

APRIL 2023



## Accurate 3D digital twin modeling

How we helped a major telecom operator optimize existing towers and prepare them for future expansion

### OVERVIEW

Accurate 3D tower models and 3D maps of existing infrastructure enable telecom operators to better visualize existing infrastructure (towers, antennas, and other equipment) and identify issues quickly and accurately. This makes it easier to ascertain coverage gaps and deploy additional antennas, equipment and services to increase network capacity and coverage.

A major telecom operator in Europe wanted to improve the efficiency of their existing network and expand their network coverage into rural areas. Optimizing the existing infrastructure is one way to minimize the expense and maximize the ROI.

However, they faced a significant challenge since most of the areas of interest were difficult to access. Finding out the actual situation on the ground would be difficult and expensive and involve an element of risk for the field operatives.

They needed a partner who could create accurate 3D tower models and 3D maps. It would enable them to optimize the locations and heights of their existing towers, assess the towers' strength and capacity to load additional equipment.



## Scope of work

- Process high-resolution aerial images, LiDAR data, and other sensor data to generate accurate 3D models of the towers and the surrounding environment.
- Apply advanced analytics and ML algorithms to the data to extract meaningful insights and identify areas of optimization.
- Create 3D digital twin models to map the tower structure mount locations, and antenna configurations for effective engineering analysis.
- Prepare site plan drawings and other technical documentation for future expansion and networking.
- Conduct tower inspection, maintenance, repair, and management of tower performance.

## PROCESS

We worked with trusted partners to capture high-quality data of the existing infrastructure and surroundings. Our experts in AI/ML and geospatial analysis processed the data using advanced geospatial applications. They applied specialized AI/ML algorithms to extract insights and optimize tower load and capacity. The team also used specialized software to map tower structures, mounts, and antennas.

## CHALLENGES

- Processing large amounts of tower data efficiently and converting them into accurate and valuable information for engineering analysis.
- Integrating data collected in various formats and from different sources into a single database for analysis.
- Developing a scalable solution that could handle large volumes of tower data and accommodate future expansion.

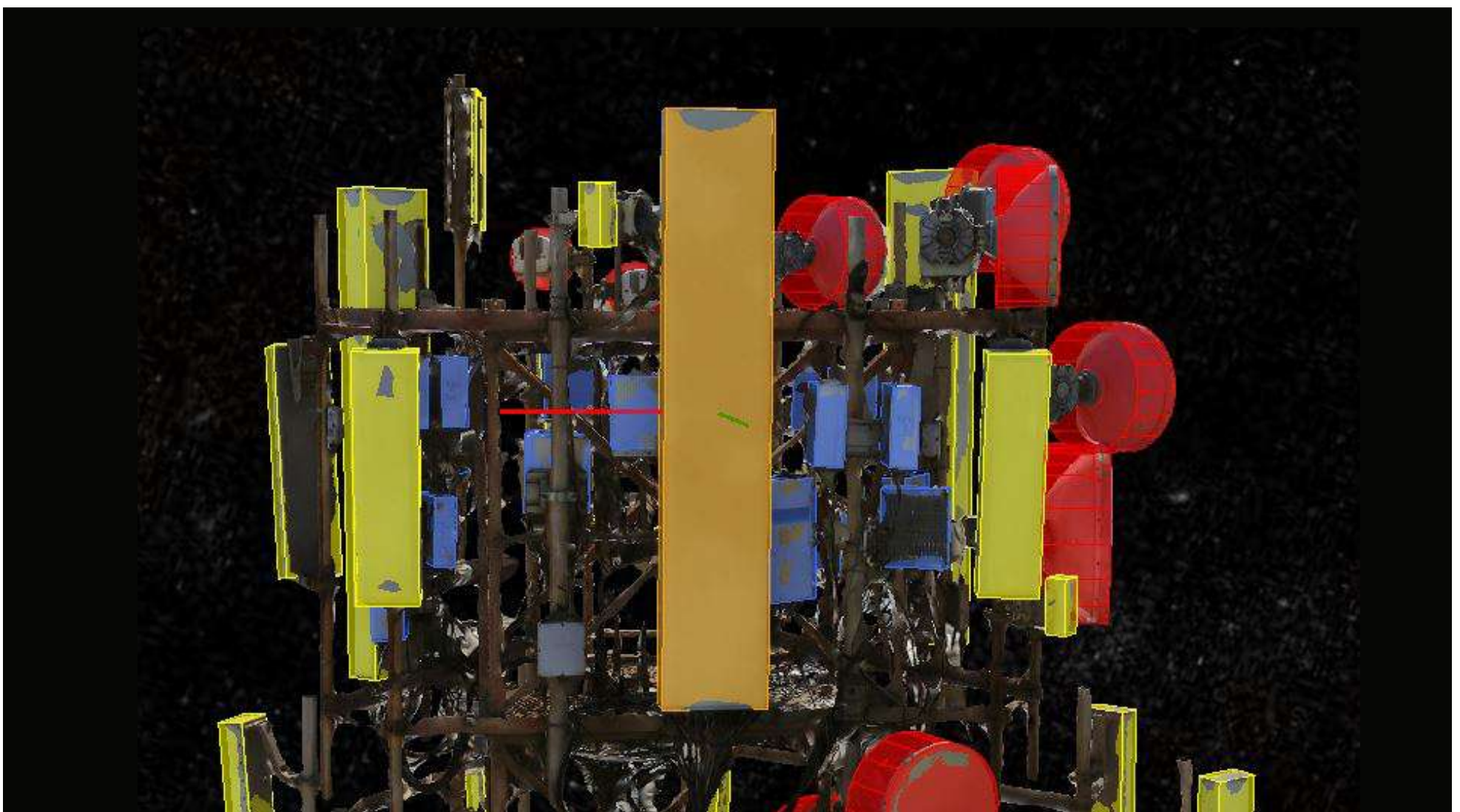
## SOLUTION

### **Automation and streamline data processing**

Our team utilized automation and advanced geospatial data processing software to process large amounts of tower data into accurate and valuable information for engineering analysis. They implemented streamlined data processing techniques to ensure that the tower data was analyzed and processed efficiently. This solution enabled them to reduce processing time and improve the overall workflow. It also ensured the final output was scalable and could adapt to the telecom operator's evolving needs.

### **Rigorous testing and quality assurance**

We have a well-defined and robust quality control protocol for projects of this nature. Our team performed extensive testing and quality assurance procedures, including data validation and verification, to ensure the accuracy and quality of the collected data.



## OUTCOME

### **Improved tower engineering**

Our solution helped our client improve their tower engineering capabilities, including tower mapping, modeling, and analysis. This, in turn, enabled the tower operator to optimize the usage of existing towers, identify areas for tower expansion, and make informed decisions about tower networking

### **Accurate engineering analysis and improved decision-making**

Our robust quality control procedures ensured the accuracy and quality of the data, which helped improve the accuracy of the engineering analysis. By integrating the various formats and sources of tower data into a single database, we were able to provide a comprehensive and accurate analysis of the towers. This led to better decision-making regarding tower optimization and networking

### **Efficient and effective network**

We utilized cloud computing to provide a scalable solution to handle large volumes of tower data and accommodate future expansion. This ultimately led to a more efficient and effective network for the telecom operator.

## CONCLUSION

Our solution helped the engineering company (our client) improve their tower engineering capabilities, optimize their tower usage, and provide better service to their customers. The telecom operator (end client) improved their network coverage, expanded their services, and provided their customers with better connectivity and network performance, ultimately leading to higher customer satisfaction with seamless network coverage.