

Travel Behavior Research in Indonesia: Its Role to Improve National Welfare

Leksmono Suryo Putranto
Civil Engineering Department
Tarumanagara University
Jakarta, Indonesia
leksmonop@ft.untar.ac.id

Abstract—Research on travel behaviour, growing quite rapidly recently both in terms of numbers and scopes. Some of them were regarding Indonesian cases. By understanding deeply the characteristics of human travel, we will be able to provide travel facilities and modes appropriately. This paper was prepared to summarize the travel behaviour research in Indonesia and its role to improve national welfare.

Keywords: *travel, behavior, research, Indonesia, national, welfare*

I. INTRODUCTION

The interest in conducting travel behaviour research was just developed quite recently (about 70 years [1]) in the long history of transportation research in general. Therefore some of us might not able to define clearly the scope of travel behaviour research. According to Ax Hausen [1] in 2007, any studies regarding the physical movement of a human being beyond their reference locations for any purpose can be categorized as travel behaviour research. Therefore, studies regarding freight transport are excluded, except if a substantial involvement of human beings was justified, e.g. characteristics of freight truck drivers. In earlier work in 2000, Urry [2] even categorize virtual travel through the use of information technology such as online chat, telecommuting or shopping through the internet as part of mobility studies.

According to Madre et al [3] in 2006, the reference location does not have to be a residence but might include temporary address such as hotel accommodation during a business trip, student accommodation during a higher education experience or a hospital when receiving health care treatment. There are several basic elements of travel [1], e.g. daily schedule, the purpose of the activity, the timing of the activity, duration of the activity, location of the activity, participants of the activity, or expenditure for the activity.

This paper is intended to compile various travel behaviour research in Indonesia, especially which have been written by Indonesian authors. The benefit of the existence of such research to improve national welfare will also be discussed.

II. INDONESIAN TRAVEL BEHAVIOUR RESEARCH

In this part, I will discuss various topics of travel behaviour research in Indonesia.

A. Walking Speed and Shelter Capacity in Tsunami Evacuation

Yosritzal et al both in [4] and [5] in 2018 have been specialized in studying walking speed during a tsunami evacuation. As an archipelago country directly facing the ocean, Indonesia is vulnerable to tsunami. Padang is a city in West Sumatera, facing directly to the Indian Ocean and located within a ring of fire of Sumatera Island and therefore has been suffered major earthquakes and some tsunami in the last century. One of the important factors to minimize victim is by assessing walking speed during evacuation as accurate as possible. It was found in [4] that mean walking speed was just below 1.5 m/s but varied depending on the age and gender of the evacuee. This was revealed after a simulated observation involving 9 volunteers and 6 observers. The volunteers were asked to walk as fast as possible along 1.6 km from densely populated areas to a shelter. The selected evacuation route was considered as the easiest and the safest route. The route consists of three straight sections with two right turns. Meanwhile, in [5], it was found that almost 50% of the existing shelters in Padang will not be able to accommodate all of the evacuees in the shelter coverage area. If each shelter was designed to accommodate 2000 evacuees, almost 40 additional shelters were required.

B. Motorcyclists Travel Behaviour

In the last decades, the growth of motorcycles in general traffic was quite significant. This was confirmed by Putranto and Setyarini [6] in 2011 who found that in the major roads in 4 large cities in Indonesia the percentage of motorcycles was quite high, i.e. 56-71% in Bandung, 69-72% in Surabaya, Medan 43-69% and Makassar 60-71%. These percentages were greatly exceeding 38%, the reference value for large cities. This might be a pragmatic effort to overcome congestion whilst no sufficient public transport service available. Therefore studies regarding motorcyclists' travel behaviour become very important. For example, Irawan and Sumi [7] in 2012 found that in Yogyakarta, instead of asking their teenage children to school using public transport, the parents tend to escort them to school by motorcycle. As a consequence, these children arrived at school at a very early time in the morning.

Problems related to a large fleet of motorcycles in the road were not only threatening the environment through additional air pollution, noise pollution and greenhouse gas, but also traffic safety. Therefore studies regarding traffic violations among motorcyclists are also urgent and

important. Susilo et al [8] in 2015 found a surprising result on this topic. They found that females are more likely to disregard traffic rules compare to males. The most prominent motorcyclist traffic violations were accepting a narrow gap to get through between vehicles in the traffic, speeding, reckless driving, and the wrong side overtaking. The authors suggest imposing tougher sanctions on any traffic violation which may cause loss of life of human beings. Therefore, the deterrent effect of the sanction will be perceived more.

Suatmadi et al [9] in 2019 in Jakarta, Indonesia, found that the mode shift from minibuses to online motorcycle taxi cannot reduce greenhouse gas if pick-up distance of motorcycle is included. This might justify keeping our idealism not to include motorcycle taxi as a part of the urban passenger transportation system as its nature seems to be not sustainable. On the other hand, there are a lot of pressures both from the public and the online motorcycle taxi riders to improve their position from informal passenger transport to more formal passenger transport as their popularity and the demand for such services was very high. Up to now, according to Law No.22/ 2009 on Road Traffic [10], a motorcycle can only be used as personal transport (not public passenger transport) or as a goods transport (with some regulation regarding the size and the placement of the goods.

C. Paratransit User and Driver Behaviour

Tarigan et al [11] in 2014 studied the service quality of paratransit in Bandung. The paratransit is minibus with a carrying capacity of 10-12 passengers at once. Locally, it usually called *angkot*, stands for *angkutan kota* (city transport). *Angkot* users (mainly female) were not satisfied with the punctuality of departure and arrival and vehicle security. However, as most of the users were captive (almost 35% of the about 500 respondents), they still use paratransit daily due to unavailability of motorized private vehicles (about 40%), paratransit practicability (about 17%), cheap fare (about 13%), easy access (about 11%) and the rest said it was convenient.

Guritnaningsih et al [12] in 2013 conducted a study regarding the effect of the number of passengers and music genre of the recorded audio played in *angkot* on speed choice of the driver. It was found that the music genre was significantly affecting young adult *angkot* drivers behaviour including their likelihood of speeding. However, although the number of passengers can become a proxy of income, the combined effect between the number of passengers and the music genre was not statistically significant. As the drivers tend to get as many passengers as they can above the daily rental fee of the *angkot* to get net a higher daily net income, to improve *angkot* safety, the government was recommended to implement 'buy the service' scheme for paratransit operation.

D. Travel Time Use on a Train

When someone becomes a passenger in any vehicle, he or she can freely use most of the travel time for something useful. It can be productive activities such as completing urgent office work, engage in the business call, reading, etc. Otherwise, he or she can just enjoy the view or take a nap/ sleep. Yosritzal et al [13] in 2017 conducted a study in a train service between Padang and Pariaman in West Sumatra. This was about two hours journey between the capital of West

Sumatera Province, Padang City, and Pariaman City. The respondents were 280 passengers. 62% of them were female, 53% of them aged between 16-24 years old, and 47% of them in full-time education. Most of the respondents (27.2%) were enjoying the view, 17.5% of them listening to music, 14.6% talking to other passengers and 12.3% communicating through SMS/ social media. Productive activities, such as working on an office job (2.2%) and studying (1.5%) were significantly below 10%. The reasons for not conducting productive activities were the inconvenience of reading in a moving vehicle, limited space for working, the insecure feeling when using the device on-board, and short travel time. In the earlier work in 2014, Yosritzal et al [14] found that the reason for travel time use in the public transport was to avoid boredom, to be able to perceived shorter travel time, to gain knowledge or to complete the unfinished job.

E. In-Store Shopping Activity and Travel Behaviour

Joewono et al [15] in 2019 found that in Bandung, Indonesia, although online-shopping has been widely used among the public, their need to conduct in-store grocery shopping is still significant. Most of the in-store grocery shopping was done by a private motorized vehicle.

F. Household Time Use and Activity Dairy

Dharmowijoyo et al [16] in 2015 conducted multi-dimensional three-weeks household time-use and activity dairy in the Bandung Metropolitan Area. 732 respondents aged 7 years and older from 191 families. 584 of 732 participants aged 15 years and older became a part of the attitude and health survey. There were four groups of questions, i.e. out of home/ in non-mandatory activities, maintenance activities and recreational activities. They found that different faiths, anticipated emotions, support and attachment to motorized modes significantly associate with the different classification of the job, gender, age, activity participation, multitasking activities, and physical health, but not with different social and mental health. Therefore, it is very urgent to conduct private motorized vehicle ownership reduction by changing people's attitudes. It was also found that additional physical activities may reduce significantly the use of private motorized vehicle, whilst respondents who in their spare time engage in social activities tend to have better social health status. Furthermore, conducting multi-tasking out-of-home discretionary activities positively associates with a better physical condition.

Dharmowijoyo et al [17] in 2015, using the same dataset with [16] found that as grocery purchase is something planned with obvious effect (you might become weak), this purchase was conducted with strong commitment to ensure that this activity was at place. Meanwhile, out-of-home social-leisure activity was less urgent and therefore was likely to be rescheduled.

G. Fly-In to Work; Fly-Out to Bali for Australian Workers

Australian people who want something different in their life might choose FIFO (Fly-In to Work; Fly-Out) scheme. There were various schedules for in (work/ on) and out (holiday/ off). The most usual shifts were two-weeks-on/ one-week-off and four-weeks-on/one-week-off. Other schemes were two-weeks-on/ two-weeks-off and eight-days-on/six-days-off. The later was the shortest day-off. Sanders

et al [18] in 2016 conducted a study regarding FIFO Australian workers and their holiday destination. There were 15 FIFO workers involved in the deep interviews. Most of them (12 workers) were male, aged between 25-35 (10 workers) and only high school graduates (12 workers). The selected respondents should work in Australia and have been in the current position at least a year and have visited Bali at least once in the last 3 years. The approximately an hour interview consists of questions regarding their life in FIFO job, their travel behaviour, the reason for choosing Bali as a tourism destination and their experience in Bali and Australia as tourists. They involve in various engineering and services jobs. Most of them were willing to become FIFO workers mainly for money. However, the next reason was the opportunity to provide full attention to their families during their breaks although sometimes they felt guilty when they can not assist the loved one when it is required. If they want to spend the break on a vacation, they tend to visit nearby Asian tourism destinations instead of Australian destinations. Affordable but high-quality accommodation was the main reason and Bali becomes one of their favourites. One of the workers even has been visited Bali more than 70 times. They found that Bali people's attitude made tourists felt comfortable.

III. TRAVEL BEHAVIOUR RESEARCH VS NATIONAL WELFARE

Different topics of travel behaviour research as described in Chapter II, certainly provide different beneficial impacts on the people of Indonesia's welfare. Research regarding tsunami evacuation [4, 5] might provide important standard for determining suitable evacuation location and capacity. Therefore, the number of the victim could be minimized.

As in [7], children need to arrive very early in the morning to negotiate with their parent's schedule to work, we might propose child-care service in the school vicinity that also open very early in the morning with additional service: healthy breakfast. The children will be more responsible and their health will be guaranteed.

Instead of producing motorcycle safety socialization material that directed to the general population, due to the finding in [8], we could narrow down the targeted population into the female, whilst specifically only provide education regarding a certain type of violations commonly conducted. The finding in [9] might be used to protect our existing traffic law for accepting motorcycle as a part of our recognized passenger public transport vehicle.

Based on the findings in [11], we should either elevate the level of service of existing paratransit or completely move to more modern with higher carrying capacity. *Angkot* can be improved by firstly requires *angkot* to be managed at least by a co-operation as a legal entity. By having a legal entity, the regulator can promote *angkot* service, e.g. integrated payment system with other public transport using e-money, installation of "green" air condition, installation of *angkot* tracking system using GPS, and overcome problems in [12] by "buy the service" of *angkot*, etc.

Based on the findings in [13, 14], we could arrange some improvement of public transport service, especially in commuter train. As more productive activities conducted on the train such as reading, working with the laptop were hindered by the significant vibration of the vehicle, we

should launch the use of a more quiet vehicle with less vibration. Additionally, free wi-fi is a must to let the customer use social media, browse the internet, send e-mail, etc.

The findings in [15], can be used to improve the satisfaction of online grocery customers. For example, if the customer requires a higher quality of groceries in terms of the freshness, nutritional value, etc the online vendor should be able to follow-up.

The findings in [16, 17], can be used to improve our understanding of Indonesian travel behaviour, including the promotion of active transport among Indonesians. This promotion might be conducted by offering a more appealing and integrated public transports system, including the first mile and last mile transportation by walking and cycling. The walking and cycling paths must be built to be shady during the day, but also fully illuminated during the night to ensure safety and security.

Indonesian tourism without Bali might be slightly paralyzed. Therefore, the findings in [18] regarding FIFO workers were very important. We could also extend the tourism destination of FIFO workers by surrounding islands such as Lombok and Sumbawa, but there is still a lot of potential tourism destination within the range of travel of Australian tourist, as long as the competitive price and service are there.

IV. CONCLUSIONS AND RECOMMENDATIONS

Travel behaviour research in Indonesia has been done on various topics. It can be seen that each of them provide different benefit for the Indonesian national welfare. Therefore, it is recommended for more Indonesian transportation researchers to pay more attention to this branch of knowledge. As can be seen in this paper, Indonesian researchers studying travel behaviour resides in a various part of the globe with their various position in the academic and research world. Travel behaviour in Indonesia was not only studied by Indonesian. Understanding travel behaviour in Indonesia as a large and important country become more and more appealing to everybody.

REFERENCES

- [1] Axhausen, K. W., "Concepts of Travel Behavior Research", 2007.
- [2] Urry, J. "Sociology beyond Societies: Mobilities for the Twenty-First Centuries", 2012.
- [3] Madre, J., Axhausen, K. W., and Brog, W., "Immobility in Travel Diary Surveys" Working Paper, 2004.
- [4] Yosritzal, Kemal, B. M., Purnawan, and Putra, H., "An Observation of the Walking Speed of Evacuees During a simulated Tsunami Evacuation in Padang, Indonesia", IOP Conf. Series: Earth and Environmental Science 140, 2018, 012090.
- [5] Kemal, B. M., and Aulia, Y. B., "Demand versus Capacity of Tsunami Shelters in Padang, Indonesia", International Journal of Advance Science Engineering Information Technology 8(5), 2018, pp: 1984-1990.
- [6] Putranto, L. S., & Setyarini, N. L. P. S., "Vehicle Composition and Lane Distribution in Multilane Highways in Indonesian Cities", Procedia and Behavioral Science, 2011, 16, pp: 374-381.
- [7] Irawan, M. Z., and Sumi, T. "Motorcycle-Based Adolescents' Travel Behaviour During the School Morning Commute and the Effect of Intra-Household Interaction on Departure Time and Mode Choice.", Transportation Planning and Technology, 2012, 35(3), pP:263-279.

- [8] Susilo, Y. O., Basuki, T., and Vandebona, U., "Reasons Underlying Behaviour of Motorcyclists Disregarding Traffic Regulations in Urban Areas of Indonesia" *Accident Analysis and Prevention*, 2015, 75, pp: 272–284.
- [9] Suatmadi, A. Y., Creutzig, F., and Otto, I. M. "On-demand Motorcycle Taxis Improve Mobility , Not Sustainability", *Case Studies on Transport Policy*, 2019, 7(2), 218–229.
- [10] Law No. 22/2009 on Traffic and Road Transport.
- [11] Tarigan, A. K. M., Susilo, Y. O., & Joewono, T. B., "Segmentation of Paratransit Users based on Service Quality and Travel Behaviour in Bandung, Indonesia." *Transportation Planning and Technology*, 2014, 37(2), pp: 200-218.
- [12] Santoso, G. A. Maulina, D., Adisty, C. and Oei, T. P., "The Influence of Number of Passengers and Music Genre on Driving Speed of Young Adult Angkot Drivers", *Transportation Research Part F: Traffic Psychology and Behaviour*, 2013, 18, p: 1-10.
- [13] Adji, B. M., and Dissanayake, D. "Indonesian Experience on Travel Time Use On-Board of Commuter Rail Services", *Transportation Research Procedia*, 2017, 25, pp: 2705–2716.
- [14] Yosritzal, Adji, B. M., Andika, R., and Novrizal F., *Time Use Study on Board of Public Transport in Indonesia*, *Proceeding of 17th Symposium of Indonesian Inter-University Forum of Transport Studies*, Jember, 22-24 August 2014.
- [15] Joewono, T. B., and Tarigan, A. K. M. "Segmentation, Classification, and Determinants of In-Store Shopping Activity and Travel Behaviour in the Digitalisation Era: The Context of a Developing Country", *Sustainability*, 2019, 11, 1591, pp: 1–23.
- [16] Dharmowijoyo, D. B. E., Susilo, Y. O., Karlström, A., & Somantri, L. *Collecting a Multi-Dimensional Three-Weeks Household Time-Use and Activity Diary in the Bandung Metropolitan Area, Indonesia*. *Transportation Research Part A*, 2015, 80, pp: 231–246.
- [17] Dharmowijoyo, D. B. E, Susilo, Y. O., and Karlström, A., "On Complexity and Variability of Individuals' Day-To-Day Discretionary Activities" *Proceeding of the 4th Symposium of European Association for Research in Transportation (hEART) in Copenhagen*, 2015.
- [18] Sanders, D., Willson, G., Susomrith, P, and Dowling, R., "Fly in to Work; Fly Out to Bali: An Exploration of Australian Fly-In-Fly-Out (FIFO) Workers Leisure Travel", *Hospitality and Tourism Management*, 2016, 26, p:36–44.