別紙様式8

<div align="center">研 究 主 論 文 抄 録</div>

論文題目

Empirical Studies on the Validity of Traveler Information: Information on Transportation by means of Expressway Toll and Public Transit Information （交通行動に与える交通サービス情報の効果に関する実証的研究：高速道路の料金と公共交通サービス情報の提供による交通行動の変化）

熊本大学大学院自然科学研究科　環境共生科学専攻　人間環境工学講座
<div align="center">（　主任指導　溝上章志　教授　）</div>

論文提出者　　　　　Yalcin Alver
<div align="center">(アルベル　ヤルチン)</div>

主論文要旨

Welfare development during industrial era caused a huge need for mobility. Thus, increases in the number of vehicles have been followed by the construction of new road infrastructure. However, as the rate of growth in car ownership especially in big cities was so fast that supply of new road infrastructure fell behind. The capacities of existing road network become very small. Thus, congestion problems occur and these problems affect people from many different perspectives. The social and environmental consequences of building new roads could be far more severe than the beneficial effects of motorists. Consequently, transportation research is focusing on using the available infrastructure more efficiently.

Nowadays, information is one of the most popular words. Right information at the right place at the right time becomes a very valuable source. Development in technology and the idea to use information in transportation have taken its place in transportation studies. In this dissertation, we have examined the effects of information on transportation with two case studies. In the first case study, expressway toll was considered as information for drivers in Kumamoto City, Japan. In the second case study, the effects of transit information and its service levels were investigated for the satisfaction of transit users. The main objective of the study is to identify the importance of information for the effective usage of transportation.

Traffic has become a big problem in Kumamoto (Japan) because of the large proportion of trucks in traffic. Thus, we have thought that converting some of the traffic from ordinary road to expressway, which passes through the city center, could help to solve this problem. First case study investigates travel behaviors and route choice decisions of production and freight companies in Kumamoto Prefecture.

In Chapter 2, a route choice model was investigated with the information of discounted expressway toll. In this model, both Revealed Preference (RP) and Stated Preference (SP) data were combined and a combined RP/SP model was proposed for the estimation on route choice decisions of freight and production companies. Modeling was done in four steps and finally a combined RP/SP model was estimated in two different forms; linear and non-linear.

In the third chapter, Value of Time (VOT) was studied. As an important instrument to evaluate transportation projects, VOT was used to evaluate the proposed models. VOT had been considered as a constant value, however; some studies investigated the variation on VOT with different factors. In this dissertation, we have investigated the variation on VOT with different socioeconomic (SE) characteristics. Considered SE characteristics are mainly company type. Then number of employee working in the company and the number of vehicles owned by the company were considered to identify the effects of company size. For this purpose, final route choice model was estimated as a non-linear function in which three SE variables were introduced in four models. Results showed that VOT decreases with increasing travel time in estimated four models. Calculated values for freight and production companies are very different from each other. In addition, company size has an effect on VOT.

In the fourth chapter, two route choice experiments were discussed. These experiments were conducted to identify the effects of toll discount by applying 50% discounted toll to expressway. The effects of the experiments were identified by discussing the surveys and traffic counts, which were done before and during the experiments. Finally, the ability of proposed model to estimate the actual route choice decisions of considered companies were tested. Results showed that proposed model could estimate the actual route choice decisions of companies under toll discounts 75% in average. The estimation results for the second experiment were better, which covers longer part of the expressway than the first one.

Chapter 5 was prepared to discuss the second case study. In this chapter, effects of transit information and its service levels in Izmir City, Turkey were investigated. As the third biggest city in Turkey, Izmir City has a large public transit network. Metropolitan municipality spends great effort and funds to provide more efficient public transit service by introducing new transit services. Information could be used as a tool to improve the service level with less cost. In this case study, we have investigated the characteristics of transit and non-transit users. Transit information types and their service levels, which were considered by transit users, were identified in three different models by using ordered probit modeling. Firstly, model is estimated for all transit users. Then considering the differences among transit modes, two different models were estimated. First model for subway and boat users (segment 1), which have high service quality, and second for bus and dolmus modes (segment 2) which have poor service quality. There are some differences between the considered information types with its service levels among segments.

Significant information categories for all transit users are; frequency of the service, fare information, number of transfers needed, operating hours of service, information about walking distance to/from the station and waiting times at the stations. Results showed that some socioeconomic factors effect the satisfaction level of the transit users such as; income, education level and having a car. Satisfaction levels for considered two mode segments are different from each other. Especially, the probability for the not satisfied answer for the hypothetical scenario is different. Probability of dissatisfaction for bus and dolmus users is higher.

This dissertation investigates the effects of information on transportation with two different case studies in two different countries. Results of the both case studies proved that information has a significant effect for the effective usage of current transportation network and systems.