
Owner Name 3: 65 ATHWA, SURAT
Postal Address: NARMADNAGAR ATHWA
Location Address: NARMADNAGAR ATHWA
Usage: RESIDENCE
Property Type: Individual Bungalow
Self / Tenant: Scf
Occuper Name: Sclf
Market Location: A
Area (Sq. Mtr): 225.75
Tax Amount: 7581.5
Outstanding Amount: 0.11
One of the factors in improvement in Property Tax recovery is the GIS based property tax monitoring.

- Zone wise/ Sub Ward wise monitoring
- Percentage of pending recovery post billing process
- Zone wise/ Sub Ward wise Defaulter count monitoring with various range of defaulter value
- SOP integration to notify concern officers to take necessary action

<table>
<thead>
<tr>
<th>Property Tax Recovery</th>
<th>Zone</th>
<th>2015-16</th>
<th>2016-17</th>
<th>2017-18</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Zone</td>
<td>50,25,76,986</td>
<td>62,03,99,385</td>
<td>76,92,79,186</td>
<td></td>
</tr>
<tr>
<td>Central Zone</td>
<td>76,59,12,398</td>
<td>94,04,53,854</td>
<td>1,05,04,22,602</td>
<td></td>
</tr>
<tr>
<td>North Zone</td>
<td>80,72,09,452</td>
<td>100,04,98,160</td>
<td>1,11,21,89,026</td>
<td></td>
</tr>
<tr>
<td>East Zone</td>
<td>108,35,79,832</td>
<td>125,11,37,270</td>
<td>1,48,51,10,105</td>
<td></td>
</tr>
<tr>
<td>South Zone</td>
<td>124,26,07,278</td>
<td>148,56,78,196</td>
<td>1,76,69,93,800</td>
<td></td>
</tr>
<tr>
<td>South West Zone</td>
<td>76,42,43,247</td>
<td>95,40,68,935</td>
<td>1,19,46,70,602</td>
<td></td>
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<tr>
<td>South East Zone</td>
<td>79,80,76,367</td>
<td>92,10,91,850</td>
<td>1,13,61,20,626</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>596,42,05,560</td>
<td>717,33,27,650</td>
<td>851,47,85,947</td>
<td></td>
</tr>
</tbody>
</table>
Property Tax System (Tax Recovery Monitoring)
Maps and Dashboard represents

Recovery of Ward wise Property Tax as on 10th August 2018

Details as On: 10/08/2018 17:05:17:883
Zone Wise Receipt Recovery Review Meeting Summary
Note : Amount in Thousand

<table>
<thead>
<tr>
<th>Zone Name</th>
<th>Property Count</th>
<th>Demand 2017-18</th>
<th>Receipt 2017-18</th>
<th>% (LastYear)</th>
<th>Demand 2017-18 AsOn</th>
<th>Receipt 2017-18 AsOn</th>
<th>Demand 2018-19</th>
<th>% (CurYear)</th>
<th>Receipt Upto Today</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Zone Total</td>
<td>1,96,599</td>
<td>8,46,035</td>
<td>7,69,279</td>
<td>50.03</td>
<td>6,52,001</td>
<td>4,23,293</td>
<td>8,61,959</td>
<td>62.44</td>
<td>5,38,225</td>
</tr>
<tr>
<td>Central Zone (A)</td>
<td>94,807</td>
<td>8,33,245</td>
<td>4,83,748</td>
<td>21.69</td>
<td>2,85,767</td>
<td>1,80,723</td>
<td>6,52,569</td>
<td>42.48</td>
<td>2,77,188</td>
</tr>
<tr>
<td>Central Zone (B)</td>
<td>1,00,948</td>
<td>8,72,889</td>
<td>5,66,675</td>
<td>28.34</td>
<td>7,07,678</td>
<td>2,47,364</td>
<td>8,75,340</td>
<td>40.79</td>
<td>3,57,062</td>
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<tr>
<td>North Zone Total</td>
<td>2,69,897</td>
<td>12,91,452</td>
<td>11,12,189</td>
<td>42.64</td>
<td>8,68,850</td>
<td>5,50,623</td>
<td>13,31,108</td>
<td>47.52</td>
<td>6,32,480</td>
</tr>
<tr>
<td>East Zone Total</td>
<td>3,78,185</td>
<td>16,07,096</td>
<td>14,85,110</td>
<td>30.80</td>
<td>11,22,190</td>
<td>4,94,946</td>
<td>10,43,392</td>
<td>57.15</td>
<td>5,96,313</td>
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<tr>
<td>South Zone Total</td>
<td>3,30,195</td>
<td>22,23,477</td>
<td>17,66,994</td>
<td>35.07</td>
<td>16,93,400</td>
<td>7,79,875</td>
<td>23,70,060</td>
<td>38.64</td>
<td>9,15,786</td>
</tr>
<tr>
<td>Athwa Zone Total</td>
<td>1,79,257</td>
<td>12,45,227</td>
<td>11,94,671</td>
<td>41.51</td>
<td>8,60,438</td>
<td>5,16,889</td>
<td>10,71,293</td>
<td>60.23</td>
<td>6,45,228</td>
</tr>
<tr>
<td>South East Zone Total</td>
<td>3,02,015</td>
<td>12,72,978</td>
<td>11,36,121</td>
<td>33.85</td>
<td>7,63,188</td>
<td>4,30,953</td>
<td>13,42,600</td>
<td>39.60</td>
<td>5,31,753</td>
</tr>
<tr>
<td>Over All</td>
<td>18,51,903</td>
<td>1,01,92,398</td>
<td>85,14,785</td>
<td>35.56</td>
<td>68,93,512</td>
<td>36,24,669</td>
<td>95,48,411</td>
<td>47.07</td>
<td>44,94,037</td>
</tr>
<tr>
<td>Sr. No.</td>
<td>Year</td>
<td>Demand</td>
<td>Recovery</td>
<td>(%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>------------</td>
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<td>----------</td>
<td>------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2013-2014</td>
<td>607.56</td>
<td>521.36</td>
<td>85.81</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2014-2015</td>
<td>663.11</td>
<td>572.19</td>
<td>86.29</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>2015-2016</td>
<td>709.77</td>
<td>596.40</td>
<td>84.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>2016-2017</td>
<td>840.24</td>
<td>723.31</td>
<td>86.08</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>2017-2018</td>
<td>1019.24</td>
<td>851.48</td>
<td>83.54</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The building plan approval system has been integrated with GIS application.

Any application received for Building permission and BU Certificate are approved only after integration with SMC GIS application.

Integration Certificate from SMC GIS team is necessary for BU permission.
Building permission & BUC Integration

**STEP 1** Upload Building layout plans through Online system

**STEP 2** GIS Integration of building layout plan through IGIS software

**STEP 3:** Integrated Building layout plans on GIS Base map with BUC details
Citizen Interface

The citizen interface provides access to public user of some functionalities from January 2015.

Key Features
• Plot Search
• Form B/F Report
• Part-print generation
• Building permission details
  • Project details
  • Technical details
  • Building details
• Online payment of Property tax
• COP and parking area
• BUC details

• Over 4000 Part Plan and Form-B/F downloaded so far
Advantages of GIS System

- Helps collate data from different departments
- Single source for information related to various utilities
- Enables to relate different information in a spatial context
- Allows to understand and visualize data in meaningful way
- Useful in identifying and planning development works
- Helps identify property tax revenue leakage and improve coverage and revenue
- Helps in better prediction and analysis
Benefits Derived

• The pilot for one zone helped identified the unassessed properties. Basis which, the entire city was reassessed. The property tax recovery rose from Rs. 596 cr. to Rs. 717 cr. (~20% rise) without increase in tax system.
• Helped in identifying the aging lines having frequent leakages and contamination. Such lines were replaced.
• At a glance information of all public purpose plots demarcated for various purposes.
• Helped in identifying the utility lines and their quantum for shifting in case of conversion to cement concrete road and major projects like flyover bridge, metro, etc.
• Creation of knowledge repository for various utilities eliminating risk of knowledge specific to one or group of individuals.
• Useful in identifying the site location for creation of new civic facility like community hall, reading room, swimming pool, etc.
• Citizen can check the development permissions and legality and ownership prior to purchase.
• Citizen can obtain the TP Scheme Part Plan and all the details of land like area, zoning, etc. on their own which reduced their trip to SMC offices.
• Helps to bring transparency and move towards open data-open government
Future Planning

• Development and Integration of GIS map with various field reporting application for direct updation from field.
• Feasibility and justification of all development works/capital projects to be first checked with GIS application prior to preparation of estimates and proposal for effective budget planning.
• Project execution lifecycle to be integrated with GIS.
• Data analytics and mapping for cross department / different domain system for better visualisation and decision making.
SMAC Center (Smart City Centre)

• The Integrated Command & Control Centre of SMC is named as Smart City Centre (SMAC Centre)

• The SMAC Centre was inaugurated on the first anniversary of Smart City Mission on 25.06.2016

• The SMAC Centre has approx. 250 sq. ft. Video Wall with 22 Operator desks and a meeting room
SMAC Center Components

- Following domains are covered in 1st Phase:
  - Property Tax System
  - VBD Health Survey Application
  - Complaint Management System
  - Monitoring City Operations through CCTV Network
  - Water Treatment Plant (WTP) SCADA (WIP)
  - Sewage Treatment Plant (STP) SCADA (WIP)
  - Integration with Geographical Information System (GIS)
  - Intelligent Transit Management System (ITMS)
  - Swachh Bharat (Swachhata App)
  - Monitoring of Door to Door Garbage Collection using GPS
  - Street Light System
- SMAC Center also uses Intelligent Operations Center (IOC)
  - IOC integrates and pulls data from different domain applications.
  - It is integrated with SMC’s GIS application.
  - It represents the abnormal events on dashboard.
  - It allows to generate Standard Operating Procedures (SOPs) to take corrective steps for any abnormal events.
SMC Mobile App – Citizen’s Connect

• First ULB in India to launch Mobile App for citizen centric information & service delivery.
• Launched Mobile App in August 2013, facility of payments & new features launched in February 2014

Services offered - SMC Mobile App

Informative Services
• Shops & Establishment Registration Certificate details
• Elected & Admin Wing Details
• Active Tenders
• Active Recruitment
• Rainfall information

Interactive Services
• Complaint Registration
• Feedback sharing
• Where can I? (find nearest facility using GPS)
• Download all SMC Forms
• Citizen Facilities
• Emergency Toolkit

Transactional Services
• Check and Pay Outstanding or Advance Property Tax
• Check and Pay Profession Tax
• Check and Pay Water Meter Bills
• Check and obtain Birth Certificate & Death Certificate
Comprehensive Complaint Management System
Complaint Management System

Categories
• Garbage & Cleanliness
• Mosquitoes and Mosquito borne Diseases
• Roads and Footpath, Street light
• Water Supply, Drainage and Storm Drain
• Property Tax
• Dead Animals
• Illegal Construction and Encroachment
• Public Toilet
• Food Safety Act
• Hospitals and Dispensaries
• Complaints against SMC Staff
• Door to Door Garbage Collection
• Others

Citizen Service Delivery Channels
- Civic Center
- Help Line
- Website
- Mobile App
- WhatsApp

Proactive Complaint Registration
- SMAC Center
- iPromise
- Night Round
- Commissioner Desk
- PG Portal
• Citizen can register complaints through various channels
• Complaints are auto assigned based on the category & location
• SLA for each complaints is defined
• Complaint Escalation
  • In case of SLA breach by officer at Level-1, complaints are escalated to higher officer at Level-2
  • If complaint remains unresolved in 24 hours, the same is escalated to officer at Level-3
• Complaint Reopening
  • Citizen can reopen the complaint if they are not satisfied with complaint resolution
  • Such reopened complaints are assigned to higher officials at Level-2 and Level-3 respectively on 1st reopening and 2nd reopening
• Reports of open complaints, complaint escalations and count reviewed every week at Municipal Commissioner level
Complaint Monitoring using GIS at SMAC

• Critical Complaints Monitoring
  • Mosquito breeding site / water logging
  • Impure/Contaminated water
  • Missing/Broken Manhole cover
  • Overflowing/choked drainage on Road
  • Street light pole collapsed
  • Lifting of dead animals
  • Food poisoning

• Non-Critical Complaints breaching SLA Monitoring

• Ward wise Complaint Summary (Red, Amber, Green indicators)
Open Loop Common City Payment Card

Information & Services on the go
To promote the cashless transactions and digital economy, SMC along with ICICI Bank is bringing “Surat Money” card.

This Open Loop Smart Card will be useful in multiple ways to citizens:

- Tap & Go in Transit
- Membership Card (library, swimming pool, etc.)
- Payment in SMC merchant environment
- Payment in retail environment

Unique Financial Applications
1. BRTS & City Bus
2. Membership Card - Library, Swimming pool
3. Pay & Park
4. Civic City Centre
5. Affordable Housing

One-Time Entrance fee
1. Gopitalav
2. Science Centre
3. Gardens & Nature Park
4. Aquarium
5. Amusement Park
6. Hospitals and Urban Health Centers

Merchant Financial Use Cases
1. Hotels
2. Hawkers
3. Shops & Malls
4. Auto-Rickshaw
5. Others as defined by SMC from time to time

Validation/Authentication only
1. SMC Employees
2. School Teacher
3. SAFAL
4. Anganwadi
Thank You

www.suratmunicipal.gov.in
www.suratsmartcity.com