PLANNING MALAYSIA:
Journal of the Malaysian Institute of Planners
VOLUME 22 ISSUE 6 (2024), Page 157 – 170

ASSESSING JOB-HOUSING BALANCE AMONG LOW-INCOME HOUSEHOLDS IN PENANG ISLAND, MALAYSIA

Hafizah Rosli [1], Mohd Azmeer Abu Bakar [2], Mohamad Pirdaus Yusoh[3], Normah Abdul Latip[3], Kasim Mansor[4]

[1, 2] *Geoinformatics Unit, School of Humanities,*
UNIVERSITI SAINS MALAYSIA
[3]*Borneo Institute for Indigenous Studies,*
UNIVERSITI MALAYSIA SABAH
[4]*Faculty of Business, Economics and Accountancy,*
UNIVERSITI MALAYSIA SABAH

Abstract

The balance between the geographical proximity of job and housing locations will have a significant impact on commuting patterns to the workplace. The key determinants for attaining job-housing equilibrium are the geographic placement, proximity, and travel time between an individual's domicile and place of employment. The absence of a balance between employment availability and housing can significantly harm the quality of life and overall welfare of those in low-income categories. The objective of this study is to assess the balance between work and residential areas for economically disadvantaged households in two distinct districts on Penang Island, Malaysia. A quantitative methodology employed to choose 306 respondents from low-income groups in the northeast and southwest areas to complete the questionnaire. The binary logistic regression analysis indicated that, despite the diverse economic sectors and distinct land uses and built environments, the job-housing balance in both the northeast and southwest areas is comparable. The study revealed that the transport system is the crucial factor in addressing the disparity between job opportunities and affordable housing for low-income individuals. In order to enhance their job accessibility, they require transportation that is both cost-effective, highly efficient, and sufficiently suitable. Hence, policymakers ought to intensify their strategies to ensure the provision of adequate, cost-effective, and proficient transport infrastructures to cater to the needs of this specific demographic across various geographical settings.

Keywords: Location; Distance; Commuting time; Job-housing balance

[3] Senior Lecturer at Universiti Malaysia Sabah. Email: pirdaus@ums.edu.my

INTRODUCTION

The excessive process of urbanisation in urban development significantly affects the changes in the characteristics and typology of outlying areas. This state is defined by alterations in land utilisation that arise as new areas of settlement are established (Syafri et al., 2024). Therefore, when selecting a place to live, it is crucial to take into account the presence of well-developed transit systems and road infrastructure of superior quality (Rosli et al., 2024). Generally, the most desirable choice for residential selecting is a place with an amazing transit network that promotes access to employment chances. In addition, the selection of a home location is impacted not only by the financial capacity of a household, but also by the geographical and spatial qualities of a given residential neighbourhood (Wee & Cao, 2020). Urban inhabitants often opt for residential communities in suburban places that offer positive community qualities. They typically rely on public transit, such as commuter services, for their mobility demands (Jones Lang Lasalle IP Ins., 2020). The ability to obtain employment is the most crucial aspect that a residential area provides in order to connect individuals with the economic foundation of their households. Hence, it is crucial to prioritise enhancing the efficiency of mobility in spatial planning and policies across all nations, with the aim of optimising accessibility levels (Kompil et al., 2019).

Since the 1960s, researchers in the fields of urban economics and sociology have examined the effects of limited job accessibility on workers, particularly those without personal transportation (e.g., Kain, 1968; Wachs and Kumagai, 1973). Several research conducted in various US metropolitan areas and selected EU cities have found that limited access to both private automobiles and public transit hinders employment accessibility. Notable studies on this topic include those by Cervero et al. (2002), Kawabata (2003), Korsu and Wenglenski (2010), Matas et al. (2010), and Sanchez et al. (2004). Nevertheless, there is a scarcity of research regarding the topic of job-housing balance among low-income workers, particularly in developing nations where the public transport system necessitates substantial enhancements and synchronised development due to its insufficient capacity to efficiently connect individuals between their residence and place of work. Hence, the objective of this study is to assess the balance between work and residential locations among socioeconomically disadvantaged households in Penang Island, Malaysia.

LITERATURE REVIEW

The Significance of Location in the Job-Housing Balance

An efficient transport and mobility infrastructure is a crucial element of the eleventh Sustainable Development Goals (SDGs), with the objective of ensuring that cities worldwide are sustainable and capable of providing a high standard of living for their inhabitants (Kompil et al., 2019). The European Union has

implemented a sustainable urban mobility policy in its member countries. This policy aims to ensure that cities and regions have a high level of sustainable mobility and provide equal access to all community facilities. Hence, it is crucial to prioritise the enhancement of mobility efficiency in the spatial planning and policy of every country in the continent. This will help mitigate social and regional disparities and alleviate the financial burden of transport for all individuals (Kompil et al., 2019).

There are two primary factors that underpin mobility: location and distance. Location is intricately linked to the act of travelling inside a certain area, use vehicles and the available transportation infrastructure to reach that particular place (Rodrigue, 2017). Regarding this matter, a site that is characterised by higher productivity, competitiveness, and appeal is one that offers a diverse range of amenities and is conveniently accessible, as opposed to a remote area that is deficient in terms of facilities (Papa & Coppola, 2012). Distance refers to the extent of trip required to connect two specific sites using available vehicles and transportation infrastructure (Rodrigue, 2017).

The housing location is a crucial factor that influences both the cost of housing and the residents' quality of life. Some households are willing to compromise on factors such as distance, travel time to work, and availability of services and facilities in order to obtain a more affordable house (Khazanah Research Institute, 2019; Yusoh et al., 2022). However, this circumstance has indirectly exacerbated traffic congestion (Osman & Md Saini, 2019), as a consequence of which, the majority of citizens are more inclined to utilise their personal vehicles for transportation. Conversely, a residential neighbourhood will gain more value and attract the attention of the local community as a desirable place to live if it offers comprehensive, convenient, and inexpensive public transportation options (The Relocation Bureau, 2017).

The selection of a housing location as a place to live depends on the requirements and talents of individuals, and can be guided by many qualities of the house's location. These features typically rely on socio-demographic factors and individual mobility choices (Zhao et al., 2017). Nevertheless, it is undeniable that an ideal residential location, which offers convenient access to essential amenities, is the aspiration of every individual (Boussauw et al., 2012). Hence, the choice to possess a residence necessitates the household to create a crucial assessment that encompasses several elements, such as the household's amount of availability to diverse amenities (Geurs & van Wee, 2004). Hence, the convenience of transportation from the residential area is a crucial factor that must be given priority by every household when selecting the desired site for their home.

Spatial Mismatch and Job-Housing Balance

Spatial mismatch refers to the disparity between the location of job opportunities and the availability of suitable housing. It is a concept that examines the imbalance between where people live and where they work. Several ideas exist that explain the relationship between housing and employment. The theory and models that align with the foundation of this work are the spatial mismatch theory. The work market's economic advantages necessitate a close correlation between housing and the accessibility to job opportunities from the dwelling location (Haddad & Barufi, 2017). Nevertheless, the degree to which individuals residing in a particular location, particularly those from the low-income group employed in urban areas, may conveniently access employment possibilities within a desirable distance from their place of residence undoubtedly varies. In Singapore, the relocation of low-income individuals to new urban settlements outside the city centre, as part of the job decentralisation process, has led to challenges such as limited resources and increased commuting time to reach employment opportunities. This is due to the spatial mismatch between the residential areas and job locations (Lau, 2011). The introduction of the 'hukou' system in China has limited migration from rural to urban areas, resulting in a spatial mismatch between housing and employment in rural areas. This has led to a scarcity of employment prospects in these regions (Bimpou et al., 2020). The 'hukou' system, which limits access to essential resources like housing, medication, and education, has led to the neglect of millions of children in rural areas. Their parents who moved to the city for survival (Jamaluddin, 2015) have left behind these children.

Kain's (1968) study on the geographical mismatch between residential areas and job chances has revealed that the inability of black individuals to access low-skilled job opportunities from their place of residence has resulted in a significant unemployment issue (Zeng et al., 2020). Spatial mismatch refers to the situation where low-income households face challenges in accessing suitable employment opportunities due to the location of their housing (Kain, 1968). In 1968, John F. Kain introduced the Spatial Mismatch Theory, which highlights the impact of residential segregation on job prospects for black individuals, resulting from their geographically dispersed population (Ihlanfeldt, 1992). The decentralisation of employment has exacerbated the issue by augmenting the unemployment rate among black individuals, who already face constraints in accessing essential amenities, particularly public transport facilities (Gobillon et al., 2007) (Gobillon, Selod, & Zenou, 2007). The notion of geographical mismatch has been extensively utilised as a framework in numerous studies examining social and economic spatial mismatch (Wei et al., 2013).

RESEARCH METHODOLOGY

Primary Data Collection

This study is a deductive study that entails the collection of primary data through the distribution of a questionnaire to 306 respondents from the low-income group in the northeast and southwest districts of Penang, Malaysia. In Malaysia, the government created a national poverty data bank called eKasih to compile information on the population living in poverty, both in rural and urban areas across the country. Therefore, it enables the Malaysian government to efficiently devise and execute strategic poverty initiatives for the intended demographic. Hence, the population size of the low-income group residing in the northeast and southwest districts of Penang was acquired from the eKasih database for the year 2016. The data indicates that a total of 1546 households with low income were registered under eKasih for the two districts (Department of Social Welfare, 2016). This figure is significantly large for this investigation. Therefore, the sample size was decreased using a suitable ratio to accurately represent the actual population to conduct this study, as indicated by the Morgan table (see Figure 1). According to the Morgan table, the appropriate sample size to accurately represent the total population size is 306 respondents. Consequently, a total of 306 participants who possessed appropriate attributes were chosen to respond to the questionnaire, as indicated in Table 1.

Table 1. Morgan Sampling Table
(Modified from: Krejcie & Morgan, 1970 in KENPRO, 2012)

Sample	Population	Sample	Population
278	1000	302	1400
285	1100	306	1500
291	1200	310	1600
297	1300	313	1700

Study Area

The study areas chosen for this research are the southwest and northeast districts of Penang state, Malaysia (refer to Figure 1). The study area is located inside the island state of Penang. Since the 1970s, the primary economic drivers in the study region have been the manufacturing and service sectors, making it an industrial state over the previous 50 years (Bernama, 2021). The service and manufacturing sector have the highest contribution percentages compared to other sectors. Specifically, the service sector contributes 51.4% and the manufacturing sector contributes 42.8%. In contrast, the construction industry contributes 2.8%, agriculture contributes 2.2%, and the mining and quarrying sector contributes 0.2%. The service industry in the state of Penang experienced a growth rate of 5.5 percent in 2019, although the manufacturing sector only grew by 2.7 percent (Department of Statistics Malaysia, 2019). However, in 2021, the manufacturing sector in the state of Penang attracted the biggest amount of foreign direct

investment (FDI) in Malaysia, totaling RM74.4 billion. This investment accounted for 98% of the total investment in the manufacturing sector (National Security Council, 2022). The influx of international investors into this state is closely linked to the availability of robust supply chains, highly skilled workforce, and the investor-friendly stance of the State Government (Kerajaan Negeri Pulau Pinang, 2018).

Essentially, the northeast and southwest districts are entirely distinct from each other. The services sector in the northeast district is highly concentrated due to the presence of major government administrative offices in this area. Conversely, the economy of the southwest district is characterized by a higher level of activity in the manufacturing sector, primarily due to the presence of a substantial industrial zone.

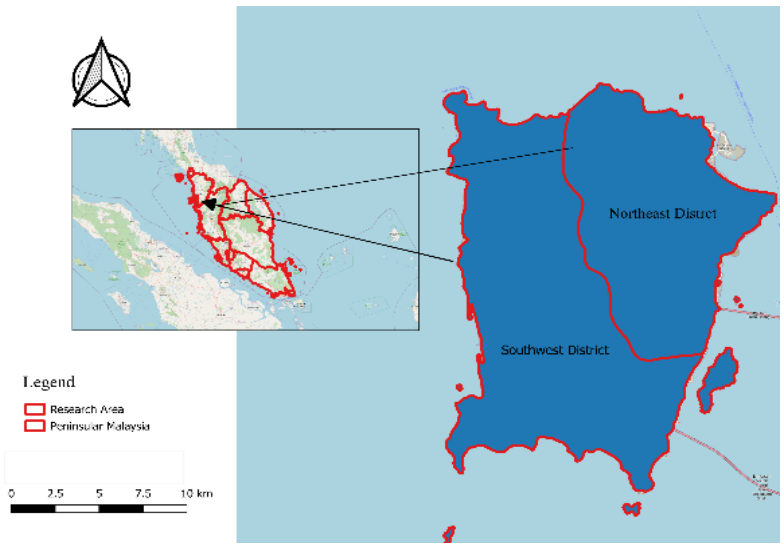

Figure 1. Study Area in Penang Island, Malaysia

Statistical Analysis

The analysis primarily utilised descriptive statistics and cross-tabulation techniques to project data on demographic characteristics, dwelling type, vehicle type, distances, and commuting time. Subsequently, the data will be utilised to perform multinomial logistic regression analysis to assess the job-housing balance between the low-income group in the northeast and southwest districts. For this regression analysis, the independent variables with respective coding had been used, namely, housing type (HT), vehicle type (VT), distance to the city centre (DCC), distance to supermarket (DS), distance to workplace (DW) and time taken for commuting between home and workplace (TC).

ANALYSIS

Table 2 displays the initial demographic profile of the responders. The survey predominantly comprises respondents of Malay ethnicity. Generally, most of the participants are employed in the manufacturing and services industry. According to the predicted statistics, a majority of 37.58% of respondents from the northeast district and 54.25% of respondents from the southwest district have a monthly family income of less than RM2,500.00. This data illustrates that a significant proportion of individuals in the low-income bracket are experiencing financial hardship. The poor income necessitates the allocation of funds towards the escalating and exorbitant expenses associated with living in Penang Island, such as food, transportation, gas, and other basic necessities. Furthermore, the value closely approximates the national poverty line, which stands at a monthly household income of RM2,208.00 according to the World Bank in 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 northeast district has the highest concentration of low-income individuals, with 21.57% residing in low-cost flats. In contrast, the southwest district has the highest proportion of low-income individuals living in detached houses, accounting for 30.39%.

Specifically, the northeast district has a majority of 19.28% or 59 respondents who live at a distance of 6.0 to 10.0 km from the city core. Meanwhile, 25.82% or 79 respondents in the southwest district live 20.0 to 30.0 km away from the city centre. Approximately 22.55% of low-income households have convenient access to supermarkets located at a distance of 0.5 to 5.0 km from their residences. This is significant as supermarkets are crucial food providers for these individuals. However, a significant proportion of low-income households in the southwest districts, specifically 23.20%, must travel a distance of 11.0 to 20.0 km in order to reach the nearest supermarkets. This data illustrates that a majority of low-income households dwelling in the core zone have convenient access to supermarkets for their daily necessities, in contrast to those

whose homes are located distant from the core zone. Regarding workplace accessibility, the majority of low-income households in the northeast district have a commute distance of less than 15.0 km. In contrast, the majority of low-income households in the southwest district have a travel distance ranging from 16.0 to 30.0 km.

The majority of residents in the northeast area have a commute time of less than 30 minutes, whereas in the southeast district, the average commute time ranges from around 31 to 60 minutes. Evidently, a majority of low-income households in the southwest region had to travel greater distances and spend more time commuting to their workplaces.

Table 3. Job-housing Balance Independent Variables

Housing Type (HT)	**Low-cost Flat**	**Medium-cost Apartment**	**Terrace House**	**Detached House**
Northeast	21.57%	3.59%	7.52%	9.80%
Southwest	14.05%	2.29%	10.78%	30.39%
Distance to City Centre (DCC)	**(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 to Supermarkets (DS)	**(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%
Distance to Workplace (DW)	**< 15.0 km**	**(16.0-30.0) km**	**(31.0-45.0) km**	**(46.0-60.0) km**
Northeast	26.80%	8.17%	5.23%	2.29%
Southwest	17.97%	32.68%	4.90%	1.96%
Vehicle Type (VT)	**Public Bus**	**Motorcycle**	**Car**	**Employer's Vehicle**
Northeast	1.63%	29.08%	8.82%	2.94%
Southwest	3.92%	42.81%	8.50%	2.29%
Time Taken for Commuting from Home to the Workplace (TC)	**<30 minutes**	**31-60 minutes**	**61-90 minutes**	**91-120 minutes**
Northeast	24.84%	14.05%	3.27%	0.33%
Southwest	26.80%	27.45%	2.29%	0.98%

Comparison of Job-Housing Balance between Two Districts

Throughout this section, a binary logistic regression analysis is conducted utilizing all independent variables related to job-housing balance, specifically HT, VT, DCC, DS, DW, and TC. This analysis has been conducted by treating the district of the study area as the dependent variable, with DW and TC selected as independent variables. DW is the first indicator and TC is the second indicator. The purpose is to determine which district has the strongest relationship between

the distance between houses and workplace, travel time factors, and the balance of home location and mobility to the workplace for respondents. The dependent variable is encoded in binary format, where the northeast district is denoted by 0 and the southwest district is denoted by 1 for the purpose of this analysis. To obtain clear and easily understandable results, it is necessary to input the indicators individually in a step-by-step manner during this study.

Based on Table 4, the results indicated that the regression model was statistically significant prior to the inclusion of the indicator. This was evidenced by a p-value of 0.009, which is below the threshold of 0.05 ($p<0.05$). The degree of freedom (df) must be greater than the significance level. The degrees of freedom (df) value for this study is 1, which is greater than the significant value, even before including the indicator. Hence, this regression model is appropriate for forecasting respondents from a certain district, where the correlation between the distance factor between home and workplace and the trip time component has the greatest impact on the equilibrium between the respondent's residential location and their mobility to the workplace.

Table 4. Variables in the Equation

		B	**S.E.**	**Wald**	**df**	**Sig.**	**Exp(B)**
Step 0	Constant	0.303	0.116	6.862	1	0.009	1.354

Subsequently, the initial indicator, denoted as DW, is incorporated into the regression model. In order to predict the district where the respondent is from, which takes into account both home location and job mobility, the chi-square value obtained must exceed the significant value after entering the indicator. Based on the data in Table 5, the chi-square value obtained is 244.397, which exceeds the significant value of 0.009 stated in Table 4. Furthermore, the df value must exceed the df value prior to the inclusion of the DW indication. Table 5 shows that the degrees of freedom (df) value increases to 47 when the Durbin-Watson (DW) indicator is included, which is higher than the previous df value. Thus, it can be inferred that the independent variable DW, representing the distance between the respondent's residence and employment, serves as an indication that helps elucidate the fluctuations in the dependent variable of this research.

Table 5. First Omnibus Tests of Model Coefficients

		Chi-square	***df***	***Sig.***
C8	*Step*	244.397	47	.000
	Block	244.397	47	.000
	Model	244.397	47	.000

Next, the regression model incorporates the TC indicator, and the corresponding outcomes are presented in Table 6. After including the TC indication, the chi-square value and df value both exhibit an increase compared to the prior value. Specifically, the chi-square value is 266.575 and the df value is 65. Thus, it can be inferred that the TC indicator, representing the travel time needed to commute between home and workplace for the participants, has the ability to impact and clarify the differences in the dependent variable of this research.

Table 6. Second Omnibus Tests of Model Coefficients

		Chi-square	***df***	***Sig.***
TC	*Step*	266.575	65	.000
	Block	266.575	65	.000
	Model	266.575	65	.000

Additionally, it is necessary to examine the R^2 value given in Table 7 to determine the extent to which the DW and TC indicators in the regression model of this study can impact the dependent variable by identifying various variations or modifications. Table 7 provides information on two approaches, Cox & Snell and Nagelkerke, which are used in binary logistic regression analysis to calculate the R^2 value. Typically, these two approaches yield distinct outcomes, however they serve the same purpose, which is to elucidate the extent to which an indicator can impact the dependent variable in this regression model. The significance of R^2 for each of these strategies will be evident when the value falls below 1. Given that the Nagelkerke R^2 method is a modified version of the Cox & Snell R^2 method, the R^2 value mentioned in this study specifically refers to the one calculated using the Nagelkerke R^2 method. The R^2 value for the regression model in this study is 0.781, indicating that 78.1% of the variation or change in the dependent variable can be attributed to the DW and TC indicators. This discovery demonstrates that the DW and TC indicators have a significant impact on the dependent variable, with a percentage above 50%. Thus, it can be inferred that the DW and TC indicators are reliable predictors of the equilibrium between residential location and commuting to work across various geographies.

Table 7. Model Summary

Step	***-2 Log likelihood***	***Cox & Snell R Square***	***Nagelkerke R Square***
1	150.690a	0.582	0.781

According to the binary logistic regression model, the categorization of the dependent variable will establish the district's balance of location and mobility to the workplace among respondents using the DW and TC indicators. The results presented in Table 8 demonstrate that respondents from both the northeast and

southwest districts have an equal balance of home location and mobility to the workplace. This is supported by a 91.5% accuracy rate, indicating that there is no disparity in terms of distance from home to workplace and mobility to the workplace. This suggests that all challenges and problems related to the distance between home and office, as well as commuting to work, are the same for both districts. There are no distinct issues or cases that can separate the mobility situation between the two. Thus, it can be inferred that the spatial and physical mobility in both districts are comparable, as all respondents commute to their workplaces in a scenario and environment where no significant distinctions can be observed.

Table 8. Dependent Variable Classification Table Binary Logistic Regression Model

Prediction			
District	**District**		**Accuracy Percentage**
	Northeast	**Southwest**	
Northeast	119	11	91.5%
Southwest	15	161	91.5%

In contrast to these study findings, Delmelle et al. (2021) discovered that the built environment does indeed have an impact on achieving a balance between job and housing. Their research revealed that polycentricity has the potential to enhance job accessibility, particularly for disadvantaged populations. In their study, Delmelle et al. (2021) examined work accessibility from residential areas in Charlotte, the largest city in North Carolina, United States. The researchers discovered that there is no notable disparity in employment rates among various neighbourhoods. Nevertheless, it was discovered that the degree of accessibility among low-income households does really influence the growth of their household income. However, the diverse and multi-centred urban structure established by Charlotte played a role in mitigating the spatial disparity between low-income workers and low-paying employment opportunities.

On the other hand, Bastiaanssen et al. (2022) found in their study conducted in Great Britain that efficient and sufficient public transport is crucial for achieving a balance between job and housing locations, as well as providing excellent job accessibility for low-educated groups and low-income neighbourhoods, regardless of whether they are in metropolitan areas or smaller cities and towns. Their research demonstrates that transit contributes to achieving a balance between employment and housing. According to the findings from this study, 29.08% of the low-income group in the northeast district and 42.81% in the southwest district choose motorbikes as their mode of transportation to commute to work (see Table 3). Therefore, it is demonstrated that the choice of mobility for commuting to work contributes to bridging the gap between employment and housing.

CONCLUSION

The study's findings concluded that variations in land use, constructed surroundings, and economic sector types do not impact the balance between employment opportunities and housing location for low-income demographics. The transit system has a crucial role in connecting low-income groups with both job opportunities and affordable housing. Acquiring the most cost-effective and highly effective means of transportation is the optimal decision for connecting those with limited financial resources to employment opportunities. Therefore, regardless of whether one resides in urban, suburban, or rural locations, transportation is of utmost significance in maintaining a proper equilibrium between employment and housing. Hence, policymakers had to enhance their approaches in order to furnish low-income demographics in various areas with cost-effective, proficient, and sufficient transportation infrastructures. Consequently, the level of work accessibility inside this group will augment, leading to economic benefits for them.

REFERENCES

Bastiaanssen, J., Johnson, D., & Lucas, K. (2022). Does better job accessibility help people gain employment? The role of public transport in Great Britain. *Urban Studies, vol., 59*(2), 301-322. https://doi.org/10.1177/00420980211012635.

Bernama. (2021, Oktober 25). Pulau Pinang jangka pemulihan ekonomi pantas. https://www.bharian.com.my/berita/wilayah/2021/10/880055/pulau-pinang-jangka-pemulihan-ekonomi-pantas.

Bimpou, K., & Ferguson, N. (2020). Dynamic accessibility: incorporating day-to-day travel time reliability into accessibility measurement. *Journal of Transport Geography*, 89, 102892. https://doi.org/10.1016/j.jtrangeo.2020.102892.

Boussauw, K., Neutens, T., & Witlox, F. (2012). Relationship between spatial proximity and travel-to-work distance: the effect of the compact city. *Regional Studies, 46*(6), 687-706.

Cervero, R., Sandoval, O., & Landis, J. (2002). Transportation as a stimulus of welfare-to work private versus public mobility. *Journal of Planning Education and Research* 22: 50–63.

Delmelle, E., Nilsson, I., & Adu, P. (2021). Poverty suburbanization, job accessibility and employment outcomes. *Social Inclusion*, Volume 9, Issue 2, 166-178. https://doi.org/10.17645/si.v9i2.3735.

Department of Social Welfare (2016). "Buku Statistik 2016" (Statistics Book 2016), Department of Social Welfare, Malaysia. Available at: https://www.jkm.gov.my/jkm/uploads/files/penerbitan/Buku%20statistik%202016.pdf. [Accessed: 4 November 2023].

Department of Statistics Malaysia (2019). Penang State Socio-economic Report.

Geurs, K., & Van Wee, B. (2004). Accessibility evaluation of land-use and transport strategies: review and research directions. *Journal of Transport Geography*, 12, 127-140.

Gobillon, L., Selod, H., & Zenou, Y. (2007). The Mechanisms of Spatial Mismatch. *Urban Studies*, *44*(12), 2401-2427.

Haddad, E. A., & Barufi, A. M. (2017). From Rivers to Roads: Spatial Mismatch and Inequality of Opportunity in Urban Labor Markets of a Megacity. *Habitat International* 68, 3-14.

Ihlanfeldt, K. (1992). Job accessibility and the employment and school enrollment of teenagers. Upjohn Institute for Employment Research.

Jamaluddin, N. H. (2015, Ogos 4). Anak ditinggalkan demi tuntutan hidup. https://www.hmetro.com.my/node/68180

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

Kain, J.F. (1968). Housing segregation, negro employment, and metropolitan decentralization. *The Quarterly Journal of Economics* 82: 175–197.

Kawabata, M. (2003) Job access and employment among low-skilled autoless workers in US metropolitan areas. *Environment and Planning* A, 35: 1651–1668.

Kerajaaan Negeri Pulau Pinang. (2018, Januari 16). Sektor perindustrian Pulau Pinang masih berdaya saing, menguntungkan rakyat terbanyak. https://www.buletinmutiara.com/sektor-perindustrian-pulau-pinang-masih-berdaya-saing-menguntungkan-rakyat-terbanyak/. Diakses pada 1 April 2022

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.

Korsu, E. & Wenglenski, S. (2010). Job accessibility, residential segregation and risk of long-term unemployment in the Paris region. *Urban Studies* 47: 2279–2324.

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.

Lau, J. C.-y. (2011). Spatial mismatch and the affordability of public transport for the poor in Singapore's New Towns. *Cities*, 28, 230-237.

Matas, A., Raymond, J.L., & Roig, J.L. (2010). Job accessibility and female employment probability: The cases of Barcelona and Madrid. *Urban Studies* 47: 769–787.

Yusoh, M. P., Dering, N. F., Mapjabil, J., Abdul Latip, N., Kumalah, M. J., Mohd. Noor, H., & Hanafi, N. (2022). ASSESSMENT OF PAYMENT RATES AND WILLINGNESS TO PAY AT TOURIST DESTINATION - A COMPARISON BETWEEN KUNDASANG AND KOTA BELUD, SABAH, MALAYSIA. *PLANNING MALAYSIA*, *20*(23). https://doi.org/10.21837/pm.v20i23.1148

Osman, S., & Md saini, K. (2019). Analisis Trend Indeks Harga dan Taburan Jenis Perumahan Mengikut Kelas Sosioekonomi di Kuala Lumpur. *Akademika*, *89*(2), 155-168.

National Security Council (2022). https://www.usgovernmentmanual .gov/Agency?Entityld=67qOZ2weSpE=&ParentEld=p0fnvDxExmY=&EType=/ sbLHImeIYK=. [Accessed on 15th November 2023].

Papa, E., & Coppola, P. (2012). Gravity-Based Accessibility Measures for Integrated Transport-Land Use Planning (GraBAM). COST Office.

Rodrigue, J.-P. (2017). The Geography of Transport Systems. Poutledge.

Rosli, H., Samat, N., & Abu Bakar, M. (2024). Accessibility to workplace and housing location choice among the low-income group: A case study of Pulau Pinang, Malaysia. *Planning Malaysia: Journal of the Malaysian Institute of Planners*. Vol. 22, Issue 1, 96-109.

Syafri, Surya, B., & Manaf, M. (2024). Developing the city and sustainable development: Urban suburban area of herstaning – Tun Abdul Razak Metropolitan Mamminasata, Indonesia. *Planning Malaysia: Journal of the Malaysian Institute of Planners*. Vol. 22. Issue 2, 411-427.

The Relocation Bureau. (2017, Mac). Top 8 factors to consider when choosing a property to rent of purchase. https://www.reloburo.com/articles/top-8-factors-consider-when-choosing-property-rent-or-purchase

Wachs, M. & Kumagai, T.G. (1973) Physical accessibility as a social indicator. *Socio-Economic Planning Sciences 7*(5): 437–456.

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.

Wei, Y., Hayden, J.A., Kutcher, S., Zygmunt, A., McGrath, P., (2013). The effectiveness of school mental health literacy programs to address knowledge, attitudes and help seeking among youth. *Early Interv Psychiatry 7*(2): 109-201.

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

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

Zeng, Y., Sean, L.M., Rebecca, K.R., Oscar, V., (2020). Environmental destruction not avoided with the Sustainable Development Goals. *Nature Sustainability* 3, 795-798.

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

Zhao, P., Lu, B., & Roo, G. (2011). Impact of the jobs-housing balance on urban commuting in Beijing in the transformation era. *Journal of Transport Geography*, 19, 59-69. http://dx.doi.org/10.1016/j.jtrangeo.2009.09.008.

Received: 8th March 2024. Accepted: 17th July 2024

