



# Design Solution For GIS Enabled Property & Tax Information System

## Introduction

Property tax is the major source of revenue for most of the Urban Local Bodies (ULBs) across the country. But tax collection has always been a pain point for the revenue departments. The development of appropriate GIS has considerable potential to improve municipal planning, administration, and management in a number of ways. GIS-based property mapping and surveys can provide the relevant and useful information base to thematically map and generate a visual in real-time for the properties assessed. This is the first climbing step to develop any city into smart city and enable the Urban Development Departments (UDD) to upgrade themselves into a powerful decision making authority.

## Purpose

To accomplish and acknowledge the sole initiative of Smart Cities Development Plan league taken by Government of India (GoI), Ceinsys Tech Ltd. was appointed as the sole consultant to provide its consultancy services for GIS- based property tax improvement for a few of Indian cities. The system enabled the decision-makers in making policies about taxation system, in efficient collection of taxes and utilization of existing manpower resources for maximum benefits in revenue collection.

## Objective

The objectives of the project were:

- To improve the revenue from property tax and management capacity of the Municipal Corporations through provision of valid, reliable and credible spatial and non-spatial information.
- Providing utility services
- Enablement of smart city

## Solution

The solution included the following:

- GIS base map preparation, property mapping and surveys.

This step consisted of High-Resolution Satellite Imagery based base-map creation which involved georeferencing of the procured imagery using the Ground Control Points (GCPs) collected using DGPS surveys. During the georeferencing process, simultaneous field surveys were carried out to verify & validate the location captured via satellite imagery. After the validation process, base layers were created and fused together for the purpose of base map generation.

Major features captured for:

City Base Map of Municipal Area on a scale of 1:1000:

- Transportation layer: Main roads & other important roads
- Facility layer: Railways, airport, cantonment areas & important landmarks, colony names.
- Water Bodies: Drains, canals, rivers and other water bodies.

Property Layer on a scale of 1:1000:

- Plot and Building footprint with unique IDs.
- Vacant lands Municipal area boundary, zone, ward boundaries and tax zones.

Development of customized web-based GIS solution in the form of mobile & web app to support property tax improvement.

This was the concluding work before publishing the solution and handing it over to the municipal corporation. To get the data for the base map generation, field surveys were done using the GPS based handheld devices in order to capture the latitude & longitude of the place. Data integration of the captured data with the available data with the department was performed in ArcMap 10.x and unique IDs were generated for the properties surveyed. The output was available in both raster and vector form.

The Geodatabase (.GDB) thus generated was thematically mapped and published on the web in form of customized web-based GIS solution to support property tax improvement using open-source software and tools. The system deployed followed Open Geo-spatial Consortium (OGC) standards which was user friendly and allowed users to add, update or modify any aspect of the component from time to time as necessary.

## Benefits

- 6,000, 00+ properties mapped.
- Delineation of exact geographical location of Infrastructure features
- Geo-database can be used by multiple sections and departments.
- Decision Support System being updated with real time information
- Review and Reassessment of present Revenue Collection



- Planning to meet the Infrastructural requirements
- Baseline for Performance Measurement
- Transparency in Location-based Data offers Citizens' Satisfaction.

## Key Project Highlights

- 27 Digitized layers
- 10% increase in built up area than recorded area
- Apprx. 40% Revenue enhancement

