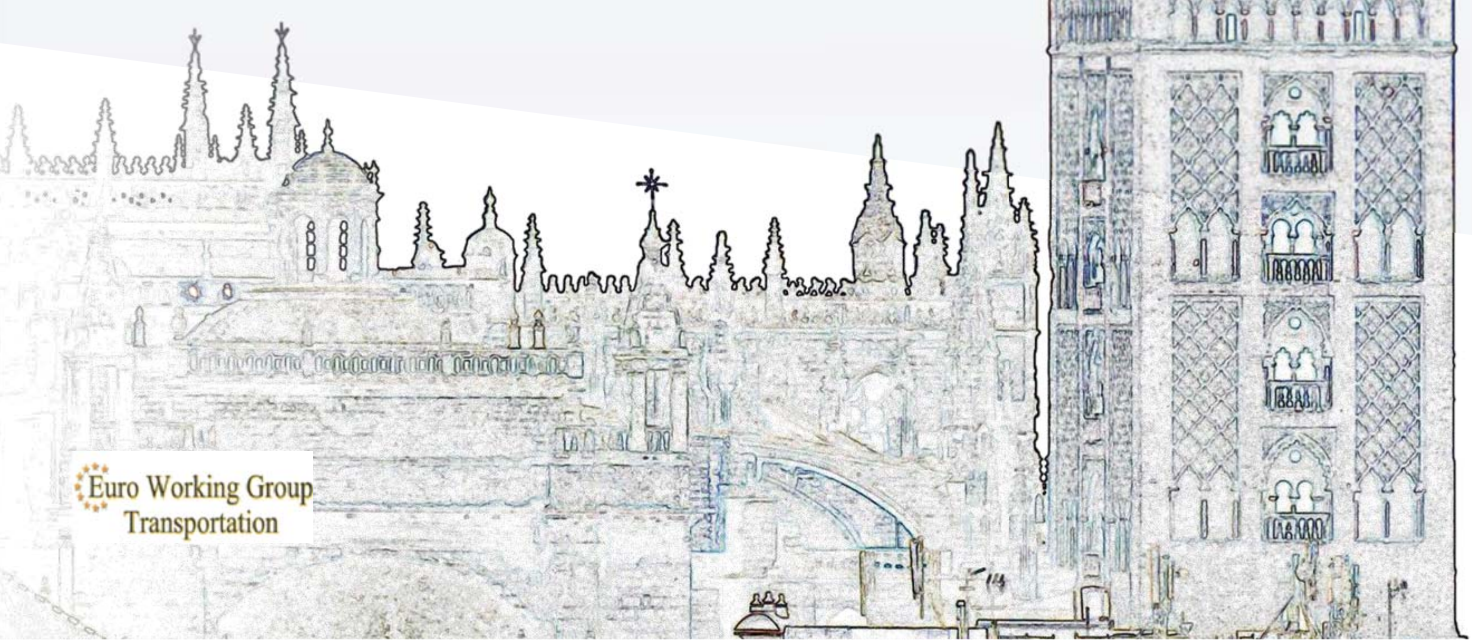
Transportation Engineering Division
SCHOOL OF ENGINEERING, UNIVERSITY OF SEVILLE

17th meeting of the
EURO WORKING GROUP ON TRANSPORTATION

EWGT 2014

JULY 2nd - 4th, 2014
SEVILLE, SPAIN

BOOK OF ABSTRACTS



Euro Working Group
Transportation

BOOK OF ABSTRACTS

17th Annual Meeting of the
EURO Working Group on Transportation (EWGT 2014)
July 2-4, 2014

ISBN: 978-84-617-1148-2

Edited and Published by:

Francisco G. Benitez

Noelia Caceres; Francisco J. Cores;
Jose M. del Castillo; Francisco J. Morales;
Jesus Moreno; Antonio Reyes;
Luis M. Romero; Cayetano Ruiz de Alarcon;
Jose I. Sanabria; Johan Wideberg

Transportation Engineering Division
School of Engineering University of Seville
Camino de los Descubrimientos s/n, ES-41092, Seville, Spain

BOOK OF ABSTRACTS

17th meeting of the

EURO WORKING GROUP ON TRANSPORTATION

EWGT 2014

JULY 2nd - 4th, 2014

SEVILLE, SPAIN

Euro Working Group
Transportation

Transportation Engineering Division
SCHOOL OF ENGINEERING, UNIVERSITY OF SEVILLE

of the output produced by this modeling system is highly dependent on the values of its parameters. Therefore, the model needs to be calibrated. In this paper we present a calibration framework for the velocity based cell transmission model (CTM-v) and ensemble Kalman filter. The framework consists of two separate techniques, one for calibrating the parameters of the fundamental diagram using a minimum square approach, and the other is based on a gradient free optimization method, for calibrating demand and filter parameters. The fundamental diagrams are calibrated based on stationary radar sensors of speeds and flows, and the demand and filter parameters are calibrated based on travel times collected from Bluetooth-based sensors. The CTM-v and Kalman filter constitutes the major parts of the Mobile Millennium Stockholm system. The calibration framework is evaluated, and the results from the calibrated model are presented for a highway stretch north of Stockholm, Sweden. The results from the calibration framework is a first step towards a travel time estimation model, which in the future, can be used in a travel time prediction framework.

107. COMPARISON BETWEEN VEHICLE SPEED PROFILES ACQUIRED BY DIFFERENTIAL GPS AND UAV

Salvo G.[(a)], Caruso L.[(a)], Scordo A.[(a*)], Guido G.[(b)], Vitale A.[(b)]

(a) University of Palermo, Department of Civil, Environmental, Aerospace and Materials Engineering, Palermo, Italy
(b) University of Calabria, Department of Civil Engineering, Rende, Italy

Abstract

Traffic microscopic simulation models are able to represent traffic conditions and their evolution over time. They take into account the geometrical aspects of transport infrastructures, driver behavior and, step by step, the vehicles' movements on the road network. The most widespread applications of these models are referred to accident management, route guidance problems (possibility of evaluating control strategies in real time), adaptive control of traffic-light and ramp metering (management and control of the ramps and flow).

To accomplish this goal observational data of vehicles' kinematic characteristics have to be acquired. These elements are not always easily available. In scientific literature there are several techniques for the detection of traffic flow characteristics that are generally classified in: 'infrastructure-based' techniques with fixed devices (intrusive or non-intrusive), and 'non infrastructure-based' techniques, that employ mobile devices such as probe vehicles or detection systems with cameras.

The aim of this paper is to compare speed profiles of probe vehicles acquired at the same time with two different 'non infrastructure-based' survey methods. The first one, commonly used in several scientific research, is based on positioning data recorded by a GPS unit. In this work, a differential GPS installed on board is used to improve data position accuracy. The second one is based on the assumption that it is possible to acquire kinematic characteristics of vehicles by a video camera mounted on an Unmanned Aerial Vehicle (UAV) that resumes study area from the nadiral point of view. Some Ground Control Points (GCP) are positioned inside the investigated area to minimize the errors of video processing analysis. Frames extracted from the video, and consequently georeferred, are useful to obtain speed profiles of the analyzed vehicles. These last steps are essential to minimize position errors due both to wind and to rotors vibrations.

Further aim of this study is to determine the minimum number of GCP that minimizes the difference between speed profiles acquired by UAV and differential GPS.