

Calculating Traffic Volume 24 Hours a Day/365 Days a Year through Effective Use of Vehicle Detectors

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1. Introduction

The Ministry of Land, Infrastructure, Transport and Tourism collects daily traffic volume data on a regional basis by estimating traffic flow between adjacent road zones using vehicle detectors installed on national roads throughout Japan. An issue that has emerged in the course of this work is how to reduce workload required to process singular and missing values of obtained vehicle detector data (Figure 1).

Here, NILIM developed a method for processing singular and missing values as well as a method for estimating traffic volume using vehicle detector data, and then arranged them into a set of “road traffic survey guidelines.” It also prepared a “traffic volume calculation tool” that automatically processes vehicle detector data and incorporated it into practical operations.

2. Method for calculating traffic volume through effective use of vehicle detectors

For the processing singular and missing values, we utilized not only accumulated past data from vehicle detectors but also data from adjacent vehicle detectors (reference regular observation point). In estimating traffic volume, we observed the fact that the traffic volume ratio between the estimated zones and adjacent vehicle detector (base regular observation point) is roughly constant. Then we multiplied the ratio of traffic volume at both points (calculated using past actual observations in the estimation zones) by traffic volume at the base regular observation point (Figure 2).

Characteristics of the developed method are that it recognizes that locally generated singular values (such as road construction-related restrictions) have a region-wide impact in terms of estimated traffic volume, and that it differentiates between localized singular values (such as road construction-related restrictions) and regional traffic volume fluctuations caused by typhoons, etc. (Figure 3).

3. Conclusion

With the goal of bringing greater efficiency to

traffic volume calculation, NILIM has launched project research* to study specifications for a new regular observation traffic data system that will incorporate the developed method for calculating traffic volume.

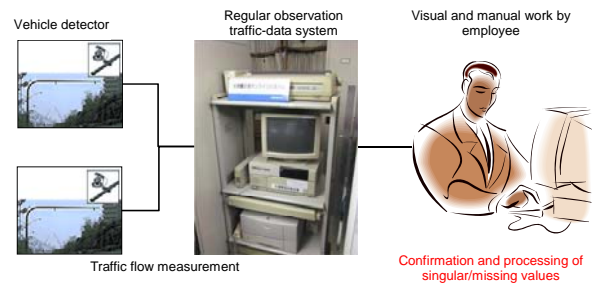


Fig. 1: Conventional processing of singular and missing values

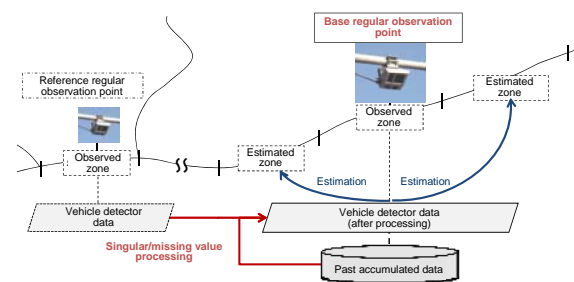


Figure 2. Relationship between vehicle detectors and estimation zones

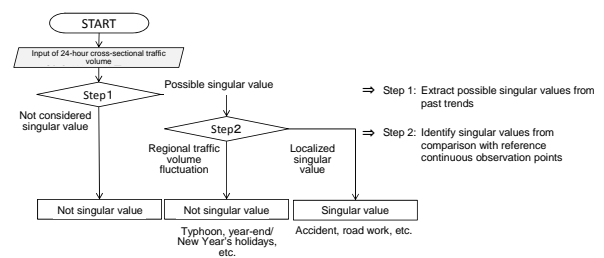


Figure 3. Method for differentiating singular values

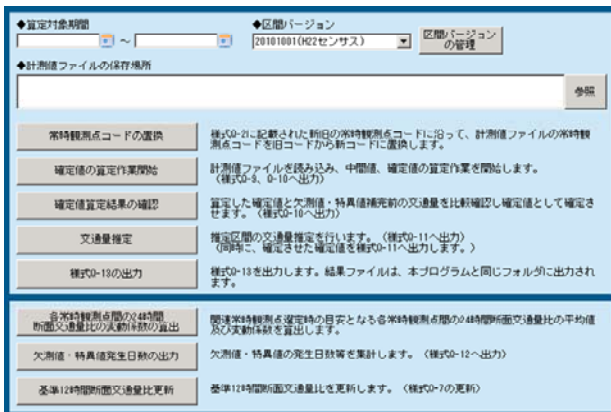


Figure 4: Initial screen of the traffic volume calculation tool

* Study on Further Development of the Collection, Analysis, and Utilization of Regular Observation Data for Road Traffic (2011 to 2013)