Analyses on Travel Demand Variation Considering User’s Choice Behavior on Urban Expressway Using ETC Data*  

ETCデータを用いた都市高速の交通需要変動分析

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* This research was conducted under the collaborative study with Tokyo Metropolitan Expressway Co. Ltd.

What is ETC data?

Electronic Toll Collection or ETC Data is obtained when a car passes through the ETC gate at the expressway. By analyzing this data, it is possible to observe and understand the behavior of each driver. This knowledge can be used by the expressway operator in making efficient strategies to manage travel demand.

Pooled Data versus Panel Data

Two data types from ETC and detector data:

- **Pooled data** is obtained by putting together all vehicle data over the observation period. If the same vehicle is observed again it will be treated as a different vehicle.

- **Panel data**, on the other hand, recognizes the same vehicle on another observation. Thus, we can check if there is variation in driver behavior.

Study Area

Analysis of Data from Tokyo Metropolitan Expressway Data collected from August 2010 to March 2011 (8 months)

Choice of Departure Time

Do drivers always depart early/late?

We set a Reference Start Time (RST) to evaluate if driver is late or early.

Buffer time = 95th Percentile travel time for a trip – Average travel time (Lomax, et al. 2003)

Drivers are aware of being late than being early on Mondays and Wednesdays. On Tuesday, Thursday and Friday, late and early penalty are slightly different.

Day of week analysis

Results show that number of trips each driver makes is not stable for each day of the week. In general, number of trips made by drivers are more regular on Mondays.

Month of year

In general, drivers tend to reduce their regularity during the end of the year.

Behavior is not stable over time!