

Preparation of the Time Reliability Index Value Calculation Manual

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1. Introduction

According to the time a motorway opens for service, travel time on sections of parallel ordinary roads may shorten. And when this happens, not only average travel time, but the 95-percentile travel time (in a sense, travel time during congestion which occurs once every 20 days) for example, is also shortened (Fig. 1). In these cases, the confidence in travel time on the road felt by road users who set their departure time predicting the 95 percentile travel time will be increased, because they will be able to set a later departure time than the departure time before the new motorway opened for service.

The Traffic Engineering Division has studied a method of using probe travel time data to calculate index values which indicate such time reliability, and has summarized the findings in the Time Reliability Index Value Calculation Manual (below called “the manual”). We presume that regional development bureaus will use this manual to calculate time reliability index values in order to measure the effectiveness of a road project.

2. Calculation of the time reliability index value in the manual

Figure 2 is a flow chart of the time reliability index value calculation method presented in the manual. A characteristic of the manual is that it presents the methods: [4. Preparing OD section data], and 5. [Setting the reliability ranking of time reliability index values].

[4. Preparing OD section data] presents a method of preparing travel times for sections consisting of a number of connected DRM (Digital Road Map) sections (below called, “OD Sections”) based on section unit probe travel time data of DRM. Compensation is done in cases where, during the processing of preparing OD section travel times, a DRM section for which probe travel time data was unavailable (below called, “missed measurement section”) is found. Compensation for a missing measurement section is done using average travel time for the DRM section.

[5. Setting the reliability ranking of time reliability

index values] presents a method of assessing reliability: a factor indicating the certainty of calculated index values. Reliability has been defined as probability that the difference between the index value calculated based on data for a number of days which can actually be obtained and the actual value (calculated value when there are no missed measurements, and data for all days could be obtained) is within $\pm 5\%$ of the actual value. Reliability is set as four ranks from A to D based on the number of days when data could be obtained, and is a yardstick indicating the probability of the calculated index value. And when the reliability rank does not satisfy the ranking which should be ensured, as necessary, the state of missed measurement sections can be checked to set sections within the OD sections whose index value is calculated.

3. Conclusions

The manual will be distributed to regional development bureaus, where it is counted on to be used not only to measure the effectiveness of road projects, but also to specify and prioritize sections where countermeasures are required.

Figure 1. Change of Required time on National Highway No. 1 (near Amanokawa Intersection: about 3km) after Opening of the Daini Keihan Expressway (2010)

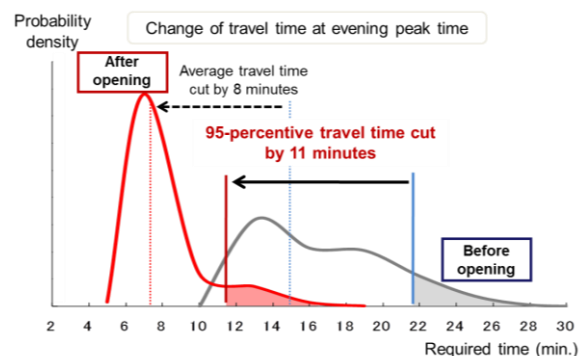


Figure 2. Time Reliability Index Value Calculation Flow

