ACCESSIBILITY TO WORKPLACE AND HOUSING LOCATION CHOICE AMONG THE LOW-INCOME GROUP: A CASE STUDY OF PULAU PINANG, MALAYSIA

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Abstract

When deciding where to reside, households must consider several factors of accessibility, including proximity to their workplace and other aspects of accessibility that are necessary for their family. This study aims to examine job accessibility, evaluate the extent of accessibility, and identify the specific type of accessibility that low-income groups prioritise when choosing where they want to reside. A total of 306 respondents from the Pulau Pinang eKasih list for 2016 were chosen to participate in the survey using the quantitative approach. The study established a correlation between the availability of career opportunities and the decision-making process involved in selecting a residential area. In addition, the accessibility to the city centre and supermarkets are identified as significant variables in determining the choice of home site. Nevertheless, the degree of accessibility on the island part of Pulau Pinang is not consistent. The southwest district has a lower level of accessibility to the city centre and supermarkets in comparison to the northeast district. The authorities should formulate a strategy to attain a balanced and harmonic state between housing growth and the average distance to job locations, city centres, and supermarkets. By strategically planning home building in appropriate locations, the quality of life, especially for low-income households, would be improved.

Keywords: Accessibility; Low-income households; Housing location choice

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INTRODUCTION

High-quality transport and road infrastructure are essential factors to consider when choosing a place to reside. The purpose of these elements is to facilitate access to a wide range of amenities and services, including jobs. The primary determinant of a location's competitive edge over others is the level of accessibility provided by its transport infrastructure (Vulevic, 2016). Hence, selecting a place that offers a high degree of accessibility, particularly in terms of job opportunities, is the optimal choice for residence.

Every household aspires to find the optimal area to reside in. Nevertheless, certain individuals, particularly those in low-income households, have limitations due to financial restraints. Low-cost housing is available for low-income groups; nevertheless, the development of such housing is severely restricted due to the continuously increasing costs. Furthermore, acquiring bank loans for developers to construct affordable housing and for purchasers to purchase such homes is notably arduous (Mohd Daud et al., 2023). Individuals experiencing poverty face multiple obstacles, including restricted access to education, healthcare, housing, and employment prospects (Sulaiman et al., 2023). Meanwhile, they require a residential area that provides optimal employment accessibility in order to have the chance to enhance their households' socio-economic status. In addition, they require a location that provides convenient access to essential amenities such as supermarkets, food establishments, healthcare facilities, educational institutions, and other vital requirements. Hence, accessibility is a highly significant attribute that the majority of households prioritise when selecting residential areas.

There is a scarcity of contemporary research on the determinants of housing site choice with regard to accessibility among low-income individuals in developing nations, particularly in urban areas that require enhancing their public transportation infrastructure. Hence, further research is required to broaden the scope of studies addressing this matter. Therefore, his study aims to investigate the locations of residential and workplaces among respondents in order to quantify their job accessibility. Next, this study will analyse the distance between their residence and various forms of accessibility. Ultimately, this study aims to determine the particular type of accessibility that low-income groups prefer when selecting the location of their residence.

LITERATURE REVIEW
Housing Location and Accessibility

The selection of a housing location is influenced not only by the household's financial capacity but also by the geographical and spatial conditions of a specific residential neighbourhood (Wee & Cao, 2020). Urban dwellers typically opt for residential neighbourhoods in suburban locales that boast favourable

neighbourhood attributes. They commonly use public transportation, like commuters, to facilitate mobility (Jones Lang Lasalle IP Ins., 2020). In their study, Larsson et al. (2022) discovered that the level of accessibility to everyday amenities is influenced by various transportation modes and types of settlement. They observed that cars offer high accessibility to both urban and suburban residents, while bicycles offer limited accessibility to residents living outside urban areas. Contrarily, Zhang et al. (2020) discovered that the proximity of housing to shopping malls had a noteworthy and favourable influence on housing values. However, the extent of this impact varied depending on the specific characteristics of the shopping mall and the metropolitan region. Evidently, accessibility is a crucial determinant when selecting the location of a house.

Furthermore, the geographical location of a housing unit is a crucial factor as it directly impacts both the financial implications and the overall well-being of its occupants. However, some households are ready to compromise on factors such as distance, commuting time, and access to facilities and services in order to get a more affordable dwelling (Khazanah Research Institute, 2019). Regardless of the housing features they are sacrificing for an affordable and high-quality home, the location of the housing is crucial in determining the level of accessibility. This refers to how easily a household can access the opportunities, goods, and services required. The performance of a city's economy and environment is optimised when the city is well-connected to all accessible locations through efficient transportation options that are easily accessible to its community (Saif et al., 2019). Hence, it is crucial to prioritise enhancing the efficiency of mobility to optimise accessibility levels in spatial planning and policy across all nations (Kompil et al., 2019).

RESEARCH METHODOLOGY
Primary Data Collection
This study was a quantitative study that focused on gathering primary data by adopting a questionnaire as its primary tool. A total of 306 respondents from the low-income demographic in Pulau Pinang, specifically the northeast and southwest regions of Malaysia, participated in the survey. The participants were specifically selected from Pulau Pinang's eKasih list for 2016. eKasih is a national poverty data bank that was created to compile comprehensive information on the impoverished population residing in both rural and urban regions across the nation. Therefore, it empowers the Malaysian government to devise and execute strategic poverty initiatives for the intended demographic efficiently. Based on the secondary data, the population size of the low-income group in the northeast and southwest districts of Penang is 1546 households. This figure is significantly large for this investigation. Thus, the sample size was adjusted to a suitable ratio to represent the real population

precisely, enabling the successful implementation of this study. The Morgan table (Table 1) was consulted for guidance in this process. According to the Morgan table, the appropriate sample size to represent the population accurately is 306 respondents.

Table 1: Krejcie and Morgan Table
Source: Krejcie & Morgan, 1970 in KENPRO, 2012

Population	Sample
1400	302
1500	306
1600	310
1700	313

Study Area

The study was carried out in the island region of Pulau Pinang state, Malaysia, specifically focusing on the districts located in the northeast and southwest areas of the state. This state encompasses an island and the adjacent land area on the mainland. The northeast district of this state includes the urban area and functions as the administrative hub for the state, hosting its capital city. The main commercial hub is also located within this district. On the other hand, the southwest district includes both urban and suburban areas, which have a notable number of vacant spaces that provide many possibilities for various spatial activities. Nevertheless, the district in issue is geographically separated from the northeast region because of a high ridge traversing the middle of the island.
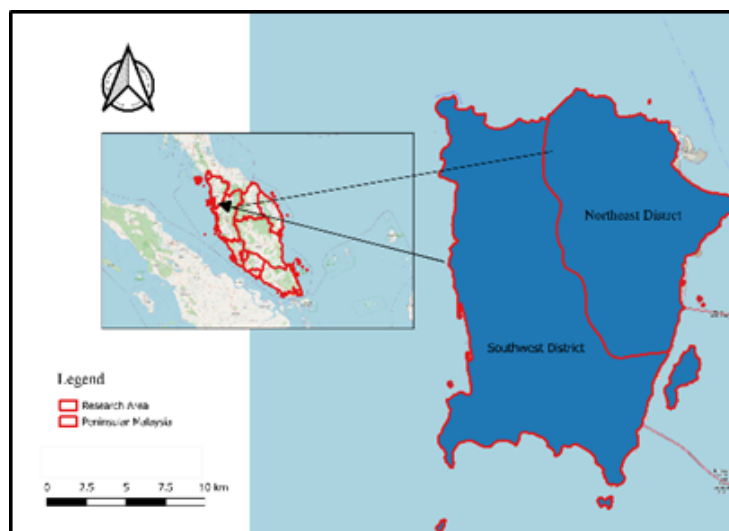

Figure 1: Study Area

FINDINGS AND DISCUSSION

Primarily, the statistical analysis in this study predominantly utilised descriptive statistics analysis, cross-tabulation, and chi-square tests. The chi-square test was employed to determine the statistically significant preferred types of accessibility.

Initially, from the data analysed, the demographic profile of the respondents is shown in Table 2. In this study, the majority of the respondents are Malay. Overall, most of the respondents are working in the manufacturing and services sectors. Based on the projected data, 37.58% of the respondents from the northeast district and 54.25% from the southwest district earn their households' monthly income of less than RM2,500.00. These figures indicate that the majority of the low-income group is facing financial burden. With such low income, they need to cater to the high cost of living on Penang Island, which keeps rising and becoming very expensive, including food, transportation, petrol, and other daily essentials. In addition, the figure also approaches the national poverty line of monthly household income of RM2,208.00 (World Bank, 2023).

Table 2: Demographic Characteristics of the Respondents

Demographic Characteristics	Northeast District		Southwest District	
Ethnicity	**Total**	**Percentage (%)**	**Total**	**Percentage (%)**
Malay	109	35.62	147	48.04
Chinese	8	2.61	7	2.29
Indian	13	4.25	22	7.19
Job	**Total**	**Percentage (%)**	**Total**	**Percentage (%)**
Manufacturing sector	46	15.03	91	29.74
Services sector	77	25.16	76	24.84
Other sectors	7	2.28	9	2.95
Household Income	**Total**	**Percentage (%)**	**Total**	**Percentage (%)**
Less than RM2,500	115	37.58	166	54.25
RM2,500-RM3,169	13	4.25	8	2.62
RM3,170-RM3969	2	0.65	2	0.65

The accessibility of jobs is intricately linked to the transportation system and the progress in the land use domain (Tao et al., 2020). There is a growing recognition of the significance of examining the connection between transport modes and the characteristics of urban neighbourhoods (Zheng et al., 2021). The Malaysian National Housing Strategy (2018-2025) prioritises accessibility and transportation in order to create a more comprehensive housing

strategy that promotes the development of high-quality homes and improves quality of life. Hence, the accessibility of job opportunities in close proximity to the residential area is considered a crucial factor when selecting a place of residence for a household. Hence, this study examined the significance of the distance between home and office as a factor influencing the residential site choices of respondents in both the northeast and the southwest districts.

Table 3 presents the cross-tabulation of the city where the respondent works and the distance between their house and workplace. Specifically, based on the statistics, the Bayan Lepas area has the highest number of workers among the 70 respondents (22.88%), while the Georgetown area has the second highest number with 51 respondents (16.67%). Typically, most respondents in these two-job settings commute from their homes to their workplaces, covering a distance of 1 to 15 kilometres.

Table 3: The City of the Respondents' Workplace Locations

City of the Respondents' Workplace	1-15km	16-30km	31-45km	46-60km	Number of Respondents
Air Itam	3	2	1	0	6
Balik Pulau	12	6	4	0	22
Batu Maung	1	10	2	0	13
Batu Uban	1	4	0	0	5
Bayan Baru	14	17	1	2	34
Bayan Lepas	30	29	6	5	70
Bukit Jambul	3	6	0	0	9
Gelugor	10	4	0	0	14
Georgetown	22	16	12	1	51
Jelutong	16	5	2	1	24
Gurney	3	3	0	2	8
Padang Kota	3	3	1	0	7
Paya Terubong	2	3	0	0	5
Sungai Ara	1	1	0	0	2
Sungai Dua	4	1	0	1	6
Sungai Nibong	5	3	1	1	10
Taman Tun Sardon	1	2	0	0	3

City of the Respondents' Workplace	1-15km	16-30km	31-45km	46-60km	Number of Respondents
Tanjung Bungah	2	1	0	0	3
Tanjung Tokong	2	4	0	0	6
Teluk Bahang	0	2	0	0	2
Teluk Kumbar	2	3	1	0	6
Total	137	125	31	13	306

The daily routine and spatial arrangement of activities are influenced by work schedules and workplace location (Cerda, 2009). Hence, policymakers and scholars view decreasing the distance between one's residence and workplace as a means of endorsing and promoting a particular policy (Celhay & Gil, 2020). This study acknowledges the significance of distance in influencing commuting patterns to the workplace on a daily basis. Additionally, it investigates the relationship between the distance separating the respondents' homes and workplaces, recognising it as a crucial factor in understanding the mobility patterns of the respondents.

The distance between the respondents' houses and workplaces can be categorised into four ranges: 1 to 15 km, 16 to 30 km, 31 to 45 km, and 46 to 60 km (refer to Figure 2). According to Figure 2, 44.80% of the respondents commute from home to work daily, covering a distance of 1 to 15 km. Furthermore, a significant proportion of the participants, specifically 40.80%, travel a distance of 16 to 30 kilometres to reach their workplace. Merely 10.10% and 4.20% of the respondents commute to their workplaces within a range of 31 to 45 kilometres and 46 to 60 km, respectively. Given these circumstances, it may be inferred that the majority of participants opted for a residential area within a 30km radius of their workplace.
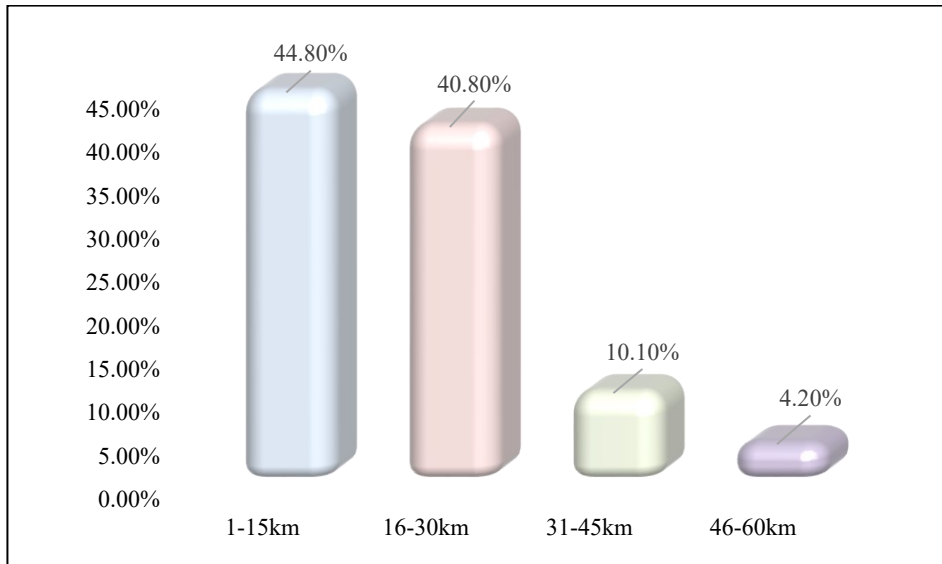
Figure 2: Distance Between the Respondent's House and Workplace

In addition, the chi-square test was used to examine the association between the distance from the respondent's home to their office and the location of their residence. The results of this analysis are illustrated in Table 4. The calculated value is statistically significant at 0.05, as it is smaller than the alpha level. This demonstrates the correlation between the variables. The minimal expected value, which is 5.52 and above 5, indicates a significant correlation between the two variables under examination.

Given that both criteria are satisfied, it may be inferred that a valid correlation exists between the distance separating one's residence and workplace and the specific residential area where the respondent resides. Hence, the correlation between the two factors is also a significant element considered by respondents when choosing a home location. This conclusion is validated by a study conducted by Hu and Wang (2017), who investigated the impact of job accessibility on the housing preferences of low-income individuals in the Chicago metropolitan region. The study's findings revealed that the availability of job opportunities significantly impacts the choice of residential areas. Tomasiello et al.'s (2020) study discovered a notable correlation between the geographical distribution of houses belonging to various socio-economic groups and their proximity to job prospects.

Table 4: Chi-Square Test of the Distance of Respondent's Home to Workplace

Chi-square Test	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	44.521[a]	3	0.000
Likelihood Ratio	46.710	3	0.000
Linear-by-Linear Association	6.648	1	0.010
N of Valid Cases	306		
a. 0 cells (.0%) have an expected count of less than 5. The minimum expected count is 5.52.			

This study evaluated various types of accessibility that are typically considered when selecting a location to reside. In order to identify the preferred types of accessibility, the Pearson chi-square analysis was conducted, as shown in Table 5. The results obtained indicate that only accessibility to the city centre and accessibility to supermarkets are significant, with a value $p<0.005$, and the minimum expected count is greater than 5. This means that these two types of accessibility are the most preferred by the low-income group in choosing their housing location. In their study conducted in Slovenia, Ferlan et al. (2017) found that the price of housing is directly related to the proximity of the housing location to the city centre. This means that the closer a housing location is to the city centre, the higher the price one must spend to reside there. Their findings corroborated the results of this study by highlighting the significance of proximity to the city centre. However, Dai and Wang (2011) conducted a study in Southwest Mississippi to analyse the correlation between spatial access to food resource stores, such as supermarkets, and non-spatial factors. Their objective was to investigate potential strategies for addressing the issue of unequal access to food resources in the region. The study revealed that the majority of low-income neighbourhoods in the city exhibited a substantial degree of accessibility to food outlets, primarily attributable to favourable urban mobility. Nevertheless, in many suburban areas inhabited by economically disadvantaged individuals who lack personal transportation, the availability of grocery stores is limited (Dai & Wang, 2011). Their findings confirmed the results of this study, which emphasised the significance of convenient access to supermarkets. The reason accessibility to supermarkets is a determining factor in home location choice is due to its role as a food resource establishment.

Table 5: Pearson Chi-Square of Accessibility Preferred in Housing Location Choice

Types of Accessibility	Asymptotic Significance (2-sided)	Minimum Expected Count
1. Accessibility to city centre	0.000	19.12
2. Accessibility to supermarkets	0.000	8.5
3. Accessibility to public transport	0.006	1.27
4. Accessibility to health facilities	0.018	0.42
5. Accessibility to community facilities	0.000	1.7

Moreover, based on the analytical data, it is evident that convenient access to the city centre and proximity to supermarkets are crucial considerations in selecting a residential area. In addition, this study ascertained the distance between the residential locations of the respondents, the city centre, and the nearest supermarkets (refer to Table 6). Concerning the proximity of their residences to the city centre, 19.28% of the respondents residing in the northeast district live within a range of 6.0 to 10.0 km from the city centre. Meanwhile, 25.82% of the respondents in the southwest district live 20.0 to 30.0 km from the city centre, making them the majority. The respondents in the southwest district are a considerable distance from the city centre and require efficient transportation to reach the necessary facilities and services.

Furthermore, this study examined the proximity of respondents' residences to supermarkets, as it demonstrated that the ease of access to supermarkets is a significant determinant in the decision-making process for selecting a residential location. The study establishes that 22.55% of the participants residing in the northeast district are located within a distance of 0.5 to 5.0 km from the nearest supermarkets. However, a substantial portion (23.20%) of the respondents who live in the southwest district have to travel a distance of 11.0 to 20.0 km from their homes to reach the nearest supermarkets.

PLANMalaysia recommends that administrative centres, city centres, shopping centres, and supermarkets be located at a maximum distance of 1.6 km from residential areas. However, the findings indicate that the northeast district exhibits a high degree of accessibility to both the city centre and supermarkets. Evidently, a majority of the respondents residing in the northeast district have convenient access to supermarkets within a 5.0 km radius. On the contrary, the southwest area likely has a lower level of accessibility to the city centre and supermarkets, as the bulk of its residents live more than 10.0 kilometres away from these locations.

Table 6: Distance from Home to City Centre and Supermarkets

Distance from Home to City Centre	(0.5-5.0) km	(6.0-10.0) km	(11.0-20.0) km	(20.0-30.0) km
Northeast	13.07%	19.28%	8.17%	1.96%
Southwest	1.63%	8.50%	21.57%	25.82%
Distance from Home to Supermarkets	**(0.5-5.0) km**	**(6.0-10.0) km**	**(11.0-20.0) km**	**(20.0-30.0) km**
Northeast	22.55%	15.69%	3.27%	0.98%
Southwest	10.46%	18.03%	23.20%	5.56%

CONCLUSION

The study demonstrates a correlation between job accessibility and the decision-making process in choosing a home location. Additionally, the study's findings reveal that the respondents prioritise two forms of accessibility when selecting a residential location: proximity to the city centre and availability of supermarkets. However, a comparison of respondents' dwellings in the northeast district and southwest district reveals that the northeast district has a higher level of accessibility to the city centre and supermarkets compared to the southwest area. The authorities should devise a strategy to achieve a harmonious equilibrium between housing development and the average proximity to work sites, city centres, and supermarkets. This would ensure that housing development is strategically planned in optimal places, thereby enhancing the quality of life, particularly for low-income households. If there are constraints on building housing in optimal locations, a comprehensive and efficient public transport system that covers a broader network, including low-income residential areas, can be an excellent solution to enhance access to employment centres, city centres, and supermarkets.

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REFERENCES

Ao, Y., Yang, D., Chen, C., & Wang, Y. (2019). Effects of rural built environment on travel-related CO2 emissions considering travel attitudes. *Transportation Research Part D 73*, 187-204. https://doi.org/10.1016/j.trd.2019.07.004.

Celhay, P., & Gil, D. (2020). The function and credibility of urban slums: evidence on informal settlements and affordable housing in Chile. Cities, 99, 102605, https://doi.org/10.1016/j.cities.2020.102605.

Cerdá, A., 2009. Accessibility: A Performance Measure for Land-use and Transportation Planning in the Montréal Metropolitan Region. Supervised Research Project Report. School of Urban Planning, McGill University, Montreal.

Dai, D., & Wang, F. (2011). Geographic disparities in accessibility to food stores in Southwest Mississippi. Environment and Planning B: Planning and Design, 38(4), 659-677. https://doi.org/10.1068/b36149.

Duncan, M. (2011). The cost-saving potential of carsharing in a US context. *Transportation, 38(2),* 363-382.

Embong, A. R. (2011). Pembandaran dan kehidupan bandar di Semenanjung Malaysia. *Akademika, 81(2)*, 23-39.

Ferlan, N., Bastic, M., & Psunder, I. (2017). Influential factors on the market value of residential properties. Inzinerine Ekonomika-Engineering Economics, 28(2), 135–144. http://dx.doi.org/10.5755/j01.ee.28.2.13777.

Grajeda, E., & Ward, P. (2011). Inheritance and succession in informal settlements of Latin American cities: a Mexican case study. *Latin America Research Review*, 139-162.

Grandboulevard Initiative. (2013). *Jobs-Housing Balance and Fit*. Retrieved from Grandboulevard Initiative: People Friendly Places: https://grandboulevard.net/housing/jobs-housing-balance-and-fit. Accessed on 23rd February 2023

Hu, L., & Wang, L. (2017). Housing location choices of the poor: Does access to jobs matter? Housing Studies, 34(10), 1721-1745.

Jones Lang Lasalle IP Inc. (2020, Julai 31). *Housing needs and resident preferences across Europe during Covid-19.* https://residential.jll.co.uk/insights/research/housing-needs-and-resident-preferences-across-europe-during-covid-19

Khazanah Research Institute. (2019). *Agenda perumahan: peranan kerajaan, pasaran dan masyarakat; sebuah laporan khas bagi penggubalan dasar perumahan negara (2018-2025), Malaysia.* Institut Penyelidikan Khazanah.

Kompil, M., Jacobs-Crisioni, C., Dijkstra, L., & Lavalle, C. (2019). Mapping accessibility to generic services in Europe: A market-potential based approach. *Sustainable Cities and Society, 47*(2019), 101372, https://doi.org/10.1016/ j.scs.2018.11.047.

Larsson, A., Ellder, E., Vafeiadis, E., Curtis, C., & Steiner, A. (2022). Exploring the potential for sustainable accessibility across settlement types: a Swedish case. *Transportation Research Part D 107,* 103297. https://doi.org/10.1016/j.trd.2022.103297.

Lee, C. (2020). Metropolitan sprawl measurement and its impacts on commuting trips and road emissions. *Transportation Research Part D 82*, 102329. https://doi.org/10.1016/j.trd.2020.102329.

Ling, Oliver & Mansor, Nurul & Mohamed Musthafa, Siti. (2016). The housing preference of young people in Malaysian urban areas: A case study Subang Jaya, Selangor. *Malaysian Journal of Society and Space, 12.* 60-74.

Lu, J., Li, H., & Xu, M. (2022). Does haze aggravate urban sprawl? *Habitat International 130*, 102709. https://doi.org/10.1016/j.habitatint.2022.102709.

McGee, T. (2013). 9 The Emergence of Desakota Regions in Asia: Expanding a Hypothesis. In N. Brenner (Ed.), Implosions /Explosions: *Towards a Study of*

Planetary Urbanization (pp. 121-137). Berlin, Boston: JOVIS Verlag GmbH. https://doi.org/10.1515/9783868598933-010

Mohd Daud, M., Rosly, S., & Muhammad Sori, Z. (2023). Determinants of investment to attract investment in affordable housing projects in Malaysia. Planning Malaysia: Journal of the Malaysian Institute of Planners, Volume 21, Issue 6, 297-312.

Mok, O. (2016). Massive projects in place to alleviate urbanisation in Penang. https://www.malaymail.com/news/malaysia/2016/10/29/massive-projects-in-place-to-alleviate-urbanisation-in-penang/1238453. Accessed on 14th December 2021.

Morris, E., Blumenberg, E., & Guerra, E. (2020). Does lacking a car put the brakes on activity participation? Private vehicle access and access to opportunities among low-income adults. *Transportation Research Part A 136,* 375-397. DOI: https://doi.org/10.1016 /j.tra. 2020.03.021.

Padawangi, R. (2018). *Routledge handbook of urbanisation in Southeast Asia*. Abingdon: Routledge Handbooks Online. Accessed on 28th February 2023.

Peng, X., Chen, X., & Cheng, Y. (2018). Urbanisation and Its Consequences. *Demography, Vol. II,* 1-16.

Piorr, A., Ravetz, J., & Tosics, I. (2011). Peri-urbanisation in Europe.

PLANMalaysia. (2013). Community facility planning guidelines. Kementerian Kesejahteraan Bandar, Perumahan dan Kerajaan Tempatan.

Rostam, K., Rosul, M., Choy, E., Nor, A., Sakawi, Z., Hashim, N., & Muhammad, A. (2010). Pembandaran dan rebakan bandar di pinggir wilayah metropolitan Klang-Langat. *Malaysian Journal of Society and Space, 6(2)*, 37-50.

Saif, M. A., Zefreh, M. M., & Torok, A. (2018). Public transport accessibility: A literature review. *Periodica Polytechnica Transportation Engineering,* 1-8.

Sulaiman, S., Abu Bakar, N., Tun Ismail, W., Mohd Pauzi, H., & Tuan Sembok, T. (2023). Poverty and well-being: The subjective well-being status of poor children in Kuala Lumpur, Malaysia. Planning Malaysia: Journal of the Malaysian Institute of Planners, Volume 21, Issue 6, 266-281.

Tao, S., He, S., Ettema, D., & Luo, S. (2022). The role of transit accessibility in influencing the activity space and non-work activity participation of different income groups. Journal of Transport and Land Use 15(1), 375-398. http://dx.doi.org/10.5198/jtlu.2022.2075.

Tomasiello, D., Giannotti, M., & Feitosa, F. (2020). ACCESS: An agent-based model to explore job accessibility inequalities. Computers, Environment and Urban Systems 81 , 101462. https://doi.org/10.1016/j.compenvurbsys.2020.101462.

Travisi, C., Camagni, R., & Nijkamp, P. (2010). Impacts of urban sprawl and commuting: A modelling study for Italy. *Journal of Transport Geography, 18,* 382-392, DOI: http://dx.doi.org/10.1016/j.jtrangeo.2009.08.008.

Vulevic, A. (2016). Accessibility concepts and indicators in transportation strategic planning issues: theoretical framework and literature review. *Logistics & Sustainable Transport Vol. 7, No. 1*, 58-67. doi: 10.1515/jlst-2016-0006.

Wee, B., & Cao, X. (2020). Residential self-selection in the relationship between the built environment and travel behavior: A literature review and research agenda. *Advances in transport Policy and Planning, 9,* 75-94. https://doi.org/10.1016/bs.atpp.2020.08.004.

Weerakoon, P. (2015). How and where is urban growth? analysis of urban growth in Colombo district, Sri Lanka. *A Advances in Environmental Biology, 9(4)*, 233-236.

Wolday, F., Naess, P., & Tonnesen, A. (2019). Workplace location, polycentrism, and car commuting. *Journal of Transport and Land Use, 12(1)*, 785-810.

World Bank. (2023). *Poverty and Equity Brief East Asia and Pacific*. Malaysia: World Bank Group Poverty and Equity.

Yi , C., Yuan , W., & Zhigang, L. (2017). From blueprint to action: the transformation of the planning paradigm for desakota in China. *Cities, Volume 60, Part B*, 454-465. https://doi.org/10.1016/j.cities.2016.04.010.

Yusof, N., & Jamaluddin, Z. (2018). Kos perbelanjaan perumahan dalam kalangan penduduk kawasan perumahan kos rendah dan sederhana di Pulau Pinang. *Akademika, 88(1)*, 167-179. https://doi.org/10.17576/akad-2018-8801-12.

Zhang, L., Zhou, J., & Hui, E.-m. (2020). Which types of shopping malls affect housing prices? From the perspective of spatial accessibility. *Habitat International 96,* 102118. https://doi.org/10.1016/j.habitatint.2020.102118.

Zheng, Z., Zhou, S., & Deng, X. (2021). Exploring both home-based and work-based jobs-housing balance by distance decay effect. Journal of Transport Geography, 93, 103043. https://reader.elsevier.com/reader/sd/pii/S096669232100096X?token=CCBF6AE2E8AAE7CC663F2C2B86770900B4598003425CD9154E15DBA476A96B7A7BB456A0A3D95C1C362245DD18F4C88F&originRegion=eu-west-1&originCreation=20220804142746#catch_JTRG103043.