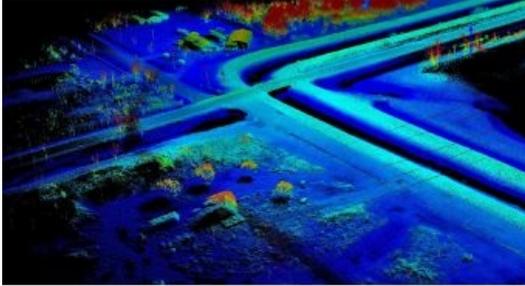


# 9 Revolutionary Lidar Survey Projects



The history of Lidar goes back to the early 1960s. In 1969, a laser rangefinder and a target mounted on the Apollo-11 spacecraft was used to measure the distance from the Earth to the Moon. Now, more than four decades later, Lidar has become a fundamental technology in the geospatial sector. *GIM International* has compiled a list of nine inspiring and spectacular Lidar projects that show the almost unlimited possibilities Lidar offers the geomatics world.

## Airborne Lidar in Rainforest

At the experimental forest site Paracou in French Guiana, a range of data is being collected to enable the short-term dynamics within the tropical rainforest canopy to be better understood and quantified. Airborne laser scanning (ALS) was used to obtain high spatial resolution data of the 3D canopy structure. The data has been utilised to build a canopy height model and provides valuable information about the foliage density. The sensing system can also be mounted on an unmanned aerial vehicle (UAV). The French Guianian project demonstrates proof of concept for the further application of this technique. [Read on...](#)

## Pathfinding through Identified Empty Space in Point Clouds

Indoor point clouds are useful for many applications, such as for pathfinding through empty, collision-free space. Fast-performing methods are required to identify this empty space because the indoor environment changes frequently and often does not follow the architectural design. As part of the Synthesis Project 2015, students of the MSc in Geomatics programme at Delft University of Technology have developed a method to efficiently identify and structure connected empty space in point clouds. [Read on](#) to learn more about the project.

## Operation IceBridge

Operation IceBridge completed its 2014 Antarctic field campaign, the sixth in a row, at the end of November. The campaign was aimed at recapturing a part of the Antarctic ice sheet which appears to be in irreversible decline. For six weeks from 16 October 2014, NASA's DC-8 airborne laboratory collected a wealth of data for the benefit of gaining insight into climate change. The first IceBridge flights were conducted in spring 2009 over Greenland and in autumn 2009 over Antarctica. What is Operation IceBridge, which sensors are used, what can the data be used for and who may use the data? The author provides an overview. [Read on...](#)

## Building a Global 3D Routing Map

Mapping company HERE, co-owned by German automotive companies Audi, BMW and Daimler, uses a fleet of more than 200 cars to collect dense point cloud data about roads around the world. The data from these mobile mapping vehicles is processed to secure privacy and produce detailed routing maps. This data is the input for various applications, ranging from traditional car navigation to analysis of the steepness of ramps. The most compelling application, however, is the application of this data to enable self-driving cars. [Read on...](#)

## Interpolation of Lidar Point Clouds

For representing terrain heights INSPIRE, which is aimed at creating an EU spatial data infrastructure, has developed specifications for digital terrain models (DTMs). DTMs are preferred as the main source for computing risks of flooding and other analytical tasks while their quality should be specified in terms of accuracy and resolution, i.e. grid size. Here, the author applies five interpolation methods to two airborne Lidar datasets both located in northwest Italy – one capturing a mountainous area and the other a flat urban area – and investigates the resulting accuracy for diverse grid sizes. [Read on...](#)

## Surveying in the Valley of the Temples

Full-waveform terrestrial laser scanning enables high-precision 3D topographic modelling of unstable rock valleys that is valuable for various geomorphological investigations. The area below the archaeological site of Temple of Juno in Agrigento, Sicily, is characterised by the presence of large sections of rock that have fallen down from the upper ridge. In this context, full-waveform laser scanning technology was tested for the production of a highly detailed 3D topographic model at two resolutions (2cm and 20cm) for simulating potential rockfall paths at the site. [Read on...](#)

## Reconstructing a Church in 3D

Reconstruction and maintenance work in historical buildings such as churches requires detailed and accurate information about them, but it can be difficult and expensive to acquire such data efficiently. The combination of terrestrial Lidar and UAS-based photogrammetry provides an adequate approach for gathering a full model of the outside of a church. Additionally, it allows for accuracy evaluation by comparing areas with overlap between terrestrial Lidar and the point cloud derived from the UAS images. [Read on](#) to learn about a project at the 13th-century Cathedral of St. Nicholas in Greifswald, Germany.

## Road Maintenance with an MMS

A mobile mapping system (MMS) enables laser data and images of a road and its vicinity to be collected from a van or other moving platform. Here, the author describes data collection and accuracy assessment of a pilot carried out in Finland. It has been demonstrated that MMS data processed with sophisticated software is well suited for road maintenance tasks as many parameters can be accurately calculated from the 3D model. [Read on...](#)

## Mobile Lidar for Urban Streetscapes

Surveying And Mapping, Inc. (SAM, Inc.) performed a mobile Lidar survey of the historic Sixth Street district in Austin, Texas, USA, for an urban planning project being conducted by the municipality. Sixth Street is an acclaimed music and entertainment district in the heart of downtown Austin, and city planners intend to redevelop it, broadening the pedestrian streetscape and improving both vehicular and pedestrian traffic control. Using mobile Lidar technology to survey this busy street significantly shortened data-acquisition time and provided survey-grade deliverables to the city. The detailed point cloud dataset was also made available to city planners for 3D planning and visualisation. [Read on...](#)

---

<https://www.gim-international.com/content/news/9-revolutionary-lidar-survey-projects>

---