CASE STUDY

Dronezone SRL

OXTS partner Dronezone SRL were tasked with mapping an old railway bridge. The scan was to identify potential weaknesses in its structure and to understand possible degradation over time.

PROJECT AIM

Due to concerns about safety and the danger from overgrown foliage, Dronezone was asked to survey an old railway bridge to help understand its structural integrity, potential weaknesses, degradation over time, and determine whether any future restoration work was needed. The key deliverable for the client was a clear and accurate survey of the bridge to answer their questions.

CHALLENGES

+ Build a LiDAR surveying payload capable of surveying the bridge from every possible angle.
+ Ensure the payload's SWaP-C was optimised to maximise flight time and accuracy.
+ Find a localisation solution accurate enough to produce a clear, precise point cloud for the final deliverable.
+ Accurately calibrate the onboard sensors to help ensure optimal point cloud quality.

SUMMARY

Company:
Dronezone srl.

Industry:
Drone surveying

Country:
Romania

Website:
www.dronezone.ro

OXTS Hardware:
xNAV650 GNSS/INS

OXTS Software:
OXTS Georeferencer
Boresight Calibration

Other Technology:
DZX8 Heavy Drone
Velodyne VLP-16 LiDAR

THE SOLUTION

Dronezone chose a Velodyne VLP-16 LiDAR sensor for the payload, built onto its own DZX8 Heavy Drone. For localization, Dronezone chose the xNAV650 from OXTS, supported by OXTS Georeferencer, our LiDAR point cloud georeferencing software.

Weighing just 130 g and measuring 77 x 63 x 24 mm, the xNAV650 met the SWaP-C requirements of the project while still providing the accuracy required to confidently produce a 3D point cloud of the bridge.

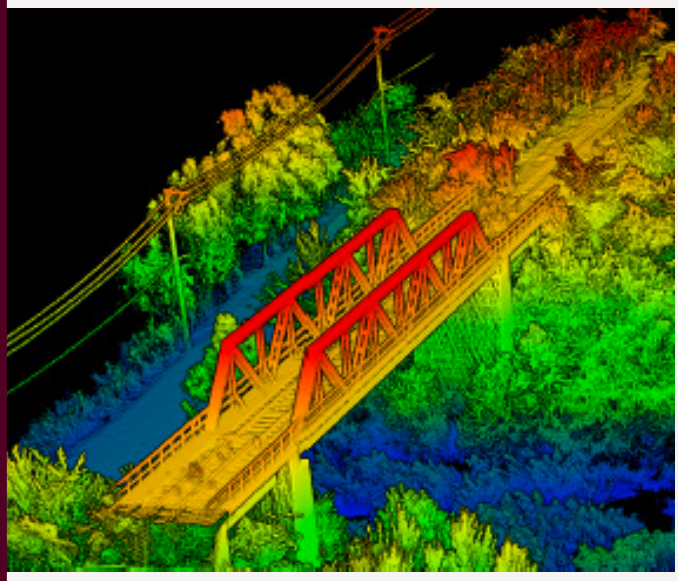
To further improve the quality of the final point cloud, Dronezone used the boresight calibration capabilities of OXTS Georeferencer to calibrate the angles between the xNAV650 and Velodyne VLP-16 sensor to remove any blurring or double vision from the final result.

OXTS Georeferencer's pre-built integration with Velodyne LiDAR sensors, also meant that set up and post-processing time was minimal.

PAYLOAD SPEC

The xNAV650 and LiDAR included on the payload have the following specification:

- Position accuracy: 0.02 m (RTK/PPK)
- Roll/pitch accuracy: 0.05°
- Heading accuracy: 0.01°
- Data processed using NAVsuite and OXTS Georeferencer
- LiDAR range accuracy: up to ±3 cm (typical)



RESULTS

The point cloud was of a very high standard, and the project team were easily able to identify areas of the bridge that needed closer inspection. The foliage surrounding the bridge was also included in the survey and the team was able to determine the areas that needed further attention.

"Once we decided to survey the bridge using the DZX8 Heavy drone, the obvious choice was to use the xNAV650 as our navigation device. Despite its small, lightweight form factor we're fully confident in its ability to supply us with the accurate measurements we need"

Nora Jurca,
Business Development Manager,
Dronezone SRL.