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User perception of paratransit in Thailand: case study of journey to work in Khon Kaen city

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Abstract

Studies regarding paratransit in Thailand are mainly concerned with issues such as the role of paratransit focusing on the supply side like service characteristics and service quality. However, the study on Songtaew service in Thailand have not yet well understood. This study is the attempt to focus on the demand side of the Songtaew service in the medium-sized cities in Thailand, including Khon Kaen City by examining the use of Songtaew from the commuters' point of view by their participation in rating the condition of Songtaew and loyalty to it. Its main objectives are to investigate the workers' motivations for using or not using Songtaew for traveling to work, and to understand which factors influence workers in Khon Kaen City to use Songtaew. Based on the analysis, the cost and the convenience have a strongly positive impact on the decision to commute by Songtaew and the users want to keep using it in the future.

Keywords: Paratransit, Songtaew, Journey to work, Satisfaction, Khon Kaen

1. Introduction

Currently, paratransit or informal public transport is a predominant urban public transport mode in developing countries, especially in Thailand where has various types of paratransit such as motorcycle-taxi, Tuk-Tuk, Songtaew, and Silor-lek. Specially, Songtaew or a modified pick-up truck taking passengers on the back with an overhead cage and two row seats in the back, operates as a main public transport mode in many medium-sized cities of Thailand. Studies regarding paratransit in Thailand are mainly concerned with issues such as the role of paratransit focusing on service characteristics and service quality specially in Bangkok area. This study is the attempt to focus on the role of Songtaew service in the medium-sized cities in Thailand for identifying problems and suggesting the recommendation to improve Songtaew service. The main goal of this paper is to investigate the role of Songtaew service focusing on examining the user perception of the journey to work in the city. Therefore, this paper corroborates the authors' hypothesis regarding the decision of selecting the transport mode for going to work that there is a significant difference decision among the users who have vehicle licenses about the work travel pattern in Khon Kaen City.

Based on the authors' field survey conducted in August 2015 about the existing Songtaew service, there are a total of 19 Songtaew service routes operated in Khon Kaen City. It can accommodate up to 20 passengers on any trip. Moreover, a flat-fare system is used, with adults costing 9 Baht and students costing 5 Baht.

This paper begins by providing the motivation of the study and a brief introduction of the Songtaew service in the introduction, followed by the research methodology, the data collection and the results. Finally, the paper concludes with the findings of the work travel pattern and the Songtaew satisfaction focusing on workers' perception.

2. Research Methods and Data Collection

A comprehensive field survey of workers was carried out for investigating the journey to work patterns and the satisfaction with Songtaew service of the workers in Khon Kaen City. To study the travel patterns and the satisfaction, we analyze results from a questionnaire survey conducted among the workers in Khon Kaen city. Then data were analyzed through percentage, Chi-square statistical techniques and multiple regression analysis for testing the hypotheses and examining the work travel pattern and the Songtaew perception for the users and the non-users. The total sample of 600 respondents who commute in Khon Kaen City were sampled as respondents in August 2015. According to this study which related to the journey to work, then there were 389 workers which the number of sample is more than 50 % of the total respondents were used in this study. The questionnaire items were divided into three components: (1) general information such as gender, age, occupation, driving license, and loyalty to keep using Songtaew in the future. (2) detailed information on the journey to work patterns such as travel mode, travel time, and transport cost, and (3) users satisfaction with Songtaew service relating to the factors which are availability, information, safety, cost, waiting time, in vehicle time, comfort, flexibility, and image of Songtaew. These factors were measured in four-point Likert-type format from 1 (Very dissatisfied) to 4 (Very satisfied).

The study revealed that the majority of respondents is female (77.9% for users and 62.8% for non-users). The most of respondents are the labors who had motorcycle driving license 42 %. However, among the total respondents there is 42.6 % who do not have driving license and this group is the dominant user who selects Songtaew as their urban transport mode for going to work. For the experience with Songtaew, it is shown that there are the respondents who use Songtaew 48.6% and the non-users 51.4%. Moreover, the non-users selects car as their main transport mode (52%) because riding car is more convenient and safer than using other modes then they prefer car more than motorcycle and Songtaew. Considering about the loyalty users who want to keep using Songtaew in the future, it revealed that 78.7% of the users expressing their attitude toward still using Songtaew in the future even there will be a new transport mode.

Table 1 General Characteristics of Respondents

Characteristics		Users (%)	Non-users (%)
1. Gender	Male	22.1	37.2
	Female	77.9	62.8
2. Age	15-30	32.1	40.7
	31-40	28.4	28.1
	41-40	27.4	22.6
	> 50	12.1	8.5
3. Education	Lower than undergraduate	61.6	41.2
	Undergraduate	36.8	54.3
	Graduate	1.6	4.5
4. Occupation	Government officer	25.3	38.7
	Private employee	5.8	11.1
	Labor	53.2	37.7
	Others	15.8	12.6
5. Driving license	None	42.6	8.5
	Car	10.5	30.2
	Motorcycle	30.0	27.6
	Both	16.8	33.7
6. Motorcycle driving	No, Yes	79.4, 20.6	22.3, 77.7
7. Car driving	No, Yes	60, 40	21.8, 78.2
9. The loyalty to keep using Songtaew in the future	Yes, No	78.7, 21.3	-

3. Results

The results of this study are presented under two sub-headings: travel patterns; and satisfaction on Songtaew Service.

3.1. Travel patterns of work trip in Khon Kaen City

The journey to work patterns, in terms of transport mode, as shown in Figure 1 indicated that 49% of the respondents travel to work by Songtaew. The respondents who use Songtaew are Labor (low-income workers) 26%, Government officer 12%, Business owner 8%, and Private employee 3%, respectively. The use of car accounted for 31.1%, and motorcycle 20%. The study revealed the reasons that the workers prefer private automobile because Songtaew was seen as less convenient than private vehicles for commuting to work included the belief that private vehicles were quicker and more direct (door to door) for traveling to their destination. For the average commuting time to work, the finding revealed that it took Songtaew users about 38 minutes longer than private car users to get to work which took about 16 minutes. These differences are due to the fact that the Songtaew users have to take more time on walking to the bus stop, waiting for the Songtaew and taking the time in the vehicle. On the other hand, the private car users take time only in the vehicle from their home to workplace. The relationship between driving license holding and work travel mode selection was also examined. According to Figure 2, it revealed that 81% of the Songtaew users has no driving license. Furthermore, Chi-square analysis revealed that there is a significant difference for the transport mode selection among the workers who have vehicle licenses especially car license, $P\text{-value} < 0.05$. Most of workers who have car license going to work by car. On the other hand, the users who do not have both car and motorcycle driving licenses, 81 %, have gone to work by taking Songtaew more than the other modes.

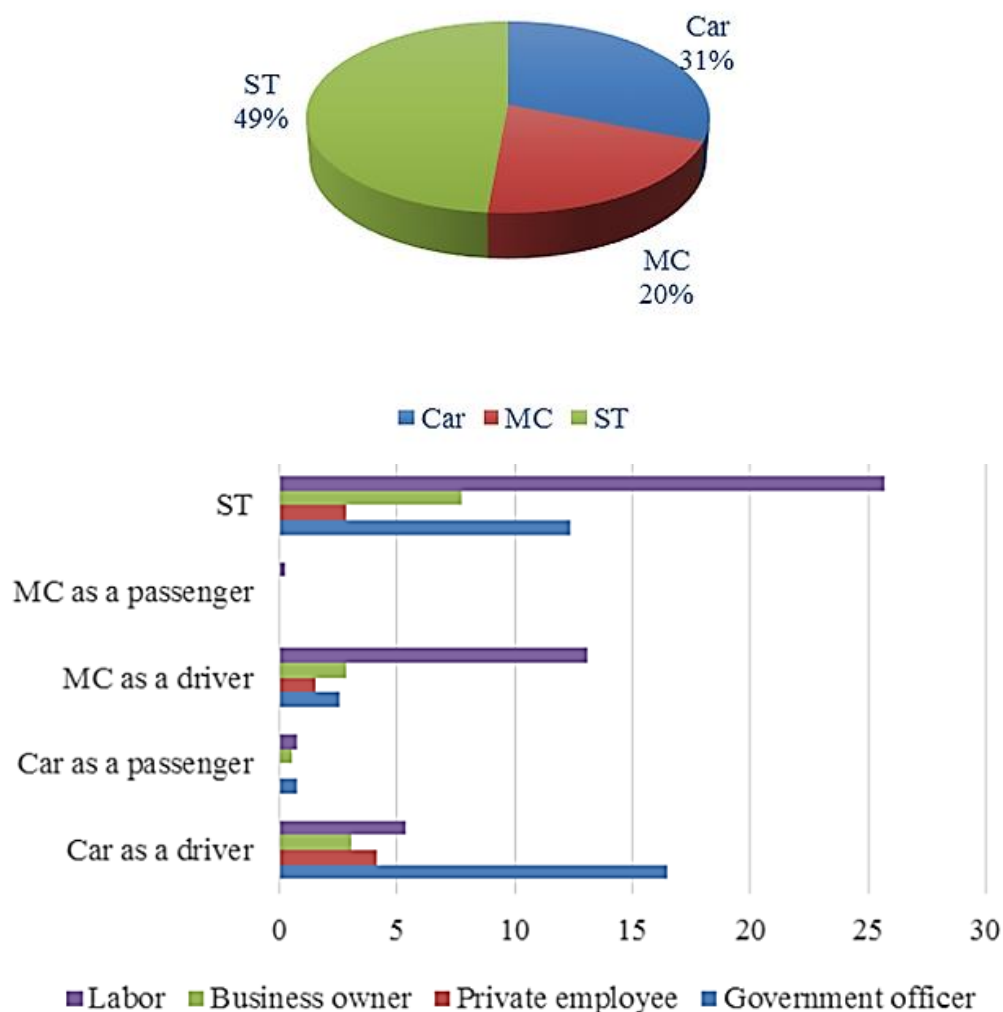


Figure 1 Mode shares and Work travel mode selection

3.2. Satisfaction on Using Songtaew Service

The result of multiple regression analysis in Table 2 showed the important factors influencing the overall trip satisfaction of Songtaew use in Khon Kaen City. By using stepwise method with PIN 0.25 and POUT 0.3, the best set of predictors was finally found.

The finding about the perception for the users indicated that the fare of Songtaew which is cheaper than other modes, and the convenient of the service had a significant effect on the Songtaew users' satisfaction. Turning to the perception for the non-users, the results also explained the factors which are the cost, the availability, the waiting time, the safety and the comfort are the important factors which had a significant influence on their perception for not using Songtaew. This indicated that non-users do not select Songtaew as their transport mode because of the important reasons which are (1) they believe that going to work by private automobile is cheaper than by Songtaew, (2) there is not enough service availability covered the route going directly (door to door) to their destination, (3) the waiting time is too long, (4) it is unsafe because of the reckless driving and picking up the passengers more than the vehicle capacity, and (5) Seats are uncomfortable and they do not like to sit close to the other users. As a result of multiple regression analysis in Table 2, the perception on Songtaew service about the cost and the convenient have strongly a positive impact on the decision to commute by Songtaew for the users because most of them is the labor who has low income and no driving license. Thus, they have a limitation on mode choice, then they prefer Songtaew

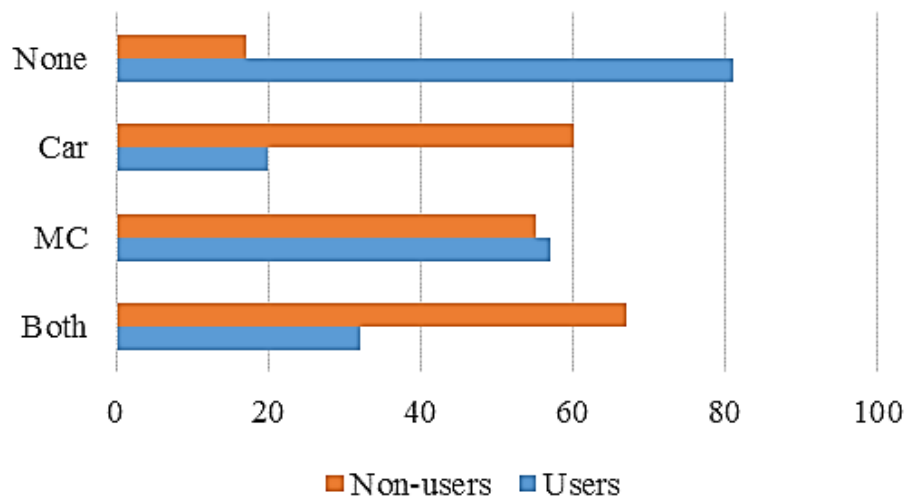


Figure 2 Driving license holding

Table 2 Regression results: Songtaew (ST) trip satisfaction for the users and non-users

Variables	Users		Non-users	
	B	t	B	t
Information	.053	.666	-.098	-1.273
Image of ST	-.074	-.875	.013	.178
Availability	-.011	-.623	.153*	1.779
Reliability	.004	-.484	.236	0.575
Waiting time	.050	.623	.052	1.472
Boarding time	.043	.472	-.011	-.114
Safety	-.038	-.525	-.037	-1.426
Comfort	.002	.017	.105	1.302
Convenient	.360***	5.650	.019	.162
Flexibility	-.014	-.178	.034	.449
Cost	.194**	2.281	.181**	2.508

Significant at 99% (p-value < 0.01),

** Significant at 95% (p-value < 0.05),

* Significant at 90% (p-value < 0.1)

4. Conclusions

The study revealed that the present main modes of travel to work in Khon Kaen city are Songtaew, car, and motorcycle, respectively. There are also exist significant difference in mode choice among the commuters who have driving licenses and the commuters who have no driving licenses. The study highlights the main reasons for commuters' Songtaew usage in Khon Kaen City are driving license unavailability, and the benefits of low fare. This results indicate that the main users of Songtaew is the captive users. However, the other Songtaew users is the users who have driving licenses especially motorcycle driving license which is the choice users who intend to use Songtaew when the parking at their destination is not available and when they bring many stuffs with them which cannot carry on when they travel by Motorcycle. They claimed these reasons is called convenient factor which is one of the main factors inducing the choice users especially the low-income workers traveling by Songtaew. Moreover, the finding is very interesting that the cost of the service is the same factor which has an influence on Songtaew perception for both users and non-users. Consequently, it is needed to study more about the different perception on this factor in detail and it should be studied more about the improvement of Songtaew regarding impact factors on their satisfaction, in order to maintain existing users and attract new users.

5. References

- [1] Cervero, R., 1992. Paratransit in Southeast Asia: a market response to poor roads, *Review of Urban and Regional Development studies* 3, 3-27.
- [2] Dhoda, S., Allopi, D., 2005. Travel patterns and safety of school children in the Ethekwinini municipality, *Proceedings of the 24th Southern African Transport Conference*, 576-586.
- [3] Jaensirisak, S., Klungboonkrong, P., Udomsri, R., 2013. Development of Bus Rapid Transit (BRT) in Khon Kaen, Thailand, *Proceedings of the Eastern Asia Society for Transportation Studies* 9.
- [4] Joewono, T.B., Kubota, H., 2005. The characteristics of paratransit and non-motorized transport in Bandung, Indonesia, *Journal of the Eastern Asia Society for Transportation Studies* 6, 262-277.
- [5] Joewono, T.B., 2007. User Perceptions of Private Paratransit Operation in Indonesia, *Journal of Public Transportation* 10, 99-118.
- [6] Loo, B.P.Y., 2007. The role of Paratransit: some reflections based on the experience of residents' coach services in Hong Kong, *Transportation* 34, 471-486.
- [7] Tangphaisankun, A., 2010. A study in integrating paratransit as a feeder into mass transit systems in developing countries: a study in Bangkok, *Doctoral Dissertation*, Yokohama National University.