

# Promoting Public Transportation for Women: A Review of Factors Affecting the Mobility

Yong Adilah Shamsul Harumain\*, Nur Farhana Azmi, Suhaini Mohamed Yusoff

Department of Urban and Regional Planning, Faculty of Built Environment University of Malaya, 50603, Kuala Lumpur MALAYSIA

\*Corresponding author E-mail: [adilah\\_shamsul@um.edu.my](mailto:adilah_shamsul@um.edu.my)

## Abstract

Globalization, urbanization, motorization, and socio-demographic transition have transformed travel pattern in particular in the growing mobility concerns on female public transportation user. Women mobility has been an interest in social and transportation studies due to the arising numbers of women working and travelling. The diversity social roles of women nowadays in family and workplace strongly define the travel-activity pattern of women. Hence, this paper aims to review factors affecting women mobility at the Light Railway Transit (LRT) stations. It is found that the factors affecting mobility of women users are significantly towards the facilities and the distance of the station to their destination. The preliminary survey also suggests the study of women behavior and their mobility are significant to promote the use of public transportation for women.

**Keywords:** Mobility, women, public transportation, LRT

## 1. Introduction

It has been long recognized the importance of the development of transport system, not only in enabling individuals to travel further and faster to the choice of destinations, but also have a greater societal and economic impacts globally to create a more sustainable living world. With the high capability in travelling across various locations, it removes all the physical boundaries for individuals to access and connect to any places in this world. However, it is not equally accessible for every individual in benefiting from the advanced transport system due to differences needs for example between man and women. Mobility in public transportation is focused as it has increasingly become a societal concern nowadays. Among factors which influenced mobility patterns are type, quantity and timing of activities, choice of destinations and activity spaces, realized distances and modal choice (Curtis & Perkins, 2006; Rosenbloom & Plessis-Fraissard, 2010). Various studies had attempted to examine women's mobility pattern when using public transport system (Loukaitou-Sideris, 1999). Women's mobility has been a concern in social and transportation studies. The diversity social roles of women nowadays in family and workplace strongly define the travel-activity pattern of women. Many studies had concluded that three key factors for women's travel patterns are marital status, household composition and levels of income (Hjorthol, 2008). Besides travelling for work, women were more likely to travel for non-work journey, including running household errands and escort other passengers (Murakami & Young, 1997; Root, 2000; McGuckin & Nakamoto, 2005; Rosenbloom & Plessis-Fraissard, 2010). The promotion of public transportation for women is severely crucial hence, this paper wants to review the factors affecting women mobility at the light railway transit (LRT) station in Malaysia.

## 2. Women's Mobility

Mobility is defined as the movement of people across geographical locations (Wachs, 2010). In general, mobility is measured in terms of time, distance and modal choice in travel, and the purpose and destination for travel (Duchène, 2011). Due to the rising house price in the city center in the recent years has reduced the affordability of house ownership. Hence, there were increasing numbers of long-distance commuters who chose to stay away from the workplace (Crane, 2007). The definition of mobility might also not be the same between genders. Therefore, women were more likely to trip-chain for multi-purpose (Lyons & Chatterjee, 2008). The purpose of travel also influenced the mobility pattern as women were more likely to travel by private vehicles for non-working travel trip but less likely to drive for work (Boarnet & Sarmiento, 1998). However, there was a pattern of decreasing reliance on public transport to work among women. Various reasons were suggested to explain this pattern, such as the preference of using cars, the limited availability of public transport service at their residential or working areas (Crane, 2007). In addition, women had increasingly placed higher values on time and reliability of travel modes, which resulted in the insufficiency of public transport in fulfilling women's needs (Giuliano & Schweitzer, 2009). Nevertheless, more studies need to be done to understand this changing travel pattern of women.

Demographic factors such as marital status and race had impacts on the length of travel. Some studies concluded that there were no gender differences for total travel time if demographic factors such as race, sex, age and mode were controlled (Doyle & Taylor, 2000). Some studies also found that the number of journeys and total distance travelled by women were fewer than men in general (Cristaldi,

2005; Susilo & Kitamura, 2008; Cao & Chai, 2007). However, others concluded that there were no significant differences between men and women in the number of journey and distance travelled (Best & Lanzendorf, 2005). Still, there were studies concluded that women had higher number of journeys although the total travelled distance could be shorter due to multiple short trips and their use of slower modes (Anand & Triwari, 2006). Lower income restricts the accessibility to better transport modes. Conversely, lower accessibility to better transport modes reduces the availability of resources and access of jobs with better income (Rao, 2001; Fernando, 1999; Cressell&Uteng, 2008; Dobbs, 2005). Regardless of being in developing or developed countries, women are generally less access to better transport modes due to lower incomes compare to men (Rosenbloom & Plessis-Fraissard, 2010; Hjorthol, 2008). Studies showed that women travelled more by private cars in recent years in developed countries. Yet, the increasing number of women having driver's license did not imply equivalent amount of the actual driving experience of women as they were more likely to be passengers rather than driver (McGuckin, Contrino, Nakamoto, & Santos, 2009; Rosenbloom 2006; Bernard, Seguin, Bussiere, & Polacchini, 1996). Other studies concluded that it was the choice of women who were more likely to cycle or walk to work instead of driving cars even though women increasingly owned driving license and dependent on private cars (Naess, 2008). On the other hand, the daily activity patterns of individuals are highly dependent on mobility. In terms of spatial range of travel, studies showed that women had a smaller activity space and move closer to home compared to men in general even though there were growing numbers of women working outside of home (Rosenbloom, 2006; Hanson & Pratt, 1995). The gender differences in mobility pattern are strongly connected to the social factors such as the social roles of individuals in household, neighborhood, activity areas and wider societal relations (Cresswell & Uteng, 2008).

As women are less likely to access or own private vehicle, women are more likely to be public transport users compared to men. Most studies concluded that women were more likely to use public transport compared to men who were highly dependent on private cars (Curtis & Perkins, 2006; Polk, 2003). In Australia, women comprised of two-thirds of total number of bus users (Hanson, 1996). However, less percentage of women among total number of railway transit users, which was in consistent to the notion that individuals with higher income were more likely to access relatively costly public transport such as trains, mini vans and taxis while individuals with lower incomes and minority group were more likely to use relatively cheaper public transport such as buses and trolleys (Peters, 2002). Most studies had identified three main transport needs for women which were safety and security, reliability and physical access (Hanson, 1996). However, it is widely concerned about whether the public transport system fulfils the needs of women as the majority public transport users. An affordable public transport service is also an essential mobility challenge and need for women who have low or no incomes (Roy, 2010).

### 3. The Preliminary Survey

The objective of the preliminary survey is to evaluate the available facilities at the LRT stations and to observe between gender behaviors among women LRT users. This preliminary survey was conducted randomly at nine stations of Kelana Jaya Line Light Railway Train (LRT) that are mostly located adjacent to commercial and residential land use without centralized parking in order to assess the walkability and mobility (Refer Table 1). At present, there are 35 car trains that are in service on Kelana Jaya Line LRT. During the observation, an audit list was prepared beforehand to distinguish surrounding land uses and the available facilities. The purpose of the audit is to recognize the current situation of the stations as to investigate the other factors besides behavior that affecting the use of LRT as transport mode. A scheduled observation was conducted during the preliminary survey in May, 2016 during peak and non-peak hour to understand the situation of each station including on the quality of the available facilities and surrounding condition of the station. The audit also includes observation of walking directions of the pedestrian within 500 meters from the station, documentation of peak and non-peak hour and also the behavior of LRT user using the facilities. The audit list shows randomly selected LRT Stations and its facilities including areas surrounding the station and within 500-meter radius from each station. The categories of land use adjacent to the station are divided into residential, office, commercial, other public uses, industrial/warehouse, green space, transportation and vacant/empty. Each station has its own distinctive feature. In terms of the facilities, most of the stations are provided with covered and well-paved walkway that connects stations with adjacent buildings.

**Table 1:** The audit list of randomly selected LRT Stations at Kelana Jaya Line in relations to mobility and the use of facilities.

LRT Station	Land use characteristic within 500 meter radius from station	Surrounding Land Use								Facilities Available				
		Commercial	Residential	Office	Other Public Uses	Industrial/Warehouse	Green Space	Transportation	Vacant/ Empty	Covered Walkway	Good lighting	Railings	Parking Lots	Underground
Asia Jaya	Residential		✓						✓			✓		
Universiti	Residential		✓	✓	✓			✓	✓					✓
Abdullah Hukum	Commercial			✓				✓	✓					✓
Bangsar	Offices/ Commercial	✓	✓	✓	✓			✓	✓	✓	✓	✓		✓
Pasar Seni	Tourist/ Commercial	✓		✓				✓				✓		✓
Kampung Baru	Residential		✓					✓					✓	
Dato' Keramat	Residential	✓	✓					✓						
Wangsa Maju	Mixed used	✓	✓					✓						✓
Taman Melati	Residential		✓		✓			✓	✓			✓		

However, there are lack of proper lighting at the pedestrian pathway connecting the stations with the surrounding buildings and areas. In addition, the on-going construction nearby the LRT stations decreased visibility especially during the night and temporary construction barriers isolated certain areas from the main road. Further investigation was done at all nine stations to understand more about the factors that promotes more passengers to one another. In summary, factors affecting the mobility specially to attract women users are significantly directive towards the providence of facilities and distance of the station to their destination. It appears that station near offices, shopping malls and residential areas has higher number of people compared to stations which are located far from them. The lacking of facili-

ties appears to discourage women to use the LRT station which lead to the perception of safety at the station which many women concerns. However, detail investigations will be conducted at these stations to evaluate and understand the behavioral of different genders using the facilities at the station and if different facilities will affect their decision to use the public transport. In spite of that, this preliminary survey suggests the study of women behavior and their mobility are significant to the provisions of facilities at the station.

## 4. Conclusion

The state of condition in all nine LRT stations suggest that connectivity between stations with surrounding land uses and existing infrastructures are rather sensible. Mobility could not be achieved with poor lighting, barriers that limit pedestrian's visibility and poor land use connectivity with the stations. Mobility is not just about providing but also about adapting and flexibility which most women users would appreciate due to the nature of their travel. From the literature reviews, women travels are much more unique in terms of the combining activities in each trip, family responsibilities and may be travel with children using public transportation. In addition, informal travel modes could be more expensive in the context of accessing areas with limited availability of public transport service (Kamuhanda & Schmidt, 2009). In certain places, cultural practices restricted women from working and travelling outside the home, and discouraged women from using public transport (Wafa, Newmark, & Shiftan, 2008; Peters, 2002). There were also cultural norms that limit women in using alternative travel modes such as motorbikes, bicycles, wheelbarrows and handcarts (Bryceson and Howe, 1993; Fernando, 1999). In addition, travelling with public transport posed challenges for women to fulfil both familial and work obligations as it was time-consuming and less convenient in comparison to own of or access to a car (Crane, 2007; Rosenbloom, 2006). In other cases, when the cultural norms and structural support available for women in using alternative public transport modes, social roles such as child care and other familial obligations restricted the travel modes and length of travel for women (Pucher & Buehler, 2007; Katler, Jorritsma, & Harms, 2011).

Various perspectives such as historical, socioeconomic and geographical viewpoints have to be considered in order to understand women mobility in a holistic approach. Women are being exposed to higher risk of victimization due to socioeconomic factors. Therefore, various related agencies have to cooperate in creating a safer public space in order to fulfil the need of women as the majority users of public transport. Further research in the women's mobility through behavioral study will help to contribute to sustainable transportation to all gender needs.

## Acknowledgement

The authors would like to thank University Malaya for Bantuan Kecil Penyelidikan (BKP) grant to conduct the Women Mobility research (BK002-2016) and other individuals involved direct and indirectly to this project.

## References

- [1] Anand, A., & Tiwari G. (2006). 'A gendered perspective of the shelter-transport-livelihood link: the case of poor women in Delhi'. *Transport Reviews*, 26(1), 63–80.
- [2] Bernard, A., Seguin, A., Bussiere, Y., & Polacchini, A. (1996). Household structure and mobility patterns of women in O-D surveys: Methods and results based on the case studies of Montreal and Paris. In *Women's Travel Issues: Proceedings from the Second National Conference* (pp. 249-266). Washington, DC: U.S. Department of Transportation.
- [3] Best, H., & Lanzendorf, M. (2005). Division of labour and gender differences in metropolitan car use: an empirical study in Cologne, Germany. *Journal of Transport Geography*, 13(2), 109-121.
- [4] Bryceson, D., & Howe, J. (1993). Rural household transport in Africa: Reducing the burden on women? *World Development*, 21(11), 1715-1728.
- [5] Crane, R. (2007). 'Is there a quiet revolution in women's travel? Revisiting the gender gap in commuting'. *Journal of the American Planning Association*, 73(3), 298–316.
- [6] Cresswell, T., & Uteng T.P. (2008). 'Gendered mobilities: Towards a holistic understanding'. In T. Cresswell and T.P. Uteng (Eds.), *Gendered mobilities* (pp.1-14). Hampshire, UK: Ashgate Publishing.
- [7] Cristaldi, F. (2005). Commuting and gender in Italy: A methodological issue. *Professional Geographer*, 57(2), 268-284.
- [8] Curtis, C., & Perkins, T. (2006). *Travel Behaviour: A review of recent literature (Impacts of Transit Led Development in New Rail Corridor Working Paper No. 3)*. Perth: Curtin University.
- [9] Dobbs, L. (2005). 'Wedded to the car: women, employment and the importance of private transport'. *Transport policy*, 12(3), 266–278.
- [10] Doyle, D. & Taylor, B. D. (2000). Variation in metropolitan travel behaviour by sex and ethnicity. In *Batelle Columbus Laboratories (Eds.), Travel Patterns of People of Color* (pp.181-244). Washington, DC: Batelle Columbus Laboratories.
- [11] Duchène, C. (2011). Gender and transport, presented at 2011 International Transport Forum, Leipzig, 2011. Paris: International Transport Forum.
- [12] Giuliano, G., & Schweitzer, L. (2009). Her money or her time: A gendered view of contemporary transport policy. In *Conference Proceedings 46: Women's Issues in Transportation: Report of the 4th International Conference; Volume 1: Conference Summary and Plenary Papers* (pp.78-93). Washington DC: Transportation Research Board of the National Academies.
- [13] Hjorthol, R. (2008). Daily mobility of men and women-A barometer of gender equality? In T. Cresswell and T.P. Uteng (Eds.), *Gendered mobilities* (pp.193-210). Hampshire, UK: Ashgate Publishing.
- [14] atler, M.-J., Jorritsma, P., & Harms, L. (2011). Changing travel patterns of women in the Netherlands. In *Conference Proceedings 46: Women's Issues in Transportation: Report of the 4th International Conference; Volume 2: Technical Papers* (pp.179-190). Washington DC: Transportation Research Board of the National Academies.
- [15] Loukaitou-Sideris, A. (1999). Hot spots of bus stop crime: The importance of environmental attributes. *Journal of the American Planning Association*, 65(4), 395-411.
- [16] Lyons, G., & Chatterjee, K. (2008). A human perspective on the daily commute: Costs, benefits and trade-offs. *Transport review*, 28(2), 181-198.
- [17] McGuckin, N., Contrino, H., Nakamoto, H., & Santos, A. (2009). Driving Miss Daisy: Older women as passengers. In *Conference Proceedings 46: Women's Issues in Transportation: Report of the 4th International Conference; Volume 2: Technical Papers* (pp.134-142). Washington DC: Transportation Research Board of the National Academies.
- [18] Naess, P., (2008). Gender differences in the influences of urban structure on daily travel. In T. Cresswell and T.P. Uteng (Eds.), *Gendered mobilities* (pp.173-192). Hampshire, UK: Ashgate Publishing.
- [19] Polk, M. (2003). Are women potentially more accommodating than men to a sustainable transportation system in Sweden? *Transportation Research Part D: Transport and Environment*, 8(2), 75-95.

- [20] Pucher, J., & Buehler, R. (2007). At the frontiers of cycling policy innovations in the Netherlands, Denmark and Germany. *World Transport Policy and Practice*, 13(3), 8-56.
- [21] Rao, N. (2001). Enhancing women's mobility in a forest economy: Transport and gender relations in the Santal Parganas, Jharkhand. *Indian Journal of Gender Studies*, 8(2), 271-290.
- [22] Root, A. (2000). Women, travel, and the idea of 'sustainable transport'. *Transport Reviews*, 20(3), 369-83.
- [23] Rosenbloom, S. (2006). Understanding women's and men's travel patterns: The research challenge. In *Conference Proceedings 35: Research on Women's Issues in Transportation: Report of a Conference; Volume 1: Conference Overview and Plenary Papers (pp.7-28)*. Washington DC: Transportation Research Board of the National Academies.
- [24] Rosenbloom, S., & Plessis-Fraissard, M. (2010). Women's travel in developed and developing countries: Two versions of the same story? In *Conference Proceedings 46: Women's Issues in Transportation: Report of the 4th International Conference; Volume 1: Conference Summary and Plenary Papers (pp.63-77)*. Washington DC: Transportation Research Board of the National Academies.
- [25] Roy, A. (2010). Gender, poverty, gender and transportation in the developing world. In *Conference Proceedings 46: Women's Issues in Transportation: Report of the 4th International Conference; Volume 1: Conference Summary and Plenary Papers (pp.50-62)*. Washington DC: Transportation Research Board of the National Academies.
- [26] Susilo, Y., & Kitamura, R. (2008). Structural changes in commuters' daily travel: The case of auto and transit commuters in the Osaka Metropolitan Areas of Japan, 1980-2000. *Transportation Research Part A*, 42(1), 95-115.
- [27] Wachs, M. (2010). Women's travel issues: Creating knowledge, improving policy, and making change. In *Conference Proceedings 46: Women's Issues in Transportation: Report of the 4th International Conference; Volume 1: Conference Summary and Plenary Papers (pp.41-49)*. Washington DC: Transportation Research Board of the National Academies.
- [28] Wafa, E., Newmark, G., & Shiftan, Y. (2008). Gender and travel behavior in two Arab communities in Israel. *Transportation Research Record: Journal of the Transportation Research Board*, 2067, 75-83.