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A novel monitoring procedure for assess the correct road pavement restoration after the One- Day-Dig micro-trenching installation

Abstract:

This paper presents the results of a novel monitoring campaign aimed at evaluating the effect of the installation of the One-Day-Dig (1DD) micro-trenches on the road surface aspect. The 1DD, patented by SIRTI, leading Italian company in the infrastructure sector for telecommunications, is an innovative installation method for the creation of a very narrow trench to lay cable or micro-duct in the ground. In a few hours, the trench is backfilled and sealed, speeding up the construction process and reducing any aesthetic issues thanks to the small footprint that will fade over time.

In this experimental activity, more than 20 kilometers of road network interested by 1DD micro-trenching were surveyed using a 3D laser scanner. The point clouds collected by the laser scanner have been handled using an open source processing software and developing a proper procedure to manage the whole dataset. The main goal is to assess the vertical deviations of the micro-trench surface from a reference plan representative of the road pavement.

Results show that either negative (sags) or positive deviations (bumps) are determined with a high level of accuracy for the entire route realized in 1DD. Furthermore, the available data can be analyzed considering different levels of inspection, from local evenness evaluations to a wider scale of assessments such as on hundred meters stretches.