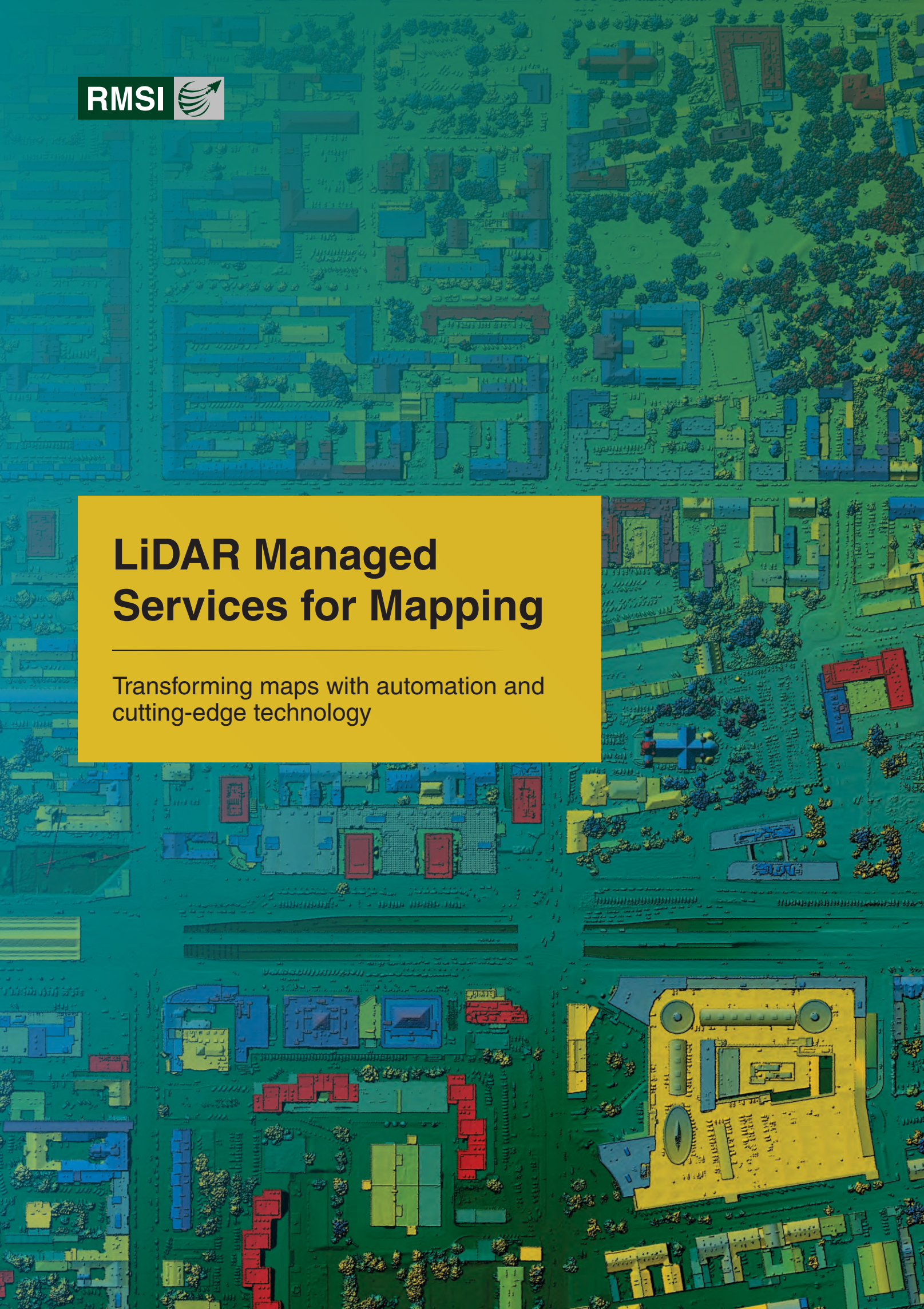
RMSI

LiDAR Managed Services for Mapping

Transforming maps with automation and cutting-edge technology



LiDAR (Light Detection and Ranging) has become a powerful catalyst, that has revolutionized mapping industry by providing unparalleled accuracy and efficiency. It is a cutting-edge remote sensing technology that utilizes laser light to measure distances and creates detailed, accurate representations of the Earth's surface.

RMSI combines LiDAR technology with GIS, Artificial Intelligence and Machine Learning (AI/ML) to deliver actionable insights and precise mapping solutions for a wide range of industries like utilities, telecom, transportation, land, and infrastructure etc. helping clients optimize operations and achieve their strategic goals.

Our LiDAR managed services empower organizations to automate data extraction, enhance visualization, and make informed decisions with ease.

Advantages of LiDAR

High Accuracy

Provides centimeter-level precision, capturing subtle elevation changes

Rapid Data Collection

Scans large areas quickly, even in challenging terrains

Penetration Capability

Penetrates vegetation to map the bare-earth terrain beneath

3D Modeling

Generates true 3D representations, allowing advanced simulations and analyses

Versatility

Applicable across diverse industries and adaptable to specific project needs

Processed **27,000+** miles of asset data with **98.8%** accuracy

Expertise in vegetation clearance and risk analysis with up to **99.9%** reliability

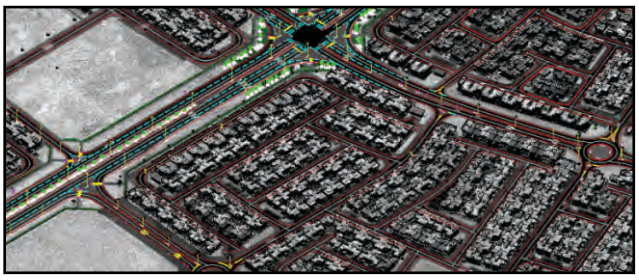
Customizable solutions powered by AI, ML, and GIS technologies

Proven capability in large-scale mapping and data management.

LiDAR-Based Conflation

LiDAR-Based Conflation integrates spatial data from LiDAR with other mapping datasets like GIS, satellite imagery, or aerial photos to create accurate and unified maps. It ensures consistency and completeness for applications such as urban planning, disaster management, and autonomous navigation. Examples:

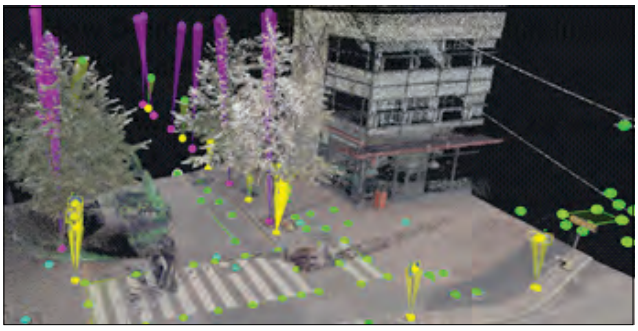
- Aligns road networks from aerial imagery with LiDAR elevation data
- Updates outdated map features (buildings, vegetation, terrain) using LiDAR scans



Asset Capturing and Monitoring

Asset Capturing and Monitoring involves using LiDAR technology to collect, analyze, and maintain geospatial data for efficient management and monitoring of physical assets.

These managed services are crucial for organizations that require ongoing access to accurate, up-to-date spatial data for infrastructure, utilities, transportation, and environmental monitoring.



LiDAR Platforms for Asset Capturing

Airborne: Used for large-scale mapping and monitoring, such as forests, coastlines, and infrastructure corridors

Mobile: Mounted on vehicles for detailed mapping of roads, bridges, and urban infrastructure corridors

Terrestrial: Stationary systems for capturing small areas with extreme details, often used for construction sites or industrial facilities

UAV/Drone: Cost-effective and versatile for smaller, hard-to-reach areas

Vegetation Management

Vegetation Management leverages high-precision 3D data to monitor, analyze, and maintain vegetation in various contexts.

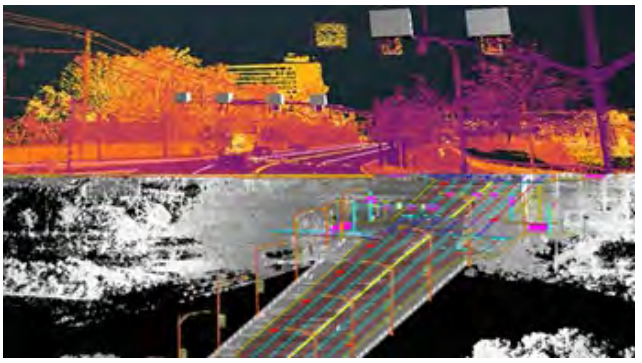
These managed services provide organizations with actionable insights for maintaining safe infrastructure, protecting ecosystems, and ensuring regulatory compliance.

Emerging Trends in Vegetation Management with LiDAR

- **AI and Machine Learning**: Automating vegetation classification and health assessment using advanced algorithms.
- **Digital Twins**: Creating virtual replicas of landscapes for real-time monitoring and predictive analytics.
- **UAV and Drone Adoption**: Expanding the use of drones for localized, cost-effective vegetation scanning.
- **Integration with IoT**: Combining LiDAR data with IoT sensors for continuous vegetation and environmental monitoring.

Asset 3D Modelling

Asset 3D Modelling focuses on creating accurate, high-resolution, and actionable digital representations of physical infrastructure and environments. These 3D models are widely used in industries like construction, utilities, real estate, transportation and urban planning, providing a foundation for visualization, analysis, and decision-making.



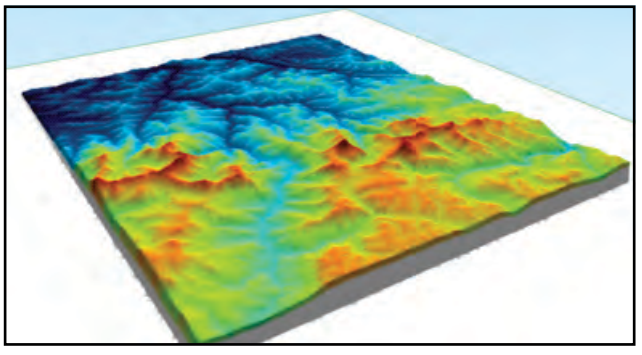
Industries Using LiDAR for 3D Asset Modelling

- **Energy and Utilities**: Monitor and maintain energy distribution networks
- **Construction and Real Estate**: Plan, design, and market structures effectively
- **Government and Urban Planning**: Develop smart cities and manage public infrastructure
- **Transportation**: Enhance road safety and optimize traffic management
- **Environmental Agencies**: Manage natural resources and address climate challenges

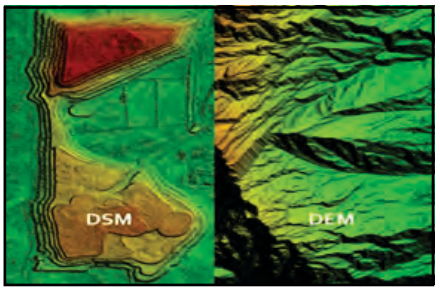
Terrain Modeling

Elevation/Surface/Terrain Modeling involves using LiDAR technology to capture, process, and model the Earth's surface in high detail.

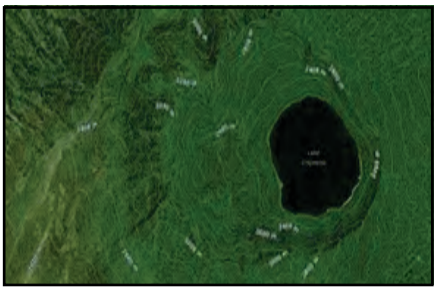
These models are foundational for applications in construction, environmental planning, disaster management, and resource management, providing precise data on topography and surface characteristics.



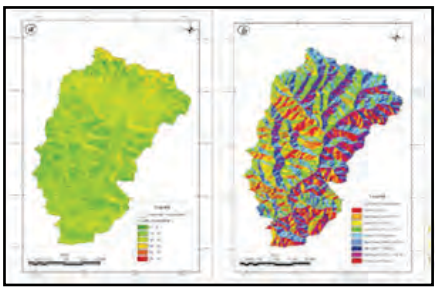
Terrain Models Created with LiDAR



Digital Surface Model (DSM), Digital Elevation Model (DEM)

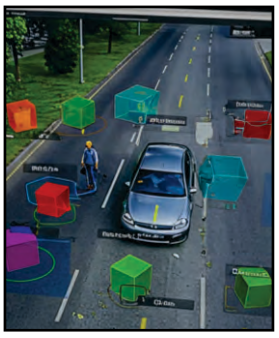


Contour Maps



Slope and Aspect Models

Success Stories



Annotating Dynamic Objects for Autonomous Driving

Used LiDAR data inputs along with computer vision images and LiDAR annotation expertise, RMSI experts annotated dynamic objects such as Vehicles, Pedestrians, Animals using 3D cuboids in the client's preferred platform.

Key labels assigned: Object type, Relative Position, Occlusion Ratio, Pose, Emergency, Artificial, etc.

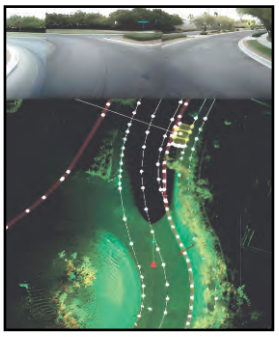
Output: 20+ million 3D Cuboids Annotated with accuracy of less than 2 cm.

3D Semantic Segmentation and Classification for a Leading Utility

The client required 3D semantic segmentation and classification of the features such as Ground, Vegetation, Vehicles, Buildings, Water, Power line, Transmission towers, Bridge, Roof Objects, etc.

RMSI experts conducted 3D semantic segmentation and classification of the various type of features present in the LiDAR data.

Output: 50K+ features identified and segmented with accuracy of Less than 2 cm.



Road Network Feature Extraction using 3D LiDAR Data for Transportation

RMSI team executed Road Network Feature Extraction using 3D LiDAR data with 9 vehicle mounted camera sensors on the client's platform to process and extract the required feature classes

Total 13 types of feature classes extracted using Polygon, Polyline and Point in the LiDAR data such as lineworks, intersections, crosswalks, sidewalks, amenities, obstructions, hazards, pavement messages, maintenance covers, speed limit signs, traffic signs, ADA Devices, Gates etc.

Output: Total 1250 miles of high-quality data delivered with accuracy of less than 1 cm.