



# Land Use Land Cover Mapping and Change Detection Analysis of Yamuna Expressway Authority Area using High Resolution Satellite Image and Cadastral Mapping of the Villages

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*To improve the connectivity of the National Capital Region and Agra, the Government of Uttar Pradesh is building 6 new Lanes (extendable to 8 lanes) Access Controlled Expressway with brand name of Yamuna Expressway. The Yamuna Expressway Project is conceived with the idea to not only reduce the travel time between New Delhi and Agra but also to open up avenue for Industrial and Urban development of the region and provide the base for convergence to tourism and other allied industries.*

**CLIENT:** UP Electronics Corporation Limited for Yamuna Expressway Authority Limited

**LOCATION:** India

### **CLIENT DESCRIPTION**

Yamuna Expressway Industrial Development Authority was constituted for the following reasons

- To provide a fast moving corridor to minimize the travel time
- To connect the main townships/commercial centres on the eastern side of Yamuna
- To ensure development of adjoining area
- To relieve NH-2 which is already congested and runs through the heart of cities like Faridabad, Ballabgarh and Palwal
- The Yamuna Expressway along with the existing NH-2 and NH-91 and interconnectivity between all three of them will form a good network of roads which in turn, open up a vast area of all-round development.

### **CHALLENGES**

The Yamuna Expressway Region is under development. To develop the complete road and the township, land has to be acquired by the YEA and landowners have to be given compensation. The land compensation act of India expressly mentions that land includes benefits that arise of land and things attached to the earth or permanently attached to anything fastened to the earth.

The public officers/collectors prepare the declaration for acquiring the land. This declaration is issued as a notification. Often it has been observed that after notification, there are tendencies of landuse change by the owners to claim greater compensation. The Authority needs to check such unscrupulous events; thereby they need to develop scientific real time data. With this objective change detection has been proposed to YEIDA, wherein, high resolution satellite image of Yamuna Expressway is being procured every quarter of the year to map changes in the property parcel.

### **SCOPE**

- Preparing a detailed landuse map from High Resolution satellite images.
- Geo-referencing the Cadastral Maps using minimum 3 DGPS points for every village over the image.
- Attaching Right of Records (ROR) data with every plot.
- Procurement of High Resolution Satellite Images with 0.6 meter resolution at the interval of 3 months.
- Quarterly Change Detection Analysis carried out at the Plot Level.
- Ground Truth Analysis and mapping the parcel wise landuse changes.
- Printout of the Maps at A1 size at the scale of 1:4000
- Preparing village wise report showing the change in Landuse.

## **TECHNOLOGY**

- Satellite Image: GeoEye 0.5 m
- Image Processing Software: Erdas Imagine
- Vector Data Preparation, Reporting: ArcGIS 9.3

## **BENEFITS TO THE CLIENT**

Yamuna Expressway Authority is able to ensure the timely land acquisition and the justified compensation to the land owners and proper land assessment through the scientific technology of Remote Sensing and GIS. Quarterly Change Detection Analysis through GIS Technology can detect whether any change has occurred in the land use since notification. Since the High Resolution Satellite Data has time stamped over the image, any dispute arising out of land acquisition and compensation can be challenged in the Court of Law.

## **REPLICATION**

The same application and technique may be replicated to detect changes in the forest cover, to detect changes in opencast mines, growth of settlements in sensitive areas like border, etc.