

Guest Editors' Note

Built Environment and Transportation in Asian Megacities

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1. INTRODUCTION

Rapid population and economic growth with massive rural-urban migration are major concerns in urban and transportation planning in Asian developing megacities. They have caused drastic changes in travel demand and its structure, associated with a rapid increase in private vehicle ownership and inadequate extensions of the public transportation system; and have produced various problems such as traffic congestion, noise, and ambient air pollution. As an improvement of public transportation infrastructure matching the demand changes often faces difficulties due to resource constraints, one of the natural consequences is an decentralized urban form based on growing motor vehicle ownership and usage.

The above-mentioned relationship between transportation and land use is more or less similar to the past evolution of transportation systems and urban form in today's developed cities. In this sense, it is certainly worth learning lessons from past experiences of developed cities with respect to both theory and practice. For instance, the concepts of “smart growth,” “new urbanism,” and “compact cities” are now widely applied to urban and transportation planning practices in many developing cities. On the other hand, there are non-ignorable differences between developing and developed cities, not only in terms of transportation systems (e.g., the existence of paratransit), but also in terms of the scale of cities, speed of growth, available technologies, natural environment such as weather conditions, and social systems such as culture and social norms. These differences need to be embedded into urban and transportation planning discourses, which potentially make tremendous differences in the choice of policy options. However, such Asian-specific contexts have been underexplored both theoretically and empirically.

Motivated by the above discussion, four papers have been selected for this special issue.

2. A BRIEF REVIEW OF SELECTED PAPERS

The first paper, by Abe and Kato, explores factors affecting residential satisfaction in the metropolitan area of Jakarta, Indonesia. The determinant factors considered in the paper include (1) subjective evaluations on residential and social environment, (2) current social

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engagement (such as frequency of communication with neighbors), (3) built environment (such as travel time to the nearest bus stop), and (4) individual and household characteristics. Data was gathered in 2011 based on face-to-face interviews using pencil-and-paper questionnaires from 948 respondents who lived in the Jakarta and the surrounding areas. The results based on structural equation modeling show that neighborhood-level built environment conditions have significant impacts on residential satisfaction: Particularly, it is found that a larger residence lot size significantly increased residential satisfaction, indicating that policies enhancing sustainable urban form could have a negative impact on residential satisfaction. The authors argue that the relevant land use policies should be discussed and developed based on a better understanding of local contexts and residents' preferences.

The second paper, by Nguyen *et al.*, develops a joint model of vehicle type choice (including both motorcycle and car) and usage behavior, and applied it to estimate CO₂ emissions under different future scenarios in Ho Chi Minh City, Vietnam. The authors employed a copula-based discrete-continuous joint model to handle selectivity bias in the data. The data used in the empirical analysis was collected based on face-to-face and mail interviews in 2014. Major findings from model exercises include (1) vehicle type choice and usage behavior are not independent, and thus these two aspects need to be simultaneously analyzed, (2) the impacts of built environment on vehicle type choice and usage behavior are relatively small, and (3) the simulation results show that income increase would induce a significant shift from motorcycle to car, and CO₂ emissions will increase by about 60% for all types 10 years later. Through the simulation analysis, the authors argue that changing people's perceptions would be more effective than increasing operating costs.

The third paper, by Basu *et al.*, explores the impacts of attitudinal factors and individual/household attributes on the choice of paratransit services in Mumbai and Kolkata, India. The authors particularly focus on the differences between traditional paratransit services and the emerging car-service apps like Uber (the emerging mobile apps-based service is seen as one type of paratransit services in the paper). Data collected from 200 individuals based on both pencil-and-paper and web-based questionnaire surveys was used for empirical analysis. They found that major factors affecting the choice of traditional paratransit services include price, availability, and infrequent ICT use, while comfort, reliability and decent driver behavior are significant factors for choosing the emerging paratransit services. The authors also discuss about the possibility of the co-existence of traditional and emerging paratransit systems and their relationship with public transport, and argue that a successful urban transport system can be achieved by utilizing paratransit services as complementary to the public transport system.

The fourth paper, by Huynh *et al.*, focuses on the impacts of tour complexity and trip flexibility on stated commuting mode choice in Ho Chi Minh City, Vietnam. In Vietnam, drop-off/pick-up children to/from school are quite common, forcing parents to take complex tour patterns. Such complex tours could be a major barrier to the shift from car/motorcycle to public transportation, but little study has properly taken into account the impacts of tour complexity, particularly where a "currently unavailable" travel mode is included as an alternative. The authors propose a simple method to identify the impacts of tour complexity on stated commuting mode choice, and conduct an empirical analysis by using Revealed Preference and Stated Preference (SP) data collected from 320 commuters who lived in the suburban area of Ho Chi Minh City who are potential users of Mass Rapid Transit (MRT) which is now under construction. The results confirm that both tour complexity and trip flexibility would have significant negative impacts on MRT use.

3. FUTURE DIRECTIONS

The papers in this special issue have shown that the concepts and/or methods that have been accepted in developed countries are not always suitable to handle issues in developing countries; preferences on residential environment and transportation mode in developing nations may be quite different from those in developed nations, requiring careful re-evaluations of conventional policy options widely applied in developed countries; the impacts of emerging mobile apps-based transportation services like Uber would largely depend on whether traditional paratransit service exists or not; and, a country-specific social context (e.g., children's travel largely depends on pick-up/drop-off by parents) may require a new analytical framework (e.g., a shift from a conventional trip-based SP survey to a survey which takes into account tour complexity). Those case studies evince the importance of exploring the features of transportation services and demand in a step-by-step fashion for better policy decisions in developing world. It should be noted that the lack of data is always one of the major problems faced in many studies on the developing countries, and this is also the case in some empirical results of this special issue; thus further empirical evidences are clearly needed. In this context, utilizing a massive amount of passive data collected via mobile phones and GPS devices installed to vehicles (Chen *et al.*, 2016) should be an important future direction (Hasegawa *et al.*, 2014), while continuing to collect richer behavioral data which contain travel mode and trip purpose information would also be necessary for a better understanding of Asian-specific transportation phenomena (Dharmowijoyo *et al.*, 2015). The latter data would particularly be important when focusing on social disparity issues since passive data may tend to be collected from the rich rather than the poor.

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