

Mobile laser scanning to spatially update the city infrastructure networks.

ABSTRACT

This research discusses a more efficient geospatial monitoring technique for city infrastructure networks. It will concentrate on polyethylene city infrastructure materials, where power, water and communication networks are covered or protected by polyethylene materials. A technical comparison is conducted between current and proposed geospatial monitoring techniques in order to develop an overall performance evaluation. The mobile laser scanning technology achieved the best performance evaluation, where detailed data analysis and collection, mobile laser missions, modeling and interpretation, and system geometrical corrections for location and orientation have also been conducted. Prior to conducting the performance evaluation, the research investigates mobile laser behavior and recognition capabilities with respect to Polyethylene City infrastructure materials. After analyzing the mobile laser pulses behavior, and its correlations with the mission ground speed and exposed scanned surface, it is concluded that the mobile laser pulses response is constant for the Polyethylene City infrastructure materials. The concluded mobile laser pulses constant is utilized to develop a mathematical model for re-planning the mobile laser scanning missions to obtain the best model for monitoring the Polyethylene City infrastructure networks.

Keyword: Spatial Thinking; Smart Cities; GIS; City Infrastructure Development.