THE EFFECTS OF ROAD HUMPS ON RESIDENTIAL LIVING ENVIRONMENT IN TAMAN KERAMAT, KUALA LUMPUR

BY

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ABSTRACT

This research investigated the effects of road humps in residential environment at Taman Keramat in Kuala Lumpur, Malaysia. Traffic volume, noise level, and speed level were the variables selected to measure the traffic living environment. Questionnaires were used to evaluate the residents' perceptions regarding their living environment. Field surveys were administered to collect data on traffic volume, noise and speed levels at the three selected roads. Measurement on noise levels such as LAeq, LAFmax, and LAFmin and the traffic volume were undertaken for about 12 hours, while the speed levels were recorded during the morning and afternoon sessions. In addition, 328 questionnaires were distributed at the residential area, and 187 usable responses were received. The findings show that the highest traffic volume (563 vehicles per hour) and the highest noise level (75.6 dB(A)) were measured at Road 1. At 85th percentile, the speed after passing the road hump was slightly higher than the posted speed limit with speed of 32km/h (in the morning) and 31km/h (in the afternoon). For Road 2, there were more vehicles on the road in the afternoon compared to the morning, and the highest noise level recorded was 70 dB(A). At 85th percentile, the speed of the vehicles was found to be around 23 to 24 km/h when approaching and passing the road hump. While Road 3 indicated the highest average speed before and after the road hump (morning and afternoon session) and the highest noise level recorded was 72.9 dB(A). At 85th percentile, the speed of the vehicles when approaching and passing the road hump was 35 km/h and 34 km/h, respectively. In addition, the result from the questionnaire survey shows that 35.8 per cent of the respondents were extremely dissatisfied with the traffic volume at major roads, and the highest dissatisfaction came from the residents living in the flat and terrace type of houses. Vehicles passing along the roads made more noises compared to the noise braking and accelerating after the road humps. However, most of the respondents were satisfied with the current noise level. About 32.6 per cent of the respondents were also found to be dissatisfied with the overall speed at the residential roads, and the use of road humps did not seem to slow down the speed of the vehicles. Overall, the residents were satisfied with the current living condition although the traffic volume and speed level have proven to be the major problems concerning a healthy living environment. This contradicted the findings of the fieldwork survey, where noise level was found to be the main source of problem as it exceeded the permissible noise limit in the residential area. Finally, this research recommends with further research to be conducted on the effect of road hump in other residential areas in Kuala Lumpur. This includes suggestions on how to implement measures for a pleasant, harmonious and safe living environment for the community.

ملخّص البحث

يتناول هذا البحث تأثير المطبات على البيئة السكنية في تامن كرامت، كوالا لمبور بماليزيا. تم تحديد المتغيرات الثلاثة وهي حجم المرور ومستوى الضوضاء ومستوى السرعة لقياس البيئة المرورية. وتم استخدام الاستبيان كاداة لتقييم تصورات البيئة السكنية لدى السكان. وكذلك أجريت الدراسة الميدانية لقياس المعطيات عن حجم المرور ومستوى الضوضاء ومستوى السرعة في ثلاثة طرق مختارة. استغرق القياس على مستويات الضوضاء نحو L_{Aeq}, L_{AFmax}, L_{Afmin} وحجم المرور حوالي 12 ساعة بينما تم تسجيل مستوى السرعة صباحا ونهارا. تم توزيع 328 استبانة على السكان في المنطقة السكنية المذكورة، وتم استلام 187 استبانه صالحة للتحليل. وفق لنتائج الدراسة أعلى حجم مرور كان (563 مركبة/ساعة) بينما أعلى مستوى ضوضاء كان ((75.6 dB(A)) في الشارع الأول (1). كما اوضحت النتائج ايضا ان سرعة 85 بالمائه من المركبات كانت أكثر بقليل من حد السرعة المعلنة بقرائتها 32 كلم/ساعة (صباحا) و 31 كلم/ساعة (نهارا) وذلك بعد المرور بالمطب في الشارع الاول (1). أما في الشارع الثاني (2) فهناك مركبات أكثر على الطريق في النهار مقارنة بالصباح وأعلى مستوى ضوضاء سجل هو (70 dB(A). كشفت النتائج ايضا ان 85 بالمائة من المركبات تسير بسرعة حوالي 23 حتى 24 كلم/ساعة عندما تقترب من المطب وتمر عليه. بينما أشارت النتائج إلى أن أعلى معدل سرعة قبل المرور بالمطب وبعد مروره (صباحا ونهارا) وأعلى مستوى ضوضاء مسجل ((72.9 dB(A)) كان في الشارع الثالث (3)، في حين كانت سرعة 85 بالمائة من المركبات عندما تقترب من المطب وتمر عليه 35 كلم/ساعة و34 كلم/ساعة. إضافة إلى ذلك، أظهرت نتائج الاستبيان أن 35.8% من المجيبين غير راضون للغاية مع حجم حركة المرور في الشارع الرئيسي وأعلى عدم رضا يأتي من السكان الذين يعيشون في الشقة والشرفة، وأن المركبات التي تسير على الطريق تصدر ضوضاء أكثر مقارنة مع ضوضاء الكبح والتسارع بعد المرور بالمطب. ولكن معظم السكان راضون على مستوى الضوضاء الحالي. أما 32.6% من المجيبين فهم غير راضون بالسرعة الإجمالية في طريق منطقتهم إضافة إلى أن استخدام المطب لم يبطئ سرعة المركبات. عموما، السكان راضون بظروف المعيشة الحالية، لكن وفقا لهم يكون حجم المرور ومستوى السرعة قيدا رئيسيا فيما يتعلق ببيئة معيشة صحية. وتناقضا مع المسح الميداني، في حين ان المجيبين كانوا راضين عن مستوى الضوضاء في منطقتهم السكنيه، أشارت نتائج التحليل إلى أن مستويات الضوضاء كانت مصدر المشكلة الرئيسي حيث تبين أنها تتجاوز الحد المسموح به من الضوضاء في المنطقة السكنية. وأخيرا، تقترح هذه الدراسة إجراء المزيد من الابحاث حول تأثير وجود المطبات في مناطق سكنية أخرى في كوالالمبور. كما تقترح الدراسة إجراء المزيد من الدراسات لإختبار مقاييس اخرى لتوفير بيئة معيشه متناغمة وامنه للمجتمع.

APPROVAL PAGE

I certify that I have supervised and read this study and that in my opinion, it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a thesis for the degree of Master of Science (Built Environment)

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DECLARATION

I hereby declare that this thesis is the result of my own investigation, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

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"Bismillahirrahmanirrahim: In the of Allah, the Most Gracious and the Most Merciful"

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CHAPTER ONE

INTRODUCTION

1.0 RESEARCH BACKGROUND

Residential environmental quality is an essential part of the quality of life concept that conveys a sense of well-being to the population. This concept of quality of life involves both the human and physical factors that support the activities of economy, culture and social aspects of the society. According to Maran and Couper (2000), an environment on quality of life is the aspect of economics, social and physical environment that makes it desirable a place to live or do business. The residential environmental quality as the main habitat has now become a great concern to most people. It is not only being contributed by the physical attributes such as air and sound pollutants, and built environment such as services and facilities but also the psycho-social attributes such as crowding and safety issues (Yoon, 2008).

The improvement of residential environmental quality is now being one of the main targets of city policy makers and urban planners and has also been discussed in numerous studies. This residential built environment and the quality of life relationship has been examined extensively in many disciplines and perspectives, such as anthropology, architecture, economics, environmental design, geography, psychology and sociology (Moore, 2012; Jefferson, 2008). Some studies have shown that the quality of life of the residents is influenced by the place where they live with access to amenities and public services (Boyer, 2003), while others found the types of communities and neighbourhood may enhance or diminish their quality of life (Wilkerson, Carlson, Yen & Michael, 2012; Weisner, 2004). Some studies have also looked at the effect on crime, or fear of crime (Day, Anderson, Powe, McMillan & Winn, 2007; Perkins, Meeks, &

Taylor, 1992), safety and mobility (Engwicht, 1993; Carp, Zawadski & Shokron, 1976), building structure and space (Jelinkova & Picek, 1984; Ha & Weber, 1994), and personal characteristics such as age, gender and socio-economic status (Carp & Carp, 1982; Evans & Cohen, 1987). Although numerous studies have examined the environmental influence on the quality of life, there is still a dearth in the literature on the possible influence of transportation policy and strategy such as traffic calming in reducing congestion, air pollutants, promoting network efficiency and consequently improves the quality of life (Boarnet & Haughwout, 2000; Peterson, 2006; Litman, 2007).

The escalating traffic speeds and volumes on the residential streets have a toll on the safety of the local residents. They have being struggling with the issue since and have asked that their residential quality of life be improved through a reduction of vehicle speeds and volume. Many of them desire the simple pleasure of being able to walk or ride bicycles through their neighbourhoods without fear of motorised traffic, a key factor in neighbourhood liveability. It has been argued that when traffic volumes increased beyond what is considered normal by local residents, the social street activities are greatly reduced, and the feeling of well-being in the affected neighbourhood is threatened (Appleyard, 1981).

Therefore to protect the liveability and to enhance the neighbourhood environmental quality traffic calming measures are suggested. These may be helpful in the reduction of noise, improve adverse air quality, increase beautification (landscaping), and providing a potential deterrent to crime as well as to provide for efficient movement of motor vehicles in the residential streets. Thus there is a need for a research to find the balance between traffic and environments by analysing the living environment through the traffic calming measures.

1.1 PROBLEM STATEMENT

Malaysia is experiencing rapid growth in population, economy and motorization during the past decade. It also saw a two-fold increase in the number of motor vehicles registered from 10,598,804 units in 2000 to 20,188,565 units and 22,702,221 units for the years 2010 and 2012, respectively (MIROS, 2012). With the increase in the number of motor vehicles, traffic hazard has become a major health and social problem to the country with a high number of road accidents, traffic noise and air pollution. Table 1.1 shows the fatality rates due to road accidents had increased from 6,035 in the year 2000 to 6,917 in 2012. It is also predicted that road fatalities in Malaysia for 2015 would be 8,760 and 10,716 for the year 2020 (MIROS, 2012).

Table 1.1
General Road Accident Data in Malaysia
(Source: MIROS, 2012)

	Year 2000	**Year 2005**	**Year 2010**	**Year 2012**
Population	23,263,600	26,130,000	28,910,000	29,300,000
Road Length	68,770	71,814	111,378	127,517
Road Death	6,035	6,200	6,872	6,917

The period also saw the length of roads nationwide increased tremendously. This development coupled with the increases in car ownership and travel demand created various traffic related problems in the cities. In most major cities in the Klang Valley area, the alignments of major roads were running very close to the residential areas. When the street in residential areas is dominated by motorised traffic, the liveability and quality of life in the neighbourhood suffers. The potential impacts of

speeding vehicles to the neighbourhood include the possibility of a higher number of motor vehicle accidents and an increase in traffic noise and emissions.

A study in Australia has documented that the speed of vehicles contributes to at least one thirds of fatal accidents (Frith, Strachan & Patterson, 2006). Another study found that along the major road to the residential neighbourhood showed the noise level has exceeded 75 dB and NO2 level more than 0.02 ppm (Kadar, Miura, Inokuma & Nishimura, 2006). This impacted the living environment of the affected residential areas where 60 per cent of the residents voiced dissatisfaction with the noise level and another 55 per cent with the air level (Kadar et.al, 2006; Wan Nurul Mardiah, 2005).

Most of these major cities are now plagued with urban traffic problems with negative impacts that jeopardised residential environmental quality. A healthy living environment is vital for a positive lifestyle of residential environment (Kadar et al., 2006). Although the street has been accepted as a physical and social part of the living environment and it is used simultaneously for vehicular movement, social contacts and civic activities, the quality of living environment in many residential areas has been deteriorating mainly because of an increase in traffic volume, excessive speed, road alignment and other related factors (Kadar et al., 2006; Bowers, 1986; Schlabbach, 1997; Ben-Joseph, 2004).

As a result, many neighbourhood residents and local officials have expressed interest in undertaking traffic calming as a means of decreasing the dominance of automobiles. Thus there is an urgent need to address the issue through implementing known and effective programme so that the number of accidents could be reduced and to overcome the traffic problems in order to accommodate the residents, pedestrians and motor vehicles at the same time.