Traffic Engineering Lab

Data fusion for instantaneous travel time estimation
Loop detector data and ETC data

Michael Do

Key words: Travel time, data fusion, ETC data

Background

Travel time is one of the most understood measures for road users. By providing accurate and reliable travel times it is possible to influence road users' route choice and travel behavior, hence improving the performance of traffic networks.

Purpose

The aim of this research is to develop a travel time estimation algorithm suitable for real-time estimations. Inputs are loop detector data and ETC data. With the incorporation of ETC data, travel time estimations are expected to be more accurate than algorithms based on loop detector data only.

Method

loop detector data → **Estimate travel time** → ETC data estimates → **Analyze estimate error** → correction rules → **Improve estimate** → travel time estimate

Two different estimation algorithms will run simultaneously. For this research an extrapolation algorithm and the Nam and Drew algorithm are selected. The first tends to underestimate travel times, while the second tends to overestimate.
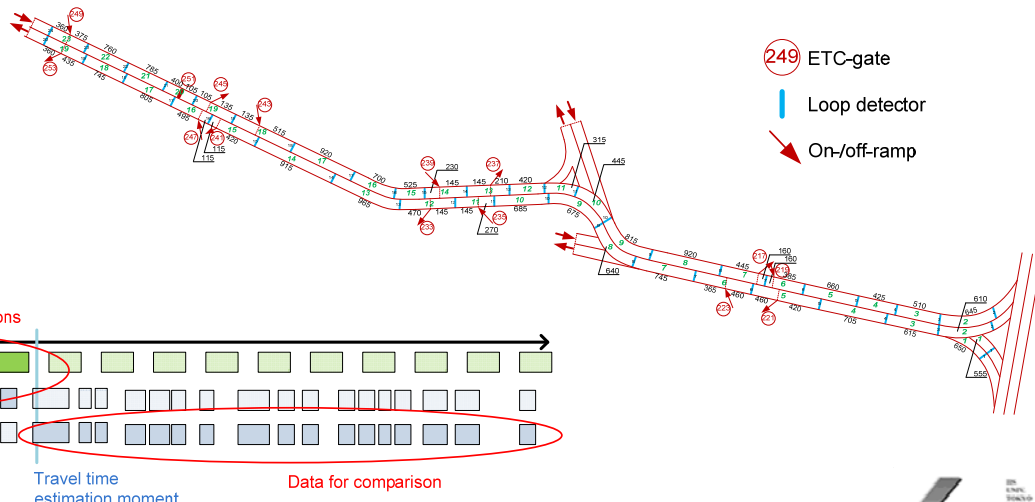
With the input of ETC data, estimates in previous intervals can be analyzed in real-time. Based on the error in previous intervals, estimates for the current interval can be corrected and become more accurate.

Travel time on Route #04 from ETC-gate 521 to 217 *(July 01, 2006)*
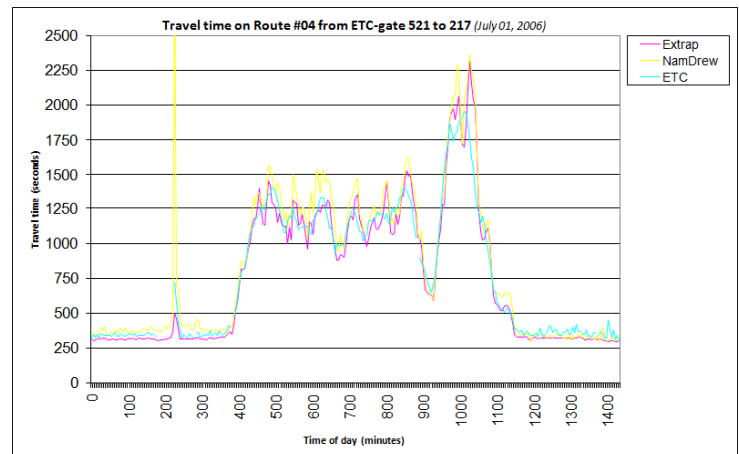
Application

For this research data from the metroploian express way route #4 is used. Length of the study area is about 14 km. Travel time estimates will be compared to travel times obtained from the ETC data.

Although the ETC data is also being used for making the estimates, it will still be a valid source for comparison. This is because there is a small delay between the data used for estimations and the data for comparison.

249 ETC-gate
Loop detector
On-/off-ramp

Time — Data for estimations
Loop detector data
ETC data
Travel time estimation moment — Data for comparison

Contact

m.do@student.utwente.nl

Bachelor internship at Kuwahara Lab.
From: Univeristy of Twente, the Netherlands

University of Twente
Enschede - The Netherlands