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DOES RAIL TRANSPORT IMPACT HOUSE PRICES AND RENTS?

Nursyazwani Abdullah Suhaimi[1], Nurul Hana Adi Maimun[2] & Nurul Fazira Sa'at[3]

[1,3] Department of Real Estate, Faculty of Built Environment and Surveying
[2] Centre for Real Estate Studies, Institute for Smart Infrastructure and Innovative Construction
UNIVERSITI TEKNOLOGI MALAYSIA

Abstract

Rail transport is one of the factors that boost economic growth. Increased accessibility while saving travel costs and time offered by rail transport attracts foreign and local investments, which lead to increased house prices and rents. Nonetheless, it is argued that noise pollution coming from rail transport may also reduce house prices and rents because these areas are less desirable for occupation and investment. Hence, this research aims to establish rail transport's impact on house prices and rents through a critical review of the literature. An overview of previous studies shows that house prices and rents are significantly influenced by proximity to rail transports. This indicates that proximity to rail transports is accounted for when making house purchase and rent decisions. Thus, property valuers, planners, and developers should consider rail transport location in planning, developing, and valuing properties.

***Keywords**:* Rail transports; House prices; House rents

[2] Lecturer at Universiti Teknologi Malaysia. Email: nurulhana@utm.my

INTRODUCTION

By 2050, 68% of the world's population will be urban, adding nearly 2.5 billion individuals to the existing metropolitan population (UN-DESA, 2018). Cities worldwide are increasing their investment in metros, to meet the rising demand for urban travel (Anupriya et al., 2020). The International Association of Public Transportation claimed that about 45 metro lines have operated during the previous decade. Over the next five years, an additional 200 new metro lines are projected. Rail transports are critical in addressing the population's urban mobility requirements to satisfy employment, retail, and recreation activities (Diaz, 1999; Hess & Almeida, 2007). These activities eventually accelerate a nation's economy, making transportation infrastructure critical to growth. When a region adds train service, expectations regarding the project's effects on the surrounding area, particularly on housing prices and rentals, often arise. Although substantial studies on the rail transportation effect on property values and rentals have existed, the evidence is inconsistent and ambiguous, since conclusions are contingent on the local characteristics of the rail transit systems analysed. These many instances often emerge as individual anecdotes in studies examining the effect of rail transport on house prices and rentals. Existing research on the effect of rail on house prices and rentals is insufficient and based on anecdotal information, leaving regional planning for rail investments without a clear empirical foundation for assessing the investment's future effect. Additionally, this lack of accurate information constrains the ability of rail transportation authorities to devise plans that maximise the benefits of favourable home prices and rentals.

Thus, this study attempts to establish the rail transportation effect on the housing market. This review paper will determine if rail transportation has a beneficial or detrimental effect on the local housing market, hence filling a knowledge gap on rail transportation's effect on home prices and rentals. This paper begins with a general discussion on rail transportation in the second section. The third section examines the effect of rail transportation on housing prices and rentals. Section four discusses the results, followed by Section five's conclusions and implications.

RAIL TRANSPORT AND THE HOUSING MARKET

Rail Transport

Rail transport is a mode of transporting people and commodities through wheeled vehicles that operate on tracks. It is a safe, quick, and cost-effective form of transportation for both long and short distances. Maximum efficiency can be attained especially for transferring mass numbers of people and commodities (Lin & Ponrahono, 2019). Rail transport, which started in ancient Greece as human-hauling contraptions, has grown into a contemporary, complex, and sophisticated system that is utilized in both urban and cross-country networks. Rail transport is

more organised than automobile travel owing to its established routes and timetables, and it enables economic advancement. Rail transport increases investment and attracts foreign investors due to efficient and fast service, cost savings, improved traffic safety and reduced pollution. Nowadays, rail travels include airport rail connections, funicular railway line, heavy rail, Light Rapid Transit, Mass Rapid Transit and monorails. It is also known by the term metro, subway, mass transit and underground.

Rail Transport Impact on House Price and Rent

House prices and rents are susceptible to changes surrounding them. Any changes in attributes may increase or decrease house prices and rents. In general, house attributes can be grouped into locational, structural, and neighbourhood (Goodman, 1989; Williams, 1991). Structural attributes represent the characteristics and conditions of the house. Structural attributes include age of building, floor area, kitchen cabinets, lot area, materials and finishing types, neighbourhood area, number of rooms, repair condition and structural condition (Adi Maimun, 2011). Structural conditions may affect house prices and rents positively or negatively. Meanwhile, neighbourhood attributes may include socio-economy, externalities, local authority services (Chin and Chau, 2003) and facilities (Roe et al., 2004). A housing area that has all facilities required will form a good market (Nor Asmahan, 2012) because facilities provided enhance the economic activity of that area. The location factor lies in the bid-rent theory as posited by Alonso (1964). According to Alonso's bid-rent hypothesis, people are willing to spend a portion of money for location. An attractively located house is highly sought after and pushes prices up through the bidding process, whilst an unattractive location will bring down prices. The location of a property mainly influences purchase decisions and thus is reflected in house prices and rents. Numerous individuals are ready to pay a premium for an enviable location. (Prasad & Richards, 2008).

Houses located near the city centre, for instance, will likely fetch high prices since many economic and business activities mainly take place within the city centre area. In contrast, houses located farther from the city centre will decrease in price (Chin & Chau, 2003). It has been reported that good access to a transportation system such as rail transport will enhance the price and rent of houses nearby. This is possible due to strong demand for houses located close to the rail transport system (Pan et al., 2014). Houses located close to railway stations are highly sought after because of their strategic location and easy access to public utilities (Alan Tong, 2010). In addition, the effects of rail transport are also acutely felt in the residential sector due to the large number of consumers (buyers and renters) within the property market segment. As a result, most research within this field has concentrated on the residential sector. Table 1 summarises prior research on rail transport effects on house prices and rents.

Table 1: Summary of Previous Studies: Rail Transport Effects on House Prices and Rents

Author (Year)	Types of Rail Transport	Approach	Findings
Benjamin and Sirmans (1996) Washington, D.C.	Metro	Hedonic model	Rent decreased by 2.4 to 2.6% per 100m away from Metro station.
Lewis-Workman and Brod (1997a) New York	Rapid rail: New York City MTA	Hedonic model	Price decreased by $2,300 per 100ft away from the station areas.
Lewis-Workman and Brod (1997b) San Francisco	Rapid rail: BART	Hedonic model	Price decreased by $1,578 per 100ft away from the station.
Henneberry (1998) Sheffield, England	Supertram (Light Rail)	Hedonic model	No effect.
Delmelle and Duncan (2012) Charlotte, North Carolina	Light Rail	Hedonic model	Price increased by 0.1% per mile (1609m) closer to the LRT station.
Dziauddin et al. (2013) Klang Valley, Malaysia	Light Rail Transit (LRT)	Hedonic model	Price increased by RM10,560 (straight-line-distance model) and RM6,610 (network-distance model) for houses located within 1,000m from LRT station.
Pan et al. (2014) Houston, Texas and Shanghai, China	METRO Rail	Hedonic model	Price increased by 1% per 100m closer to METRO Rail.
Mulley, Tsai and Ma (2018) Sydney	Light Rail Line	Geographically Weighted Regression (GWR)	Price increased by over 0.5% per 100m closer to the LRT station.
Pilgram and West (2018) Minneapolis, Minnesota	METRO Blue Line	Hedonic model	Price increased by 3% for houses located within a half-mile of METRO station (compared to other houses in South Minneapolis).
Dziauddin (2019) Kuala Lumpur, Malaysia	Light Rail Transport	Hedonic model	Prices increased by 30% for houses located within 800m to LRT station.
Pan (2019) Houston, Texas	METRO Rail	Hedonic model	Price increased up to 39% for houses located ¼ mile closer to METRO Rail.

Overall, the body of research used the Hedonic model to establish the relationship between rail transport and house prices and rents. This method is popularly used

as it can measure the impact of each quality on the total price and rent of houses (Asmawi et al., 2018; Rahman et al., 2019). Using the Hedonic model, previous studies examining the relationship between rail transport and house prices and rents tend to vary in findings. Early research demonstrated a positive relationship between rail transport and house prices and rents. These include works by Boyce et al. (1972), Dewees (1976), Lerman et al. (1978), Dvett et al. (1979), Damm et al. (1980), Bajic (1983), Voith (1991), Al-Mosaind et al. (1993), Gatzlaff and Smith (1993), Benjamin and Sirmans, (1996), Lewis-Workman and Brod (1997a; b). Recently, researchers have also found positive effects of rail transports on house prices with between 0.1% to 39% increase in values for homes located near rail stations (Delmelle & Duncan, 2012; Pan et al. 2014; Mulley et al., 2018; Dziauddin, 2019; Pan, 2019). Nonetheless, some studies have found rail transport's adverse effects on house prices. In other words, house prices tend to decline the farther away from rail transportation from where the housing is located. Discounts that vary in strength were reported for studies based in the United States, such as in Philadelphia (Slater, 1974), Atlanta (Nelson & McCleskey, 1990; Baum-Snow & Kahn, 2000; Bowes & Inlanfeldt, 2001), Portland (Al-Mosaind et al., 1993; Dueker & Bianco, 1999; Chen et al., 1998), Boston, Chicago, Portland, and Washington (Baum-Snow and Kahn, 2000), Dallas (Clower and Weinstein, 2002), San Francisco (Weinberger, 2001), Buffalo (Hess & Almeida, 2007), San Diego (Duncan, 2008) and in Asian countries such as Seoul, Korea (Bae et al., 2003), Bangkok, Thailand (Chalermpong, 2007) and Shanghai (Pan & Zhang, 2008). This negative effect is attributed to noise pollution (Bowes & Ihlanfeldt, 2001), visual intrusion, and rail right-of-way's association with industrial uses (Diaz, 1999). Meanwhile, there are cases where findings are less conclusive due to mixed results. Rail transportations was reported to impact house prices positively and negatively in Atlanta (Nelson, 1992), San Diego, San Francisco, Sacramento, and San Jose (Landis et al., 1995), San Diego (Ryan, 2005) and Bogotá (Munoz-Raskin, 2010).

DISCUSSION

Different findings established by previous studies showed that rail transport might impact housing in various ways, either positive, negative or mixed, based on the type of externalities produced by rail transport. Although there is a long history of literature examining rail transport's effects on house price and rent, most studies were based in the United States. Only two research projects were based in Malaysia, occurring only in 2013 and 2019. Most studies also analysed the impacts of LRT on the local property market. Very few have attempted to investigate whether MRT will affect the housing market. This includes Malaysia. The lack of Malaysian empirical research, particularly on MRT station impacts on house prices and rents, raises a question on whether MRT will impact the housing market, and if so, what is the magnitude of impact? The lack and

uncertainty of market information affect the property market player's decision-making, such as valuing houses and developers in developing areas. Thus, there is a crucial need for a study investigating the impact of MRT on the local Malaysian housing market.

CONCLUSION

This paper established several key findings related to rail transport's impact on house prices and rents. The study concluded that the effect of rail transport on the housing market is situation-dependent. Positive impacts from rail transport were expected if the accessibility and attractiveness of the surrounding area are improved. In contrast, an area may experience a decline in values if rail transport produces negative externalities such as noise, visual intrusion, and the rail right-of-way's association with industrial uses. The various price and rent impacts of rail transport highlights the necessity for a locally based study, particularly in Malaysia. The findings of the study contribute to the clarification of the rail transport impact on housing market literature. Property market players such as valuers, planners and developers may find the study findings beneficial in making various property-based decisions, such as planning, developing and valuing properties.

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REFERENCES

Adi Maimun, N. H. (2011). *Spatiotemporal Autoregressive Model for Malaysian Housing Market Analysis* (Master dissertation, Universiti Teknologi Malaysia).

Al-Mosaind, M. A., Dueker, K. J. & Strathman, J. G. (1993). Light Rail Transit Stations and Property Values: A Hedonic Price Approach. *Transportation Research Record*, *1400*, 90–94.

Alonso, W. (1964). *Location and Land Use: Toward a General Theory of Land Rent*. Cambridge, M. A.: Harvard University Press.

Anupriya, Graham, D. J., Carbo, J. M., Anderson, R. J. & Bansal, P. (2020). Understanding the Costs of Urban Rail Transport Operations. *Transportation Research Part B*, *138*, 292-316.

Asmawi, M. Z., Mohit, M. A., Noor, N. M., Abdullah, A., & Paiman, T. (2018). Factor analysis on hedonic pricing model on open space affecting the housing price in

Melaka and Seremban. *Planning Malaysia Journal of the Malaysian Institute of Planners*, *16*(2), 119-130.

Bae, C.-H. C., Jun, M.-J. & Park, H. (2003). The Impact of Seoul's Subway Line 5 on Residential Property Values. *Transport Policy*, *10*, 85-94.

Bajic, V. (1983). The Effects of a New Subway Line on Housing Prices in Metropolitan Toronto. *Urban Studies*, *20*, 147-158.

Baum–Snow, N. & Kahn, M. E. (2000). The Effects of New Public Projects to Expand Urban Rail Transit. *Journal of Public Economics*, *77*, 241-263.

Bowes, D. R. & Ihlanfeldt, K. R. (2001). Identifying the Impacts of Rail Transit Station on Residential Property Values. *Journal of Urban Economics*, *50*, 1-25.

Chalermpong, S. (2007). Rail Transit and Residential Land Use in Developing Countries: Hedonic Study of Residential Property Prices in Bangkok, Thailand. *Transportation Research Record, 2038*, 111-119.

Clower, T. L. & Weinstein, B. L. (2002). The Impact of Dallas Texas Area Rapid Transit Light Rail Stations on Taxable Property Valuations. *Australasian Journal of Regional Studies*. *8*(3), 389-400.

Debrezion, G., Pels, E. & Rietveld, P. (2007). The Impact of Railway Stations on Residential and Commercial Property Value: A Meta-analysis. *The Journal of Real Estate Finance and Economics, 35*, 161-180.

Dewees, D. (1976). The effect of a Subway on Residential Property Values in Toronto. *Journal of Urban Economics*, *3*, 357-369.

Diaz, R. B. (1999). *Impacts of Rail Transit on Property Values*. Paper presented at the Commuter Rail/Rapid Transit Conference. American Public Transportation Association. Toronto, Ontario May.

Dueker, K. J. & Bianco, M. J. (1999). Light Rail Transit Impacts in Portland: The First Ten Years. *Transportation Research Record, 1685*, 171-180.

Duncan, M. (2008). Comparing Rail Transit Capitalization Benefits for Single-Family and Condominium Units in San Diego, California. *Transportation Research Record*, *2067*, 120-130.

Dziauddin, M. F., Alvanides, S. & Powe, N. (2013). Estimating the Effects of Light Rail Transit (LRT) System on the Property Values in the Klang Valley, Malaysia: A Hedonic House Price Approach. *Jurnal Teknologi*, *61*(1): 35-47.

Dziauddin, M.F. (2019). An Investigation of Condominium Property Value Uplift Around Light Rail Transit Stations Using a Hedonic Pricing Model. *IOP Conf. Series: Earth and Environmental Science, 286(2019), 012032.*

Goodman, A. C. (1978). Hedonic Prices, Price Indices and Housing Markets. *Journal of Urban Economics*, *5*(4): 471-484.

Gu, Y. (2007). *The Impacts of Rail Transit on Property Values: Empirical Study in Beijing*. Paper presented at the AsRes Conference.

Hess, D. B. & Almeida, T. M. (2007). Impact of Proximity to Light Rail Rapid Transit on Station-Area Property Values in Buffalo, New York. *Urban Studies*, *44*(5/6): 1041-1068.

Landis, J., Guhathukurta, S., Huang, W., Zhang, M., Fukuji, B. & Sen, S. (1995). Rail Transit Investments, Real Estate Values, and Land Use Change: A Comparative Analysis of Five California Rail Transit Systems. *Research Report No. 48*, Institute of Urban and Regional Studies, University of California, Berkeley.

Lewis-Workman, S. & Brod, D. (1997). Measuring the Neighborhood Benefits of Rail Transit Accessibility. *Transportation Research Record*, *1576*, 147-153.

Li, Z-C., Lam, W. H. K., Wong, S. C. & Choi, K. (2012). Modeling the Effects of Integrated Rail and Property Development on the Design of Rail Line Services in a Linear Monocentric City. *Transportation Research Part B: Methodological*, *46*(6), 710-728.

Lin, C. A. L. J. & Ponrahono, Z. (2019). Service Catchment of Mass Rapid Transit (MRT) Feeder Bus: A Preliminary Study of T461 Route Taman Kajang Utama. *Planning Malaysia Journal of the Malaysian Institute of Planners*, *17*(2), 74-91.

Loo, B.P.Y., Chen, C. & Chan, E. T. H. (2010)- Rail-Based Transit Oriented Development: Lessons from New York City and Hong Kong. *Landscape and Urban Planning*, *97*(3): 202-212.

Mulley, C., Tsai, C. P. & Ma, L. (2018). Does Residential Property Price Benefit from Light Rail in Sydney? *Research in Transportation Economics*, *67*, 3-10.

Munoz-Raskin, R. (2010). Walking Accessibility to Bus Rapid Transit: Does it Affect Property Values? The Case of Bogota, Colombia. *Transport Policy*, *17*, 72-84.

Nelson, A. C. (1992). Effects of Elevated Heavy Rail Transit Stations on House Prices with Respect to Neighborhood Income. *Transportation Research Record*, *1359*, 127-132.

Nelson, A. C. & McCleskey, S. J. (1990). Improving the Effects of Elevated Transit Stations on Neighborhoods. *Transportation Research Record*, *1266*, 173-180.

Pan, H. & Zhang, M. (2008). Rail Transit Impacts on Land Use: Evidence from Shanghai, China. *Transportation Research Record*, *2048*, 16-25.

Pan, Q. (2019). The Impacts of Light Rail on Residential Property Values in a Non-Zoning City: A New Test on the Houston METROrail Transit Line. *The Journal of Transport and Land Use*, *12*(1), 241-264.

Pan, Q., Pan, H. & Zhang, M. (2014). Effects of Rail Transit on Residential Property Values: Comparison Study on the rail transit Lines in Houston, Texas, and Shanghai, China. *Transportation Research Record*, *2453*, 118-127.

Pilgram, C. A. & West, S. E. (2018). The Effect of Rail Transit on Property Values: A Summary of Studies. *Research carried out for Project 21439S, Task 7 NEORail II*, Cleveland, Ohio.

Rahman S. N. A., Adi Maimun, N. H., Razali M. N. & Ismail, S. (2019). The Artificial Neural Network Model (ANN) for Malaysian Housing Market Analysis. *Planning Malaysia Journal of the Malaysian Institute of Planners*, *17*(1), 1–9.

Ryan, S. (2005). The Value of Access to Highways and Light Rail Transit: Evidence for Industrial and Office Firms. *Urban Studies*, *42*(4), 751-764.

Slater, P. B. (1974). Disaggregated Spatial–Temporal Analysis of Residential Sales Prices. *Journal of the American Statistical Association*, *69346*, 554-560.

The MRT Report: The Affordability of Homes Surrounding MRT Stations (2018).

The Report of the Transportation Strategies Ad Hoc Committee of the Incog Transportation Policy Committee *(2008)- Rail Transit Strategic Plan*.

UN-DESA (2018). *The 2018 Revision of World Urbanization Prospects*. Technical Report. Department of Economic and Social Affairs, United Nations. https: //esa.un.org/unpd/wup

Weinberger, R. R. (2001). Light Rail Proximity: Benefit or Detriment in the Case of Santa Clara County, California? *Transportation Research Record*, *1747*, 104-113.

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