THE IMPACT OF NEIGHBORHOOD TYPES ON THE PRICES OF RESIDENTIAL PROPERTIES

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ABSTRACT

This paper attempts to examine the impact of neighborhood types on residential property prices in the Klang Valley, Malaysia. Results show that the gated-guarded landscape compound neighborhood could attract higher market prices by 14.26%, and the freehold neighborhood could fetch a 20.68% higher price than the leasehold neighborhood. It is interesting to note that house buyers are willing to pay 23.52% to live in the gated-guarded and freehold neighborhoods. In order to meet the increasingly demanding house buyers, instead of just offering dram houses in prime locations, housing developers should provide intangible benefits in the neighborhood that are just as sought after by today's house buyers, such as a sense of security, a feeling of harmony with one's surroundings, and an infrastructure which supports a eco-friendly lifestyle.

Keywords: gated-guarded neighborhood, freehold neighborhood, property prices, Klang Valley, Malaysia

INTRODUCTION

The housing industry in Malaysia encountered an oversupply problem recently. A massive over construction of houses by public and private housing developers has contributed to the problem of property overhang. The term *property overhang* means residential units that have been issued with certificates of fitness for occupation (CF) and have remained unsold for more than 9 months (Ministry of Finance's Valuation and Property Service Department 2006). As reported in the Property Market Status Report (2009), the overhang units increased from 23, 866 units worth RM (Malaysian Ringgit) 3.82 billion in 2007 to 26, 029 units worth RM 4.476 billion in 2008. Most of the overhang units had been in the market for more than 24 months. The majority of these units remain unsold for reasons beyond the price factor, ranging from poor location to unattractive neighborhoods. These unsold houses do not attract the target market nor cater to the housing needs of the target group. It is important for housing developers to know what the market really wants as house buyers are becoming more cautious before choosing the right house to live in.

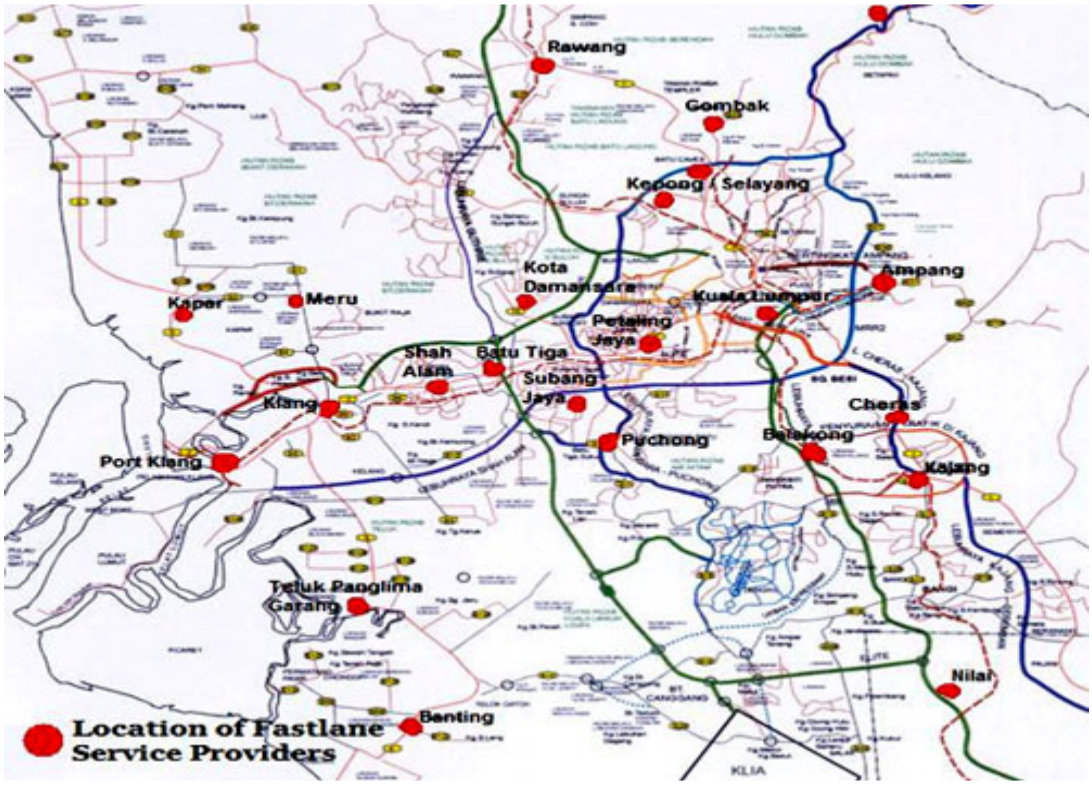
One way for housing developers to ride out the challenges of the industry is to determine the responsiveness of those willing to pay for changes in housing attributes. As such, a model representing house price determination in Malaysia, particularly within Klang Valley, is developed. The determination of house prices can be carried out by the using the hedonic price model (Rosen 1974). Many researchers have used the hedonic price model to examine the relationship between attribute preferences and house prices. The house prices in

this study are assumed to be affected by neighborhood, structural, and locational attributes of dwellings.

There are many neighborhood, structural, and locational attributes of dwellings that can affect house prices. The main emphasis of this paper is to determine the responsiveness of the willingness to pay for changes in neighborhood types. In this study, two neighborhood types are assessed and examined, namely a gated-guarded landscaped compound neighborhood and a freehold neighborhood.

Klang Valley, also known as the Kuala Lumpur conurbation, is the country's fastest growth region. The valley is ideally suited for the purpose of this research because it is a large residential area with a large number of residential transactions. As reported by the Ministry of Finance's Valuation and Property Service Department (2007), the valley contributed more than 45% of the total amount of constructed houses in the country. Additionally, households from the Klang Valley have similar demographic characteristics, and variations in their housing qualities are small. Figure 1 is a map of Klang Valley, Malaysia.

Figure 1: Map of Klang Valley, Malaysia



Source: ***http://www.fastlane2u.com/images/klangvalley_map.jpg***

LITERATURE REVIEW

There are many structural, neighborhood and locational attributes that could have brought about impacts on house prices (Chin, Chau & Ng, 2004). The most common structural attributes that are included in measuring property prices are the built-up area, the size of the living area or the dining area, number of bedrooms or bathrooms in a house, the car porch and the internal or external structure of a house (Arimah, 1992; Laakso & Loikkanen, 1995; Tiwari & Parikh, 1998; Wilhelmsson, 2000; Tse & Love, 2000). Empirical work generally found that quality structural attributes have a positive impact on housing price.

With respect to the locational attributes of housing, distance to the workplace, schools, retailing outlets and public transportation stations have been found to significantly affect house prices (Chin et al, 2004; Hui, Chau, Pun & Law, 2007; Jim & Chen, 2006, 2007, 2009; Redfearn, 2009; Poudyal, Hodges & Merrett, 2009). This indicates that house price is determined not only by accessibility, but also savings in transportation costs

There are many types of neighborhood attributes that house buyers can choose from. One way to classify neighborhood types is by looking at the environmental qualities within and around the neighborhood. Many studies conducted in Europe, Asia and the US evaluate the impact of environmental qualities, such as green space provision (Tyrvainen, 1997; Tyrvainen & Miettinen, 2000; Tajima, 2003; Jim & Chen, 2006), proximity to parks (Bolitzer & Netusil, 2000; Paudyal et al, 2009), and views of green space and water (Luttik, 2000; Jim & Chen, 2006) on house prices. The conclusion is that a property that is located in a good neighborhood is preferred as house buyers are willing to pay extra for a house with good environmental qualities. For example, a view of green space and proximity to water bodies raise prices by 7.1% and 13.2% respectively (Jim & Chen, 2006), and accessible green spaces near homes could raise house prices by 5 – 6% (Tyrvainen & Miettinen, 2000; Tajima, 2003). Besides, a garden bordering on water could attract a premium of 28% higher than one without this attraction (Luttik, 2000).

The main emphasis of this paper is to examine the impact of environmental qualities within the neighborhood on residential property prices. The study of the impact of environmental qualities has been conducted in developed countries. There is little or no empirical evidence to examine the impact of environmental qualities in Malaysia. In this study, two environmental qualities are assessed and examined, namely a gated-guarded landscaped compound neighborhood and a freehold neighborhood. Living in the gated-guarded landscaped and freehold neighborhood has become more and more popular. One of the popular examples is Desa Park City in Kepong, which is located in the northwestern district of Kuala Lumpur. It is a safe and vibrant community, and each neighborhood is gated-guarded and fully landscaped.

In the gated-guarded landscaped compound neighborhood, native tree species are planted within buffer zones, green reserves and pocket green spaces. Additionally, all utilities are built underground so that the natural landscape is protected and the views are not blocked. Additionally, these neighborhoods have sufficient recreation facilities, such as swimming/ wading pools with Jacuzzi, squash court, gym and sauna, BBQ corner, cafeteria and convenience store. Tan (2010) argues that home owners from the gated and guarded neighborhood socialize more with their neighbors. It is reasonable to believe that the enclosed common areas and amenities provide residents with day-to-day social activity requirements. The availability of these facilities brings some positive effects on property

prices. It is documented that the price of large housing estates, in which facilities such as a private clubhouse and swimming pool are provided, tend to be higher (Mok, Chan & Cho, 1995; Tse & Love, 2000; Hui et al., 2006). One of the main characteristics of the gated-guarded landscape compound neighborhood is the added security features. The commonly installed security features include perimeter walls and fences, security personnel and professional property management. There are CCTVs installed along the perimeter fencing, which help the security personnel to monitor visitors and outsiders.

House buyers nowadays generally want to live in the neighborhood with a freehold tenure besides the secured and exclusive gated-guarded landscape compound neighborhood. The land tenure of the freehold property is for life. The owners of the land own the land, the building and all that is on the land. There is no time limit for the owner and the freehold land lies with the title holder until the land owner transfers it to someone else. The difference between leasehold and freehold neighborhoods is that for leasehold, the land is to be returned after the expiry of the period. This type of land also belongs to the government and the lease is usually for 99 years. When the lease expires, the government can retrieve the land or lease it further. The shorter the remaining lease, the less valuable the land becomes. It is a widely known fact that freehold properties, as compared to leasehold properties, tend to perform better in terms of long-term capital appreciation. Also, home owners who own freehold properties stay in their present dwellings longer as they own everything that is on the land.

METHODOLOGY

A self-administered survey was conducted to collect the required data directly from home owners in the Klang Valley. This survey gleans information about the dwellings of the respondents, including internal characteristics, location, outdoor environment and neighborhood attributes. The sample of home owners is randomly selected in a series of steps. First, the area sample, the most popular type of cluster sample, is used to sample economically while retaining the characteristics of a probability sample. Next, districts within the Klang Valley are chosen to ensure that different areas are represented in the sample. According to the Population and Housing Census of Malaysia (2000), there are 8 districts in Klang Valley, namely Gombak, Klang, Petaling, Hulu Langat, Kepong, Cheras, Wangsa Maju, and Kuala Lumpur city. In this survey, 100 households within each district were chosen. In total, 800 copies of questionnaires were distributed in identified residential areas near major hypermarkets in each district. Out of the 800 copies of questionnaire forms, 400 forms were returned to the researcher. However, only 299 were used in the analysis due to incomplete information in some survey forms, and outlier removal.

The hedonic price model is used to determine the responsiveness of the willingness to pay for changes in housing attributes. Rosen (1974) established the price of a heterogeneous good in terms of its attributes, assuming a perfect competitive model in which the price of an indivisible and differentiated product is determined by the joint iteration of the supply and demand of the product's attributes.

The fundamental assumption is that in purchasing a house, the house buyer is paying not only for the dwelling unit, but also for its surrounding environmental qualities in the neighborhood. The house prices in this study are assumed to be affected by

neighborhood, structural, and locational attributes of dwellings. There are many neighborhood, structural, and locational attributes of dwellings that could affect the house prices. A functional relationship between them can be developed. It can be represented by:

$$P_{ij} = \beta_0 + \beta_s S_{ij} + \beta_l L_{ij} + \beta_n N_{ij} + \varepsilon_{ij}$$

where β_s is the coefficient vector for the structural attributes *(S)* which measure the structural effect on the housing price *(P),* while β_l and β_n are locational *(L)*, and neighborhood *(N)* coefficient vectors respectively, reflecting the locational, and neighborhood effects on the housing price. ε is the stochastic disturbance vector.

There are many forms that can be used to describe the relationships between price and housing attributes. Commonly adopted forms are linear, quadratic, semi-log, log-log and Box-Cox form, etc. In this study, a semi-logarithmic form is used. As pointed by Bolitzer and Netusil (2000), Geoghegan (2002), Jim and Chen (2007), this form is considered to be the best without too many complicated computations. The estimated equation in a semi-logarithmic form is expressed as:

$$\begin{aligned} \ln P = {} & \beta_0 + \beta_1 \ln Age_{ij} + \beta_2 \ln Built\text{-}up_{ij} + \beta_3 Flcer_{ij} + \beta_4 Fltim_{ij} + \beta_5 Wlkit_{ij} \\ & + \beta_6 Wlbat_{ij} + \beta_7 Housetype_{ij} + \beta_8 Worktime_{ij} + \beta_9 Retailtime_{ij} + \beta_{10} Hospitime_{ij} \\ & + \beta_{11} Sportime_{ij} + \beta_{12} Transtime_{ij} + \beta_{13} Gated_{ij} + \beta_{14} Freehold_{ij} \\ & + \beta_{15} Gated*Freehold_{ij} + \epsilon_{ij} \end{aligned}$$

The definition of the dependent variable (P) and explanatory variables included in this study are given in Table 1.

The house price, built-up area and age of the dwellings are continuous variables while the other explanatory variables are dummy variables. The house price refers to either the current or resale price of the dwellings. The resale prices were used instead of the original sale prices as stipulated in the original Sales and Purchase Agreement. This is because the transaction price in the resale market is closer to the true market price. Households in the survey know the resale prices of their dwellings if they want to dispose their properties as they are aware of the recent transacted price of houses in their neighborhoods. The size of the dwellings refers to the actual built-up area in square feet, and the number of rooms was not included in the model as the number of room is highly correlated with the built-up area (Chin et al 2004). The age of the housing unit was measured in number of years.

Seven variables related to structural characteristics of dwellings are considered in this study: the age of the building (Age); the built-up area in square feet (Built-up); living room ceramic-tiles flooring (Flcer), and bedroom laminated timber flooring (Fltim); and ceiling-height kitchen wall tiles (Walkit) and ceiling-height bathroom wall tiles (Wlbat). Floor and wall finishes of the house are measured in dichotomous codes. Housing structure dummies, namely detached, terrace, apartment, and others, are also included in the model as prices would be different between house types. The common types of houses that are available to Malaysian house buyers are detached, terrace houses, and high rise apartment. Terrace houses are the most popular at 45% share of the transaction volume while apartments made up 23% of the total transactions in 2009 (Property Market Status Report 2009).

Table 1: Definition and A Summary of Variables in the Hedonic Pricing Model

Variables	Definition
House Price (P)	Market Price (RM 000)
Age	Age of the housing (years)
Built-up	Built- up area (square feet)
Floor ceramic (Flcer)	1 if living room ceramic tiles flooring, 0 otherwise
Floor timber (Fltim)	1 if bedroom laminated timber flooring, 0 otherwise
Wall kitchen (Wlkit)	1 if ceiling-height kitchen ceramic wall tiles, 0 otherwise
Wall bathroom (Wlbat)	1 if ceiling-height bathroom wall tiles, 0 otherwise
House Type: Apartment	1 if the house type is apartment, 0 otherwise
House Type: Terrace	1 if the house is terrace, 0 otherwise
House Type: Detached	1 if the house is detached, 0 otherwise
Workplace (Worktime)	1 if the traveling time to the workplace is less than 20 minutes, 0 otherwise
Retail (Retailtime)	1 if the traveling time to retailing outlets is less than 20 minutes, 0 otherwise
Hospital (Hosptime)	1 if the traveling time to the hospital is less than 20 minutes, 0 otherwise
Sport center (Sportime)	1 if the traveling time to sport and recreation centers is less than 20 minutes
Transport (transtime)	1 if the traveling time to public transport stations is less than 20 minutes
Gated-Guarded (Gated)	1 if the property is located in the gated-guarded landscape neighborhood, 0 otherwise
Freehold tenure (Freehold)	1 if the property is located in the freehold neighborhood, 0 otherwise
Gated*Freehold	1 if the property is located in the gated-guarded landscape and freehold neighborhood, 0 otherwise

Locational variables (dichotomous codes) are included in this survey to capture the proximity of the house to several amenities in the neighborhood. These variables include the distance to the workplace (Worktime), to retailing outlets (Retailtime), to the hospital (Hosptime), to sport and recreation centers (Sportime), and to the public transport stations (Transtime).

Two categorical variables that measure the neighborhood characteristics of the housing, which are the focus variables in the study, are the gated-guarded neighborhood with the landscape compound and the freehold neighborhood. A dichotomous coding denoted whether the house is located in the gated-guarded neighborhood with the landscape compound, and whether it is in the freehold tenure neighborhood. Positive and significant effects of the good environmental qualities are expected.

RESULTS

The data used in the estimation were derived from the sample households. A descriptive statistics with the mean, standard deviation, minimum and maximum for the housing variables was summarized in Table 2.

The average price of a dwelling unit in the survey was RM 327, 386. Households, on average, own their present dwellings for more than 9 years. In this survey, the average built-up area of their dwellings was 1, 884 square feet. The majority of households own better home quality that are located conveniently near places of employment, amenities, medical, and transportation centers.

Table 2: A Summary of Variables in the Hedonic Pricing Model

	Minimum	Maximum	Mean	Std. Deviation
Market Price (000)	70.00	1500.00	327.3860	217.88149
Age (years)	1.00	31.00	9.3545	7.61146
Build up (square feet)	500.00	5000.00	1883.6722	768.79098
Flcerm	.00	1.00	.9030	.29644
Fltimber	.00	1.00	.6789	.46767
Wlkit	.00	1.00	.8060	.39608
Wlbath	.00	1.00	.8528	.35486
Gated	.00	1.00	.2943	.45650
Freehold	.00	1.00	.5853	.49350
Gated*freehold	.00	1.00	.1906	.39346
Worktime	.00	1.00	.1773	.38253
Retailtime	.00	1.00	.9799	.14046
Hospitime	.00	1.00	.9465	.22543
Sportime	.00	1.00	.9699	.17115

In order to assess whether the equation suffers from the problem of multicollinearity, VIF is computed. Table 3 shows that most of VIF values are less than 5, indicating there is no major multicollinearity problem in the model.

The results of the estimation of the semi-log model (OLS with white heteroskedasticity-consistent standard error and covariance) are presented in Table 3. This model explains about 88.4% of variations in the house prices determination. 14 coefficients out of 17 in OLS are statistically significantly at the 5% level, and the signs of the effects of these variables are consistent with previous studies. Following Jim and Chen (2009), the impacts were calculated based on a double increase ($2^{coefficient}$ -1) for continuous variables, and the impacts were calculated based on ($e^{coefficient}$ -1) for dummy variables.

The results in Table 3 reveal that all other things being equal, the gated-guarded landscape compound neighborhood is significantly related to the house prices. The gated-guarded neighborhood with the landscape compound attracts higher market prices. In this survey, house buyers are willing to pay 14.26% more to live in the gated-guarded neighborhood with the landscaped compound. The variable associated with the

neighborhood with a freehold tenure, which also is the focus of the study, is a key factor in the house price determination model. There is a significant difference between freehold properties and leasehold properties in terms of property prices. This study reveals that house buyers are willing to pay 20.68% higher to live in the freehold neighborhood, *ceteris paribus*. It is interesting to note that house buyers are willing to pay 23.52% to live in the gated-guarded and freehold neighborhood.

As far as structural attributes of dwellings are concerned, there are significant relationships in the property prices on living room flooring, bedroom flooring, kitchen wall finishes, and bathroom wall finishes, assuming all other things being equal. As shown in Table 3, the prices of houses with laminated timber flooring bedrooms are 5.46% higher than the house without. Additionally, households in the survey are willing to pay 19.64% more to own houses with ceiling-height bathroom wall tiles. Not surprisingly, home buyers are willing to pay for a premium for quality house finishes. However, the results show that living room ceramic tiles flooring is negatively and significantly related to house prices, indicating that respondents prefer better flooring for the living room such as porcelain tiles and marble than ceramic tiles. Again, house buyers prefer better kitchen wall tiles because kitchen ceramic wall tiles are statistically and negatively related to the property price. As far as house types are concerned, house buyers are willing to pay 46% more to own detached houses, 27% more for terrace houses, and only 6% more for apartments, everything else being equal.

Location and accessibility also play a role in the determination of house prices. There are significant relationships between property prices and four locational attributes, namely the distance to the workplace, to retailing outlets, to the hospital, and to public transport stations. As indicated in Table 3, a house that is situated within a 20-minute traveling time from the work place could fetch a 14.68% higher property price. This is quite consistent with the economic theory because a long distance to the work place means incurring more traveling time and cost and that would dampen house prices. According to this survey, it is interesting to note that the houses located near retailing outlets are 25.65% cheaper. Similar to the findings of Tse and Love (2000), proximity to retailing outlets does not seem to have any positive impact on the house price. This response might be partially due to the fact that the quality of living would be affected if a house is located near retailing outlets. As shown in Table 3, a higher house price (19% more) is reported if the house is located less than 20 minutes away from the hospital. The accessibility to convenient public transport is also an important factor in the determination of house prices assuming all other variables remain constant. A 25.64% higher sale price is observed for the houses that are less than 20 minutes away from public transport facilities. However, the results show that the distance to sport and recreation centers is statistically insignificant to the house price. The results in this survey are comparable to findings obtained in other studies as far as locational attributes are concerned.

Among the continuous variables, only the build-up area is statistically significant in relation to the house price. The estimation results also show that, holding all other factors constant, house age contributes a positive relationship to house prices, but the relationship is not statistically significant. This finding is not in line with the works of Hui et al (2006), Tse and Love (2000), Jim and Chen (2009), and Poudyal et al (2009) all of whom report negative and significant relationships between house prices and the age of the properties.

Generally, older properties are inferior in quality and thus would fetch a lower price than a new one.

Table 3. Housing Characteristics and Residential Property Values (OLS White heteroskedasticity-consistent standard errors & covariance)

	B	Std. Error	VIF	Impact (%)
(Constant)	-7.257**	.645		
Structural Attributes				
Age	.015	.007	1.354	0.0105
Built-up	.168**	.068	5.024	0.1237
Flcerm	-.113**	.039	1.469	-0.1072
Fltimber	.053*	.026	1.179	0.0546
Wlkit	-.111**	.042	2.795	-0.1055
Wlbath	.179**	.047	2.818	0.1964
Detached	.376**	.089	9.885	0.4562
Apartment	.061	.057	4.411	0.0627
Terrace	.243**	.068	1.480	0.2744
Neighborhood Attributes				
Gated	.133**	.041	3.525	0.1426
Freehold	.188**	.033	1.640	0.2068
Gated*freehold	.211*	.051	3.434	0.2352
Locational Attributes				
Worktime	.137**	.032	1.215	0.1468
Retailtime	-.296**	.075	1.672	-0.2565
Hosptime	.174**	.052	1.406	0.1900
Sportime	.013	.048	1.623	0.0133
Transptime	.228**	.083	1.378	0.2564
R square	.884			
Adjusted R square	.877			
Std Error of the Estimate	.203			
F	125.920			
Sig	.000			

*** p < 0.01; * p < 0.05*

DISCUSSION AND CONCLUSION

This study is relevant to housing developers as they have to be cautious before undertaking any new housing projects since property overhang is the central concern in the Malaysian housing industry. The house price determination analysis in Klang Valley indicates that having laminated timber flooring and ceiling-height bathroom wall tiles are a few of the main variables in house price determination, which is similar to empirical findings in other countries. Other statistically significant variables include the distance traveled to the hospital, public transportation facilities, and the workplace. All these indicate households want their homes located conveniently in relation to the place of employment, medical facilities and transportation. Another implication of this study is that housing developers should bring new living concepts such as landscape compound living in a well-planned gated-guarded neighborhood. House buyers are willing to pay more to live in a gated-guarded neighborhood because of the security provided by security guards. Better security measures could instill a sense of trust and peace of mind amongst the residents. In addition to the provision of security guards, common facilities within the gated-guarded neighborhood such as a private club house and a swimming pool could increase the value of the property. As reported in the study of Hui et al (2006), the availability of a private clubhouse facility within a housing estate could increase the sale value of the house by about 3.5%. Additionally, home owners prefer freehold properties because they are directly connected with the land they own, and they may obtain higher margins of financing

Today, housing is a lifestyle issue. A house is no longer just a dwelling. It is now described as a lifestyle or space to reflect the owner's personality, self-image and character. Based on the findings of this study, it is highly recommended that housing developers build freehold gated-guarded properties rather than just attractive properties in their housing development plans. Social and recreation facilities within neighborhoods allow free interaction among residents of the local neighborhood. Rohe and Steward (1996) argue that these social interactions is the first step towards participation in local neighborhood organizations. Residents are able to solve mutual problems through face-to-face discussions, negotiation and co-operation.

It is reasonable to believe that neighborhood characteristics play a role in determining the residential values of a property. In order to meet the demands and needs of the increasingly affluent and discerning house buyers, instead of just offering dream homes in prime locations, housing developers should provide intangible benefits in the neighborhood that are just as sought after by today's house buyers such as a sense of security, a feeling of harmony with one's surroundings, and an infrastructure which supports an eco-friendly lifestyle.

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