SMART Data for SMART Utilities using LiDAR Technology
Geokno
The LiDAR Company

- Incubated in IIT Kanpur (2009)
- Introduced LiDAR technology to Infrastructure Industry
- Awarded Best Startup 2011 by ISBA
- Only company in India to own high end equipment in all the three platforms
- Market leader in providing LiDAR based end-to-end technology solutions
- Completed over 15,000 sq km of Aerial LiDAR & 3,000 km of road LiDAR projects
Geokno has executed and is executing multiple challenging projects with a number of happy clients

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<th>Organization</th>
<th>Projects and Achievements</th>
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<tr>
<td>Survey of India</td>
<td>- Disaster Mapping of Uttarakhand Flood impacted area (3,600 sq km)</td>
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<td>- First Airborne LiDAR Project for Major Disaster Assessment in India</td>
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<td>Govt of Telangana</td>
<td>- Aerial LiDAR Survey of over 10,000 sq km in Telangana</td>
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<td>- Project helped in shortening DPR preparation time from 3 years to 6 months with more accurate results</td>
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<td>Govt of Rajasthan</td>
<td>- Over 2,200 sq km of area mapped. Further awarded 700 sq km</td>
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<td>Govt of Mizoram</td>
<td>- Aerial LiDAR Survey for Mizoram State Roads Project</td>
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<td>RITES Ltd</td>
<td>- Geokno awarded the prestigious project for Ahmedabad-Mumbai High Speed Rail Corridor</td>
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<td>C-STEP</td>
<td>- Geokno awarded the prestigious project for Aerial LiDAR data capture for Bangalore city for Solar Rooftop potential modelling project</td>
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<td>GMR Goa Airport</td>
<td>- Mapping of greenfield airport at Mopa, Goa</td>
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<td>PWD Karanataka</td>
<td>- Survey of over 3000 KM of roads completed</td>
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<td>- More than 1000 KM in pipeline</td>
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<td>IRCON</td>
<td>- Arpinchalla Station Yard survey in highly challenging Banihal area of J&amp;K</td>
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<td>- Station Yard was in between 2 tunnels and adjoined by river</td>
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<td>Tehri Hydro Corp (THDC)</td>
<td>- Survey of very steep slopes in Pipalkotti (Uttarakhand) for planning of Hydro Power Dam</td>
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<td>CIDCO, Maharashtra</td>
<td>- Topographical Survey for Chikaldara Hill Station</td>
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<td>- Topographical Survey of NAINA &amp; New Khopta Areas of over 500 sq km</td>
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About Geokno: Undertaken multiple Aerial LiDAR projects in India with MoD and DGCA clearances

- **Telangana Project**
- **Rajasthan Project**
- **Mizoram Project**
- **Goa Project**

Survey of India Project
Geokno’s Aerial LiDAR Survey helped Govt. of Telangana ink pact on Godavari water projects with Maharashtra

Mr. Chandrasekhar Rao explained how they had been working for over an year including conducting a LiDAR (Light Detection and Ranging) survey for identifying locations to tap water of Godavari and its tributaries to minimise submergence in Maharashtra so that disputes could be avoided.

Hope Springs as Telangana, Maharashtra Set to Script Water-sharing Treaty

“The actual negotiation process for Medigadda and Tummadi Hatti barrages started three months back. After TS government conducted Lidar survey, the Maharashtra officials too conducted a ground survey. They were convinced and accepted our viewpoint,” top sources in irrigation department told Express.
Geokno is undertaking India’s first project for Solar Rooftop Mapping potential using LiDAR technology

- LiDAR is the used world-wide for mapping city management and infrastructure projects including solar rooftop potential
- Geokno has been awarded the India’s first project for Solar rooftop potential mapping for Bengaluru

Rooftop solar could provide almost 40 percent of US electricity

This is huge.

To come up with the estimate, scientists from the National Renewable Energy Laboratory (NREL) used light detection and ranging (LiDAR) data to calculate the suitability of rooftops for hosting solar panels – aka rooftop photovoltaic (PV) systems – in 128 cities across the US, then extrapolated from there.

Within the cities examined, the researchers found 83 percent of small buildings have a suitable location for installation of solar panels. But when they analysed each building’s capacity to hold a PV system on their roof, only 26 percent passed the grade.

While only about a quarter of most small buildings’ roofs could practically be used for solar panels, there are a whole lot of them across the US, which means this type of building could actually provide the greatest combined technical potential compared to other kinds of structures.

Source: [http://www.sciencealert.com/rooftop-solar-could-provide-almost-40-percent-of-us-electricity](http://www.sciencealert.com/rooftop-solar-could-provide-almost-40-percent-of-us-electricity);

BENGALURU

Aerial mapping of city’s solar energy prospects

Once completed, it will eliminate the need for consumers to hire a consultant to determine the potential of a rooftop plant in their homes

A small aircraft will soon be going around Bengaluru to map the rooftop area available for generation of solar energy. The Bangalore Electricity Supply Company (Bescom) has entered into an agreement with Karnataka Renewable Energy Development Limited (KREDL) and the Centre for Study of Science, Technology and Policy (CSTEP) to build a roadmap to boost the quantum of power generated using solar energy.

The one-year project will see the use of light detection and ranging (LiDAR) technology and is touted as the first such exercise in India.

At present, Bescom generates 14.8 MW of solar energy from 524 solar rooftop plants across the eight districts it caters to. But this is woefully short of the target set by the Central and State governments. The target for Bengaluru alone is expected to be one gigawatt (1,000 MW).
Case Study: RITES awarded Geokno the Aerial LiDAR survey for Ahmedabad-Mumbai High Speed Rail Corridor

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<tr>
<th>Project Title</th>
<th>Aerial LiDAR survey of Ahmedabad – Mumbai High Speed Rail Corridor. <strong>Client:</strong> RITES Ltd. on behalf of National High Speed Rail Corporation Limited</th>
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| Project Details | - The Greenfield project is passing through varied terrain in its 500 km project length  
- Railway Board after seeing Mizoram project results opted for LiDAR technology for fast and highly detailed Aerial LiDAR survey  
- LiDAR scanner: Riegl LMS780  
- Camera: Phase One 100 MP |
| Data specifications | - LiDAR: 10 points per sq m except on slopes  
- 10 cm GSD Aerial Imagery |
LiDAR Advantages: Data accompanied by high grade imagery
Urban Planning Assistance: Data helps in identification of Narrow Lanes, Building & Safety Violations

Narrow lane with building off-set violations make it tough for Emergency Vehicles

Narrow lane accompanied with Utilities
Urban Planning Assistance: Danger Objects next to Road

High Power Transmission Towers are usually difficult to shift.

All measurements can be digitized with Point Cloud.

Display – Lat / Long

Map on the top

Immersive Panoramic Imagery in the bottom
Utility Management – Comprehensive identification of all utilities spread out in the city

Transformer on Pedestrian path
Utility Management – Comprehensive identification of all utilities spread out in the city
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Complete city can be brought into a virtual world with 3D Models for better Smart City Planning

Trinity Circle, MG Road, Bangalore – Real Imagery

Trinity Circle, MG Road, Bangalore – 3D CAD Model
In Telecom Industry itself SMART LiDAR data can be of monumental assistance across Business Operations

### Radio Network Planning
- Planning of optimal tower locations:
  - 3D City Models
  - Survey for new locations
  - Accurate data for Radio Network Planning

### Asset Registry
- Maintenance of asset registry for assets spread in multiple locations
- Optimization of capex costs during expansion planning

### Operations & Maintenance
- View health, capacity of infrastructure
- Optimal deployment of resources to maintain geographically spread assets
- Total lifecycle cost analysis for each individual asset

### Sales Force
- Feasibility studies for new connections
- Customer acquisition with geographically targeted marketing
- Customer service level analysis

A successful GIS depends on the quality of data captured for these applications and LiDAR technology is highly suited to meet the data requirements of Utility Industry for above applications.
Thank You

Geokno on YouTube:
https://www.youtube.com/channel/UCTcHSwRhGvusB3NxACelY3g/videos