A LITERATURE ANALYSIS ON THE LIVING ENVIRONMENTAL ELEMENTS IN RESIDENTIAL AREAS

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ABSTRACT: Residents are increasingly faced with poor living environment as a result of deterioration in the urban environment. Increasing traffic volume, traffic noise, traffic congestion, and air pollution are few among the many living environmental elements that the residents are subjected to which affect the quality of life and well-being of the community in the long run. A liveable residential neighbourhood is one that offers peaceful, harmonious, and healthy environment for the benefits of the community. Urban environments that are designed to achieve sustainable design principles will encourage people to reduce their car use and choose more sustainable modes for their travel activities. The purpose of this paper is to discuss on the living environmental elements that contribute to the well-being of the residents. It focuses on analysis of literature in establishing a framework on sustainability for understanding the relationship between the quality of an urban environment and the benefit to the community. In the process of planning health-promoting urban environments, it is essential to provide better living environment which can offer relief from environmental stress and opportunities and at the same time striving to minimise the negative impacts of urbanisation in the residential areas.

Keywords: living environment; residential area; sustainability; urban environment; residents.

1. INTRODUCTION

The improvement of residential environment quality had become one of the main targets of city policy and urban planning with various different methods of approaching the study resulted from the efforts of different disciplines, such as anthropology, architecture, economics, applying concepts and etc. which related to their own perspectives (Wardman and Bristow, 2004). However, currently residential areas are increasingly faced with poor living environment as a result of deterioration in the urban environment such as increasing traffic volume, traffic noise, traffic congestion, air pollution, etc.

These are few among the many living environmental elements that the residents are subjected to which affect the well-being of the community in the long run. The purpose of this paper is to discuss on living environmental elements in the residential areas and the issues which are related with these elements. In addressing these issues, a clear emphasis on the sustainable elements in the residential areas is given for a better lifestyle and satisfactory living conditions for the residents.

When planning for a better living environment for the purpose of making the residential areas a better place to live, it is worthwhile to note that the planners, architects, etc. should play an important role in designing a community by taking into account all plausible elements. It is to ensure that the residents can live in a peaceful and quiet environment for the well-being of every resident in a community. The aim of this paper is to discuss on the living environmental elements that contribute to the well-being of the residents. It focuses mainly on the analysis of literature to establish a framework on sustainability for the understanding of the relationship between the quality of an urban environment and the benefits it provide to the community.

2. LIVING ENVIRONMENTAL ELEMENTS IN RESIDENTIAL AREAS

2.1 Liveability

People want to spend their lives in residential areas where it is harmonious for raising and nurturing their families, and have good connectivity with the rest of the city to enable them to access various amenities with ease (Pandey, Garg, & Bahrat, 2010). This complex interaction between the community and its environment could be exemplified through the term liveability. Liveability is a concept that conveys an image that is full of life and creates living conditions in a locality that offers a desirable quality of life. In its broadest sense, liveability relates directly to the quality of life and wellbeing experienced by inhabitants of a particular locale (Gerrardbown, 2006).

In a residential area, liveability refers mainly to the immediate physical built environment that surrounds an individual as soon as he steps out of his home and walks or drives through the streets of his neighbourhood to reach the nearest bus stop or main road (Gerrardbown, 2006). Healthy living environment is one of the factors vital to the positive lifestyle of a residential built environment (Abdul Azeez et.al, 2006). However, there is a growing awareness of the deterioration particularly in urban built environment due to the pressure of rapid development and growing population. Study by Abdul Azeez et.al (2006), concluded that the overall satisfaction level of the residents with the living environment was high, although the satisfaction level regarding specific living environmental factors (noise and traffic volume) was low. Noise can be defined as an unwanted or undesirable sound whereas environmental noise is any unwanted or harmful outdoor sound created by human activities that is detrimental to the quality of life of individuals (Nadaraja et.al, 2010).

Furthermore, Abdul Azeez et.al, (2006) indicated that noise generated from traffic along arterial road was measured as 70 dB or more, hence caused disturbances to the residents living near the road. There are also more than 80% of the residents that had expressed 'traffic noise' as the main noise source in the present living environment setting. Moreover, based on Figure 1, study by the DOE (2008), the existing noise level at suburban residential area has quite high noise level ranging from 69.8 to 70.2 dBA on day time whereby the acceptable noise level during day time is only 55 dBA. Furthermore the noise level at night time also results in high numbers with 68.6 dBA while the night time limit is only 45 dBA. On the long term, this can results in permanent damages to the residents who are dealing with this problem every day and as stated by Botteldooren et.al, (2011) exposure to noise levels of relatively high degrees can lead to direct hearing loss and/or hearing impairment.

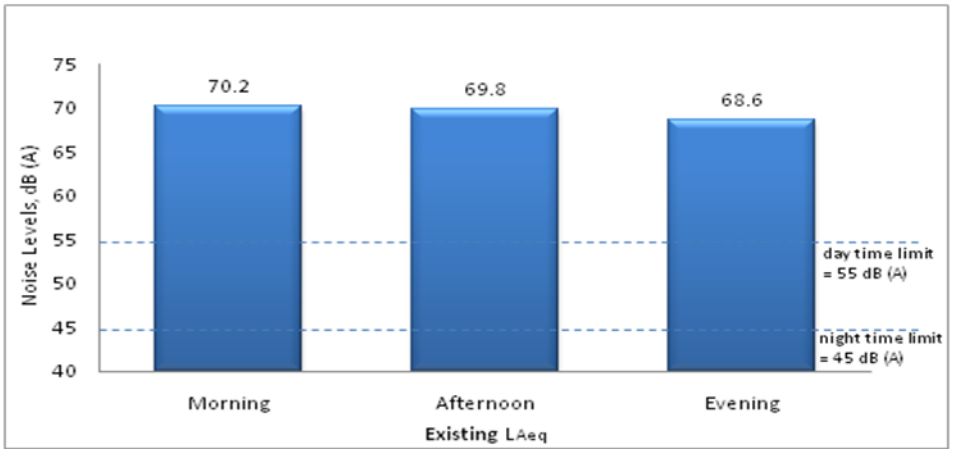

Fig. 1 Existing Noise Level in Suburban Residential Areas (Medium Density)
Source: Department of Environment (DOE), 2008

A liveable neighbourhood is one that offers quality and good environment to ensure inhabitants are able to live their lives in a satisfying way (Lau, 2008). Lyndhurst (2004, as cited in Pandey et.al, 2010) concluded in his research study that a good quality local environment is one of the key building blocks of sustainable cities and liveability can help people to take small steps towards making the environment matter, and has the potential to catalyze wider sustainable behaviours.

2.2 Quality of Life

In many places throughout the world, individual health and well-being suffer from environmental quality shortages such as lack of adequate infrastructures (water, energy, sewerage system, etc.), polluted air, traffic noise, crowding and criminality, which together are disturbing the individual's living environment (Moser, 2009). In an extensive study on the perceived quality of the residential environment, Van Poll (1997, 2003 as cited in Moser, 2009) showed that urban quality is determined by physical as well as social and planning aspects. It appeared that perceived residential quality not only depends on the quality of buildings and open space characteristics, but includes aspects like social ties in the neighbourhood, safety and environmental deterioration. Having a positive outlook on life, a good home in a safe neighbourhood and being able to pursue activities and hobbies at home alone and elsewhere with other people are regarded as important to life quality (Gabriel and Bowling 2004; Bland, 2005).

Nowadays, life as an urban residents is filled with stressful situation from demand from works, family, living condition, etc. Research had shown that nature provides restorative experiences that directly affect people's psychological well-being and health in a positive way (Gunnarsson and Ohrstrom, 2007). They also concluded that for both those with and without access to a quiet side of their dwelling, "better" availability to green areas decrease long-term noise annoyance experienced during the last 12 months, reports of noise as a neighbourhood problem, and noise disturbance of outdoor stay. For the latter, the number of disturbed residents is approximately two times greater in the condition of having "poorer" than "better" availability to green areas. Additionally, compared to "poorer" green-area availability, "better" green-area availability is linked to a higher number of residents walking and exercising in the neighbourhood and to a larger group of residents hearing natural and human sounds very often, which indicate the presence of a positively perceived soundscape (Gunnarsson and Ohrstrom, 2007).

The availability of nearby trees, opportunities for gardening, and places for taking walks (within 3min) were highly valued components of urban nature and can increased satisfaction and well-being in urban residents (Gunnarsson and Ohrstrom, 2007). Furthermore it is well known that most people prefer a natural, green setting for such leisure activities as walking and cycling. This makes it reasonable to suggest that an attractive nearby green environment may stimulate physical activity in the form of participating in such recreational activities more often or longer (Maas et.al, 2008). However De Vries (2006) contradicted the statement as he stated more visits to/more time in a green environment does not necessarily imply more physical exercise in the form of leisure activity. People may not be that active within the green area, or in case of a less abundant supply of green areas, they may be as active, but in a non-green environment (De Vries, 2006). Hence acting on a concern for people's well-being requires looking beyond singular effects of environmental features and to consider people's overall relationship to their environment, in order to identify the environmental conditions of human well-being.

2.3 Safety

There are many elements that can be discussed on the safety in the residential areas, however for this paper, it will be touched on traffic issues and crimes that currently affecting the living environment in the residential areas. Nowadays, living condition in residential neighbourhoods is significantly affected by the traffic issues of speeding and high vehicle volumes (Hughes, 1990). Factors such as excessive worry for the safety of residents required additional effort to increase safety precautions such as walking/driving a child to school; noise; discomfort when walking to a neighbour's home etc. This is mostly due to excessive speeding, high numbers of cars, and/or existing substandard improvements, and consequently reduce the standard of living in a residential neighbourhood (Pandey et.al, 2010). Conventional methods of reducing/controlling speed such as increasing traffic enforcement and improved/increased signage have not always proven effective. Because of this, nonstandard, relatively untested methods of controlling speed and reducing volumes are evolving (Wardman and Bristow, 2004). This shows that many people are environmentally concerned, and that lack of environmental quality such as noise and pollution, problems of security, inadequate facilities in the neighbourhood and lack of satisfactory transport, are repeatedly mentioned by residents as threatening their quality of life (Moser, 2009).

Crime problems in neighbourhoods are the other factors that frequently affect the safety in the residential areas. In Malaysia, the crime rate is seen to be increasing annually for the past 32 years, beginning from 1997 to 2007. This increase in the crime rate is contributed more to crimes against property if compared to violent crimes (Siti Rasidah and Aldrin, 2006). Among the seven types of property crime in Malaysia, night home break-ins register the highest number of occurrences in a period of seven years compared to other forms of property crime (PDRM, 2008). This situation is influenced by the environmental factors, specifically night time conditions that accord a sense of ease to the criminals to act against their intended targets (Siti Rasidah and Aldrin, 2006).

In terms of crime prevention methods, it cannot be denied that the relationship between communities is vital in ensuring crime rate reduction (Siti Rasidah and Aldrin, 2006). This relationship refers to the social interaction within the local community members. A good social interaction can be defined as the capability and ability of the community members to gather together and congregate at least once a year (Pandey et.al, 2010). This contributes towards the collective efficacy among the community members based on civic activities within the social control. As an indirect effect, it gives emphasis on the involvement capacity of the residents to act collectively in developing themselves or overcoming local problems (Siti Rasidah and Aldrin, 2006). The development of this social connection in turn will be able to reduce the occurrences of crimes such as home break-ins, vehicle theft as well as burglaries in residential areas (Gerrardbown, 2006). As such, a higher involvement of residents in community programmes such as neighbourhood watch and community meetings will undoubtedly be indicative that the residents are satisfied with their surrounding neighbourhood (Siti Rasidah and Aldrin, 2006).

3. SUSTAINABLE DEVELOPMENT IN RESIDENTIAL AREAS

Sustainability has become a very important element in design of cities as well as residential areas. However, Choguill (2008) argued that even though consideration of sustainability is very important in residential/neighbourhood design, it has received less importance. Jepson (2007) had also said that when it comes to practicing sustainable development it remains outside the mainstream. The term sustainable that had been quoted frequently is the definition from the Brundtland Commission of the United Nations in its Our Common Future Report. In it, the word sustainable development is defined not as a fixed state of harmony but rather a process of change in which the exploitation of resources, the orientation of technological development, and institutional change are made consistent with the future as well as present needs. In other word “Sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (United Nation General Assembly, 1987; Robert et.al, 2005).

3.1 Elements of Sustainable Residential Development

According to (Newman and Kenworthy, 1989) the concept of sustainability has emerged from a global political process that has tried to bring together, simultaneously, the most needs at present:

1) The need for social justice and culture diversity to enable local communities to express their values in solving these issues;
2) The need for economic development to overcome poverty; and
3) The need for environment protection of air, soil, and biodiversity, upon which we all ultimately depend.

To achieve triple bottom line, concept design and density play very important role. Even though there are many definitions of sustainability it is generally agreed the economy, environment and social equity are three prime values of sustainability (Chan and Lee, 2009). In spite of great concerns for creating sustainable and lively neighbourhoods, there is not enough comprehensible and consistent terminology in a framework both planners and public can use to communicate ideas about neighbourhood design (Greene, 1992). Following section will provide the impact of design and density for social, economic and environmental sustainable residential development.

i. Social Sustainability

Social sustainability is improvement and maintenance of current and future well-being and it reduces social inequality and improves quality of life (Moser, 2009). Therefore, to achieve the quality of life, there is need for interaction within the community. Chan and Lee (2009) argued that form of

development affect the micro climate of areas in terms of temperature, relative humidity, air quality, lighting level and ventilation flow, which affects human comfort. For example, residential areas with the row house design and low density tend to reduce the interaction in society, whereas a dwelling unit in U-Shape and medium density increase the interaction. U shape layout increases the interaction because this provides a common entry point for everyone. Pedestrian oriented neighbourhood provide opportunities for people to interact with society. Design is the key to create sustainable development by improving or enabling social equity, economic vitality and environmental responsibility (Greene, 1992; Chan and Lee, 2009). Therefore, to make residential development socially sustainable these design elements need to be incorporated in neighbourhood design. It is also had been stated by Chan and Lee (2009) that in low-density suburbs the interaction is less whereas in medium and high density it is more. However, as density does not have a fixed standard and varies from place to place, it needs to be identified in its specific context. Hence, social sustainability is the process that addresses the relationship between society and built environment (design and density) and quality of life in neighbourhood setting.

ii. Economic Sustainability

Design element also impact on economic sustainability. Design that takes care of orientation, ventilation, micro and macroclimate, and materials, generally has lower maintenance and ongoing cost (Chan and Lee, 2008). However, Ben-Joseph (2004) argued that better design, physical condition of the buildings and image of the neighbourhood often lead to an increase in property prices. To obtain such economic gain, development need to consider many aspects of design, and most important element is the layout pattern and spatial distribution of activities and facilities. Density also intends to raise the utilisation of land by providing high quality of high density housing to increase the total revenue (Jepson, 2007). Design also has to achieve balance between various land uses to maximise the revenue. Economical sustainability of any residential development is the outcome of intensity of gross and net residential densities and various design elements. Some of the design elements are (as stated in Chan and Lee, 2009, pp. 360-361):

1. Optimisation of natural lighting and ventilation
2. Access to open space and social facilities for all age groups
3. Efficient use of land & space and mixed use development
4. Adaptability of development to the changing need
5. Green feature related to construction such as installation of energy efficient/water saving devices, use of recyclable and durable construction materials.
6. Provision of accommodation for different income groups
7. Layout pattern
8. Building design in terms of appearance, density, height and mass
9. Convenience efficiency and safety for pedestrian and public transport users.

Therefore, density and design parameter play a very important role for achieving economically sustainable development.

iii. Environmentally Sustainable Design

There is a belief that urban environments that are designed to particular sustainable design principles may encourage people to reduce their car use and choose more sustainable modes for their travel activities (Ben-Joseph, 2004). There is a general consensus within planning and urban design policy and guidance that the ‘right’ urban design can stimulate the use of public transport, resulting in a reduction in car use. Intensity of density also plays an important role to make development environmentally sustainable. Increased density and mixed use development means more buildings, shops, homes and local services in close proximity to encourage walking and cycling. It also enables more efficient use of services, resources and more convenience to its citizens (Chan and Lee, 2009; Hickman and Banister, 2005). This increase in density means more people should walk or ride bicycle and thus medium and high density will lead to reduced emissions and pollutions (Hickman and Banister, 2005). Moser (2009) also had stated that design consideration such as quality of life, conservation and preservation, integrated design and provision of welfare facilities should be incorporated to sustain the urban environment. Intensity of density need to be carefully selected because high densities lead to traffic congestion and low density increases the cost of public transport.

In promoting sustainable and less car dependent developments, the UK government has published various policy documents seeking to encourage higher density, mixed-use developments; discourage out-of-town developments; and encourage the development of new pedestrian and bicycle infrastructure, and improved access to public transport. These schemes contain a number of 'sustainable' urban design features, e.g. they are higher density with more permeable layouts than previous developer norms, they may have infrastructure to support walking and cycling and include water and energy efficient elements (Susilo, et.al, 2011). It is hoped that these strategies will make places more sustainable, by bringing residents closer to their destinations, reducing the need to travel, providing viable alternatives to car use and making it safer and easier for individuals to access jobs and services by energy efficient modes such as walking and cycling (Hickman and Banister, 2005, Susilo et.al, 2011).

However whilst there is evidence that certain physical forms can have a positive impact on promoting more sustainable towns and cities, some studies have questioned about this. Study by Williams et al. (2000) argued that denser environments alone do not necessarily lead to the desired effects of reducing car use and promoting walking, cycling and public transport use, and raise concern over the 'compact city's' contribution to wider sustainable travel patterns on both regional and intra-regional travel. The variability in effect of urban form may be explained, partially, by differences in cultural, attitudinal and individual socio-demographic factors. Nevertheless, Susilo and Dijst (2009) had found that although land use characteristics have some significance in explaining travel behaviour, individual attitudes are often more strongly associated with travel behaviour than land use policies that promote higher densities. It is evident that urban form policies may not have a material effect on travel demand unless individuals' attitudes are also changed.

4. CASE STUDIES

4.1 Crime Prevention through Environmental Design

The concept and approach of Crime Prevention through Environmental Design (CPTED) has been chosen as one of the initiatives for crime prevention methods in the residential area. CPTED is considered to be one of the approaches that deem social interaction as one of the more important determinant factors of its success (Siti Rasidah and Aldrin, 2006). The success of CPTED is based on five main components of (i) territoriality, (ii) surveillance, (iii) access control, (iv) maintenance and target hardening and, (v) support activity. Siti Rasidah and Aldrin (2006), defined this component as; territoriality can be defined as a concept that reinforces the notion of proprietary concern and a 'sense of ownership' in legitimate users of space, thereby reducing opportunities for offending by discouraging illegitimate users. Surveillance is based on the physical design which enables the capacity to promote informal or natural surveillance opportunities for residents and their agents, thus making surveillance a part of capable guardianship. If offenders perceive that they can be observed, they may be less likely to offend, given the increased potential for intervention, apprehension and prosecution. Access control is a concept that reduces the opportunities for crime by denying access to potential targets as well as creating a heightened perception of risk in offenders. Maintenance and target hardening is to promote a positive image and to routinely maintain the built environment to ensure that the physical environment continues to function effectively and transmits positive signals to all users. Installing elements of target hardening increases the efforts that offenders must expend in the commission of a crime and the last component, support activity, can be defined as the use of design and signage to encourage intended patterns of usage in public spaces (Siti Rasidah and Aldrin, 2006).

Based on the study by Casteel and Peek-Asa (2000), they discussed the effectiveness of CPTED in reducing crimes in the residential area. The research concluded that most of the applied components had shown reduction in crime from 84% to 30%, however no associations were found between robbery decreases and either the follow-up period or the number of program components. While research by Siti Rasidah and Aldrin (2006), they had done the correlation analysis between CPTED and the Fear of Crime (FOC) as well as the Sense of Community (SOC) levels by Spearman's rho correlation test analysis. The results of the analysis indicate that the correlation test between CPTED and SOC was found to be significant, however the relationship between CPTED and FOC had shown insignificant. This demonstrates that there is no correlation between CPTED and FOC. This shows the broad nature of the CPTED approach allows its adaptation to any setting, and results indicate that it is an effective approach to reducing crime rate in the residential area and vital in improving the relationship between the communities in ensuring further crime reduction.

4.2 Green Space

Urban and rural residential areas constitute different kinds of environments in which to examine feelings of social safety. Rural areas are more sparsely populated, have a different population (fewer young adults, one-person households, and ethnic minorities, for example), and are often seen as harmonious, peaceful, tranquil, closely knit communities with lots of green space (Little et al, 2005) while urban areas green spaces are often regarded as unsafe, due to the allegedly poorer standard of maintenance (Kuo and Sullivan, 2001). As a consequence, rural areas are usually regarded as being safer than urban areas (Maas et.al, 2008). Another relevant issue is the type of green space. Several studies have shown that `open' green space (green spaces which preserve visibility) increases feelings of social safety, as opposed to `closed' green space (green spaces that do not preserve visibility), due to the higher visibility of potential dangers (Maas et.al, 2008).

Based on the study by Maas et.al (2008), the results concluded that green space in people's living environment is generally associated with enhanced feelings of social safety. This relationship is concurrent with the positive relationship between green space and people's health that has been found in the literature. Closed green space was only found to increase feelings of insecurity in very strongly urban areas, a conclusion which has implications for spatial planning. Investing in green space not only makes people healthier, but also helps to make them feel safer (Maas et.al, 2008). In contrast to the findings of Kuo and Sullivan (2001), it had been found that the positive relationship with social safety is not restricted to open green spaces in strongly urban areas, moderately urban areas, and rural areas. However Maas et.al (2008) had also stated, it is unknown why closed green spaces in very strongly urban areas are associated with increased feelings of insecurity, whereas they are associated with enhanced feelings of social safety at all other levels of urbanisation. This might be due to the size of buildings in very strongly urban areas with lots of green space: buildings in these areas are likely to be larger, higher, and more compact, which are building characteristics which are known to affect fear of crime (Siti Rasidah and Aldrin, 2006). Furthermore, these increased feelings of insecurity might be associated with poorer levels of maintenance of green areas in very strongly urban areas. Therefore the maintenance of green spaces is important for people's feelings of social safety, whereby, disorder in the form of graffiti, garbage, and vandalism diminishes feelings of social environment.

4.3 Traffic Calming Measures

The perception of speeding on local streets is probably the most persistent problem facing residents and traffic officials, alike. Although local or residential streets carry the lowest traffic volumes and suffer the fewest traffic crashes, they are the single largest consumer of a traffic engineer's time and energy (Institute of Transportation Engineers, 1999). However there are in some cases shows that the implementation of traffic calming devices may cause an extreme reduction in traffic (Patterson, 2004). Significantly, the choices of design speed are also influenced by the geometric design of roadways and have been established to provide motorized efficiency which is often incompatible with the essence of residential liveability (Koorey, 2011).

Appleyard (1981) hypothesized that when traffic volumes increase beyond what is considered normal by local residents, or vehicle speeds increase because of street design, social street activities are greatly reduced, and the feeling of well being in the affected neighbourhood is threatened. Although, Ben-Joseph (1990) recommended criteria refer to issues of liveability and safety on residential streets, many cities are finding themselves under pressure to further address the issues through the reduction of speed and volume of traffic in residential areas. This can be due to high traffic volume which is often the result of a poorly planned street system and excessive speeds are related to the street's geometrical design. The practice of constructing wider road alignment in residential streets where there is little traffic (less than 1000 trips per day) also permits and encourages high vehicle speeds (Ben-Joseph, 1990).

The environmental effects also need to be considered carefully for measuring the effectiveness of traffic calming devices, including noise and speed quality. The environmental impacts can be positive and negative as they are dependent on the changes in traffic volume and vehicle speeds after using the traffic calming devices. Numerous studies have demonstrated that most traffic calming schemes have successfully achieved the objectives set in terms of reduction in accidents, speeds and volumes, and there is ample evidence of the general positive response to traffic calming by the public (Schroll, 1999; Morrison et.al, 2003; Patterson, 2004).

However, despite the significant benefits of such schemes there is considerable professional and community opposition towards the use of physical traffic calming devices. Opinion surveys have shown that motorists feel disadvantaged by speed humps or raised platforms and that residents living near the devices often complain of deterioration of, rather than improvement in, environmental conditions (Hidas et.al, 1997). There have been cases where some devices were even removed because of community complaints (Cline and Dabkowski, 2005). Notwithstanding the overall success of traffic calming in local streets, these claims suggest that, while physical speed control devices are very effective in improving the safety and amenity of the street environment, they also produce undesirable side-effects to the community. It seems quite reasonable to assume that these effects may become more important if such devices are installed on routes with higher traffic volumes. Hence there is a need to investigate any possible side-effects associated with these traffic management techniques.

To investigate the improved amenity and to test the effectiveness and the impacts of speed control, numerous studies have been conducted on vehicle speeds, journey times, accident rates, traffic flow changes, noise levels and community reactions to these devices. According to (Hidas et.al, 1997; Cline and Dabkowski, 2005) some of these studies have indicated that speed control devices may have some minor negative environmental impacts in terms of noise and air pollution in the vicinity of the devices. While based on a study by Mao and Koorey (2010), traffic noise pollution levels will generally decrease if there is reduction in traffic speeds. However, it may increase as a result of vertical deflections such as road humps. In residential areas, speed reductions from 50 to 30 km/h typically reduce noise levels by 4 to 5 decibels, or more in some circumstances (Engel and Thomsen, 1992). Conversely, Hidas et.al (1997) reported that the noise level is negatively affected when more noise can be produced in areas with or near traffic calming devices. This is due to increases in the number of accelerations or decelerations. He also reported that the effects of traffic calming measures have positive outcomes, although traffic calming devices can result in some undesirable side effects in relation to traffic noise of individual cars that are due to decreased traffic volumes. However, no previous attempts have been made to research other possible side-effects. Some authors suspected that speed control devices may induce changes in the traffic flow which, in turn, may increase the delays of vehicles entering from driveways and the delays for pedestrians attempting to cross the road (Koorey, 2011). Except for the occasional contradictory views expressed by residents living near such devices, no evidence is currently available to support or refute this assumption.

Indisputable, the application of the traffic calming measures is one of the tools that need to be highlighted in order to improve the residential environment for people living in the area. Additionally, traffic calming measures is the technique that applied the reduction in average speeds of vehicles in built up area as well as a measure to change the driver's perception of an area. As Engel & Thomsen, (1992) and Schroll, (1999) highlighted, the traffic calming can alter the balance and impress upon the driver that the street is primarily for residential use. Overall, it can be concluded that the changes in environment are dependent on the traffic calming schemes applied, the traffic volume, the reductions in travel speed and any changes in driving style.

5. DISCUSSION AND CONCLUSIONS

Despite the fact that the living environment has a great impact on the happiness and well-being of individuals, urban planners and designers have not taken much action to shape the environment into communities where people can live comfortably and enjoy the highest possible quality of life (Gunnarsson and Ohrstrom, 2007). The fact that inefficient and inadequate planning and design have plagued residential areas for many years and have hindered life from being as pleasant and enjoyable as it can and should be (Ben-Joseph, 1990; Patterson, 2004; Pandey et.al, 2010). Several case studies have been discussed to shows the approach in making the residential area a better living environment, such as CPTED, green space and traffic calming measures. These concepts, with its pros and cons have proven to improve the safety of the residential areas and consequently improve the liveability and quality of the living environment.

Additionally, in order to make the residential area a better communities place, authority should also work with the community in order to serve the area based on the social, economic, political, religious and other cultural desires and concerns of residents (Etzioni, 1993). The social environment is vital to the general well-being of humans and growth of individuals, therefore the authority must develop various strategies to help strengthen the social fabric of a community (Moser, 2009).

Furthermore, citizen participation and influence on planning decisions is also central to the improvement of the quality of life in residential areas (Gabriel and Bowling, 2004). If planners and designers do not know and understand the needs and aspirations of the people who live in the targeted community, then they cannot appropriately plan for the betterment of that community. The forging of a stronger sense of community can also result in a safer, more secure neighbourhood (Choguill, 2008).

Safety is a very important factor when measuring the quality of life in any area, and residents tend to feel safer when they are surrounded by people they know and with whom they are acquainted (Siti Rasidah and Aldrin, 2006; Pandey et.al, 2010). People who are part of a closely-knit community are more inclined to work together to help patrol their neighborhoods for crime and danger (Harang, 2003; Siti Rasidah and Aldrin, 2006). These residents will also often assist their local authorities in order to keep their residences safe (Massam, 2002). However, there are those who argue that common citizens may face danger when attempting to fight crime because some of these citizen groups have become overly active in keeping their neighborhoods safe (Siti Rasidah and Aldrin, 2006). However, many neighbourhood watch programs and similar programs, however, were successful in reducing levels of fear and thus improving the quality of life in communities without putting the civilian volunteers in danger (Harang, 2003; Siti Rasidah and Aldrin, 2006).

While taking into consideration the societal changes that are taking place, the authority must also understand that creating liveable communities that allow for the highest possible quality of living environment is a very complex task (Greene, 1992, Moser, 2009). When shaping residential environments, professionals must consider issues beyond the realm of one-dimensional urban design and planning. It must explore on the effects of design, architecture, physical surroundings and social environment on humans in order to understand how to structure healthy neighbourhoods and actively seek to change our practice for the betterment of individuals and, in turn, of society as a whole (Gabriel and Bowling, 2004; Wardman and Bristow, 2004). Through reforming the practice of urban planning and design, it can create community-friendly residential areas so that the residents can enjoy a better quality of living environment.

REFERENCES

Abdul Azeez Kadar Hamsa, Miura, M., Inokuma, S., Nishimura, Y. (2006). “Evaluating the Living Environment in Residential Areas at Taman Melati, Kuala Lumpur”. *Journal of Asian Architecture and Building Engineering*. **5 (2)**, 377-384.

Appleyard, D. (1981). *Livable Streets*. Berkeley, CA.: University of California

Ben-Joseph, E., (2004) “Residential Street Standards & Neighborhood Traffic Control: A Survey of Cities' Practices and Public Officials' Attitudes”. <http://web.mit.edu/ebj/www/Official%20final.pdf> [Accessed 18 June 2011]

Bland, R. E., (2005) “Senior Citizens, Good Practice and Quality of Life in Residential Care Homes”. Degree of Doctor of Philosophy (PHD) Thesis : University of Stirling

Botteldooren, D., Dekoninck, L. and Gillis, D. (2011) “The Influence of Traffic Noise on Appreciation of the Living Quality of a Neighborhood”. *International Journal of Environmental Research and Public Health*. **8**, 777-798.

Casteel, C., and Peek-Asa, C.,(2000). “Effectiveness of crime prevention through environmental design (CPTED) in reducing robberies”. *American Journal of Preventive Medicine*. **18(4S),** 99-115.

Chan, E. H. W. & Lee, G. K. L. (2008) “Contribution of Urban Design to Economic Sustainability of Urban Renewal Projects in Hong Kong”. *Sustainable Development*. **16**. 353-364.

Chan, E. H. W. & Lee, G. K. L. (2009) “Design considerations for environmental sustainability in high density development: a case study of Hong Kong”. *Environment Development and Sustainability*. **11**. 359-374.

Choguill, C. L. (2008). “Developing sustainable neighbourhoods”. *Habitat International*. **32**, 41-48.

Cline, E. and Dabkowski, J. (2005). “Traffic Calming - Beware of the Backlash”, < http://www.ite.org/traffic/documents/CCA99A46.pdf> [Accessed 20 March 2011]

Department of Environment (2008). “Noise Monitoring”. <http://www.doe.gov.my/files/u1/NOISE%20MONITORING.pdf> [Accessed 20 April 2011]

De Vries, S., (2006). “Contributions of Natural Elements and Areas in Residential Environments to Human Health and Well-Being”. < http://edepot.wur.nl/23823> [Accessed 10 November 2011]

Etzioni, A. (1993). *The Spirit of Community: The Reinvention of American Society*. New York: Simon & Schuster.

Engel, U., and Thomsen, L.K., (1992). “Safety Effects of Speed Reducing Measures in Danish Residential Areas”. *Accid Anal Prev*. **24(1)**,17-28.

Gabriel, Z. And Bowling, A. (2004) *‘Quality Of Life in Old Age from the Perspectives of Old People’* In: Walker, A. And Hagan Hennessy, C. (Eds.) Growing Older: Quality Of Life In Old Age. Buckingham: Open University Press.

Gerrardbown (2006) “Capitalizing on Melbourne’s status as one of the world’s most livable cities, Committee for Melbourne: Livability report”. <http:// melbourne.org.au/static/ files/ assets/ 89b7362e/CFM_2006_Liveability_Report.pdf>. [Accessed 18 August 2012]

Greene, S. (1992) “Cityshape: Communicating and Evaluating Community Design”, *Journal of the American Planning Association*. **58 (2)**, 177-189.

Gunnarsson, A.G, and Ohrstrom, E., (2007). “Noise and well-being in urban residential environments: The potentialvrole of perceived availability to nearby green areas”. *Landscape and Urban Planning*. **83**, 115–126

Harang, M. (2003). “The Improvement of the Quality of Life in Residential Areas”. <http://www.thepolicytree.com/The_Improvement_of_the_Quality_of_Life_in_ Residential_Areas_April_2003.pdf> [Accessed 28 August 2012]

Hickman, R., Banister, D., (2005). *Reducing Travel by Design*, in Williams, K. (Ed.), Sustainable Planning, Urban Form and Sustainable Transport, Ashgate.

Hidas, P., Weerasekera K.,and Dunne, M. (1997). “Negative Effects Of Mid-Block Speed Control Devices and Their Importance in the Overall Impact Of Traffic Calming on the Environment”, *Transport Research Part D*. **3 (1)**, 41-50.

Hughes, B. (1990) ‘*Quality Of Life’* In: Peace, S.M. (Ed.) Researching Social Gerontology: Concepts, Methods And Issues. London: Sage Publications.

Institute of Transportation Engineers (1999). The Traffic Safety Toolbox: A Primer on Traffic Safety. Washington, D.C.

Jepson, E. J. (2007) “Sustainability and the Childe thesis – What are the effects of local characteristics and conditions on sustainable development policy?”, Cities. **26**, 434-447.

Koorey, G. (2011). Implementing Lower Speeds in New Zealand. IPENZ Transportation Group Conference, Auckland. March, 2011.

Kuo F. E., and Sullivan, W.C., (2001). “Environment and crime in the inner city: does vegetation reduce crime?'' *Environment and Behavior*. **33**, 343 -367.

Lau, J. (2008) “Residents’ Perception of Liveable Neighbourhood Environment in Subang Jaya, Selangor, Malaysia”. Degree of Master of Science Thesis: Universiti Putra Malaysia.

Little J., Panelli, R., and Kraack A., (2005). “Women's fear of crime: a rural perspective''. *Journal of Rural Studies*. **21**,151-163.

Maas, J., Spreeuwenberg,P., Winsum-Westra, M.,V., Verheij, R.A., De Vries, S., Groenewegen, P.P (2008). "Is green space in the living environment associated with people's feelings of social safety?". Environment and Planning A. 1-15.

Mao, J., Koorey, G. (2010)" Investigating and Modelling the Effects of Traffic Calming Devices". Christchurch, New Zealand: IPENZ Transportation Group Conference 2010, 14-17 Mar 2010.

Massam, B. H. (2002). *Quality of Life: Public Planning and Private Living*. Danvers, MA: Pergamon.

McClure, W.R. and Bartuska, T.J. (2007). *The Built Environment: A Collaborative Inquiry into Design and Planning*, second edition, John Wiley and Sons, Hoboken, New Jersey.

Morrison, D.S., Thomson, H., & Petticrew, M. (2003). "Evaluation of the health effects of a neighbourhood traffic calming scheme". *Journal Epidemiol Community Health*. **58**, 837–840

Moser, G. (2009) "Quality of life and sustainability: Toward person–environment congruity". *Journal of Environmental Psychology*. **29**,351–357.

Nadaraja, B., Xin Wei, Y. and Ramdzani Abdullah (2010). "Effect of Traffic Noise on Sleep: A Case Study in Serdang Raya, Selangor, Malaysia". *Environment Asia* 3 (special issue): 149-155

Newman, P. & Kenworthy, J. (1989) *Cities and Automobile Dependence: An International Sourcebook*, Aldershot: Gower Publishing Company.

Pandey R.U., Garg Y. K., and Bahrat A. (2010). "A Framework for Evaluating Residential Built Environment Performance for Livability*". Institute of Town Planners, India Journal*, 7 - 4, 12-20.

Patterson, T. (2004). "Local Area Traffic Management Schemes / Traffic Calming". <http://www.ite.org/traffic/tcsop/Chapter2.pdf> [Accessed 15 March 2011]

Roberts, W.K., Thomas, M.P. and Anthony, A.L., (2005). "What Is Sustainable Development? Goals, Indicators, Value, and Practice". *Environment: Science and Policy for Sustainable Development*, **47 (3),** 8-21.

Schroll, J. D. (1999) .The Traffic Safety Toolbox: A Primer on Traffic Safety. Washington, D.C.

Siti Rasidah Md Sakipa and Aldrin Abdullah, (2006). "Measuring Crime Prevention through Environmental Design in a Gated Residential Area: A Pilot Survey". *Procedia - Social and Behavioral Sciences*. **42**, 340 – 349.

Susilo, Y.O., Dijst, M., (2009). "How far is too far? Travel time ratios for activity participations in the Netherlands". *Transportation Research Record*. **21(34)**, 89–98.

Susilo, Y.O., Williams, K., Lindsay, M., & Dair, C., (2011) "The influence of individuals' environmental attitudes and urban design features on their travel patterns in sustainable neighborhoods in the UK". *Transportation Research Part D*. **17**, 90–200

United Nations General Assembly (1987). "Report of the World Commission on Environment and Development: Our Common Future. Transmitted to the General Assembly as an Annex to Document A/42/427 – Development and International Co-operation: Environment". <http://www.energy.kth.se/courses/4A1613/2008-2009/1987-brundtland pp 01-17.pdf > [Accessed 6 June 2012].

Wardman, M., and Bristow, A., L., (2004). "Traffic related noise and air quality valuations: evidence from stated preference residential choice models". *Transportation Research Part D*. **9**, 1-27.