

F. Soriguera & F. Robusté

Insights on Freeway Travel Time Estimation Methods Based on Punctual Speed Measurements

ABSTRACT

The accuracy of the real-time travel time information disseminated on metropolitan freeways is one of the key issues in the development of advanced traveler information systems. Although, very accurate estimations could be obtained if suitable and intensive monitoring systems were available, usually travel time estimations must rely on data obtained from the preexisting surveillance equipment installed on freeways: loop detectors. Travel time estimation from loop measurements has attracted much research effort during the last decade, resulting in numerous methodologies. Among these, the ones that rely on spot speed measurements at detector sites to obtain the travel time estimation on the target stretch are the most intuitive. The key issue in these methods is the spatial generalization of point measurements over a freeway link. Multiple approaches can be found in literature, ranging from the simplest, and mostly implemented in practice, constant speed approach, to recent and more complex mathematical interpolations. The present paper shows that all speed interpolation methods that do not consider traffic dynamics and queue evolution, do not contribute in better travel time estimations. All methods are inaccurate in congested and transition conditions, and the claimed relative benefits using various speed interpolation methods result from context specific experiments.