



GIS Based Property and Asset Mapping for New Delhi Municipal Corporation

The IT Department of New Delhi Municipal Corporation (NDMC) has been working on developing a GIS Platform capable of storing data and doing calculations, analysis and reporting. NDMC has developed detailed map of its entire jurisdiction with a view to create a map database which would help in urban redevelopment, engineering services and all other municipal administration matters. NDMC is developing the GIS Platform for the aid of planning, maintenance and administration. The GIS data supports property taxation, utility billing, building plan approval and urban asset management.

CLIENT: New Delhi Municipal Corporation

LOCATION: New Delhi, India

CHALLENGES

To provide better facilities and services to the citizens is the basic aim of any Municipal Corporation. By using traditional paper based or PC based spreadsheets, databases and other generic applications, urban management bodies have failed to meet the overall organization's growing financial and reporting requirements to support strategic decision making – principally because isolated points of information have become "stove-piped" into decentralized data.

The next generation e-Governance program aims to integrate these stovepipes of information with proven operating processes to become 'complete' systems for functioning of the Municipalities and increasing their revenue by using Spatial Information about the Properties and Utilities.

The foremost need of NDMC is to have the scientifically prepared digital base map, which shows the existing infrastructure facilities like roads, drains, built up areas, waterbodies, etc. These base maps also help them in knowing the extent of their jurisdiction and the various divisions like zones, ranges and wards, etc. for day to day monitoring and development works. The other requirements of the NDMC are the detailed digital maps of the various local areas/wards which are showing the properties/buildings, utilities, etc.

The advantages of the GIS system is that it provided power of visualization of the assets integrated with its attribute to do spatial analysis of the property and assets through Query and subsequent thematic representation and Custom built reports. This can bring significant cost savings and efficient asset and risk management to Urban Development and associated Government bodies. Thus, it gives NDMC better control over the revenue base and Asset management. Finally, GIS provides Spatial Decision Support System, to visualize and analyse the Property and Utility and enables flexible information formats necessary for decision-making.

SCOPE

New Delhi Municipal Corporation with its vision to provide highly efficient services to its citizens and with a vision of "A Model Well-Planned Metropolitan City", are adopting the Information Technology services to remain informed about every asset and property in the municipal corporation along with the knowledge of day to day problems faced by the citizens in respect to the services being provided by municipal corporation and to serve in better way and in time. One of the best things adopted by NDMC is the Spatial decision Support System. We will develop a detailed land base plan for the NDMC using satellite images and total station survey for visualization of the all the municipal assets along with the complete land-use plan of the region. All this will be integrated with a web based application for decision support system. The NDMC Geo Spatial solution covers a wide spectrum of layers, which helps the Authority to assess its utilities and manage its assets within its jurisdiction.

Geospatial Layers of NDMC

S.No	Entity Category	S.No	Entity Category
A.	Land Management	B.	Building
1	Land Parcel-Primary Road	1	Tag Points for Prominent Land Marks
2	Land Parcel- Secondary Road	2	Security Post (public)
3	Land Parcel- Tertiary Road	3	Security Post (Private)
4	Land Parcel- Primary Intersections	4	Boundary Wall
5	Footpath Land	5	Stairs
6	Kerb Land	6	Primary Gate Entries
7	Public Park	7	Secondary Gate Entries
C	Transportation	D	SURVEY
1	Center Line of Primary Roads (ROW)	1	Surveyed GPS Reference points
2	Center Line of Secondary roads (ROW)	2	Contour Level Points
3	ROW of roads (Widths)	3	Survey Location Points
4	Primary Road Intersection Points	4	Grid
5	Railway Line	5	Contour Lines
6	Metro Station Entry Points	F	WATER SUPPLY
7	CL of Metro Line (Underground)	1	Tube Well
8	CL of Metro Line (Overhead)	2	Water Harvesting Point
9	Overhead Metro Line ROW	G	HORTICULTURE
10	Pedestrian Underpass	1	Open Green Area
11	Foot Over Bridge	2	Large Public Trees
12	Railway Underpass	3	Small Public Trees
13	Railway Overhead Bridge	4	Large Private Trees
14	Paved Cycle Paths	5	Small Private Trees
15	Primary Road Intersection Points	6	Park Shrubbery Type-1
16	Primary Road Signage	7	Park Shrubbery Type-2
17	Traffic Lights Type-1	8	Shrubbery Bed Type-1
18	Traffic Lights Type-2	9	Shrubbery Bed Type-2
19	Traffic Signal Control Box Type-1	10	Shrubbery Bed Type-3
20	Concrete Bollard Type-1	H	SEWAGE
21	Concrete Bollard Type-2	1	Round Manhole 600 mm Diameter
22	Low Reflector Type-1	2	Round Manhole 900 mm Diameter
23	Concrete Road Signage	3	Main Manholes
24	Metal Signage Type-1	4	Distribution Valve Manholes
25	Metal Signage Type-2	5	Rectangular Manholes Type-1
26	Metal Signage Type-3	6	Rectangular Manholes Type-2
27	Speed Breaker Signage	7	Vent Pipe Outlet
28	Metro Pillars	J	HORTICULTURE WATER
29	Grade Speed Breakers	1	Public Horticulture Water Outlet
E	TOPOGRAPHY	K	SANITATION
1	Refreshment Booths	1	Rain Water Manhole
2	Flower shops and Such Booths	2	Rain Water Outlet Type-1
3	Taxi Stand Booth/Rooms	3	Rain Water Outlet Type-2
4	Bus Stand Shelters	4	Rain Water Outlet Type-3

S.No	Entity Category	S.No	Entity Category
5	Temporary Shed	L	TELECOM
6	Fire Tank	1	Primary Telephone Pillar Boxes
7	Generator Rooms	2	Secondary Telephone Pillar Boxes
8	Public Toilets	3	Overhead Telephones Poles
9	Platform	M	POWER
I	LANDSCAPE	1	Overhead Electrical Lines (440V)
1	Walking Path Type-1	2	Overhead Electrical HT Lines
2	Water Body	3	High Mast Halogen Light
3	Public Park Dustbin	4	Tall Mast Light
4	Public Park Bench	5	440 V Pillar Box
5	Single Dustbin	6	11KV Package Transformer
6	Double Dustbin	7	Tall Street Light
7	Letter Box	8	Medium Height Park Light
8	Public Z-Gate	9	Low Light Type-1
9	Park Fencing Type-1	10	Low Light Type-2
10	Park Fencing Type-2	11	Round Street Light
11	Park Fencing Type-3	12	Two way Tall Street Light
12	Street Sculpture and Art	13	Overhead Electrical Poles (440V)
N	GAS & FIRE	14	Overhead (Pole Mounted) Electric Transformers (To 440V)
1	Fire Water Line	15	Containerized 11KV Transformers
2	Gas Line Indicators	16	4 Pole Electrical Transformers (11KV to 440V)
3	Fire Hydrants		

TECHNOLOGY

- AutoDesk Mapguide Enterprise Version 2011,
- Database: Oracle 11g

BENEFITS TO THE CLIENT

- It provided power of visualization of the assets integrated with its attribute to do spatial analysis of the property and assets through Query and subsequent thematic representation and Custom built reports. This can bring significant cost savings and efficient asset and risk management to Urban Development and associated Government bodies. Thus it gives NDMC better control over the revenue base and the Asset management.
- Through this initiative, NDMC aims to counter illegal construction and theft of properties.
- Problems such as electricity faults can be tackled more easily as the fault can be traced faster, officials say.
- The number of trees in an area has also been mapped so that greenery can be maintained better.
- Every property has a building plan attached to it for building approval.

REPLICATION

This application may be replicated for Town planning and Geospatial Information System.