

CASE STUDY

Oversize Loads

Author

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Organizations involved

Fagioli SpA, Ansaldo Energia SpA

3DT
Technology meets efficiency

Background

Creating a digital copy of a road environment enables a variety of new ways to visualize assets, perform analysis and, in general, drive decisions concerning the infrastructure.

Mobile mapping systems based on LiDAR allow for collecting a huge amount of data in reduced time and, with their flexibility, they represent an established method to create digital twins or road infrastructures and urban areas very effectively cost-wise.

Additionally, mobile mapping systems address the concern about the work safety of the operators, which can now measure relevant information directly from the digital twin at the office, instead of

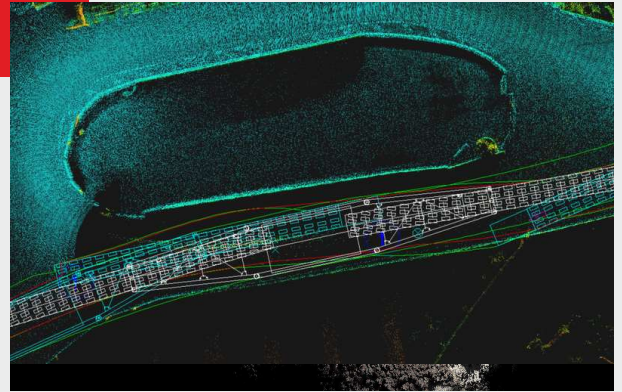
The project

Fagioli SpA handled the transport of a 300 tons generator stator type TRYL 63 on behalf of Ansaldo Energia, with Bangladesh as the final destination.

The first part of the journey was one of the most challenging, as the route 2.3 km long between the Ansaldo Energia warehouse and the freight port located at the Dente di Cornigliano, featured two underpasses with very low clearances, that prevented the possibility to use traditional trailers.

The route also included a pass under the Polcevera Viaduct, rebuilt after the collapse of the old Morandi Bridge on August 14, 2018. In that occasion, a part of the bridge landed on the warehouses of Ansaldo Energia.

To perform the task, Fagioli organized the load in a dedicated trailer, carried by two self-propelled modular transporters (SPMTs). The overall length of the convoy was 70 m. The particular configuration was selected to keep the maximum height below the threshold necessary to successfully avoid the collision with the interferences in the site while keeping the possibility of steering along the track.



The simulated path of the trailers in the point cloud



A phase of the transport

PROJECT INFORMATION

Location

Geneva, Italy

Survey

30 km/h average speed in urban area

Product used

Scanfly XT

Car mounting kit

Wheel speed sensor

Web App

Smart Processing Lidar



The payload lidar not only for UAS



MULTI-PLATFORM SOLUTIONS

The workflow

Scanfly XT was quickly installed on the vehicle designated from the survey via the dedicated car mount adapter. System was configured in the field, and the navigation system completed the initialization in less than a minute in good, open sky conditions. After a warm-up of a few minutes, the operator activated the recording of the LiDAR data and traveled the designated route in the north-south direction, with just a single pass in normal traffic conditions. The whole operation required less than 15 minutes.

Later at the office, the trajectory of the survey was estimated with an RMS accuracy in the range of 3 cm using the RINEX corrections from the nearby base station of a CORS network.

Finally, the point cloud was generated in SmartProcessing Lidar, 3DT proprietary direct georeferencing software,

Results

The route was previously inspected by Fagioli with traditional methods in the field, as it constitutes the obligatory passage to reach the freight port of Geneva from the Ansaldo Energia's site. In particular, the analysis was focused on two underpasses.

The clearance measurements from the point cloud were compared to the values previously taken in the field by the operators.

The average difference between the digital twin of the route and the field measurement was 2.5 cm, with the maximum value being below the 5 cm threshold required for the application, in compliance with the specifications of the Scanfly XT.

It was possible to use the point cloud from the survey as the base for simulations of the convoy traveling in the most demanding parts of the track.

The Scanfly advantages

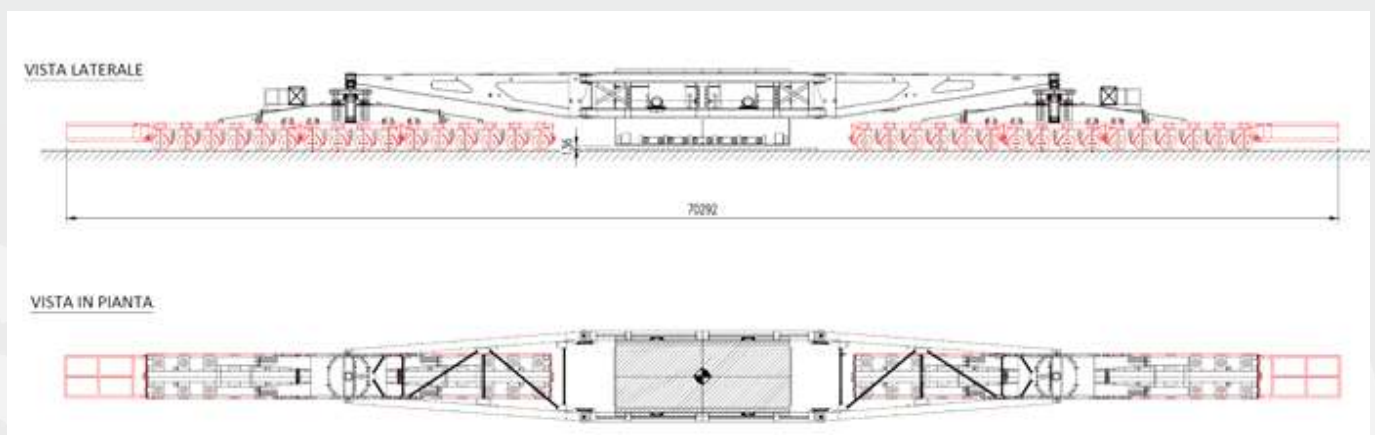
Fagioli validated the use of Scanfly XT for the preparation of the transport of oversized loads. Since traditional surveys on the critical points method were typically performed manually, Scanfly XT enables to increase the efficiency of the operations without creating interferences to regular traffic.

Since most of the critical points are on public roads open to heavy traffic, surveying with Scanfly XT reduces the risks for the operators in the field.

Finally, creating the digital twin allows taking any additional measurements directly from the point cloud stored at the office, reducing the need to go back in the field.



Scanfly installed on the survey vehicle



A diagram of the trailers and the oversized load



On board



Backpack



Flying