

Development and Deployment of GIS Based Spatial Decision Support System

for

Greater NOIDA Industrial Development Authority

About Development Authority in India

Development Authorities in India play a very significant role in carrying about planned and organized growth. The basic premise of all the Development Authorities in India is the realization of the fact that there is distinction between Growth and Development and the latter has to be achieved through strategic use of the available resources. Development Authorities concentrate on special functions like Housing, Planning and Restructuring and Urban Development. They are responsible for providing Housing for residents, undertaking urban restructuring, development of commercial as well as residential properties and providing opportunities to avoid the clash between residential and commercial priorities.

CLIENT DESCRIPTION

Greater NOIDA Industrial Development Authority or GNIDA was incorporated on January 1, 1991 under the UP Industrial Area Development Act of 1976. Under the act, systematic planning, organized development, undertaking operations, maintenance and imparting regulatory functions became the functions of the Greater NOIDA Development Authority. These functions, rather than being distributed amongst various Greater NOIDA authorities were handed over to the single agency called the Greater NOIDA Development Authority.

CLIENT: UP Electronics Corporation Limited for Greater NOIDA Development Authority

LOCATION: Greater NOIDA, Gautam Budh Nagar, Uttar Pradesh, India

CHALLENGES

Greater NOIDA Industrial Development Authority is slowly becoming a self-sufficient industrial township out of a small town that lacked the very basic infrastructure and logistical support systems. However, to do so, the authority has to do proper planning of landuse and infrastructure. It must know every detail of the resources and property it has, know what lies where, and all the dynamics of the landuse. The process of development is complex. For this, land has to be acquired for which a complete set of Right of Records, regarding the ownership of the land is required. To capture the dynamics of the rapidly evolving National Capital Region, the GNIDA needs to do scientific assessment of the land instead of following the manual process of capturing layers of information which is tedious and cumbersome.

OBJECTIVE OF THE PROJECT

GNIDA has set up a goal of achieving a balanced development of the area by preparation of perspective plans, strengthening of infrastructure facilities and promotion of Growth Centres. GNIDA intends to develop Greater NOIDA as a world Class city where the grass is

greener, the roads wider, the air cleaner and where proactive and responsive governance is the norm. GNIDA is managing all kinds of development related to Industrial, Institutional, Residential and Commercial sectors in Greater NOIDA. To develop and manage such a large infrastructure, GNIDA needed a logistic support system with the following Key objectives:

Key Objective of the Project:

- Development of common platform for information sharing between all stakeholders of GNIDA.
- Development of Logistic Support System for better planning of Landuse, Infrastructure development and further assets maintenance.
- Development of Logistic Support System that is able to provide the Decision Support Report in Land acquisition and compensation assessment Tools.
- Development of Site Planning tools, Building Plan Approval Tools.
- Integration with Legacy Systems Development Assessment Tools.

SCOPE OF WORK

- Generation of existing Landuse Maps from High Resolution Satellite Image upto building footprint.
- Cadastral mapping of 124 Villages falling under GNIDA Phase 1 with capturing of the Right of Records.
- Acquiring ROR data (collected from DM Office) from Bhulekh and Integration of the Land Acquisition and Compensation module
- Geo-referencing and Digitisation of Master plan and Sector Plans Layouts.
- Field survey for Property Verification and detailed landuse, collecting data for residential, commercial, industrial, green space and vacant land.
- Digitization of utility assets of each circle of road network, water supply network, sewage network, electricity lines, poles, substations, transformers, storm water drainage network.
- A web based geospatial application is developed to bring different levels of information, data images in one platform. The Land Acquisition Application is being integrated with geospatial application through User Login and Front end Interface to enter the application.
- The application has a Building plan approval tool, a Query Builder where all queries are represented as thematic maps and reports. The web page has information at a glance about the urban assets and the development (acquired and developed).
- The GIS System is also being integrated with Oracle based Property Management Application, Grievance Management System, Citizens Charter, Integration with Office Automation Project, Integration with field Data and GPS, Integration with the existing CAD Data.
- A PDA based application has been created whereby the officials of GNDA have the complete data of building approval. The aim is to verify the data in the field whether the development is as per the plan.
- The geospatial data is integrated with Google maps for wider visualization. The query generated can also be visualized over Google maps.

TECHNOLOGY & SOFTWARE USED

- Web Application: Open Source Map Guide
- Database: Oracle 11g
- Programming Platform: ASP.NET
- Map Preparation : Arc GIS Desktop 9.3, AutoCad

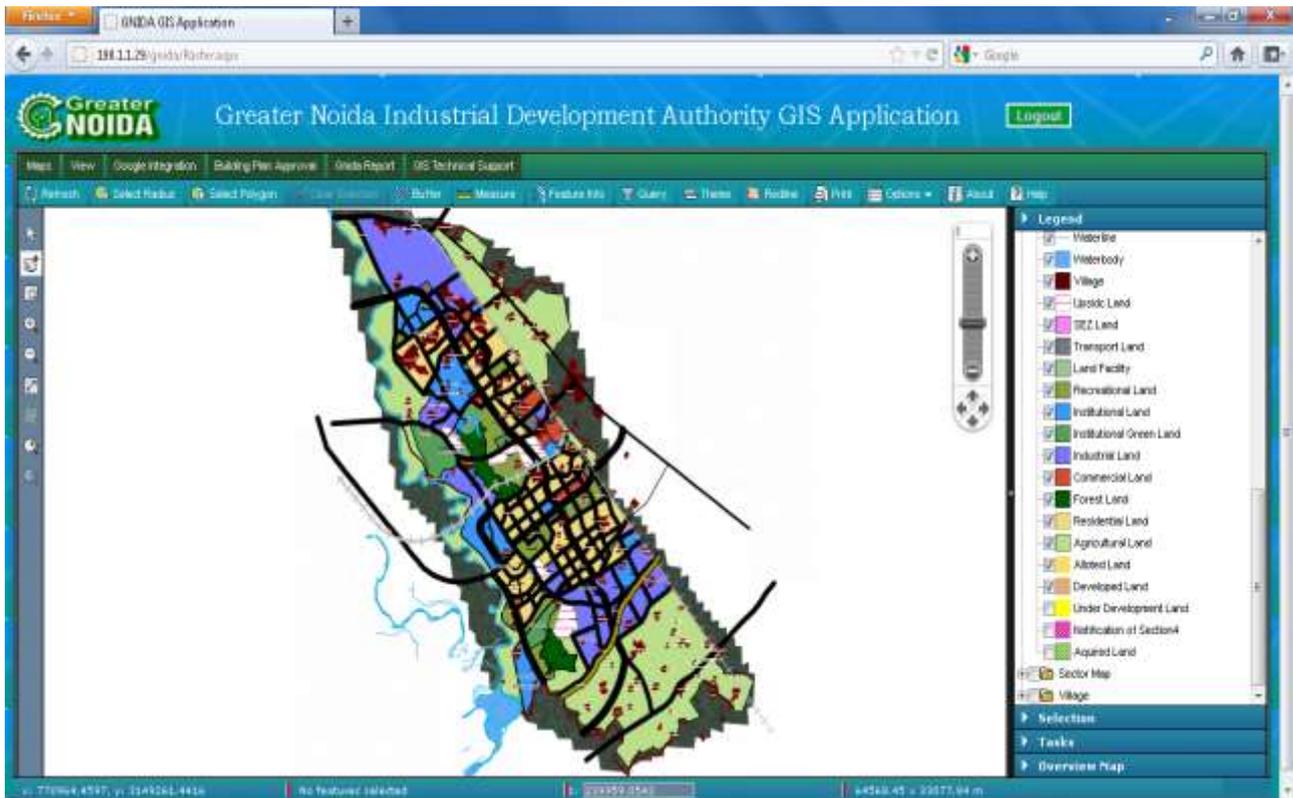
APPLICATION VIEW OF DEVELOPMENT AND DEPLOYMENT OF GIS BASED SPATIAL DECISION SUPPORT SYSTEM DEVELOPED FOR GREATER NOIDA INDUSTRIAL DEVELOPMENT AUTHORITY

- Home Page

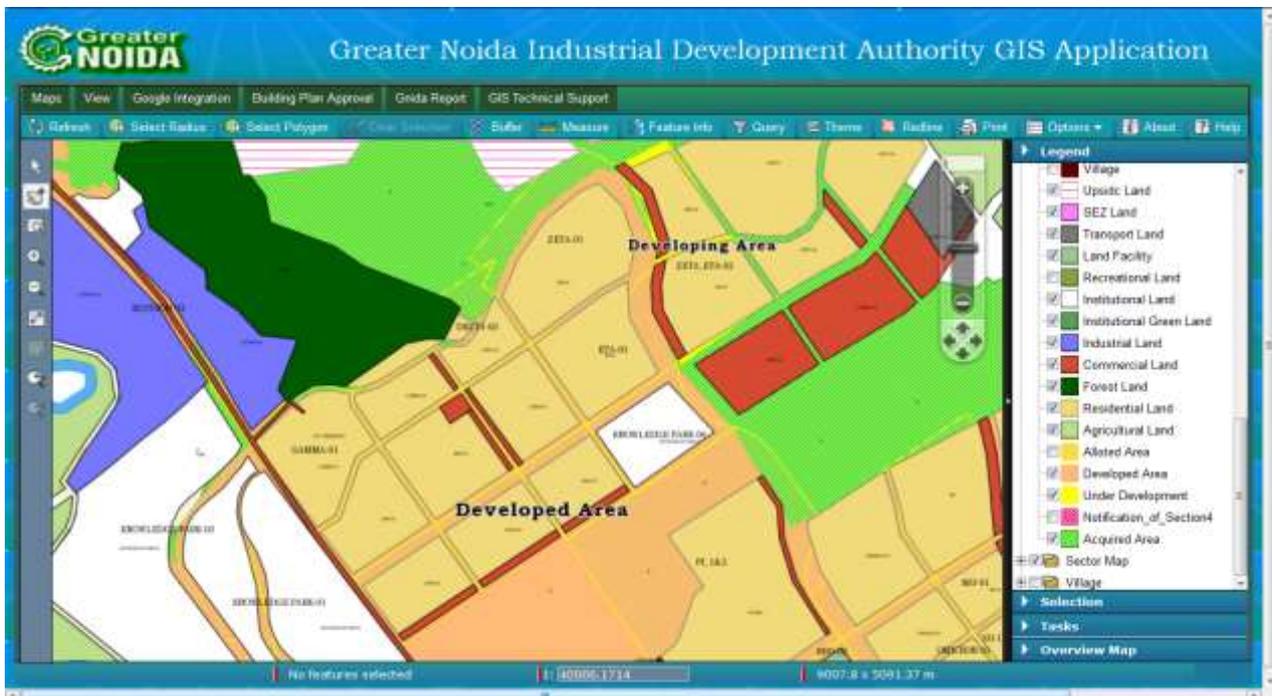
The screenshot shows the home page of the Greater Noida GIS Application. The browser window title is 'Gr Noida Authority:HOME' and the address bar shows '196.1.1.29/gnida/Login.aspx'. The page layout includes:

- Header:** Greater Noida logo and 'GNIDA GIS Application' title.
- Navigation:** 'Please send your suggestions to: authority@gnida.in'
- Activities of the Greater Noida Industrial Development Authority:**
 - To construct a well integrated and self reliant industrial town.
 - To provide all essential infrastructural support.
 - To offer special incentives to the operating organizations of the township.
 - To conceptualize the needs of a fast developing city of the future.
 - To make the Action Plan and execution at par with global standards.
- Map:** A satellite map of Greater Noida with yellow grid lines.
- Login to Navigate:**
 - User Name:
 - Password:
 -
- Gr. Noida Master Plan:**
 - Master Plan-Developed & Underdeveloping
 - Developed Area: 6122.826 Hec.
 - Under Developing Area: 4251.1 Hec.
- Summary:**
 - Total GNIDA area in hectare : 34,253
 - Total Built-up area in hectare : 15,692
 - Total Acquired area in hectare : 7,765
 - Total Vacant area in hectare : 15,136
 - No of Sectors : 54
 - No of Blocks : 112
 - No of Schools : 54
 - No of Hospitals : 29
 - No of Parks : 112
 - No of Water /Overhead Tanks : 38
 - No of Bus Stops : 82
 - No of Police Stations : 2
- GIS Based Solutions:**
 - GIS technology provides excellent support for:
 - Land use planning projects
 - Ecological and hydrological investigations
 - Environmental assessments
 - Watershed assessments
 - Wellhead protection programs
 - Water quality monitoring and assessment programs
 - Water resource development projects
 - Design and construction of water system infrastructure
 - Public outreach and education programs
 - Top Five Benefits of GIS:**
 - Faster decision-making
 - Efficiency increased
- Master Plan Navigation to Google:**
 - [Gr Noida Sector New Scheme](#)
 - [Gr Noida Acquired Land](#)
 - [Gr Noida Acquired Land](#)
 - [Gr Noida Developed Land](#)
 - [Gr Noida Notification of Section 4](#)
 - [Gr Noida Under Development Land](#)

- Digitization and Updation of Master Plan, Sector Layout, Blocks over the High Resolution Satellite Imagery

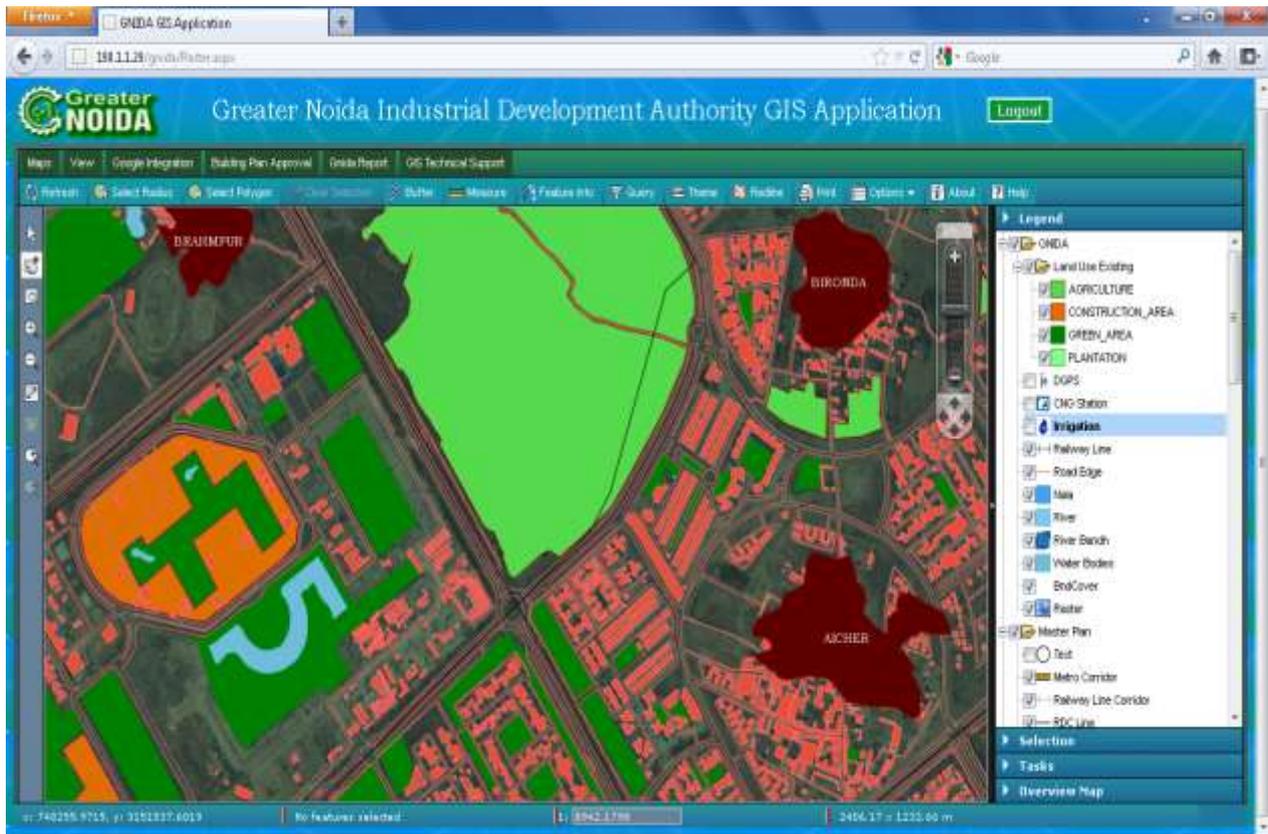


I-Master Plan

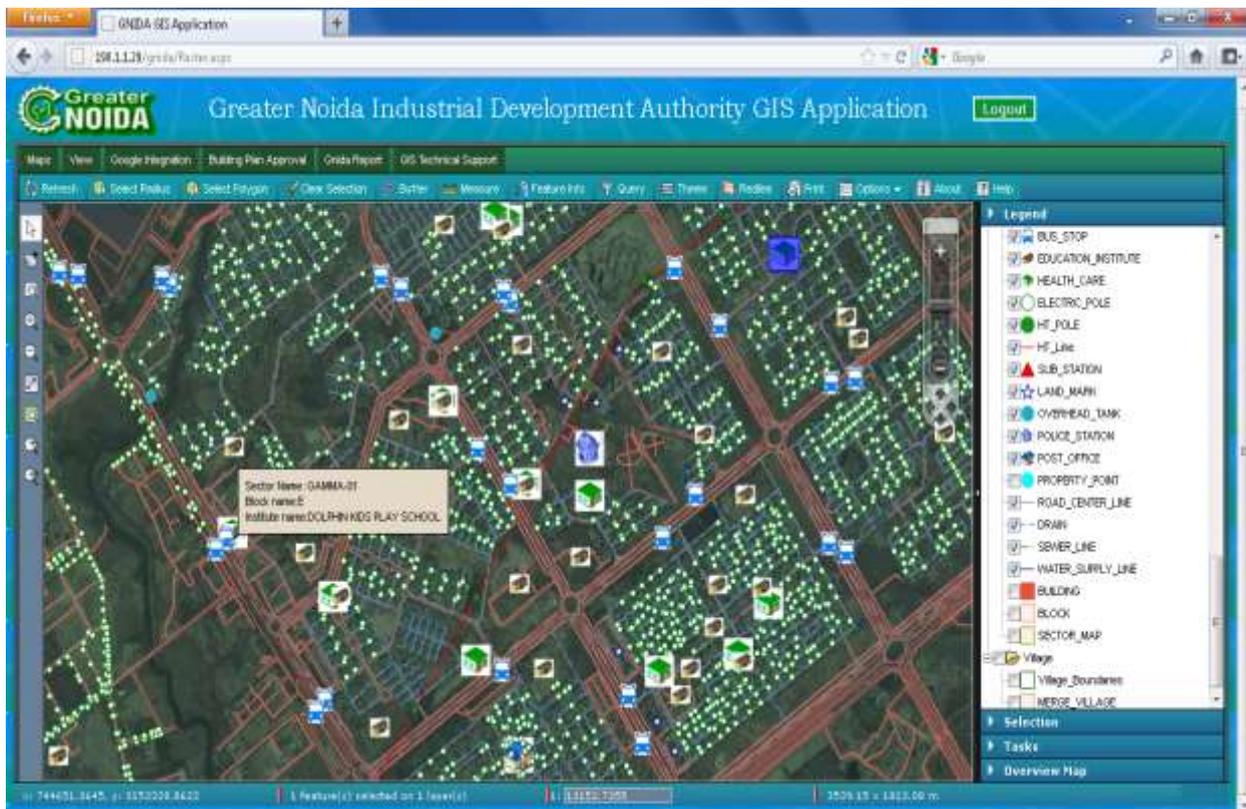


II-Sector Layout

- Digitization of Base Maps using High resolution satellite imagery for 341 SqKm of GNIDA Area



- Digitization of Utility features, i.e., Electrical Asset, Water Supply, Sewage, Manhole, Fire Hydrant, Transportation, etc.



BENEFITS TO THE CLIENT

- The geospatial application developed by Vayam, for Greater NOIDA Development Authority helps them to find about every detail required for Planning and Development of the world class city as layered information. The history of the Development can be construed through this System.
- It helps the Authority to analyse of trend of development.
- The system helps the Authority in better planning and management of resources, as they are able to judge the details of the infrastructure and deduce what facilities need to be upgraded and where new facilities have to be created.
- It helps them to analyse the available green space, and take measures to preserve them.
- The authority is also benefitted in their day to day activity like land acquisition and building plan approval.
- The system being dynamic, new satellite image can be imported and the changes in landuse can be detected, updated and edited from time to time.

REPLICATION

The same application may be replicated for GIS-based Decision Support System or Management Information System, town planning, mapping of natural vegetation/forest, etc.