Evaluation of a Low-cost Mobile Mapping and Inspection System for Road Safety Classification

Abstract:
This paper presents the results of an investigation about a mobile low-cost dual-DGPS system for the fast tracing of the basic road design elements (horizontal plan, long section and cross sections). It is based on the use of GPS/GNSS technology and the requirements set by the “Safety Criterion III” of vehicle movement dynamics introduced by the guidelines set by the Greek Ministry of Infrastructure, Transport and Networks. The main scope of the system is to become a useful and practical low-cost decision support tool for the inspection and the classification of road segments in safety categories based on a repeated procedure and the available vehicle fleet of the maintainer of the road. A major application task of the system could be the case of emergency conditions, i.e. to perform a quick survey of road deformation after a major disaster occurs, affecting the road infrastructure. The system consists of a moving vehicle equipped with GPS receivers. It was tested on a road segment that was accurately surveyed right after its construction (as-built) with classical surveying methods in order to verify its results. The performance of the system was evaluated on a mapping generalization base, more concerning the geometrical generalized road surface reliability and less the point mapping accuracy.

Stichworte:
Road Geometry, Differential Kinematic GPS, Exponential Models