

Characteristics of roads traveled by international marine container trucks

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1. Introduction

Our division conducts survey research on the characteristics of actual routes traveled and of route selection activity by international marine container trucks in order to accumulate knowledge of use in studying measures to smooth international logistics. Below, an outline of the survey and analysis and part of the knowledge already obtained are introduced.

2. Outline of survey and analysis of routes actually traveled

- (1) Surveyors visited 83 container transport companies in the Kanto Region to survey the transport routes they usually use (routes actually traveled), departure/arrival times, and whether or not arrival times are designated. As a result, we obtained information regarding 890 container truck routes and 112 ordinary truck routes.
- (2) Road network data was built with information such as road widths or intersection standards etc. which are included in the Road Information Manual as its link attributes.
- (3) The routes actually traveled information obtained in (1) was applied to the road network data obtained in (2) and various analyses are performed.

3. Knowledge concerning routes traveled by container trucks

The following is knowledge we obtained from the analysis.

- The percentage distance traveled on national highways and higher level roads is 88% for container trucks 54% for passenger cars, showing that a high percentage of container trucks travel on high standard roads (Fig. 1).
- The turning percentage at the highest standard Rank A intersection (a vehicle less than 20m in length can turn without intruding on the opposing vehicle lane) is 77% for container trucks and 65% for small trucks, showing that a high percentage of container trucks turn at high standard intersections (Fig. 2).
- A comparison of the outward run (transport route for loaded containers from the container terminal to the shipper) and return run (transport route of

empty containers from the shipper to the container terminal) of the import container transport (first transport run of the day) (Fig. 3) shows that a higher percentage travel on expressways for their return run than their outward runs (1% is significant, t-value =4.3). The reasons were confirmed as follows by interviews with transport companies. On the outward runs, departure times are adjusted so that they can arrive at the designated time, and more economical routes are used. Its merit is that on the return runs, it is possible to increase the quantity of work done in a single day by shortening the transport time (the next transport is performed or the next days' loaded containers are picked up in advance, etc.). So, on return runs, there is a stronger incentive to shorten the time than on outward runs which means a high percentage use expressways for return runs.

4. Conclusion

In the future, we want to model container truck route selection actions based on knowledge obtained in the past and apply it to study international logistics smoothing measures etc.

Related research is available on the Traffic Engineering Division web site <http://www.nilim.go.jp/lab/gbg/index.htm>

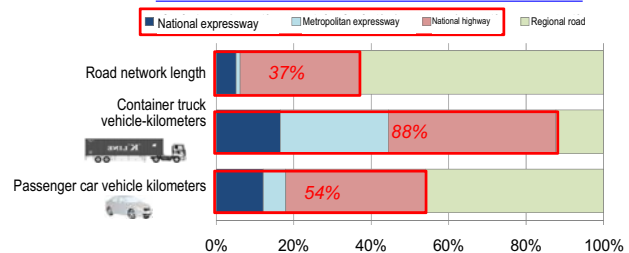


Figure 1. Vehicle-kilometer Percentage

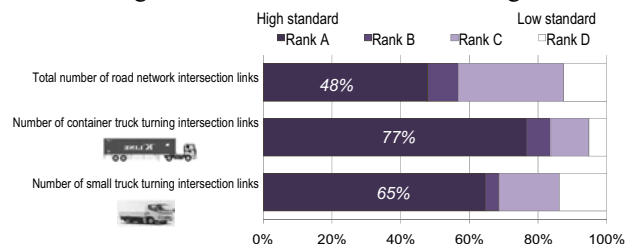


Figure 2. Standards for turning Intersections

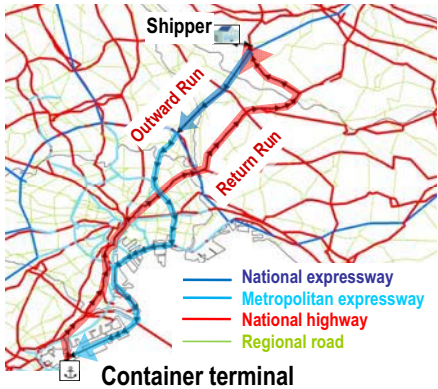


Figure 3. Outward Run and Return Run Routes of Import Containers (Example)