

# Multisensor System for Automatic Monitoring of Highway Linear Features

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## ABSTRACT

During the last decade of the 20<sup>th</sup> Century the concept of Mobile Mapping Systems (MMS) has been established and evolved from rather simple land-based systems to more sophisticated, real-time multi-tasking and multi-sensor systems, operational in land and airborne environments. Mobile Mapping technology has made remarkable progress, notably expanding its use in remote sensing, and surveying and mapping markets. New systems are being developed and built for specialized applications, in support of land-based and airborne imaging sensors, aimed at automatic data acquisition for GIS databases.

The major objective of this paper is to present a new GPS/INS/CCD integrated system for precise monitoring of highway center and edge lines. The system has been developed at The Ohio State University for the Ohio Department of Transportation. The prototype of the positioning component of the system is based on a tightly integrated GPS/INS (Trimble 4000SSI, Litton LN100), and the imaging component comprises a fast, down-looking, color digital camera from Pulnix (TMC-6700, based on 644 by 482 CCD and acquisition rate up to 30 Hz). The high image rate provides sufficient overlap of the subsequent images at highway speed; therefore stereo data processing can be performed in near real time with the support of a single camera and on-the-fly navigation solution.

In this paper, we discuss the design, operational aspects and performance analysis of the system prototype. A new approach to the application of navigation data to real-time processing of the imagery is also presented. In particular, a performance analysis of the georeferencing module, based on extended field tests, will be discussed.

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