

Possibility of applying digital trail data to traffic planning

IMAI Ryuichi (Ph.D.), Researcher

IBOSHI Yuki, Researcher

Research Center for Advanced Information Technology, Information Technology Division

HAMADA Shunichi, Green innovation researcher

Research Center for Advanced Information Technology

(Key Words) Trail data, bus smart card data, probe car data

1. Introduction

The Research Center for Advanced Information Technology is researching methods of obtaining and using multiple digital trail data using Information Technology as a measure to effectively support the enactment of traffic plans by the national government and regional governments. In 2011, the Center performed research on methods of using trial data obtained by bus smart cards and probe cars, focusing on the enactment of plans for the improvement of traveling near bus stops and on the clarification of the effectiveness of small-scale road improvements.

2. Use to prepare measures to improve traveling near bus stops

Trail data from bus smart cards was used to abstract from among all bus stops in Saitama City (1,116 bus stops), the top 30 in terms of number of users, and clarified the actual state of use by busses (usage rates during commuting periods, on holidays, etc.). Then trail data from probe cars (ordinary automobiles) was added and the actual state of travel by busses and by ordinary automobiles (average traveling speed, or fluctuations) was clarified. The rate of obstruction of travel at bus stops was calculated based on the traveling speeds of busses and of ordinary automobiles, and a comparative verification with the local situation was done, confirming its effectiveness (see Fig. 1). In order that analysis results are easy to use to prepare traffic plans, the state of traffic for each bus stop was clarified (visualized) in chart form.

3. Verification of the effectiveness of a road improvement

Two kinds of trail data were used to measure the expressed effect of intersection improvement done by extending the right turn zone by 60m. Specifically, trail data obtained from bus smart cards and from probe cars were used to calculate the distribution of average traveling speeds by time of day, by time of day by day, and by month and the average traveling speed of busses (see Fig. 2), confirming that cars were no longer prevented from entering the right turn lane, improving the punctuality of busses and smoothing the progress of automobiles turning right.

4. Conclusion

This research confirmed that it is possible to apply

analysis combining multiple trail data to traffic planning. In the future, we want to study methods of use including digital trail data obtainable from mobile phones in addition to transportation (bus and railway) smart cards and probe cars.

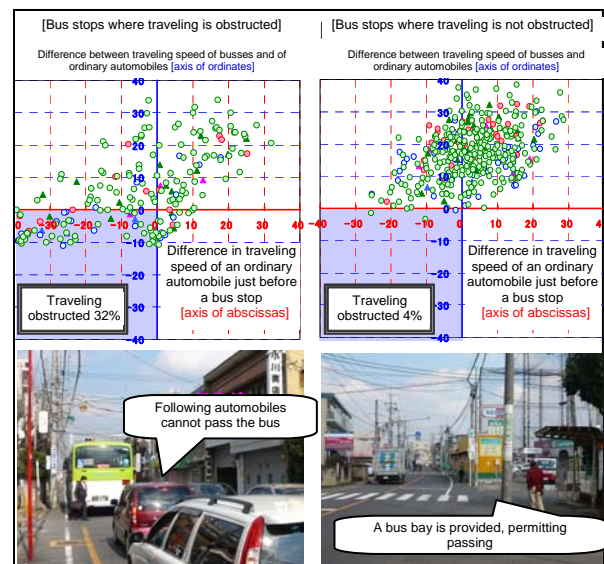


Figure 1. Example of the Identification of Locations where Travel is Obstructed

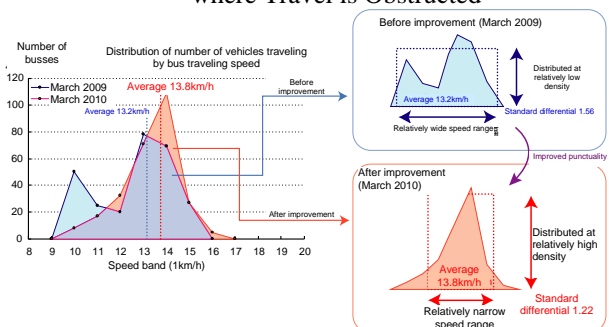


Figure 2. Change of Bus Traveling Speed Distribution by Road Improvement

[Reference]

Hamada, S. Imai, R. Iboshi, Y.: Support for the study of improving bus traveling using trail data and verification of the effectiveness of road improvements, *Civil Engineering Journal*, pp. 22-25, October 2011.