



# The Opinion Study of Pedestrian User to Footpath Characteristics in Rajamangala University of Technology Thanyaburi Rangsit Center

**TRIPOB BOONTHAM\***

*Faculty of Agricultural Technology, Rajamangala University of Technology Thanyaburi, Pathum Thani, Thailand*

*Email: tripob\_b@rmutt.ac.th*

Received 31 December 2017 Accepted 5 May 2018 (\*Corresponding Author)

**Abstract** The purposes of this research are 1) to investigate the pedestrian behavior; 2) to analyze the footpath physical characteristics and opinion of user in Rajamangala University of Technology Thanyaburi (RMUTT) Rangsit center; 3) to present footpath model that encourage to use footpath in RMUTT Rangsit center. The samples used in this research were analyzed by 340 sampling sets from instructor, student and officer in RMUTT Rangsit center. The main questions focused on pedestrian behavior, satisfaction and attitudes of pedestrian towards physical obstacles in sidewalk. The answers were analyzed by statistical methods. The results found that the factor affecting the choice to walk at RMUTT Rangsit center was based on cover way. Factors considered were pedestrian satisfaction of footpath physical characteristics such as parallel footpath with road, shade tree and good surrounding environment.

**Keywords** opinion, pedestrian, footpath, characteristics

## INTRODUCTION

At present, universities around the world have begun to focus on green university concepts that are especially environmental protection, climate change, global warming and greenhouse conditions. The green university approach that is used to UI green metric world university ranking will measure campus sustainability efforts. The criteria of UI green metric world university ranking in 2016 are 1) setting and infrastructure; 2) energy and climate change; 3) waste; 4) water; 5) transportation; 6) education (UI green metric world university ranking, 2016). All of the above about green university shows that the transportation system is important in reducing carbon emissions and polluting in area and it is related to encourage pedestrian to use footpath in the university. It also affects the relationship with pattern of pedestrian to use area (Frank and kavage, 2009). Thus, Rajamangala University of Technology Thanyaburi (RMUTT) Rangsit center has started to develop the area in accordance with the green university guidelines by lay-out planning and creating space and activities area according to the UI green metric world university ranking. Therefore, the pedestrian policy on campus is part of develop to green university. At present, RMUTT Rangsit center is no pedestrian walkway in the campus and there is a lack of proper routing and lay-out to accommodate the behavior and needs of users within the university. Therefore, a major goal of this research is to analyze pedestrian satisfaction of footpath physical characteristics. In addition, the footpath model that encourages pedestrian to use footpath in RMUTT Rangsit Center was also investigated.

## OBJECTIVE

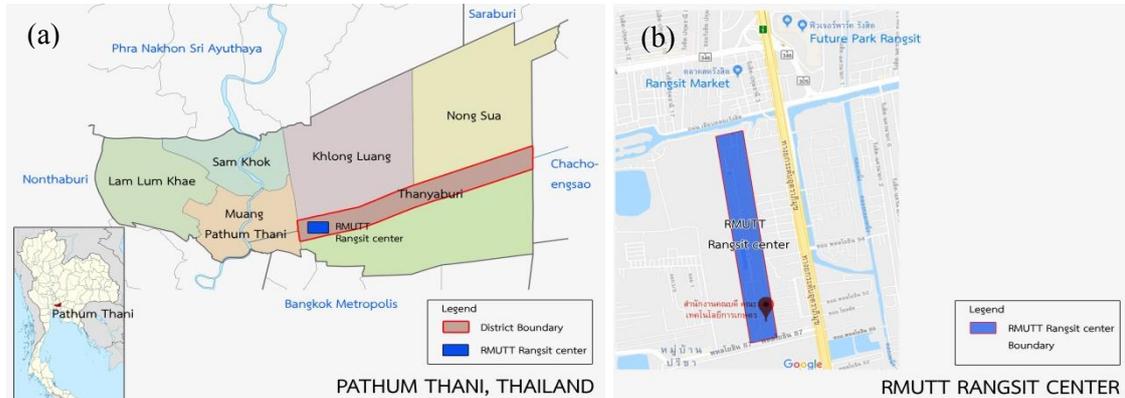
The research was conducted for the following three main objectives:

- 1) To investigate the pedestrian behavior,
- 2) To analyze the footpath physical characteristics and opinion of user in RMUTT Rangsit Center,

3) To present footpath model that encourage to use footpath in RMUTT Rangsit center.

## METHODOLOGY

The proposed study site is located within Rajamangala University of Technology Thanyaburi (RMUTT) Rangsit Center, Pathum Thani, Thailand (Fig. 1).



**Fig. 1 Location (a) and study site (b)**

The sample of this research is calculated by using Taro Yamane (Yamane, 1967) formula with 95% confidence level. (according 2,267 persons from the data of RMUTT Rangsit center report 2017.) The calculation formula of Taro Yamane is presented as follow.

$$n = \frac{N}{1 + N(e)^2}$$

Where: n=sample size required, N=number of people in the population, e=allowable error (%)

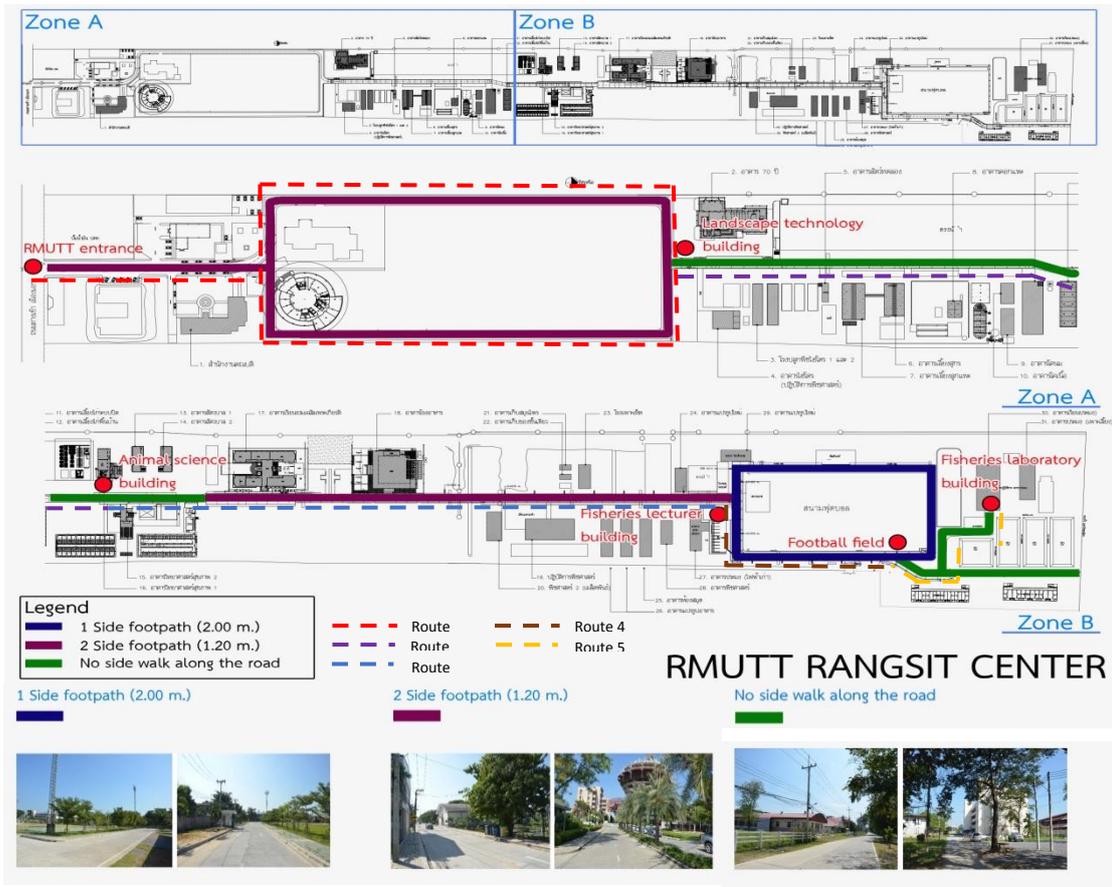
$$n = \frac{2,267}{1 + 2,267(0.05)^2} \quad \text{Substitute number in formula: } n = 340$$

Data collection is divided into two parts such as physical survey in the study area and behavior survey including comments and requirements of pedestrian. Questionnaire used to collect behavior data, comments and requirements are divided into four parts such as personal information, pedestrian behavior, opinions and obstacles in the study area and formats, and suggestions for pedestrian walkways within the study area. Data collection was conducted in April 2017 and all the collected data was analyzed by statistic package for social science (SPSS and Excel).

## RESULTS AND DISCUSSION

The physical of pedestrians within the study area are divided into 3 types are 1) one pedestrian walkway (width 2.00 meter.) is parallel to the road on one side of the road. Found around football field; 2) two pedestrian walkway (width 1.20 meters) is parallel to the road. Both sides of the road will meet RMUTT entrance to landscape technology building, and from the animal science building to the fisheries lecturer building; 3) no pedestrian walkway along the road will be a range of landscape technology building to the animal science building, and the football field to the fisheries laboratory building. Problems and obstacles within the area are pedestrian walkway is not divide space between footpath and car, no shade for pedestrian walkway footpath, the pedestrian is deteriorating, no ramp for the disabled, and obstructions on the pedestrian walkway, for example, bench, road symbol sign, electric pole, garbage can (Fig. 2).

(a)



(b)



**Fig. 2 Physical of study area (a), problems and obstacles of study area (b)**

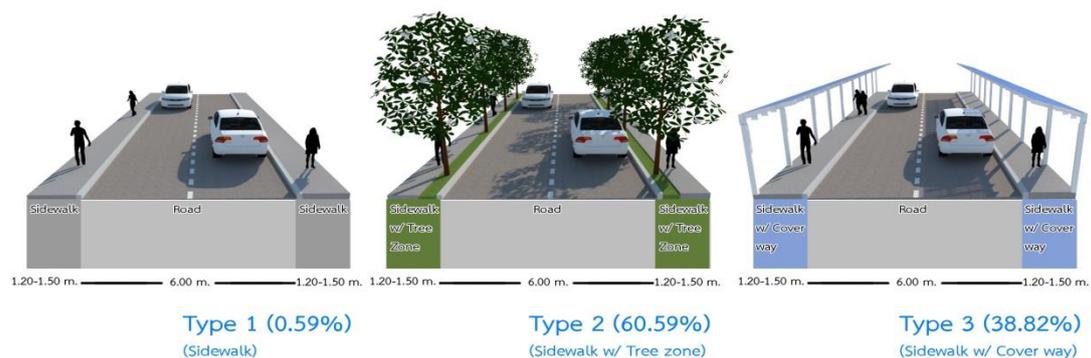
The statistics from observed data show that the proportion of female pedestrians is higher than male pedestrians during peak hour and proportion of range 18-25 years of pedestrians is the largest comparing to range 26-32 years and range 33-40 years. The data indicates that pedestrians are student rather than officer with 96% of pedestrian and lecturer with 98% of pedestrian. The average pedestrian time observation 6.00-12.00 rather than 12.00-18.00. The data collection showed that pedestrian behavior use route 1 (RMUTT entrance to landscape technology building) is higher than route 2 (landscape technology building to animal science building), route 3 (animal science building to fisheries building), route 4 (fisheries lecturer building to football field), and route 5 (football field to fisheries laboratory building) (Table 1). In additions, Marisamynathan (2014) indicated that pedestrian crossing speed of a male is faster than that of a female. Pedestrian age and departure signal phase have more significant impact on crossing speed variations. Gender and group size of pedestrians are significant factors affecting the pedestrian compliance behavior. Approaching and the vehicle are identified as the influencing parameters in pedestrian – vehicular interactions.

From the previous study by physical of pedestrians within the study area, statistics from observed data, and questionnaire (characteristic, behavior, and model of pedestrian) found that footpath which encourage to use footpath in RMUTT Rangsit center were footpath model (type 2) consisted of parallel footpath containing shade tree and good surrounding environment (Fig. 3). Leopairojana (2016) reported that problems in travelling to the station include: the unsafe atmosphere prevailing along routes to the station and at the station itself; inconvenient and long access routes, and high travel expenses. The concepts of sustainable transportation that promote walking, cycling and public transportation was then used to develop recommendations as to how improve the station’s environment and access. In addition, Tanarinya et al. (2007) indicated that improving condition of footpaths, creating good environments, promoting walking and connecting footpath to BTS stations will encourage people to change their modes from cars to walking and riding public transports.

**Table 1 Pedestrians classified by their characteristics and behavior**

Observed parameter		No. of observed pedestrians	Percent (%)
Gender	Male	143	42.06
	Female	196	57.94
Characteristic	Age	18 – 25 years	332
		26 – 32 years	7
		33 – 40 years	1
		Student	328
User type	instructor	4	1.18
	Officer	8	2.35
Time observation	6.00 – 12.00	185	54.41
	12.00 – 18.00	182	45.59
Behavior	Route 1	Route 1	126
		Route 2	122
	Pedestrian	Route 3	62
		Route 4	24
		Route 5	6

Route 1 (RMUTT entrance to landscape technology building), route 2 (landscape technology building to animal science building), route 3 (animal science building to fisheries lecturer building), route 4 (fisheries lecturer building to football field), route 5 (football field to fisheries laboratory building)



**Fig. 3 Pedestrian model type 1 (a), type 2 (b) and type 3 (c)**

**CONCLUSION**

This study revealed the perception of pedestrians on the use of footpath in RMUTT Rangsit center. It is found that 37.06% of the pedestrians use route 1 (RMUTT entrance to landscape technology building), and also identified that no shade for pedestrian walkway is the problem of pedestrian to use footpath. Footpath model has been proposed and selected based on pedestrian behavior in order

to encourage to use footpath is model type 2 (side walk with tree zone).

## **ACKNOWLEDGEMENTS**

The author would like to acknowledge to all the staff member of Division of Landscape Technology, Faculty of Agricultural Technology, Rajamangala University of Technology Thanyaburi for all supports and assistance, particularly Miss Adcharphon Verachue for research assistance.

## **REFERENCES**

- Frank, L. and Kavage, S. 2009. A national plan for physical activity, The enabling role of the built environment. *Journal of Physical Activity & Health*, 6, S186.
- Leopairojana, S. 2016. Mass transit station environments and accessibility improvements, Lessons learned from Ban Thab Chang airport rail link station, Bangkok. *Journal of Built Environment Inquiry*, 15 (1), 153-172.
- Marisamynathan. 2014. Study on pedestrian crossing behavior at signalized intersections. *Journal of Traffic and Transportation Engineering*, 1 (2), 103-110.
- Tanarinya, P., Leopairojana, S. and Preamechai, S. 2007. Footpath development for encouraging non-motorized transportation, Case study areas around BTS station, Bangkok. *Journal of Kasetsart University*.
- UI Green Metric World University Green Ranking. 2016. UI green metric world university green ranking 2016. <http://greenmetric.ui.ac.id> (retrieved in September 2016).
- Yamane, T. 1967. *Statistics, An introductory analysis*. Harper and Row Publications, New York.