



Roles of Bangkok Vanpool Commuter Services Towards Livable City

Boonsap Witchayangkoon^{a*}, Sayan Sirimontree^a,
Saharat Buddhawanna^a, and Krittiya Lertpocasombut^a

^a Department of Civil Engineering, Faculty of Engineering, Thammasat University, THAILAND

ARTICLE INFO

Article history:
Received 29 September
2014
Accepted 24 December
2014
Available online
24 December 2014

Keywords:
questionnaire survey;
satisfaction survey;
minibus;
Likert scales;
vanpool transport.

ABSTRACT

This work reports an observation on vanpool commuter services in Bangkok. Vanpool commuter services, a unique service in Thailand, are offered by a join of van owners. Vanpools are similar to carpools in that all passengers share the ride. As an element of the transit system, vanpools offer reduced travel costs as it can save fuels and tolls. Each vanpool service conveys hundreds of thousand passengers with specific route of origin and destination, as riders can also get off at a station along its route. This study uses questionnaire as a study tool, to ask 100 passengers about their satisfactions in term of safety, convenience, and reasonable fares. The questionnaire has 5 Likert scales, with 5 being the highest satisfaction level and 1 the lowest satisfaction level. From the study, passengers have moderate satisfaction with the services, with 3.4 score. With hundreds of thousand users, vanpool commuter services make Bangkok a livable city in aspects of public transportation, and environmental issues.

© 2015 INT TRANS J ENG MANAG SCI TECH.

1. Introduction

Vanpools are similar to carpools in that all passengers share the ride. Each vanpool commuter service takes off from its station. Most of the passengers are collected at its take-off station; some passengers possible get in at the following stations along the route. As an element of the transit system, vanpools offer reduced travel costs of fuels and tolls. Stress of driving is also avoided (worry-free). In fact, vanpool services help decrease traffic volume and congestion. By this, vanpool can help reduce amount of emitted gases, thus less pollution. Also, it is no need

*Corresponding author (Boonsap Witchayangkoon). Tel/Fax: +66-2-5643005 E-mail address: drboonsap@gmail.com. ©2015. International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies. Volume 6 No.1 ISSN 2228-9860 eISSN 1906-9642. Online Available at <http://TUENGR.COM/V06/031.pdf>.

of finding parking spaces. In Thailand, most of vanpool commuter services are in Bangkok and its outskirt provinces areas. With more than a hundred routes, vanpool commuter services make Bangkok a livable city in aspects of public transportation, and saving environmental issues.

2. Review of Literature

In USA, there are companies and government agencies offering vanpool and school-bus services sending students to school and people to work. For example, the State of Wisconsin provides alternate vanpool transportation for state and non-state employees commuting to Madison from outside communities. The State of Wisconsin Vanpools are groups of 7-15 commuters sharing their ride to work in a passenger van that is owned, insured and serviced by the Wisconsin State Vanpool Program. Passengers share the van operating cost by paying a fare based on fixed and variable costs, the number of riders, and the number of miles driven. The fare covers all costs including gas, insurance and van maintenance (self-supporting operation). Participants can join a group that is already established or, if there are enough interested people, they can form a new vanpool. Participants who like to drive could commute for free. Riders enjoy low rates (allowed up to 100% deduction for their services), comfortable vans, and the benefit of convenient pick-up and drop-off locations (UWM, 2010).

For international travels, there are companies offer daily minibuses (vanpools) for more than 10 years, for example, for trips between HadYai (South of Thailand) and Malaysia (e.g. Penang and Kuala Lumpur) (KST, 2010). Many travellers have used the minibuses services for many years and some seem happy with the services (Pantip, 2013).

Transport Studies Group of the Polytechnic of Central London studied on minibus development in Britain in term of cost-benefit analysis (White, 1992). Unit operating cost savings and passenger benefits were taken into account. Factors of passenger benefits primarily comprised reduced waiting time at the stop, reduced in-vehicle traveling time, and reduced walking time particularly permit minibus operation for better penetration to housing estates and town centers.

A survey of Sydney Metropolitan bus users 2010 was performed after a Sydney Metropolitan bus customer satisfaction survey in 2009 (TNSW, 2010). For each bus route, respondents were taken from different ages and genders. For quality rating, the study used five-scale rating with score 5 referring to very good, 4 good, 3 acceptable, 2 poor, and 1 very poor. For important rating for aspect of service, score 5 means very important, 4 important, 3 desirable, 2 somewhat unimportant, 1 not at all important. Even though, there are many bus customer satisfaction surveys, but there are never any vanpool customer satisfaction survey. This work is thus aim at studying vanpool services via satisfaction survey.



Figure 1: Standard Vanpool Commuter in Thailand.

3. Characteristics of Public Vanpool Commuter in Thailand

In Thailand, a vanpool commuter carries a group passenger of up to 15 people who commute together from the same origin to the same destination, with fixed route. The van is owned, maintained, and insured by its driver or a co-op. The van station collects passengers until the schedule time or immediately hit the road when passengers are full. Each seat is equipped with a seat belt. Passengers are normally sitting in the upright posture, as there is limited legroom. The van is installed mostly with either two steel cylinder NGV tanks or one LPG tank. Each public vanpool has yellow plate. The vanpools are run for many routes with different providers. Each vanpool vehicle normally runs multiple rounds each day. Vanpool is an economic way of sharing commute platform to get from specific place to place along its route. Normally, vanpools in Thailand share bus stations for pickup (additional passengers in case of available seat) and drop-off passengers. Some vanpool routes also use toll-ways, in order for passenger to travel faster, while the toll cost is included in the vanpool fare. Vanpool commuter services gain popularity among Thai due mainly to convenience and cheap commute cost. Most of passengers are students, and working people. Figure 1 shows a standard vanpool commuter in Thailand.

4. Vanpool Fares and Daily Service Hours

In Thailand, fares of vanpool commuter are fix prices, depending on route. Driving distance for each vanpool route is varied, approximately 10-40km for local travel or longer distance for traveling to/from upcountry provinces. Current fares are from 15Baht (about US\$0.50), 30Baht (about US\$1.00), 40Baht (about US\$1.30) and more. Travel fares of each vanpool commuter route are posted at its take-off station. Vanpool commuter daily service hours vary on the route, mostly start about or before 6AM until about 9PM or later.

*Corresponding author (Boonsap Witchayangkoon). Tel/Fax: +66-2-5643005 E-mail address: drboonsap@gmail.com. ©2015. International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies. Volume 6 No.1 ISSN 2228-9860 eISSN 1906-9642. Online Available at <http://TUENGR.COM/V06/031.pdf>.

5. Methodology

5.1 Passenger Satisfaction

With vanpool services, passenger satisfaction indicates how products and services meet or exceed passenger expectation or specified satisfaction goals. This work uses questionnaire as a study tool to survey passengers' perceptions regarding their satisfactions of the uses of vanpool services.

5.2 Questionnaire Survey

A questionnaire asks a series of questions about respondents' experience and perceptions of their vanpool travel in the previous six months. The pilot test questionnaire is conducted for ten respondents to obtain feedbacks for improvements. After the pilot test, the questionnaires are revised such that each question can be more clearly understood. The questionnaire asked for the main reason of why respondents have been using vanpool commuter services.

The questionnaire surveyed for passengers' satisfaction levels of using vanpool commuter services. The satisfactions are derived from the five Likert scale questionnaire with

- 5: High Satisfaction.
- 4: Good Satisfaction,
- 3: Satisfaction,
- 2: Fair satisfaction, and
- 1: No satisfaction.

Respondents are asked to answer with their perceptions and experiences they have with the vanpool commuter service within the past six months. Total three main criteria are asked, in terms of physical landscape of vanpool station, aspects of service, and conditions of vehicle. For physical landscape, the questionnaire involves satisfaction on vanpool take-off station, cleanliness of vanpool take-off station, access to vanpool commuter service, and number of vanpool commuter. For aspects of service, the questionnaire involves satisfaction on taking off follow posted schedule, willingness and eagerness to serve of staff, driving follow posted speed, having confidence in vanpool driver, and fare rates. For conditions of vehicle, the questionnaire asks satisfaction on Cleanliness inside the vanpool commute vehicle, Air condition system, Seat comfortability, and Seat belt. A privacy statement is noted that the identity of interviewers is not collected.

In this study, there are total 100 respondents (56 males and 44 females) are randomly selected from a wide range of respondents and different age groups of males and females. The survey is conducted during April 2014.

6. Study Result

6.1 Reasons of Using Vanpool Commuter Services

All respondents are asked for the main reason of using vanpool commuter service. The reasons of using vanpool commuter are mostly from convenience, cheap cost, and being a fast commute, as shown in Table 1.

Table 1: Main Reason of Using Vanpool Transport.

Main Reason of Using Vanpool	Frequencies
Convenience	35
Cheap Cost	23
Being a Fast Commute	29
Punctuality	4
No other type of commute available for the route	9
Other reasons	-
Sum	100

6.2 Respondents' Expense for Vanpool Transport

Expense of each respondent is surveyed, as shown in Table 2. A few of respondents spend for vanpool commuter services more than 200Baht/week (US\$6.24), as most respondents pay less than 100Baht/week (US\$3.12).

Table 2: Respondents' weekly expenses for vanpool transport.

Expense for Vanpool Transport (per week)	Frequency
< 50 Baht (< US\$1.56)	49
50-100 Baht (US\$1.56 – US\$3.12)	29
101-200 Baht (US\$3.13 – US\$6.24)	14
> 200 Baht (> US\$6.24)	8
Total	100

7. Satisfaction Criteria

Having vanpooling experiences, respondents' perceptions on various criteria are reported in Table 3. Even though average of each criterion is above 3.0, criteria for physical landscape of vanpool station seem to be higher than criteria for service and criteria for condition of vanpool vehicle. Condition of vanpool vehicle seems to produce least satisfaction level, compared to other main criteria. This indicates that vanpool owner should improve and maintain good vehicle conditions. The highest satisfaction is criterion on suitability of vanpool take-off station. It is also learn that passengers are quit very happy with the fair rates of vanpooling services. This may that even the fuel prices are high, but the fares are cheap because the vanpools are using LPG or NGV.

*Corresponding author (Boonsap Witchayangkoon). Tel/Fax: +66-2-5643005 E-mail address: drboonsap@gmail.com. ©2015. International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies. Volume 6 No.1 ISSN 2228-9860 eISSN 1906-9642. Online Available at <http://TUENGR.COM/V06/031.pdf>.

Table 3: Satisfaction Criteria in Using Vanpool Commuter Services.

Satisfaction Criteria	Frequencies					
	Satisfaction Level					
	5	4	3	2	1	Avg
Physical Landscape of Vanpool Station						
Suitability of vanpool take-off station	16	52	25	5	2	3.75
Cleanliness of vanpool take-off station	12	41	43	3	1	3.60
Access to vanpool commuter service	15	39	38	5	3	3.58
Number of vanpool commuter	13	38	38	10	1	3.52
Services						
Taking off follow posted schedule	5	33	45	15	2	3.24
Willingness and eagerness to serve of staff	5	42	46	7	0	3.45
Driving follow posted speed	4	46	38	12	0	3.42
Having confidence in vanpool driver	5	23	58	11	3	3.16
Fare rates	10	53	33	4	0	3.69
Condition of vehicle						
Cleanliness inside the vanpool commute vehicle	8	47	38	7	0	3.56
Air condition system	3	23	52	15	7	3.00
Seat comfortability	4	32	44	13	7	3.13
Seat belt	8	30	34	21	7	3.11
Overall satisfaction						3.40

8. Conclusion

This work presents an observation on vanpool commuter services in Thailand. Similar to carpools, all vanpools passengers share the ride for the same specific route of origin and destination as riders can hop in and get off at any station along its route. Being an element of the transit system, vanpools give worry-free and cost-effective commute as it save fuels and tolls. This study uses questionnaire as a study tool, asks 100 passengers about their satisfactions in three main criteria: physical landscape of vanpool station, aspects of service, and conditions of vehicle. With five Likert scales questionnaire, it is found that passengers have moderate satisfaction with the vanpool services, with 3.4 score at average. Vanpooling is an important environmentally friendly, sustainable, and faster way to commute. With vanpooling, sharing journeys reduce traveling cost and toll, driving stress, traffic congestion, and carbon emissions on the roads. In Bangkok alone, hundreds of thousand people traveled with vanpool commuter services truly make Bangkok a livable city.

9. Acknowledgment

The authors would like to thank Mr.Pittawas Thoenburin and Mr.Voraphan Jitarjhan for helping collect the data of this study.

10. References

- KST. (2010). Van-Bus-Boat Service. <http://www.ksttravelthailand.com/index.php?lay=show&ac=article&Id=538990053> Accessed October 2014.
- Pantip. (2013). What is the best vanpool service for traveling to George Town Penang Malaysia from HatYai Thailand. Pantip Discussion Board. <http://pantip.com/topic/30699231> Accessed October 2014.
- TNSW. (2010). Survey of Sydney Metropolitan Bus Users 2010. Transport New South Wales. http://www.transport.nsw.gov.au/sites/default/files/b2b/publications/bus_survey_2010.pdf Accessed October 2014.
- UWM. (2010). Vanpooling Information. Transportation Services of the University of Wisconsin-Madison. <http://transportation.wisc.edu/transportation/vanpool.aspx> Accessed October 2014.
- White, P. R., Turner, R. P., & Mbara, T. C. (1992). Cost benefit analysis of urban minibus operations. *Transportation*, 19(1), 59-74.



Dr. Boonsap Witchayangkoon is an Associate Professor of Department of Civil Engineering at Thammasat University. He received his B.Eng. from King Mongkut's University of Technology Thonburi with Honors in 1991. He earned his PhD from University of Maine, USA in Spatial Information Science & Engineering. Dr. Witchayangkoon current interests involve applications of emerging technologies to engineering.



Dr. Sayan Sirimontree earned his bachelor degree from Khonkaen University Thailand, master degree in Structural Engineering from Chulalongkorn University Thailand and PhD in Structural Engineering from Khonkaen University Thailand. He is an Associate Professor at Thammasat University Thailand. He is interested in durability of concrete, repair and strengthening of reinforced and prestressed concrete structures.



Dr. Saharat Buddhawanna is an Assistant Professor of Structural Engineering at Thammasat University in Thailand. He received a Bachelor Degree in Agricultural and Civil Engineering and Master Degree in Structural Engineering from Khonkaen University (KKU), Khonkaen, Thailand. Dr Buddhawanna earned Master and Ph.D. degrees in Civil Engineering concentrated on Structural Engineering field from University of Colorado (UCD), Denver, and Colorado State University (CSU), Fort Collins, Colorado, USA. His research involves non-destructive testing of structures.



Dr. Krittiya Lertpocasombut is an Associate Professor in the Department of Civil Engineering, Faculty of Engineering, Thammasat University, Thailand. She received a B.Sc. from Chulalongkorn University, Thailand, an M.Sc. from Asian Institute of Technology, D.E.A. Diplome d'Etudes Approfondies in Water Purification and Treatment Engineering from INSA de Toulouse, France, and a PhD in Water Purification and Treatment Engineering, Institut National des Sciences Appliquees (INSA), Toulouse, France. Dr. Lertpocasombut is interested in water and wastewater treatment; wastewater recycled by membrane technology; water supply sludge treatment and its reuse/recycle.

Note: The original of this article was presented as a keynote paper at the 2nd International Workshop on Livable City 2014 (IWLC2014), a Joint Conference with International Conference on Engineering, Innovation, and Technology (EIT), held at Tabung Haji Hotel, Alor Star, Malaysia, during December 9-11, 2014.