

Application of Probe Data to the Evaluation of Traffic Smoothness

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1. Application to the front line of policy planning

(1) Preparing a common nationwide traffic smoothing evaluation index

The Ministry of Land, Infrastructure, Transport and Tourism has announced the results of a trial calculation of total lost time nationwide performed at the 12th session of the Road Subcommittee (August 3, 2010) of the Panel on Infrastructure Development (Fig. 1).

This trial calculation was performed applying a lost time calculation method using probe data (driving record data) obtained by ordinary automobiles which is the object of research by the NILIM.

- The annual total lost time nationwide is approximately 5 billion hours
 - Equivalent to about 40 hours per capita (approximately one week's working hours)
 - Converted to money, it is approximately 11 trillion yen, which is equivalent to about 2% of GDP
- The nationwide hourly loss rate is about 37%.

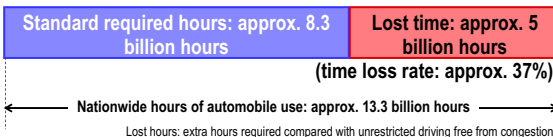


Figure 1. Results of Trial Calculation of Total Lost Time Nationwide

(2) Clarifying the results of implementing measures nationwide

Research findings obtained from the Public Test of Toll-free Operation of Expressways in 2010 have been used to clarify the traffic smoothing effects of wide-area change of the traffic flow (Fig. 2).

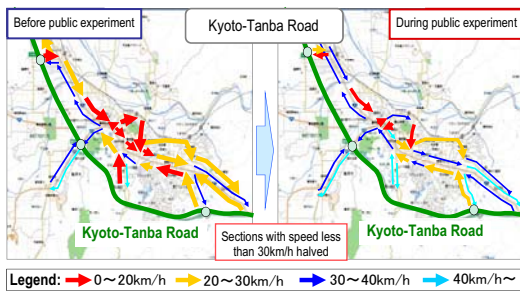


Figure 2. Example of Application to a Public Test of Toll-Free Operation of Expressways

2. Application to the front line of project implementation

(1) Diagnosis of state of congestion before and after a new road begins service

Figure 3 shows the temporal and spatial distribution of traveling speed on National Highway No. 1 (section with length of about 17km), which runs parallel to the Daini-Keihin Expressway (from the Hirakata-Higashi IC to the Kadoma Junction) which was prepared using probe data obtained on this section of National Highway No. 1 during two periods of about 1 month before and 1 month after this section of the Daini-Keihin Expressway opened for service on March 20, 2010.

The distribution before the start of service has shown that (1) taking the bottleneck intersection as the start point of congestion, (2) congestion occurs from after 6:00 a.m. to 7:00 p.m. and (3) the longest congestion occurs after 6:00 p.m.

The distribution after the start of service has shown that almost all the congestion which occurred before the start of service ended after service started, improving traffic smoothness.

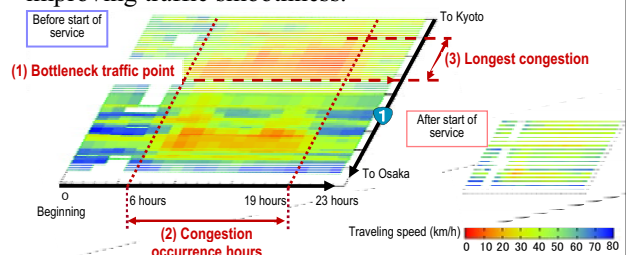


Figure 3. Example of Diagnosis of Occurrence of Traffic Congestion

3. Application to the front line of technical policy research

The NILIM is using probe data not only to support the work cited above, but also for technical policy research from the medium-term perspective, such as research and development on time reliability evaluation methods to achieve the final goal of calculating convenience in order to evaluate projects (Fig. 4).

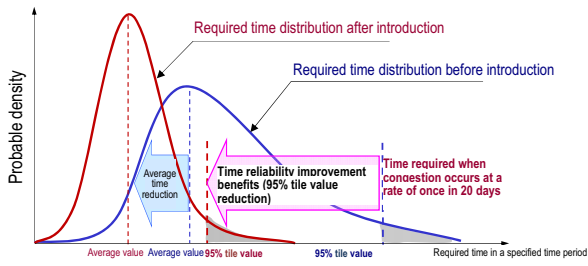


Figure 4. Image of Time Reliability Improvement Benefits

(Traffic Engineering Division) HP:
<http://www.nilim.go.jp/lab/gbg/index.htm>】