

Impacts of COVID-19 on Travel Mode Preferences in Klang Valley

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ABSTRACT

Change in activity patterns and travel behaviour were seen worldwide as a response to the COVID-19 pandemic. This is mainly due to the restrictive measures imposed by the government and perception of own safety or commitment in reducing the spread of the disease. However, with or without the restrictive measures, people still have various needs to travel. Thus, this study was initiated to understand the changes in travel behaviour due to the COVID-19 pandemic. An online questionnaire survey, including questions related to purpose of travel, transport mode choice, distance and frequency of trip was conducted. Findings from this study revealed that there is a significant change in activity pattern and travel behaviour, before and during the COVID-19 pandemic. Based on the 460 responses received, it is known that mode shifts, from public transportation to private vehicles, occurred mainly due to pandemic related concerns. This study reveals that people perceived public transportation as a potential risk for exposure of the COVID-19 virus, while private vehicles, bicycles and walking are viewed as the safest mode of transport during the pandemic. Gender, age group, vehicle ownership, marital status and purpose of travelling had significant impact on the mode choice during the pandemic. Based on these findings, it is hoped that rail and bus transport service providers will be able to plan measures and further encourage the usage of the rail and bus transport services post-pandemic.

Keywords: COVID-19; pandemic; transportation; mode choice

INTRODUCTION

Private vehicles are essential and convenient for daily use. However, the increase in the number of vehicles on the road has led to several issues such as congestion, air and noise pollution as well as increase in number of road traffic crashes due to the increase of exposure and risk of being on the road. The increase of road traffic crashes over the years has become a burden to the country as it causes an increase of healthcare cost and may result in loss of human resources.

Previous studies have proven that public transportation is a safer mode of travel as compared to private vehicle. A 10-14% reduction in road traffic crashes can be expected in every 10% reduction in mileage travel (Litman and Fitzroy,

2011). According to Lalive et al. (2012), 15% reduction in road traffic crashes were recorded with the increase usage of rail services. Thus, to overcome these issues, the government has proposed and implemented several measures to encourage the usage of public transport.

The usage of rail and bus transport service in Klang Valley is as shown in Figure 1. Over the years, an upward trend in the usage of rail and bus transport service can be seen. However, a huge dip was observed as the government was forced to implement Movement Control Order (MCO) as a preventive measure in controlling the spread of the COVID-19 virus starting 18 March 2020. The implementation of MCO has not only affected the public transport service, but all services, causing less need to travel.

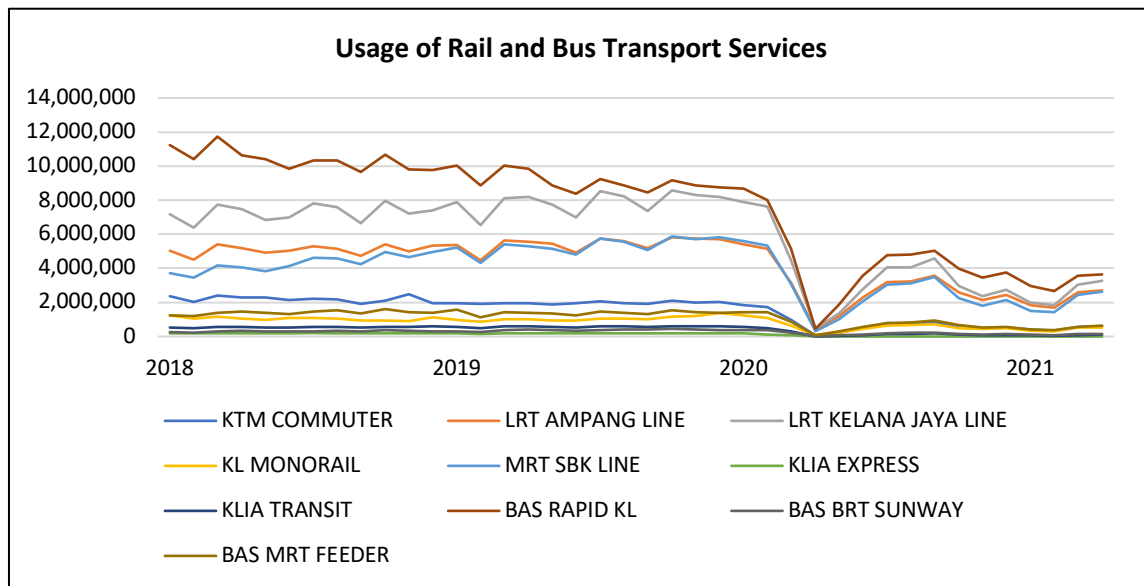


FIGURE 1. Usage Trend of Rail Service in Klang Valley
 Source: MOT rail ridership statistics, 2021

With the lift of the MCO by the government, movements were observed. The usage of public transportation began to increase. However, according to observations and studies conducted, it is revealed that the usage pattern of public transportation differed as compared to the usage pattern before the pandemic (as shown in Figure 1). Thus, to obtain feedback and gain further understanding on the choice of mode of transportation and the challenges faced by Malaysians when using public transportation, before and during the COVID-19 pandemic, this study was conducted by the Malaysian Institute of Road Safety Research (MIROS). Findings from this study will hopefully be beneficial to rail and bus transport service providers in planning measures to further encourage the usage of the rail and bus transport services in the future.

PREVIOUS STUDY

Mobility and interaction pattern contribute directly to the spread of infectious diseases, particularly during the pandemics (Yan et al. 2018, and Peixoto et al. 2020). A study by Epstein et al. (2007) revealed that travel restriction is less effective in controlling a disease outbreak but may delay the spread of the disease and help to flatten the curve. This finding is supported by Kraemer et al. (2020).

Thus, to further control the spread of the virus and to ‘flatten the curve’, various preventive measures, such as travel restriction during the pandemic have been imposed by the government in most countries, depending on the local governance and socio-economic condition (Peak et al.

2018; Muley et al.2020). According to Yilmazkuday, 2020 and Jones et al. 2020, limiting home-based work trips and shopping trips, limiting community contacts, and restricting international travel are effective mitigation in reducing the spread of viruses during the pandemic. However, these mitigations may also affect the health and well-being of people (De Vos, 2020). Thus, a balance is required when considering and determining the appropriate mitigation to be conducted.

Previous studies on the travel pattern during the pandemic revealed that people perceive higher risk for all trip types and fear of being infected by the virus during a pandemic (Cahyanto et al. 2016; Kim et al. 2017). According to the Google Mobility Data, a substantial decrease in the number of trips to all locations, except to parks, was observed in the European countries (Google, 2020). Thus, regardless the various needs to travel during the pandemic, people avoid travelling to places where they medium to high risk during the pandemic (Hotle et al. 2020). Different socio-demographic groups of different countries have reacted differently in terms of activity patterns and travel behaviour (Molloy et al. 2020; Beck & Hensher 2020; AlmlÖf et al. 2020).

A reduction in travel demand and use of public transportation is observed as many were reluctant to use public transport and were more willing to travel using private vehicles due to the spread of the COVID-19 virus (De Vos, 2020). Sadique et al. (2007) revealed that approximately 75% of the survey participants avoided using public transport during MERS. A similar trend was observed in most studies conducted during the COVID-19

pandemic. According to Mohammadian (2020), majority viewed public transit, taxis and ride-hailing services as a potential risk for exposure of the coronavirus, while private vehicles, bicycles and walking are viewed as the safest mode of transport during the pandemic. Yildirim et al. 2020, mentioned that avoidance in public transport usage was the most adopted preventive behaviour taken in Turkey during the COVID-19 pandemic. Kwok et al. (2020) revealed that 40% of respondents declared that they avoided using the public transport in Hong Kong during the early stages of COVID-19 pandemic. In another study by Bucsky, 2020, approximately 80% reduction on the demand for public transport was observed in Budapest, Hungary due to the spread of the COVID-19 virus.

METHODOLOGY

This paper aims to determine the relationship between socio-demographic characteristics with changes in mode of transport usage as well as frequency of travel before and during the Covid-19 pandemic among those who stayed in the Klang valley, through an online questionnaire survey. The online questionnaire survey was conducted from 5 December 2021 to 25 December 2021, capturing mode choice of transportation before and during the pandemic.

Each respondent was required to complete five main sections; demographic, public transportation usage, travel details, impact of COVID-19 towards travel pattern and factors affecting mode choice of transportation during the online questionnaire survey.

RESULTS AND DISCUSSION

SAMPLE CHARACTERISTICS

A total of 460 respondents were obtained from the online questionnaire survey, covering the population within Klang Valley. Details of the demographic information of the study sample is as summarized in Table 1.

TABLE 1. Demographic information of study sample

Item	Category	Percent
Gender	Male	39.1
	Female	60.9
Age	18-35	54.3
	36-55	41.3
	Greater than 55	4.3
Marital Status	Single	37
	Married	63
Employment	Public Service	56.5
	Private Service	41.3
	Retired	2.2
License ownership	Yes	95.7
	No	4.3
Vehicle ownership	Yes	95.7
	No	4.3

As the study was conducted through online questionnaire survey, the demographic of respondents may bias towards those who are more internet savvy. However, a 60-40 split between female and male respondents was achieved. Thus, the data obtained within this study is said to have a fairly balanced coverage.

EFFECT OF COVID-19 TOWARDS COMMUTING BEHAVIOUR

The current social distancing norm is said to have implications on daily travel patterns. As the COVID-19 virus may cause death, it is hypothesized that people, especially those with more health concerns (having history of known illness), will shift to private mode to reduce the risk of being infected by the COVID-19 virus when they travel. Findings from this study supported this hypothesis. Before the pandemic, 91% of the respondents used to travel using public transportation. However, as shown in Figure 2, 40.5% of the respondents no longer use public transportation and 26.2% respondents use public transportation at a lower rate during the pandemic, revealing that the commuting behaviour is highly affected by the pandemic. Though, it should be noted that 28.5% respondents declared that the COVID-19 pandemic did not affect their mode of choice. This finding is consistent to findings of previous studies conducted on this matter. According to De Vos (2020), a reduction in travel demand and use of public transportation is observed due to the spread of the COVID-19 virus.

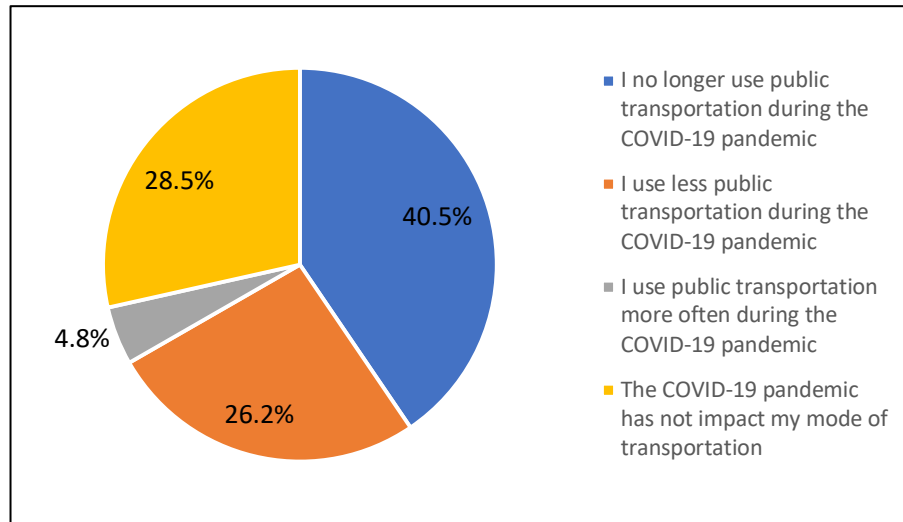


FIGURE 2. Commuting behaviour during the pandemic

Results from the online survey concluded that the mode choice of travel is significantly different before and during the pandemic. Gender, age group, marital status and purpose of travelling had significant impact on the mode choice during

the pandemic. Table 2 reveals the factors contributing to the shift of mode choice among respondents who no longer use public transportation during the pandemic.

TABLE 2. Factors shifting to private vehicles

	Gender		Age			Marital status		Purpose of travel	
	Male	Female	18-35	36-55	>55	Married	Single	Work	Leisure
Risk of being infected with COVID-19	4.43	4.50	4.44	4.50	4.50	4.50	4.33	4.42	4.60
SOPs are not being emphasized by the public transport operators	3.86	4.00	4.00	3.83	4.00	4.00	3.67	3.83	4.20
Long waiting time	4.00	4.10	4.00	4.33	3.50	4.00	4.33	4.08	4.00
No traffic jams due to MCO	3.71	3.00	3.22	3.50	3.00	3.14	4.00	3.42	3.00
No movement requirements due MCO	4.29	3.60	4.11	4.00	2.50	3.86	4.00	3.92	3.60
Threatened personal safety risks due to increased criminal activity	3.57	4.00	3.78	4.00	3.50	3.71	4.33	4.00	3.40
Worried other passengers not complying with the SOP	4.43	4.40	4.44	4.33	4.50	4.43	4.33	4.25	4.80

Data obtained from the online questionnaire survey revealed that female respondents, those who are above 36 years old, married and travelling for leisure purposes tend to shift to public transportation during the pandemic, due to the fear of being infected by the COVID-19 virus. During pre-COVID, women are reported travel more than men. However, a large drop in the number of travel activities among women compared to men were recorded during the pandemic (Bhaduri et al. 2020). Less travel was recorded as employers allowed to continue working from home and people preferred to shop online as compared to

shop physically eventhough the MCO was lifted by the government due to the fear of being infected (Hensher et al. 2021).

Based on previous studies, service provided, travel time, cost are concluded as the most influential factors encouraging people to shift their mode of transportation. According to Kaffashi et al. (2016), a person is said to change his mode choice of travel based on his travel time. A similar finding was revealed in this study. Besides than the fear of being infected by the COVID-19 virus, most respondents no longer used public transportation during the pandemic due to the long waiting time between trips.

FACTORS AFFECTING MODE OF CHOICE

Previous studies conducted showed that factors such as travel time and fare (Horowitz, 1993), as well as comfort and convenience (Morikawa et al. 2002) play an important role in selection of transportation mode used when there was no pandemic. However, due to the pandemic, this statement may no longer be valid. As summarized in Table 3, the selection of transportation mode used is highly affected by pandemic related concerns with the spread of the COVID-19 virus. Pandemic related concerns include the risk of being infected and compliance of SOP by other passengers as well as the public transport operator. This finding is similar to the findings revealed by Mohammadian (2020) and Beck and Hensher (2020). According to their study, majority viewed public transit, taxis and ride-hailing services as a potential risk for exposure of the COVID-19 virus, while private vehicles, bicycles and walking are viewed as the safest mode of transport. Thus, to further encourage the usage of public transportation during the pandemic, emphasis on SOP compliance should be given.

TABLE 3. Factors affecting less usage of public transportation during the pandemic

Worried other passengers not complying with the SOP	4.50
Risk of being infected with COVID-19	4.43
No movement requirements due MCO	3.89
Long waiting time	3.86
SOPs are not being emphasized by the public transport operators	3.79
Threatened personal safety risks due to increased criminal activity	3.57
No traffic jams due to MCO	3.46

However, for some, as shown in Table 4, regardless of the pandemic or not, convenience is an essential factor in selecting transportation mode among the respondents. Being hassle free in terms of parking issues and route to use is the main factor encouraging the use of public transportation. This is then followed by the cheap fare price and clean and comfortable facilities provided by the public transport operator.

TABLE 4. Factors encouraging usage of public transportation

No need to think about parking issues and which route to use	4.36
Cheap fare	3.86
Facilities provided are clean and comfortable	3.79
SOPs are complied well	3.29
Short travel time	3.21
No other mode of transport	2.86

SHIFTING TO PUBLIC TRANSPORTATION

68% reduction on public transportation usage during the pandemic was reported based on the online questionnaire survey. This is mainly due to the fear of being infected by the COVID-19 virus. Thus, although the movement control order has been removed by the government, a larger reduction can be expected if no action is taken to reduce the risk perception on the spread of the COVID-19 virus.

CONCLUSION

The Movement Control Order imposed by the government to control the spread of the COVID-19 virus and fear of being infected by the virus has mainly affected the travel behaviour and preferences of people during the pandemic. Less movement was observed, and travels were only made due to the necessity to work and buy groceries. People tend to avoid large crowds thus, an increase use of private vehicles and a drastic drop in public transportation was recorded, especially during the early days of the pandemic.

To most, general factors, such as cheap fare, clean and comfortable facilities provided by the public transport operator, that usually affect the mode choice during pre-pandemic became less important during the pandemic. High emphasis on pandemic related issues such SOP compliance and risk of being infected was of concern when choosing the mode of travel.

Thus, to ensure continuity in public transportation services and increase the usage of public transportation, strategies should be adopted according to the pandemic needs. For example, encouraging contactless payment methods, providing sanitizing facilities and fining those who fail to wear a face mask will reduce the perceived risk of infection among passengers. And as social distancing among passengers may cause additional delays due to the reduced number of the maximum passengers, increase in number of trips may encourage public transportation usage.

In conclusion, attitude, understanding, and perception affect travel decisions and mode choice during the pandemic.

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DECLARATION OF COMPETING INTEREST

None

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