



The 9<sup>th</sup> International Conference on Traffic & Transportation Studies (ICTTS'2014)

## Can We Reduce the Access by Motorcycles to Mass Transit Systems in future Hanoi?

Minh Tu Tran<sup>\*</sup>, Junyi Zhang, Akimasa Fujiwara

*Transportation Engineering Laboratory, Graduate School for International Development and Cooperation, Hiroshima University, 1-5-1 Kagamiyama, Higashi-hiroshima 739-8529, Japan*

---

### Abstract

Whether or not the number of short-distance trips by motorcycles can be reduced still remains as an ill-answered question, especially in motorcycle dependent cities. Introducing mass transit systems in such cities may reduce long-distance trips by motorcycles on one hand, but may create short access trips by motorcycles on the other. Therefore, this paper aims to clarify the possibility of reducing the use of motorcycles for access trips. Based on subjective expectation data collected in Hanoi in 2009, we found significant disparity in the modal shares of future access modes to/from different stations between motorcycle and non-motorcycle users, suggesting potential influences of state dependence and spatial differences on why people ride motorcycles. For the purpose of this study, we apply a multi-level modeling approach. Estimation results revealed the causal link between current main travel mode and future access mode choices. Current walkers and cyclists tend to choose walking and bicycle modes as future access modes, but they are less likely to choose motorcycles. If current bus users mostly walk from their homes to bus stops, they do not tend to ride motorcycles to access to/from urban railway stations in future. Additionally, people may dislike riding motorcycles from their homes to stations if they request the improvement of sidewalk and pedestrian facilities for better accessibility. Inversely, those selecting measures to improve parking facilities prefer motorcycles than other access modes. Moreover, it is empirically confirmed the significant influences of spatial variations and inter-household variations on choices of future access modes. The findings of this study suggest the importance of incorporating state dependence, spatial variations and inter-household variations in future studies of access mode choice behavior.

© 2014 Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/3.0/>).

Peer-review under responsibility of Beijing Jiaotong University(BJU), Systems Engineering Society of China (SESC).

*Keywords:* Motorcycle, access mode, urban railway, multi-level modeling, Hanoi.

---

<sup>\*</sup>Corresponding author. Tel.: +81-(0)82-424-6910; Fax: +81-(0)82-424-6919.  
E-mail address: [tminhtu85@gmail.com](mailto:tminhtu85@gmail.com).

## 1. Introduction

In developed countries, transportation researchers have much been interested in how to reduce the number of short car trips (Mackett, 2001; Mackett, 2003; Maibach et al., 2009), because the proportion of short car trips is significant. For example, 17% of trips within 1.6 km (1 mile) were made by cars in the UK (Mackett, 2001). Different from developed cities in Europe and the United States, motorcycles are playing an important role in daily travel in Asia developing cities such as Hanoi, Hochiminh, and Taipei. Hung (2006) introduced the concept of motorcycle dependent city. In such cities, a rapid increase in ownership and usage of individual motorized vehicles results in a number of environmental and economic issues. Cars are suitable for longer trips while motorcycles are more suitable for shorter trips like travel within the city or accessing to mass transit stations (Tuan, 2011). It is expected that motorcycles are significantly used for short trips (less than 1km) in motorcycle dependent cities. For instance, about 10% of motorcycle trips were less than 1 km in Taiwan in 2001 (Hsu et al., 2003). The use of individual motorized vehicles can be reduced by several policy actions. One of them is to construct mass transit systems in such motorcycle dependent cities. Because the operation of mass transit systems is often separated from traffic flow on urban roadway, the competition of such transport modes is very high in terms of speed, travel time and punctuality. Hence, this transport mode may attract motorcycle drivers. Mackett (2001) indicated that the most significant solution to reduce number of car trips would be to improve mass transit systems. However, the use of mass transit systems may lead to the use of motorcycle for access trips to/from stations even in case of very short distance.

In the literature of access mode choice modeling, numerous studies have emphasized the importance of economic variables such as travel time and travel cost (Alhussein, 2011; Jou et al., 2011; Keumi and Murakami, 2012). But the effects of state dependence (i.e. causal link between past choice behavior and current choice behavior) and different types of variations (e.g., spatial variation and inter-household variations) have been paid less attention. In the context of medium- and long-distance trips, time and cost are main determinants of access mode choice when decision-makers trade-off between different transport modes. However, such attributes may not be the most important factors influencing mode choice in the context of short trips. Mackett (2001) pointed out that the purpose of trip was most important factor influencing the use of cars for short trips, while cost was not a big factor. Respondents are willing to reduce the use of cars for short trips if walking and cycling facilities or local facilities (e.g., shops) would be improved. Moreover, Mackett's research showed spatial differences in the reasons why people drive, implying the necessity of quantifying spatial variations. Additionally, the habit in using motorized vehicles may lead to the use of such vehicles for short trips. Many studies have confirmed the importances of state dependence and different types of variations in understanding and modeling mode choice behavior (Bhat, 2000; Chikaraishi et al., 2010; Ramadurai and Srinivasan, 2006).

Using data collected in 2004, Hung (2006) indicated that Hanoi was a typical motorcycle dependent city. According to statistics of Road and Railway Traffic Police Department in 2011, motorcycle ownership in Hanoi increased dramatically from 1.9 million in 2005 to 2.8 million in 2011. A small-scale GPS survey conducted with respect to 65 motorcycle users in Hanoi in 2010 reported that 18.32% of motorcycle trips are less than 1.0 km in length (Son, 2012). Hence, Hanoi is selected as the case study. Hanoi is one of the biggest cities in Vietnam with population about 6.8 million in 2011. The increase in number of motorized vehicles causes serious traffic congestion on main radial transport corridors. Bus ridership almost reached the capacity of bus systems and it is not easy to further construct more urban roadways. In the Hanoi Capital Construction Master Plan, it is stated that eight urban mass railway transit (UMRT) lines with total length 284.5 km will be constructed in the future. If UMRT operates, motorcycles are possibly used as access modes to/from UMRT stations. Therefore, this study empirically explores how to reduce the use of motorcycle for short access trips from origins to UMRT stations.

With the above considerations, the objective of this paper is to empirically examine factors affecting mode choices of short access trips to/from mass transit stations in the context of motorcycle dependent cities, including state dependence, different types of variations, and possible events that can meet respondents' access mode choice. These results will be used to answer the question "can we reduce the use of motorcycles for short access trips?".

Download English Version:

<https://daneshyari.com/en/article/1114260>

Download Persian Version:

<https://daneshyari.com/article/1114260>

[Daneshyari.com](https://daneshyari.com)