

Towards green cities in developing countries: a case study of Khon Kaen City

Pattamaporn Wongwiriya

Faculty of Architecture, Khon Kaen University, Khon Kaen, Thailand

E-mail: pattamawong@kku.ac.th

Abstract

With the rapid urbanization in many cities in developing countries, urban traffic congestion and environment issue are becoming increasingly rigorous and prominent. How to become green cities is raised as the mandatory urban development issue all over the world. Green transportation is a low-carbon and environmental traveling mode which is one of the significant aspects to support the green city concept. This paper examines the pedestrians' perception on the Glangmuang road walkability perspective to support Khon Kaen green city by revealing the situation of green transport mode, walking, in Khon Kaen City. Towards green cities in developing countries, green transportation should be promoted. It is not only good for the decrease of energy consumption, the ease of traffic congestion, and the improvement of air quality but also, as a return to leisure and healthy lifestyles, good for the improvement of citizen's quality of life.

Keywords: Green transportation, Green cities, Khon Kaen City

1. Introduction

Sustainable cities or Green cities are critical to sustainable development, given their position as engines of economic growth, centers of population growth and resource consumption, and crucibles of innovation and culture [1]. Recently, sustainability has been one of the most trending issues in many cities in developing countries as well as in developed countries all over the world, particularly in Thailand. Most of great efforts have been made through sustainable urban planning and design to enhance the quality of urban life.

Regarding the rapid urbanization and economic development in developing countries, urban transportation has already become one of the predominant environmental issues that are contributing to both local and global environmental concerns. The existing studies on developing Asian cities showed the fact that issues in the transportation sector need special attention to realize the environmental sustainability issue of cities. Especially, air pollution in the city is driven primarily by emissions from the transportation sector. Thus, towards green cities in developing countries, good transport or sustainable transport system in the city is imperative for citizens' quality of life and has significant consequences for the growth of the economy and the health of the environment and as a whole.

According to the success of green city development, it is advocated that to make these cities sustainable, a comprehensive research of their urban management systems is essential [1]. This study revealed that green mechanisms within urban management concerning green or sustainable urban transportation in Khon Kaen City, Thailand would offer appropriate solutions for their environmental problems.

From the perspective of modes of transportation, green transportation system includes walking, bicycle, regular public transport and rail transport [2] Therefore, the primary objective of this research is to examine the pedestrians' perception on the Glangmuang road walkability perspective to support Khon Kaen green city promoting the green transport mode, walking, in the city.

2. Research Methodology

To study the pedestrians' perception of the Glangmuang road walkability. The analyzed results were conducted from a comprehensive field survey distributed among the pedestrians in Khon Kaen City, in order to measure their perception with the walkability issues on Glangmuang road. The surveys were carried out on interviewing randomly selected people in the Central Business District (CBD) of Khon Kaen city along the Glangmuang road where there are many offices, shops, and schools located in this area in January 2018. Then data were analyzed through descriptive statistic for examining the Glangmuang road walkability's perception from the pedestrians' point of views.

3. Research Results

This section summarizes the analysis carried out on the data obtained from the survey and the descriptive statistics of the respondents are provided in Table 1.

As shown in Table 1, the majority of respondents is female (70%). Furthermore, most of the respondents are the Private employee (34.7 %) and the government officer (20.8%). However, among the total respondents, there is 45.8 % who do not have a driving license, and this group is the dominant pedestrians who select Songtaew as their urban transport mode to access the Glangmuang road.

Table1: General Characteristics of Respondents

Characteristics	Statistics
1. Gender	Male (30%), Female (70%)
2. Age	< 15-year-olds (13.1%), 15-20-year-olds (22.3%), 21-30-year-olds (22.9%), 31-40-year-olds (18.3%), 41-50-year-olds (16.6%), 51-60-year-olds (6.0%), > 60-year-olds (0.9%)
3. Education	Lower than undergraduate (67.3%), Undergraduate (30.7%), Graduate (2.0%)
4. Occupation	Junior high school student (17.1%), Senior high school student (16.4%), Government officer (20.8%), Private employee (34.7%), Business owner (9.1%), Others (1.8%)
5. Driving license	None (45.8%), MC (17.1%), Car (13.5%), Both (17.3%)

Regarding the mode share of respondents to access the Glangmuang road, as shown in Figure 4, it revealed that there are the respondents who use Songtaew 42%. The respondents who select car as their dominant transport mode going to Glangmuang road (40%) because the most of them have car driving licenses and driving car is more convenient and safer for them than using Songtaew [3] then most of them prefer car more than Songtaew getting to this area. Considering the frequency of walking along Glangmuang road, it reveals that 40% of the respondents are going to walk along the Glangmuang road almost every day. For the duration of walking along Glangmuang road, most of the respondents (48%) took the time along the Glangmuang road around 3-10 minutes as shown in figure 2.

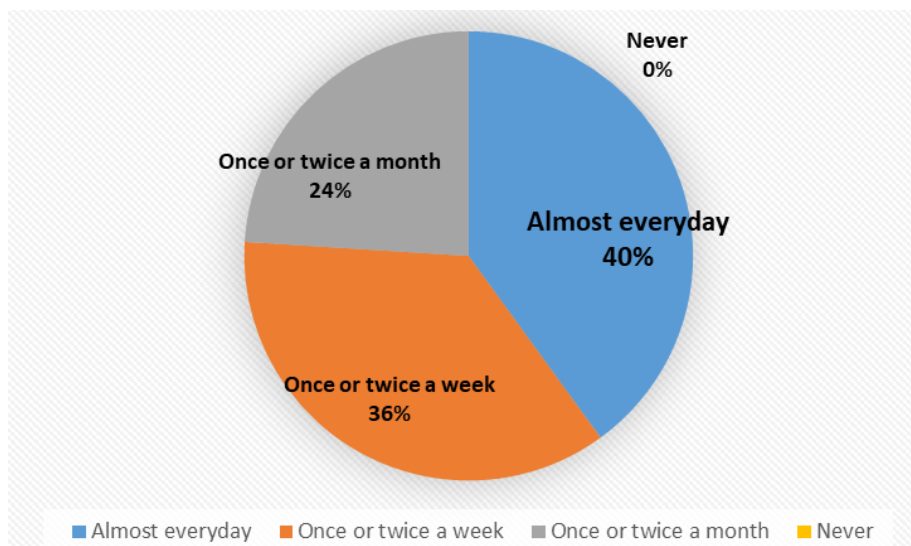


Figure 1: The frequency of walking along Glangmuang road.

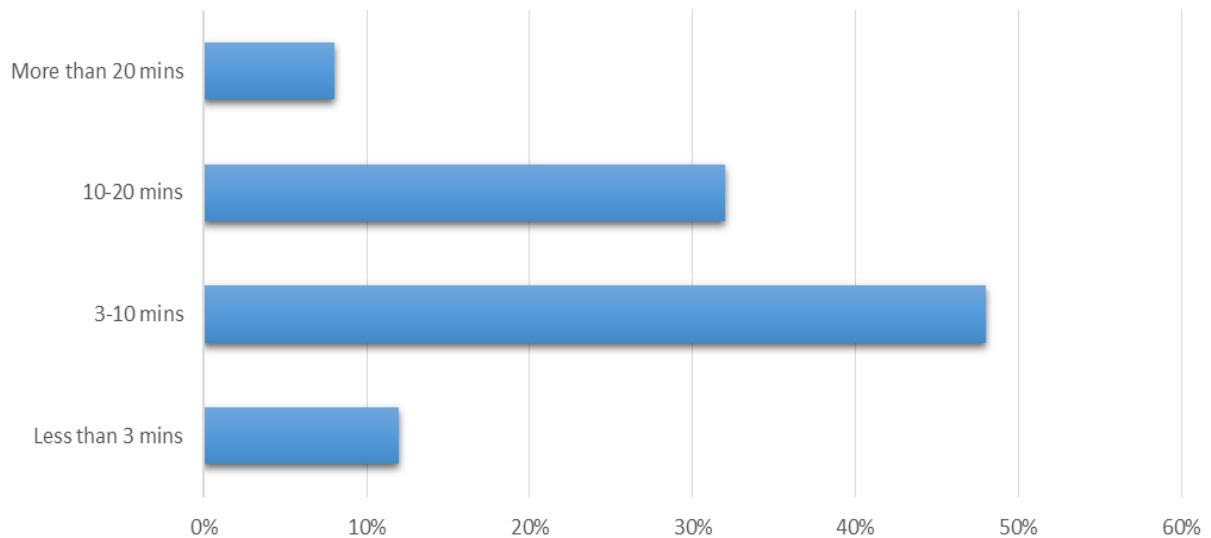


Figure 2: The duration of walking along Glangmuang road.

Figure 3 shows the reasons for walking along Glangmuang road. It is seen that more than 60% of the pedestrians enjoyed shopping at vendors and shops along the Glangmuang road which is the dominant reason of vibrant activities along this road inducing the people to visit and enjoy walking along this road.

Furthermore, this study also considered on the problems clarified by the pedestrians which showed that most of the respondents raised the negative issues about the security problem, dark sidewalk environment at night, narrow walkway, rugged walkway, illegal parking, Carelessness by the driver at the crossing. However, most of the respondents also pointed out the affirmative issues of the Glangmuang road's walkability environment which are active street users including traders and vendors as well as the diversity of visitors including young generations and family.

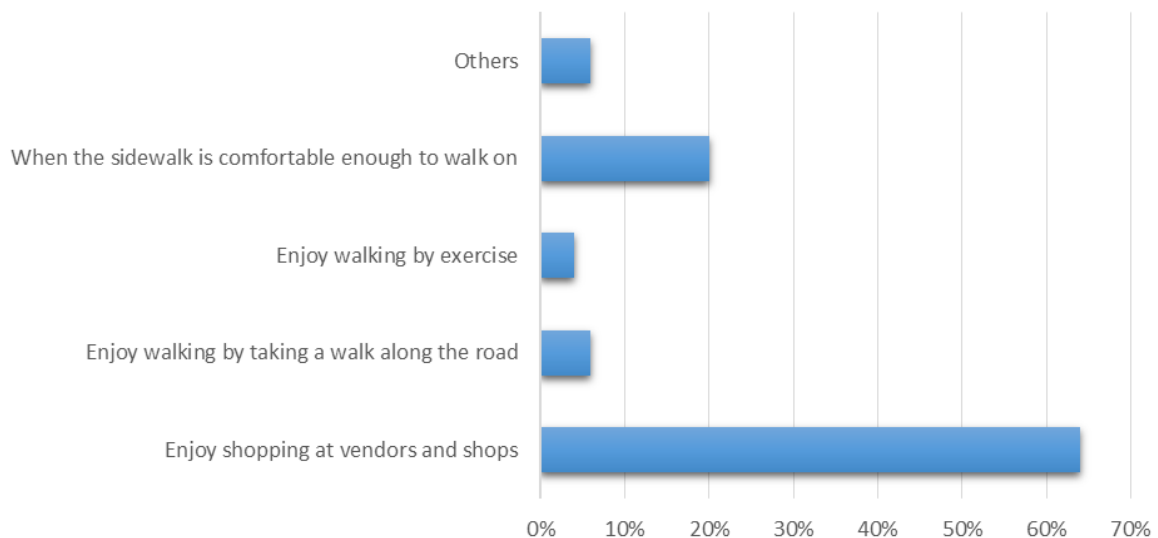


Figure 3: The reasons for walking along Glangmuang road.

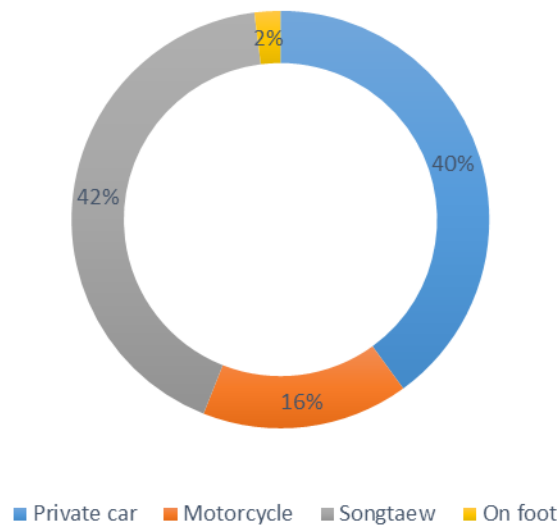


Figure 4: The means of transport to access Glangmuang road.

4. Conclusion

Admittedly, green transportation is a practice goal, explicitly referring to the convenient, safe, efficient, low-pollution, humanized and diversified urban transportation system to support the green city development. It should adapt to the environment-development trends, coordinating with the ecological environment and urban development. The research is the first small attempt to reveal the situation of walkability issue in Khon Kaen City, especially on Glangmuang road which is the main road in the city. Since green transport advocates the decreased use of private cars, the increased use of public transport, walking, and bicycle [2], it should be promoted more as a pollution-free, low-cost, and space saving transportation system suitable for all travelers in the city. The green or sustainable transport system is not only a low-carbon traveling mode but also a return to leisure and healthy lifestyle of the citizen. Therefore, it should be studied further regarding the policy development of green transport mode in Khon Kaen City towards the green city for saving energy, reducing carbon and improving the environment of the city.

5. Reference

- [1] World Bank, Building Sustainability in an Urbanizing World, 2013. Available: <http://www.worldbank.org>
- [2] H. Li, Study on Green Transportation System of International Metropolises. Procedia Engineering, 2016.
- [3] P. Wongwiriya, F. Nakamura, S. Tanaka, S. Miura, R. Ariyoshi, User Perception of Paratransit in Developing Countries: A Case Study of Songtaew in Khon Kaen City, Thailand, Proceedings of the International Conference of Asian-Pacific Planning Societies, 2016.
- [4] H.T. Dimitriou, R. Gakenheimer, Urban Transport in the Developing World: A Handbook of Policy and Practice. Edward Elgar Publishing, Massachusetts, 2011.
- [5] M.D.Guillen, H.Ishida, N.Okamoto, and M.Tsutsumi, Public transportation policies and the road-based public transport service in developing countries: the case of indigenous public transport modes in Davao city, Proceedings of the Eastern Asia Society for Transportation Studies, 6, 2007.
- [6] H. Minken, A. May, Developing Sustainable Urban Land Use and Transport Strategies: A Methodological Guidebook, 2003.
- [7] L.Chen, F. Yang, Y. Cheng, Z. Yao, X. Zhang, Urban Public Transport Choice Behavior Analysis and Service Improvement Policy-Making: A Case Study from The Metropolitan City, Chengdu, China, TRB 2014 Annual Meeting, 2014.