 https://doi.org/10.3311/PPtr.18761


**Periodica Polytechnica Transportation Engineering**, 51(1), pp. 40–48, 2023

# Exploring Commuting for Work in Kuala Lumpur

Haliza Mohd Zahari[1*], Nur Hidayah Azhar[2], Ariffin Ismail[2], Rogis Baker[2], Nur Surayya Mohd Saudi[2]

[1] HADR Research Center, National Defence University of Malaysia, 57000 Sungai Besi, Kuala Lumpur, Malaysia
[2] Faculty of Defence Studies and Management, National Defence University of Malaysia, 57000 Sungai Besi, Kuala Lumpur, Malaysia
[*] Corresponding author, e-mail: haliza.mz@upnm.edu.my

Received: 13 June 2022, Accepted: 01 September 2022, Published online: 23 September 2022

**Abstract**

Many workers face challenges in suburban areas when commuting to the urban areas from home to work. Public transportation is a fundamental component of efficient transportation in urban areas. Efficient transportation will increase economic opportunity, accessibility, and social development. This paper explored the characteristics of commuting behavior of the workers in the Klang Valley who commute to work in Kuala Lumpur, including their choice of transportation modes and the challenges they faced in traveling from home to work. This study engaged a mixed methodology where data were collected from 709 respondents voluntarily. The survey was initiated in December 2020 and lasted for six months. The respondents were approached through voluntary face-to-face and electronic means. Interviews were conducted with 14 key informants in April 2021 with workers from various backgrounds who commute to work every day. The interviews were done one-on-one. The result showed that the likelihood of choosing public transport over driving privately owned car was unfavorable where most individuals stated that the public transportation was insufficient; they had to take more than one modes to reach their workplace, and the facilities provided were insufficient for them to choose public transportation for commuting to work. These results shown that the urban workers in Kuala Lumpur preferred to drive to work rather than using public vehicles. This shows that Malaysians, especially in urban areas such as Kuala Lumpur, are not ready to adapt to SDG 11. Therefore, the government needs to create more initiatives to encourage the use of public transport.

**Keywords**

low-income group, public transportation, vehicle ownership, urban

## 1 Introduction

Following the need to achieve SDG 11, sustainable cities and communities, now is the perfect time to study the transportation needs of the working population in the city. There are various groups of workers in the city who are also influenced by the choice of their mode of transportation to go to work. These workers work in the city but live in the suburbs and require an efficient transportation system to go to work every day (Liu and Bardaka, 2021). Their inability to live in the city is caused by the scarcity of accommodation and the high cost of living.

Transportation services have now become a priority. With an inadequate transportation system, people may experience transportation disadvantages (Serulle and Cirillo, 2016; Shay et al., 2016). Many countries in the world have job opportunities mostly focusing on the central city areas. For instance, in Malaysia, Kuala Lumpur has been an administrative and commercial center since colonial times. Hence, many people from the rural areas migrated to Kuala Lumpur, which comprises the low-income groups, also known as B40, to find job opportunities in the urban area. These people were living in squatter settlements and when it was overcrowded, in 1990, the Kuala Lumpur City Hall has relocated them in the suburbs by offering them low-cost public housing (Agus, 1997). As the economy grows, the people flock there; since then, they have remained staying in this suburban area and travel to Kuala Lumpur for work (Abdullah, 2016). An interesting finding by Abdullah (2016) was that the urbanization of Kuala Lumpur has given a big impact on population growth in suburban areas. In 1990, the Klang Valley, which is a suburban area, recorded a population growth of 1,145,342 to 4,176,469 in 2000 and an increase to 7,996,830 in 2020. This shows that the increase of Kuala Lumpur's suburban areas has raised from 27.5% to 52.2%. The elasticity of demand in job opportunities has given an impact on the urbanization process and in turn pushed the lower

**Cite this article as:** Mohd Zahari, H., Azhar, N. H., Ismail, A., Baker, R., Mohd Saudi, N. S. (2023) "Exploring Commuting for Work in Kuala Lumpur", Periodica Polytechnica Transportation Engineering, 51(1), pp. 40–48. https://doi.org/10.3311/PPtr.18761

income group to live in the outskirts of the cities with more affordable accommodation (Abdullah, 2016; Oviedo et al., 2019). According to Poku-Boansi et al. (2020), this urbanization process has extended the poverty areas from the city to the suburban areas.

### 1.1 Job opportunities in the cities

Urbanization creates job opportunities for a better living (Aidar and Farlian, 2021). Economic growth and government policy promote employments in the cities (Gao et al., 2015). Large cities have more job opportunities since there are many social movements and commercial activities. However, there are arguments about whether or not low-skilled or skilled workers have more job opportunities in the cities. Gao et al. (2015) mentioned that low-skilled services such as catering and cleaning jobs are crucial in the city. In addition, Bacolod et al. (2007) discovered that skilled workers such as engineers and financiers as well as low-skilled workers such as taxi drivers and waiters are both equally important in the city. Besides, the Industrial Revolution 4.0 has changed employment opportunities (Maisiri et al., 2019) and redefined the skills needs, reshaped job demands, and introduced new job rewards. Therefore, urbanization did not only create professional jobs that shaped knowledge spillover, but also non-skilled jobs that further contributed to inner city poverty (Poku-Boansi et al., 2020).

Even though there are more job opportunities, whether skilled or low skilled jobs in the cities, with the option they have, people will seek the job that has easy accessibility; for instance, a job near to transportation system (Barboza et al., 2021; Bautista-Hernández, 2021; Liu and Bardaka, 2021). Research by Motte et al. (2016) showed that educated people live nearer to their working place and have more accessibilities and job opportunities. An efficient transportation system could assist people to move easily to work. However, transportation is more accessible in the urban areas including the city center but not in the rural areas where the route to the housing estate is very limited.

### 1.2 Transportation services to the cities

Transportation with environmentally friendly modes includes modes of public transportations such as buses, light rail, and commuter trains as well as other means, such as carpooling, cycling, and walking. Thus, the transportation sector must contribute to low-carbon cities and climate change. In Kuala Lumpur, there are varieties of transportation modes available at the city for travelers to choose from for balancing between time and money. There are public and private transportation options offered; the major transport modes are buses and Light Rail Transport (LRT). Public transportation is offered to give the priority to the group of people who cannot afford to have a vehicle (Liu and Bardaka, 2021). According to Barboza et al. (2021), people should be given access to transportation services in a reasonable time since the most crucial matter is to minimize travel time, especially to work. These transportation services are an advantage to those who live and work in the city because the transportation services and infrastructures are likely located in the city (Bautista-Hernández, 2021).

### 1.3 The low income traveling behavior

Although there are numerous modes of transportation available to get to work, not all of them are available in all residential areas. Thus, the location of the low income settlement areas must be first ascertained. In any urban area, housing in the city is often more expensive than that in the suburbs. This is caused by the fact that job opportunities are more accessible in the city besides the workplace that is nearer, making the rental higher with a housing purchase price that is more expensive and unaffordable (Bautista-Hernández, 2021; Liu and Bardaka, 2021). Therefore, most of the low income people will choose to live in suburban areas where the house rental is much more affordable with less expensive buying prices (Bautista-Hernández, 2021). Some people with poor families will opt to squat illegally near the city and thus do not have to pay for public transport to reach their workplace. Even though it is hard to commute to the city for work, many people would still prefer to work there even for low-cost labor jobs and informal sector since the salary offered and job availability are higher than those in the rural areas.

Next, the demand for work travel is predominantly based on household income and employment location. People may choose the distance between home and work. There is a tradeoff between work, time, and money in choosing transportation modes. Many low income people live in suburban areas where they have the choice to drive or use public transportation; nevertheless, they have to compromise between time and money. Driving to work may involve a more expensive traveling mode, but choosing public transportation will have to compromise with time as they must travel much further to reach their workplace. According to Bautista-Hernández (2021), this group of people generally suffers from location disadvantage and have to face the costly and long journey to work. However, in Malaysia, since public transportation has limited routes, people may

need to switch from one mode to another, which makes them not only compromise money but also time. This trend shows that the low income group spend a longer travel time to work. Since the public transportation offered has limited routes whereby taking any of these could not bring the individual to their workplace, they have to get used to various modes of public transportation, which becomes the primary choice. The government has built various transport infrastructures for the accessibilities and convenience of the people; for instance, more transit stations for easy switching between modes, parking lots for cars and motorcycles, and walking pathways. However, these infrastructures are insufficient, affecting mobility, especially for the low income group. On the other hand, some of the low income group are more likely to commute using their car since according to Bautista-Hernández (2021), driving to work reduces travel time.

## 2 Methodology

This study is an exploratory research that aims to explore the experience of the working population traveling from home to work and their traveling behavior. The previous study was more focused on the public transportation performance, which offers limited data on the working population that commute to work from suburban to urban areas and on their travel behavior. A mixed-method study was used in this research, where the Quantitative survey and Qualitative data were conducted in Klang Valley, Malaysia. This study only considered the respondents that commute to the workplace located in Kuala Lumpur from their home around the Klang Valley. The target respondents were from the low income group also known as the B40s.

## 3 Data collection

The study area (see Fig. 1), Klang Valley, is the most densely populated in Kuala Lumpur, which is also the capital of Malaysia. There are major commercial, premier business precincts and over 400 financial institutions covering 2,000 Small Medium Enterprises and business firms located here. Klang Valley's growth is mainly due to an increase in job opportunities in Kuala Lumpur. The assessment of travel behavior of the workers in Klang Valley was analyzed. A structured questionnaire was administered based on a non-probability sampling of 709 respondents voluntarily. The survey was initiated in December 2020 and lasted for six months. The respondents were approached through voluntary face-to-face and electronic means including e-mail and WhatsApp.

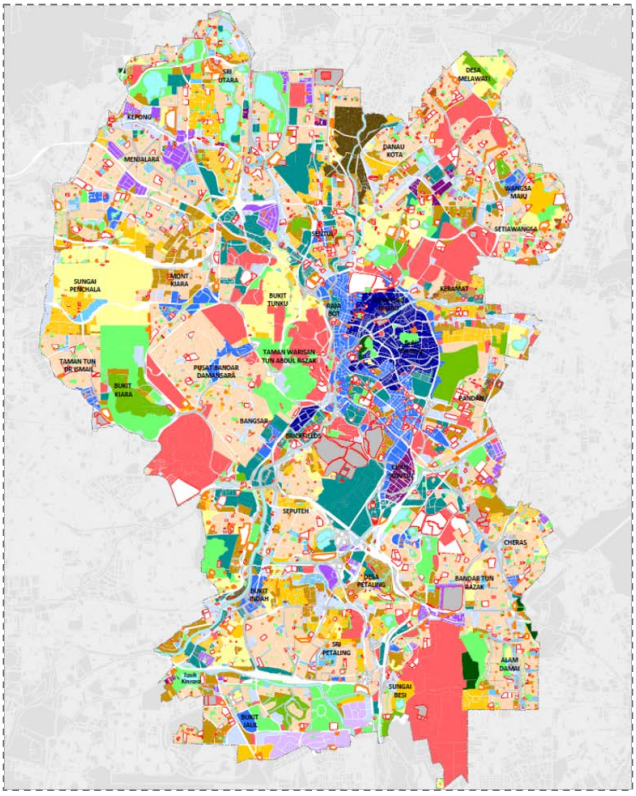

**Fig. 1** Study areas

The questionnaire design was based on an extensive literature review on urban working population travel behavior (Amponsah-Tawiah et al., 2016; Currie and Senbergs, 2007), commuting mode choice (Grison et al., 2015; Jia et al., 2018; Motte et al., 2016) and transportation services (Currie et al., 2010; Wey and Huang, 2018).

In addition, 14 key informant interviews were purposively conducted in April 2021 with the workers from various backgrounds who commute to work every day (see in Table 1). One-on-one interviews were preferred compared to Focused Group Discussion as different respondents had different experiences to be told. Therefore, it is more suitable to conduct a one-on-one interview. This method was also the most relevant and practical since many respondents would like to share their experiences and difficulties voluntarily. The respondents were encouraged to share their personal experiences freely. The interview was conducted using a recording device with the permission of the respondents. The interview questions asked were in the Malay language and contained the following questions:

1. Tell us your background.
2. Where do you live?
3. Where do you work?
4. What is your choice of transportation to work; public transportation, own car, or carpool?

**Table 1** Background of research participants

| Research Participants | Years Living in Kuala Lumpur | Work | Distance from home to work | Modes of transportation |
|---|---|---|---|---|
| Research Participant 1 | 23 years | Bank Teller | 14 kilometers | 1. Light Rail Transport |
| Research Participant 2 | 36 years | Clerk | 22 kilometers | 1. Car<br>2. Commuter<br>3.Grab service |
| Research Participant 3 | 44 years (since born) | General Worker | 29 kilometers | Car |
| Research Participant 4 | 15 years | Clerk | 12 kilometers | Car |
| Research Participant 5 | 12 years | Nurse | 9 kilometers | Van (pool) |
| Research Participant 6 | 18 years | Janitor | 7 kilometers | Van (pool) |
| Research Participant 7 | 12 years | Promoter | 12 kilometers | Car |
| Research Participant 8 | 22 years | Factory operator | 8 kilometers | Motorcycle |
| Research Participant 9 | 57 years (since born) | Guard | 25 kilometers | Car |
| Research Participant 10 | 38 years | Clerk | 11 kilometers | 1. Bus<br>2. Light Rail Transport |
| Research Participant 11 | 17 years | Teacher | 6 kilometers | Car |
| Research Participants 12 | 21 years | Hawker | 12 kilometers | Car |
| Research Participant 13 | 16 years | General Worker | 10 kilometers | Motorcycle |
| Research Participant 14 | 14 years | Clerk | 13 kilometers | 1. Commuter<br>2. Grab Service |

5. How efficient is the public transport from home to your workplace?
6. How many modes of transportation do you require to reach your workplace?
7. How many transits do you have to go through to reach your workplace?

The recording was then transcribed and categorized into themes. Following this, a thematic analysis was performed. Themes were analyzed according to the research participants' significant answers to the research questions.

## 4 Results and findings

### 4.1 Basic characteristics of respondents

The basic characteristics of the respondents are recorded in Table 2. The demographics were gathered to explore the basic characteristics socio-economics of the respondents.

As shown in Table 3, public transport was used by a higher percentage of women (67.2%) compared to men (32.8%). A chi-squared test of independence revealed that public transport was used significantly more often by females than males, $x^2$ (1, $N$ = 709) = 40.82, $p$ = 0.0001. Based on this, the results show that women are more attracted to use the public transport which supports the studies stating that there are growing trends in female labor force and a high dependence on public transport (Covault and Willeke, 2019). Even though many studies found that women feel unsafe to use public transport (Vanier and d'Arbois de Jubainville, 2017), fear of crime and sexual assault (Kash, 2019) however according to Kim (2021) the current services in public transportation are designed for the safety of female passengers. Even though women are prone to use public transport compared to men, however in this study the results show higher numbers for both men and women in using privately owned vehicle to work.

Results also revealed that public transport was used by a higher percentage of people of age group 21 years old-30 years old (54.0%) compared to other groups which are 20 years old and below (12.6%), 31 years old-40 years old (10.9%), 41 years old-50 years old (10.3%) and 51 years old and above (12.1%), $x^2$ (4, $N$ = 709) = 35.36, $p$ = 0.000. However, this result was dissimilar with studies in other countries for instant in Spain and Canada where the public transport was used more frequent by the middle aged between 35 to 44 years old (Abenoza et al., 2017). Based on these results many urban workers in Kuala Lumpur aged between 21–30 years used public transport especially transport that has many transit and requires punctuality. On the other hand, results also showed that people are likely to choose using privately owned vehicle to

drive to work especially the middle aged workers in Kuala Lumpur, they choose to drive to work for the reason that they have to take their children to school before continue driving to work (Borhan and Arsad, 2018).

The choice of vehicle to go to work depends on the offer of transportation services provided from home to work. Although transportation has been provided, users considered various other factors. For instance, periods,

**Table 2** Respondent's demographic profile

| Characteristic | | Frequency | Percentage |
|---|---|---|---|
| Gender | Male | 381 | 53.7 |
| | Female | 328 | 46.3 |
| | Total | 709 | 100.0 |
| Religion | Islam | 647 | 91.3 |
| | Hindu | 32 | 4.5 |
| | Buddhist | 23 | 3.2 |
| | Others | 7 | 1.0 |
| | Total | 709 | 100.0 |
| Age group | 20 years old and below | 41 | 5.8 |
| | 21 years old – 30 years old | 363 | 51.2 |
| | 31 years old – 40 years old | 151 | 21.3 |
| | 41 years old – 50 years old | 93 | 13.1 |
| | 51 years old and above | 61 | 8.6 |
| | Total | 709 | 100.0 |
| Employment status | Full time | 501 | 70.7 |
| | Part time | 78 | 11.0 |
| | Unemployed | 53 | 7.5 |
| | Retired | 16 | 2.3 |
| | Student | 61 | 8.6 |
| | Total | 709 | 100.0 |
| Marital status | Single | 347 | 48.9 |
| | Married | 337 | 47.5 |
| | Divorced | 25 | 3.5 |
| | Total | 709 | 100.0 |
| Highest education level | No formal education | 13 | 1.8 |
| | Primary school | 17 | 2.4 |
| | Secondary school | 205 | 28.9 |
| | Matric/Foundation/Diploma/STPM or equivalent | 221 | 31.2 |
| | Professional degree/Paper or equivalent | 208 | 29.3 |
| | Bachelor's degree, Doctor of Philosophy | 45 | 6.3 |
| | Total | 709 | 100.0 |
| Vehicle ownership | < 5 years | 357 | 50.4 |
| | 6 years–10 years | 190 | 26.8 |
| | > 11 years | 162 | 22.8 |
| | Total | 709 | 100.0 |
| Modes of transportation | Public transport | 174 | 24.5 |
| | Own vehicle | 509 | 71.8 |
| | Car pool | 26 | 3.7 |
| | Total | 709 | 100.0 |
| Distance travelled | < 10 km | 404 | 57.0 |
| | 11 km–20 km | 178 | 25.1 |
| | > 21 km | 127 | 17.9 |
| | Total | 709 | 100.0 |

Continuation of **Table 2**

| Characteristic | | Frequency | Percentage |
|---|---|---|---|
| Residential areas | Petaling | 72 | 10.2 |
| | Selayang | 51 | 7.2 |
| | Subang | 67 | 9.4 |
| | Klang | 62 | 8.7 |
| | Ampang | 86 | 12.1 |
| | Gombak | 80 | 11.3 |
| | Shah Alam | 74 | 10.4 |
| | Serdang | 87 | 12.3 |
| | Putrajaya | 72 | 10.2 |
| | Rawang | 58 | 8.2 |
| | Total | 709 | 100.0 |
| Household income group | B40s (< RM 4849) | 535 | 75.5 |
| | M40 (RM 4850 – RM 10959) | 157 | 22.1 |
| | T20(> RM 10961) | 17 | 2.4 |
| | Total | 709 | 100.0 |
| Working areas | Petaling | 72 | 10.2 |
| | Selayang | 51 | 7.2 |
| | Subang | 67 | 9.4 |
| | Klang | 62 | 8.7 |
| | Ampang | 86 | 12.1 |
| | Gombak | 80 | 11.3 |
| | Shah Alam | 74 | 10.4 |
| | Serdang | 87 | 12.3 |
| | Putrajaya | 72 | 10.2 |
| | Rawang | 58 | 8.2 |
| | Total | 709 | 100.0 |

**Table 3** Summary of respondents using public and travel by privately owned vehicle to work

| Characteristic | | Using public transport | Privately owned vehicle |
|---|---|---|---|
| Gender | Male | 57 | 324 |
| | Female | 117 | 211 |
| Age group | 20 years old and below | 22 | 19 |
| | 21 years old – 30 years old | 94 | 269 |
| | 31 years old – 40 years old | 19 | 132 |
| | 41 years old – 50 years old | 18 | 75 |
| | 51 years old and above | 21 | 40 |
| Household income group | B40s (< RM 4849) | 161 | 374 |
| | M40 (RM 4850-RM 10959) | 11 | 146 |
| | T20(> RM 10961) | 2 | 15 |
| Employment status | Full time | 97 | 404 |
| | Part time | 24 | 54 |
| | Unemployed | 20 | 33 |
| | Retired | 1 | 15 |
| | Student | 32 | 29 |
| Distance travelled | < 10 km | 123 | 281 |
| | 11 km–20 km | 40 | 138 |
| | > 21 km | 11 | 116 |

itineraries, and direct transportation services to destinations where few users were willing to use multiple modes of transportation to get to work.

"… I appreciate very much the public transportation provided by the government, however, to reach work, I have to take more than 1 mode of transportation because of the location of my job…since I work according to shift, my working hours are sometimes night and early in the morning, which differ from the public transportation schedule. Therefore, it is more convenient to drive to work even though it cost me a lot more, since I have to pay for the fuel and toll fee" said by Research Participant 9 (Fadzillah, 2021).

There are various public transport modes available, but it depends on the willingness of users to go out early in the morning to work. Not many users were willing to drive early in the morning when the traffic is heavy.

"… I have to get up very early in the morning, when I have to drive in a rush to the commuter station to ride the 6 a.m commuter. If I didn't get on the commuter, I will be late for the office. It takes me around 50 minutes to 1 hour to reach the Abdullah Hukum commuter station …. from there, I will have to take a grab car to my office" said by Research Participant 2 (Chan, 2021).

This research found that it is the choice of an individual to choose the mode of transportation. Some individuals have no choice but to drive in odd hours to work as there is no public transportation available at that time, which may involve fatigue and the risk of an accident.

Results on household income shows higher percentage of household income group B40 (< RM 4849) (92.5%) compared to M40 (RM 4850-RM 10959) (6.3%) and T20(> RM 10961) (1.1%). A chi-squared test of independence revealed that public transport was used significantly more often by people of household income group of B40 (< RM 4849) than M40 (RM 4850-RM 10959) and T20(> RM 10961), $x^2$ (2, $N$ = 709) = 36.472, $p$ = 0.000. Public transport was used by a higher percentage of people who travelled a distance < 10 km (70.7%) compared to those who travelled 11 km – 20 km (23.0%) and > 21 km (6.3%). A chi-squared test of independence revealed that public transport was used significantly more often by those who travelled a distance of < 10 km than 11 km – 20 km and > 21 km, $x^2$ (2, $N$ = 709) = 25.310, $p$ = 0.000. This result has also confirmed the study's results from the research conducted by (Jang et al., 2021) which indicate that the low income group are more dependent on the public transport but in the same time this low income group has also the highest percentage in driving privately owned vehicle to work which supported Liu and Bardaka (2021), Yang et al. (2018) who in their studies show that the low income group usually travels long distance to work. In Kuala Lumpur, the public transport typically is more efficient in the city center and suburban areas which are located less than 10 kilometers from Kuala Lumpur city center. The people of the low income group living further away travel to work using their own private vehicle since they have limited access to the public transport.

The traveling behavior for the individuals from home to work can be very complex where the way they react and the mode of transportation they choose can be influenced by many factors such as traffic congestion, public transportation availabilities, and parking space. Research participant 3 stated that she will use any apps that can help her to reach work on time even though she has to pay more for toll fees.

"…I travel every day to work. Sometimes we cannot predict how long it takes to be on the road. I have to reach work before 8 a.m. So, what I usually do is that I use Waze and make a plan on which route to choose. Sometimes I could not avoid taking toll-road, which I have to spend RM4.70 one way and the total spending for the toll is RM9.40 a day, which does not include fuel" said by Research Participant 3 (Mariani, 2021).

Furthermore, Research Participant 7 indicated that public transportation will not give her the freedom of stopover when she needs to detour or alter course.

"…I have been working as a promoter after given birth to my child. I don't get much from my salary, but I work to assist my low-income husband. Due to the high cost of living in Kuala Lumpur, both of us must work. I need to enroll my child in a nursery near my place of employment. As a result, I had to choose to drive to work because I had to make a stopover at the nursery, while my husband rides his motorcycle to work because it is more cost-effective" said by Research Participant 7 (Naqiyah, 2021).

The results show that the individuals who work in Kuala Lumpur are more keen to drive their own private vehicle to work. The researchers had the opportunity to get their opinion on what is the requirement in increasing public transportation usage. Most of the research participants state that the facilities provided for the public transportation user should be very attractive. People are more

interested to find out the benefits they could get from using public transportation.

"I worked at a bank in the KL city center. I ride LRT every day and the LRT stops near to my office where it is just a walking distance. However, the issue I face every day is to get space to park my car before taking the LRT to work. Even though I go there early, there is still no parking lot available to park my car, thus sometimes I just park my car on the side of the road, which will usually get me a parking penalty" said Research Participant 1 (Kamil, 2021).

"I choose to drive to work because I couldn't afford to pay the car park fees which keep on increasing every year. Before this, the parking fee was RM5 a day, then it increased to RM 8 a day and now it is RM 10 a day" said by Research Participant 4 (Sivalingam, 2021).

## 5 Conclusion

Insufficient public transportation will inhibit the mobility of the individual especially the low income group not only to go to work but also to search for a job. Limited access to transportation will restrict the job search area. Infrastructure investment and enhancement of transportation services by increasing the route and geographical area accessible will help the them in going to the workplace but also in increasing access to public services and facilities. In this study we demonstrate that the majority of individuals who participated in the survey and interview are more highly dependent on their own private car to work. Every individual has their reason in selecting the transportation to work. They have to choose the transportation mode not only through the consideration of time and budget but also other constraints. This study also has shown that some individuals choose to drive because they have to detour before reaching their final destination.

The trend also shows that the respondents tend to use their car to travel to work since the parking space was insufficient and fees imposed are high. Even though the transportation supply is offered, it has failed to fulfill the transportation demand. Therefore, it is suggested that the government, policymakers, and transportation planners discuss and make better decisions to cope with the commuting problems, especially in urban areas. They may plan for reshaping the current transportation system, which will offer less commuting time, low carbon emission, and reduced energy consumption. Having more efficient transportation will represent a better quality of life for the urban poor and give them more options and employment opportunities in Kuala Lumpur and will assist in supporting the SDG 11.

## Acknowledgement

This research is fully supported by the FRGS grant FRGS/1/2020/SS01/UPNM/02/1. The authors fully acknowledge the Ministry of Higher Education Malaysian and UPNM for the approved fund which makes this important research viable and effective.

## References

Abdullah, J. (2016) "The Suburbanisation of the Kuala Lumpur Metropolitan Region", Planning Malaysia Journal, 1(1), 7. https://doi.org/10.21837/pmjournal.v1.i1.38

Abenoza, R. F., Cats, O., Susilo, Y. O. (2017) "Travel satisfaction with public transport: Determinants, user classes, regional disparities and their evolution", Transportation Research Part A: Policy and Practice, 95, pp. 64–84. https://doi.org/10.1016/j.tra.2016.11.011

Agus, M. R. (1997) "The State and Urban Development in Malaysia", Journal of the Department of History, 5(5), pp. 147–167.

Aidar, N., Farlian, T. (2021) "An analysis of post-tsunami migration patterns amongst low-income women to the city of Banda Aceh", IOP Conference Series: Earth and Environmental Science, 630, 012027. https://doi.org/10.1088/1755-1315/630/1/012027

Amponsah-Tawiah, K., Annor, F., Arthur, B. G. (2016) "Linking commuting stress to job satisfaction and turnover intention: The mediating role of burnout", Journal of Workplace Behavioral Health, 31(2), pp. 104–123. https://doi.org/10.1080/15555240.2016.1159518

Bacolod, M., Blum, B. S., Strange, W. C. (2007) "Skills in the City", Journal of Urban Economics, 65(2), pp. 136–153.

Barboza, M. H. C., Carneiro, M. S., Falavigna, C., Luz, G., Orrico, R. (2021) "Balancing time: Using a new accessibility measure in Rio de Janeiro", Journal of Transport Geography, 90, 102924. https://doi.org/10.1016/j.jtrangeo.2020.102924

Bautista-Hernández, D. A. (2021) "The urban form and the social dimension of commuting in México City. An individual trip-level analysis", Transportation Research Interdisciplinary Perspectives, 10, 100346. https://doi.org/10.1016/j.trip.2021.100346

Borhan, N., Arsad, Z. (2018) "The Effects of Economic Factors on Tourism Demand for Malaysia: A Case of Asian and European Countries", International Academic Journal of Social Sciences, 5(2), pp. 32–45. https://doi.org/10.9756/iajss/v5i2/18100024

Chan, C. (2021) "Mode of Transportation", [Personal Communication], interviewed by Nur Hidayah Azhar, Apr. 21.

Covault, D. O., Willeke, G. E. (2019) "Framework For Using Social Indicators To Monitor, Evaluate, And Improve A Public Transportation System", International Journal of Gender Studies in Developing Societies, 3(2), pp. 24–36.

Currie, G., Senbergs, Z. (2007) "Exploring forced car ownership in metropolitan Melbourne", In: 30th Australasian Transport Research Forum, Melbourne, Australia, pp. 1–24.

Currie, G., Richardson, T., Smyth, P., Vella-Brodrick, D., Hine, J., Lucas, K., Stanley, J., Morris, J., Kinnear, R., Stanley, J. (2010) "Investigating links between transport disadvantage, social exclusion and well-being in Melbourne - Updated results", Research in Transportation Economics, 29(1), pp. 287–295. https://doi.org/10.1016/j.retrec.2010.07.036

Fadzillah, A. (2021) "Mode of Transportation", [Personal Communication], interviewed by Nur Hidayah Azhar, Apr. 23.

Gao, H., Lu, M., Sato, H. (2015) "Inclusive Urban Employment: How Does City Scale Affect Job Opportunities for Different People?", Asian Economic Papers, 14(2), pp. 98–128. https://doi.org/10.1162/ASEP_a_00352

Grison, E., Gyselinck, V., Burkhardt, J. M. (2015) "Exploring factors related to users' experience of public transport route choice: influence of context and users profiles", Cognition, Technology & Work, 18(2), pp. 287–301. https://doi.org/10.1007/s10111-015-0359-6

Jang, W., Yuan, F., Lopez, J. J. (2021) "Investigating Sustainable Commuting Patterns by Socio-Economic Factors", Sustainability, 13(4), 2180. https://doi.org/10.3390/su13042180

Jia, N., Li, L., Ling, S., Ma, S., Yao, W. (2018) "Influence of attitudinal and low-carbon factors on behavioral intention of commuting mode choice – A cross-city study in China", Transportation Research Part A: Policy and Practice, 111, pp. 108–118. https://doi.org/10.1016/j.tra.2018.03.010

Kamil, M. (2021) "Parking Demand", [Personal Communication], interviewed by Haliza Mohd Zahari, Apr. 21.

Kash, G. (2019) "Always on the defensive: The effects of transit sexual assault on travel behavior and experience in Colombia and Bolivia", Journal of Transport & Health, 13, pp. 234–246. https://doi.org/10.1016/j.jth.2019.04.004

Kim, H. (2021) "Service design for public transportation to address the issue of females' fear of crime", Transportation, 48(1), pp. 167–192. https://doi.org/10.1007/s11116-019-10043-5

Liu, C., Bardaka, E. (2021) "The suburbanization of poverty and changes in access to public transportation in the Triangle Region, NC", Journal of Transport Geography, 90, 102930. https://doi.org/10.1016/j.jtrangeo.2020.102930

Maisiri, W., Darwish, H., van Dyk, L. (2019) "An Investigation of Industry 4.0 Skills Requirements", The South African Journal of Industrial Engineering, 30(3), pp. 90–105. https://doi.org/10.7166/30-3-2230

Mariani, M. (2021) "Traveling Behaviour", [Personal Communication], interviewed by Haliza Mohd Zahari, Apr. 21.

Motte, B., Aguilera, A., Bonin, O., Nassi, C. D. (2016) "Commuting patterns in the metropolitan region of Rio de Janeiro. What differences between formal and informal jobs?", Journal of Transport Geography, 51, pp. 59–69. https://doi.org/10.1016/j.jtrangeo.2015.10.019

Naqiyah, N. (2021) "Traveling Behaviour", [Personal Communication], interviewed by Haliza Mohd Zahari, Apr. 23.

Oviedo, D., Scholl, L., Innao, M., Pedraza, L. (2019) "Do Bus Rapid Transit Systems Improve Accessibility to Job Opportunities for the Poor? The Case of Lima, Peru", Sustainability, 11(10), 2795. https://doi.org/10.3390/su11102795

Poku-Boansi, M., Amoako, C., Owusu-Ansah, J. K., Cobbinah, P. B. (2020) "The geography of urban poverty in Kumasi, Ghana", Habitat International, 103, 102220. https://doi.org/10.1016/j.habitatint.2020.102220

Serulle, N. U., Cirillo, C. (2016) "Transportation needs of low income population: a policy analysis for the washington D.C. metropolitan region", Public Transport, 8(1), pp. 103–123. https://doi.org/10.1007/s12469-015-0119-2

Shay, E., Combs, T. S., Findley, D., Kolosna, C., Madeley, M., Salvesen, D. (2016) "Identifying transportation disadvantage: Mixed-methods analysis combining GIS mapping with qualitative data", Transport Policy, 48, pp. 129–138. https://doi.org/10.1016/j.tranpol.2016.03.002

Sivalingam, T. (2021) "Parking Demand", [Personal Communication], interviewed by Haliza Mohd Zahari, Apr. 22.

Vanier, C., d'Arbois de Jubainville, H. (2017) "Feeling unsafe in public transportation: A profile analysis of female users in the Parisian region", Crime Prevention and Community Safety, 19(3), pp. 251–263. https://doi.org/10.1057/s41300-017-0030-7

Wey, W. M., Huang, J. Y. (2018) "Urban sustainable transportation planning strategies for livable City's quality of life", Habitat International, 82, pp. 9–27. https://doi.org/10.1016/j.habitatint.2018.10.002

Yang, Y., Wang, C., Liu, W., Zhou, P. (2018) "Understanding the determinants of travel mode choice of residents and its carbon mitigation potential", Energy Policy, 115, pp. 486–493. https://doi.org/10.1016/j.enpol.2018.01.033