DETERMINANTS OF TRANSPORT MODE CHOICE IN THE BODENSEE-ALPENRHEIN REGION

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Abstract

Almost all countries around the world have set policies to reduce the usage of private car and to raise the usage of public transport by reducing the distance of travel, increasing density, increasing the access to public transport and so on. All of these developments are effective strategies for reducing car dependency. The factors which determine travel behavior of people are relatively broad. Beside the factors such as urban form and transport infrastructure, another important factor is the personal attribute which has a strong effect on the modal choice. Promoting efficient mobility to people requires adequate demand and offer information which with them can raise motivation to change travel behavior toward more sustainable way [1].

This paper presents a case study on Bodensee-Alpenrhein region, using empirical data from international travel survey e.g. daily travels of Sigmaringen, Ravensburg, Friedrichshafen, Konstanz and Singen (Hohentwiel) from MiD2008 [2], Vorarlberg from Österreichs Unterwegs 2013 [3] and St. Gallen, Frauenfeld and Jona from FSO 2015 [4].

Bodensee-Alpenrhein is a region with four million people in almost 15000 square kilometers in four countries including Austria, Germany, Liechtenstein and Switzerland. It is an economically vibrant region with a steadily growing population. Most of the homes and work places are concentrated in the Alpine Rhine Valley. In the last 50 years, this region has gone through an intense urbanization process, and is now characterized in many parts by urban sprawl [5]. Therefore, clear spatial boundaries of the build-up areas are missing [6]. This leads to a car-dependent lifestyle and high transport-related carbon emissions. A better understanding of the factors influencing mode choice in the region is needed in order to develop strategies for a more sustainable regional mobility.

This study takes a great attention to the needs of the user, who will use and move through modes of transport. To acquire knowledge on an individual's travel behavior which provides insight for changing travel behavior in more efficient way, we address three aspects of travel behavior including socio-demographic, geographical and travel attributes such as distance and motivation of travels.

We apply a descriptive statistical analysis and multinomial logit model to describe and estimate the impact of different factors on modal share. In order to distinguish the impact of each group of independent variables, first a regression analysis of each independent group is performed and then all independent variables are included in the model.

First results show that the influence of sociodemographic factors in Vorarlberg seems to be significantly stronger than then influence of spatial factors. Whereas, in Switzerland travel attributes have stronger influence on modal choice. In German-canton both socio-demographic and spatial indicators have significant impact on the modal share. However, result shows that the share of car mode is dominant for whole region.

As a conclusion, a comparison of different cantons in the case study indicates that however cantons have similar principles and frameworks for transport sector, but they have different travel behavior. The first reason is that each canton has its own public transport structures which is relatively different than others. For instance, Switzerland has one of the best railway networks in the world, Liechtenstein and Vorarlberg have very good bus networks, while public transport in the German canton is less developed. The second reason is that the transport policy in each of these countries is relatively different than others and this creates a nonhomogeneous developing transport policy in this region. For instance, Switzerland has a unique democracy system which gives the people extreme political power by referendum or popular initiatives.

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