



The Road-Scanner for City Mapping in France

Project goal:

Survey of the cities of Nantes and Bayonne, aiming to provide a comprehensive urban and extra-urban mapping in high-grade 1:200 scale with $\leq 10\text{cm}$ accuracy.

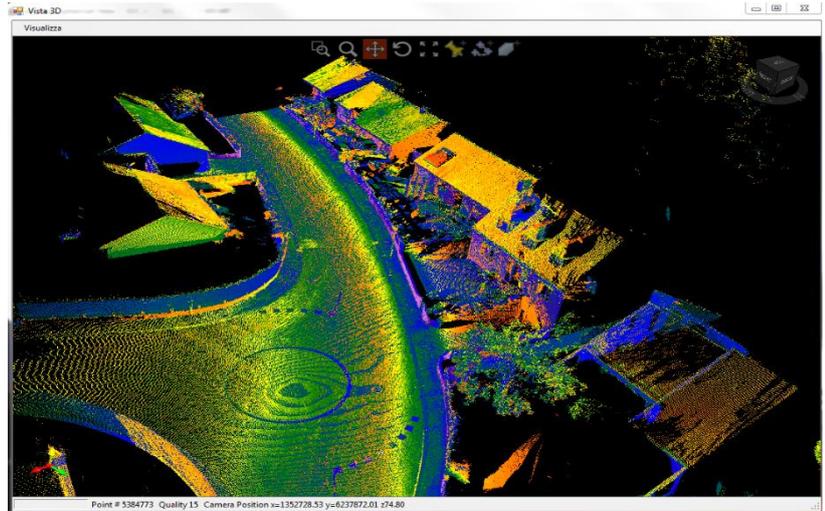
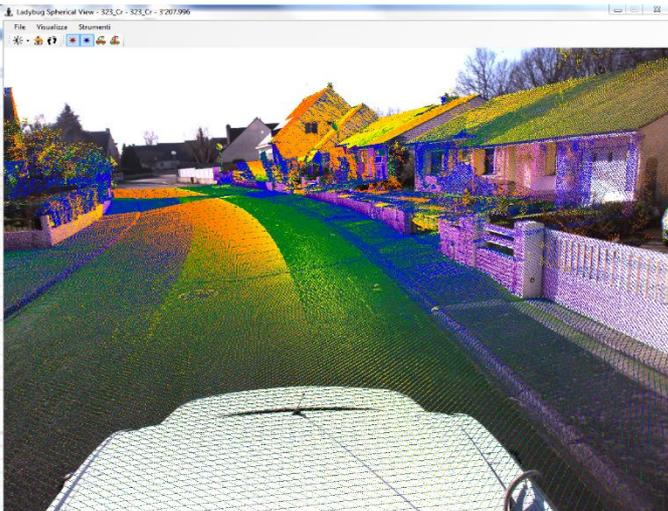
Road-Scanner Survey:

The survey has been carried out by GEOSAT, an important French engineering company, using the MMS Road-Scanner3.



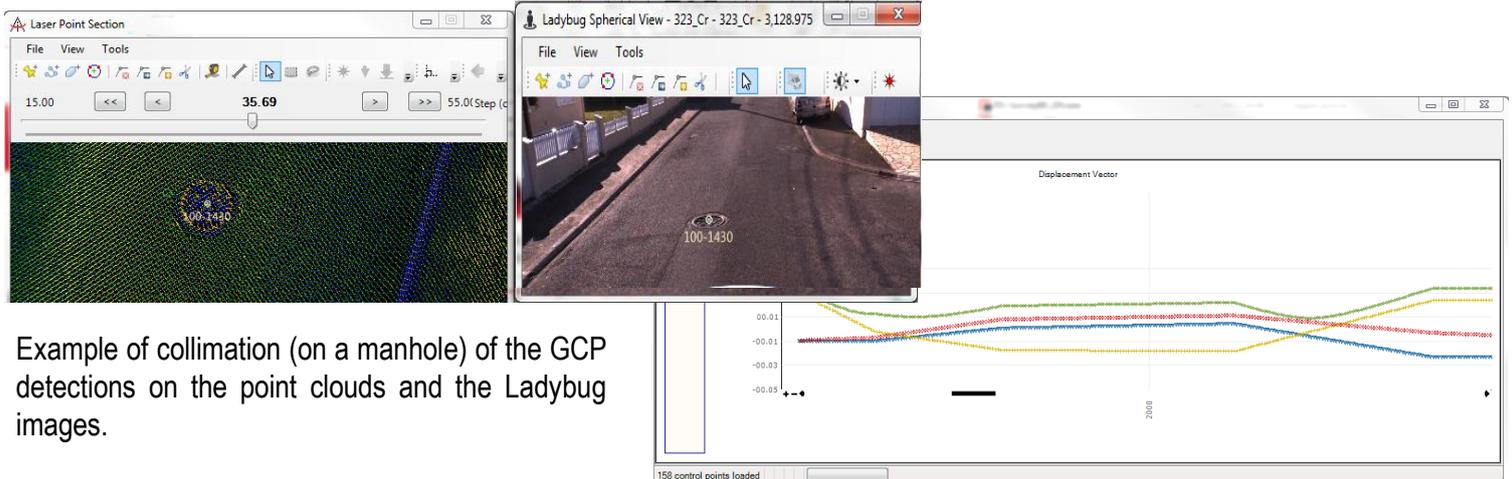
Equipment:

Road-Scanner3 has been equipped with 3 Faro Focus laser scanners, a LadyBug5 spherical camera and an IXEA positioning system to provide accurate coordinates and orientations.



Data accuracy:

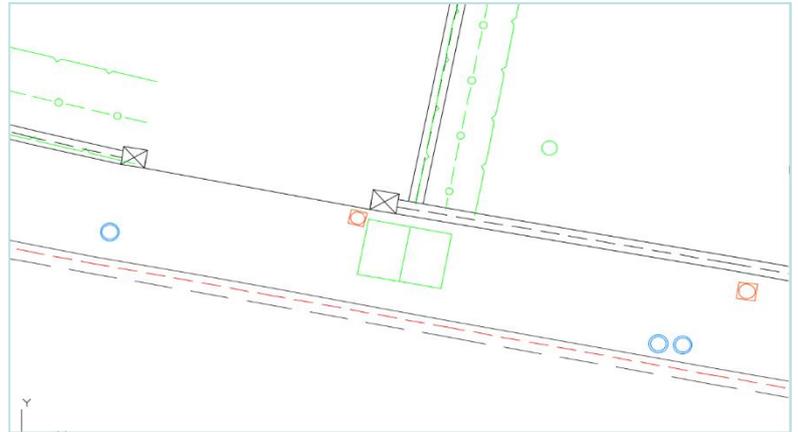
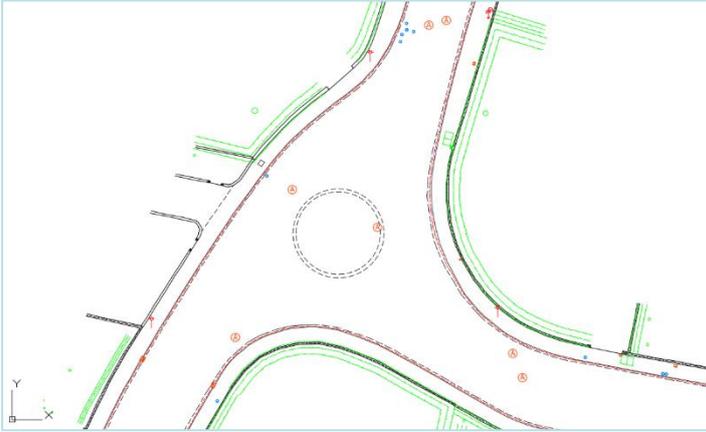
GEOSAT has verified the survey accuracies by using the Ground Control Points (GCP). The deviations of the point clouds has been contained within a few cm (5-10 cm in the absence of GPS signal). The survey accuracy has been monitored through a graphical representation of the data along the trajectories.



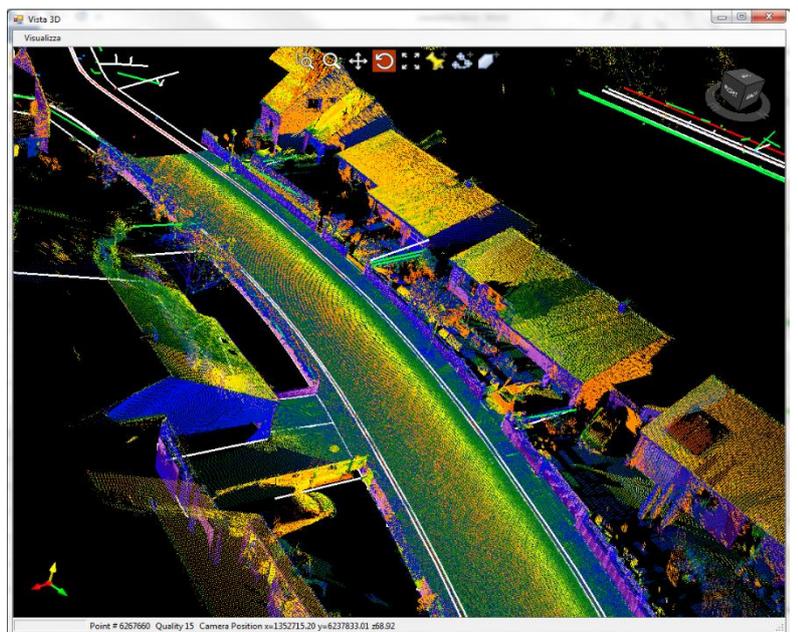
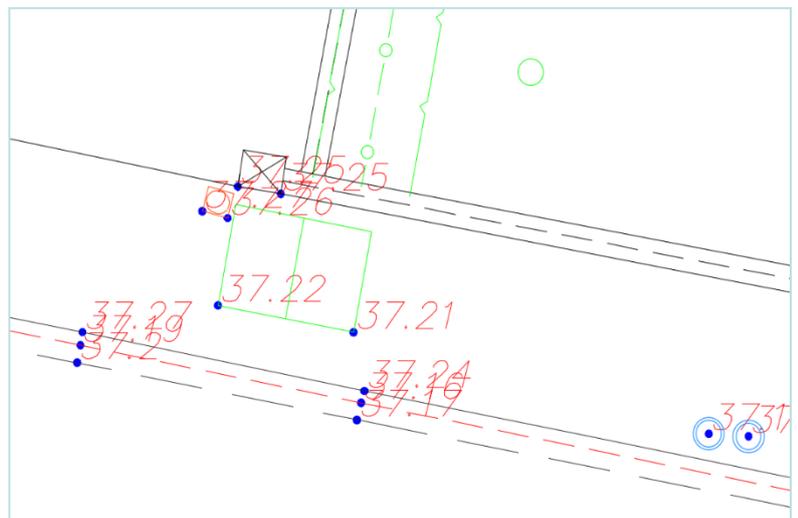
Example of collimation (on a manhole) of the GCP detections on the point clouds and the Ladybug images.

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Hi-grade mapping (1:200 scale): The technical specification is very demanding for the number of objects required and the specified drawing rules. Symbols must respect the real dimensions and orientations, in order to realize accurate and consistent maps. For instance, manholes and grids are drawn with a wide set of symbols. They are inserted with their proper scales and rotations, in compliance with the real measures. Also the linear elements (such as walls, fences, hedges, ditches) are drawn with their real thicknesses.



3D Mapping: All detected features have their own quotes, strictly picked up on the ground. Sidewalks and curbs have also additional quotes referred to their top edges. Both 3D entity maps and 2D drawings, with quote labels, are available.



Feature extraction with Road-SIT Survey

Siteco has developed some smart tools to simplify the feature extraction process, such as:

- Special rainbows to colorize point clouds. These colors highlight road elements, especially manholes, grids, etc.
- Snap to the lowest point. This tool is very useful to capture the right quote of the objects. For instance, manholes and grids are located on the road surface. Walls, fences, hedges, poles are located at their base quotes (usually at the sidewalk level).

Road-SIT automatically detects the ground quotes of the objects by projecting a selected point to the point cloud lowest surface.

- Drawing of multi-line entities to represent the object thicknesses. This tool improves the drawing performances with linear features, such as walls, hedges, etc.

- Easy symbols management. Road-SIT calculates the block scale factors and rotations for each symbol by selecting 3 points on its bounds. Users can insert rectangular symbols with real dimensions in a very fast way. Circular objects (manholes, poles) are managed similarly: the center point and radius are identified from the circle through 3 points.