Modelling the Relationship between Urban Form and Social Sustainability in Malaysian Cities – Access to Local Services and Public Facilities

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ABSTRACT

This research concerned to establish the relationship between urban form and social sustainabilityin two Malaysian cities. Kuala Lumpur and Putrajaya are the two cities selected purposely as the case study cities because of their distinctive characteristics. Specifically, this research looks in detail at the aspect of access to local services and facilities according to different aspects of urban form, such as density, building/ housing type, land use mix and layout. Urban form elements such as mixed land use and density appear to have significant impact on access and usage pattern of certain local services and facilities located within the case study cities (Kuala Lumpur and Putrajaya). Another important factor towards higher access to services and facilities within the neighbourhood is the respondents' perceptions of mobility. Aspects of safety also impact on the access and usage pattern of the respondents towards the services and local facilities within their local neighbourhood. However, satisfaction towards the neighbourhood does not influence the access or usage pattern of the local services and facilities. The research provides one of the first attempts to investigate the relationship between urban form and its impact upon social sustainability in Malaysian cities., It exposes local issues and problems related to the access and usage of local services and facilities within residential neighbourhoods which corresponds with issues highlighted in the National Urbanisation Policy (NUP) (Federal Department of Town and Country Planning Peninsular Malaysia, 2006). Findings suggest that local planning authorities should ensure that residential neighbourhood/ developments are well connected to local services and facilities – by improving public transport & pedestrian networks. It is also important that neighbourhood safety is properly addressed.

DEDICATION

This thesis is dedicated to my beloved husband, Mohd Noorizhar Ismail and my daughters- Nurul Aisya and Adlyna Zahra.

ACKNOWLEDGEMENT

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Chapter 1: Introduction

1.1 Introduction

In recent years, Malaysia has put great effort in moving towards a more sustainable urban environment. This is associated with the vision to place Malaysians on a par with societies in developed nations and further develop a progressive and inclusive society (Prime Minister's Office, 2011; Malaysia, 2010, p. 178). A *progressive society* was described as *"one that balances personal needs and civil liberties to ensure the rights of its citizens are upheld and respected"* (Malaysia, 2010, p.178). The pressure placed by the Malaysian government on policies related to social issues shows their concern with moving towards social sustainability particularly in the urban environment setting. On the subject of urban sustainability, social issues are one of the most discussed aspects at the moment. This is because social equity and sustainability of the community are most affected by the changes in urban form as a result of the urbanisation process. Generally, the form of cities influences the way people live in cities. The way people settle in cities shapes urban quality of life, the richness of local economy, the level of social cohesion, the level of safety and equity, the amount and the kind of human activities in public spaces (Porta, 2001). Overall, *"the built environment plays an important role in enabling people's needs to be met in physical terms* (Chapman and Donovan, 1996, p.88).

Theoretically, urban form is a product of street formation, land use, buildings, and land subdivisions (Cowan, 2005). According to Lynch (1981; 2008, p. 683), urban form is defined as "the spatial pattern of the large, inert, permanent physical objects in a city". Furthermore, Bramley et al. (2006) define urban form in terms of a number of distinct elements including: size of city or settlement, structural form, residential and

job distribution, population density, layout of road networks, layout and types of residential units, typical building forms and land use mix. Of these, density is the most easily measured urban form element either at a macro scale (city) or micro scale (neighbourhood). Bramley et al. (2006) further stressed that among others, density of a particular urban development has the potential to affect all components of social sustainability. Overall, changes in the urban environment i.e. layout, land use zonings, transportation network and density would impact people's access to services and opportunities.

Previous research revealed that, overall, higher density facilitates greater social sustainability impacts (Bramley & Power, 2008; Burton, 2000a; Burton, 2000b; Williams et al. 2000). However, while higher density has a significant positive impact on certain social sustainability aspects, it has a negative impact on some other aspects such as social interaction, crime rates and affordable housing. Burton (2000a) defined social equity as the ability to deliver a range of costs and benefits to its local population, which can be quantified through measurement of access to facilities, access to green areas, job accessibility, better public transport, non-motorised vehicles, amount of living space, crime rate, social segregation, job opportunities, affordable housing and wealth.

Generally, this study aims to ascertain the relationship between urban form and social sustainability in two Malaysian cities. Specifically, this research looks into detailed aspects of having good access and the usage pattern of selected local services and public facilities in relation to elements of urban form such as density, building/ housing type, land use mix and layout/ spatial configurations. Roberts and Kanaley (2006) have said that providing and maintaining good access to good quality, affordable and reliable services is one of the challenges faced by Asian cities including cities in

Malaysia. However, the initial idea of the research came from the work of the CityForm consortium (2003-2007) within the EPSRC SUE programme. This project focussed on exploring and investigating social sustainability issues related to urban form in UK neighbourhoods. The consortium is still publishing outputs from this work. It is also expected that outputs of the CityForm research will be the one of the benchmarks for comparison in this study.

1.2   Research Problem

"In terms of social facilities, it was found that the provision of recreational areas is generally inadequate for all towns in Malaysia. Moreover, there is a problem of maintenance of facilities as well as being non-user friendly since the location and design of facilities do not take into account the needs of certain segments of the society such as the disabled, children and elderly. Vandalism of public properties also exists and leads to not fully utilised facilities".
(Federal Department of Town and Country Planning, Peninsular Malaysia, 2006,p.28)

Malaysia is one of the fastest growing countries in the developing world (Federal Department of Town and Country Planning, Peninsular Malaysia, 2006). As a result, cities in Malaysia face various environmental, social and economic problems associated with urbanization such as degradation in the quality of air, water and noise; inefficient transportation system; and decline in quality of living. The situation has become intensified with the national goal to achieve developed status by the year 2020 (Federal Department of Town and Country Planning, Peninsular Malaysia, 2006). With the increasing cost of living, the urban population suffers from crucial problems such as unemployment, unequal access to public services, income disparity and other socioeconomic conditions (Federal Department of Town and Country Planning, Peninsular Malaysia, 2006).

Urban areas bring together a wide range of social facilities such as health centres, post offices, community halls, schools, religious centre and so on. These facilities have become increasingly important as populations are marginalised by poverty and other inconvenient situations. However, maintaining good infrastructure and improving access to public facilities is a critical issue in Malaysia (Federal Department of Town and Country Planning, Peninsular Malaysia, 2006). This creates the opportunity to overcome other social problems such as the accessibility of public services, quality of living, health conditions and other related problems.

In relation to social sustainability, major cities in Malaysia are deemed to be affected by rapid urbanization. The costs and benefits of living in urban areas are still uncertain. Understanding urban form and its relation to aspects of sustainability is essential to understanding the impact of urbanization on our daily social life. However, there has been little discussion or research into this matter in the Malaysian context, in comparison to some developed countries such as United Kingdom and United States where this issue has been gaining much attention and a lot of research has been done. Hence, there is a need to explore the issue of social sustainability in relation to urban form aspects in Malaysia.

1.3   Research Objectives

As mentioned in subsection 1.1, this study aims to explore the relationship between urban form and social sustainability in two Malaysian cities by assessing the provision of and access to local facilities and services. Four objectives were formulated to guide through the overall research. Each objective was further developed with research questions to be addressed in the course of the thesis.

i.   **To describe the different types of urban form in major cities in Malaysia.**

The first objective will explore the urban form in the case study cities. This task includes an exploration of changes in the physical form over time. Besides physical aspects (street layout, accessibility, land use mix, building forms, patterns of open space, residential types), consideration will also be given to urban design aspects, transportation system, planning mechanisms and related development policies that have contributed to produce the urban form that exists today.

ii.   **To identify the character of a sustainable urban form that can improve social sustainability**

This second objective will review the current literatures on the relationship between urban form and social sustainability. It will look at previous research done in other countries as well as the initiatives undertaken in Malaysia on urban form, sustainability and social sustainability. This objective also acts as the foundation to devise a set of indicator measures to evaluate the relationship of urban form aspects and its impact on social sustainability.

iii. **To establish the relationship between aspects of urban form and social sustainability in Malaysian cities through improvement in access to local services and facilities.**

The third objective is to identify and evaluate the relationship between aspects of urban form and social sustainability in Malaysian cities. This objective will be achieved through the findings and analyses from the social survey conducted within the case study areas.

iv. **To establish a set of guidelines to create a sustainable urban form to achieve social sustainability**.

The final objective is to establish set of guidelines that will act as a reference for local government to formulate their policies. The guidelines will focus on the aspects of urban form that focuses to achieve social sustainability in the context of urban areas.

1.4   Research Design

Generally, the main purpose of this study is to obtain a better understanding of the impact of urban form on social sustainability in Malaysia. Specifically, the interest to explore this research arises from concern about the potential impact of rapid urban growth and changing urban form of major cities in Malaysia on social sustainability. Currently, major cities in Malaysia are experiencing rapid development growth which has resulted in numerous urban problems. These include social problems, traffic congestions, environmental degradation, and economic instability. However, this research focuses on social sustainability issues particularly on access and usage pattern of local services and public facilities.

Previous studies have shown that different urban forms can have very different degrees of sustainability (Beatley, 1995; Newman & Kenworthy, 1999; Bramley & Power, 2009; Burton, 2000a; Burton, 2000b; Williams et al, 2000). Hence, studying and understanding the different urban form in major cities in Malaysia would be likely to open up our minds to the impact of different urban forms and their influence on sustainability, particularly on social sustainability. The research findings are expected to advance our understanding in a number of ways. First, it will help to improve understanding about the overall impact of urban form on social sustainability in a developing country, Malaysia. Secondly, as Malaysia is aiming to achieve developed status by 2020, the research will be of great value while Malaysia undergoes rapid urbanisation. It is crucial to have an active understanding of the immediate and long term impact of urban form on social sustainability.

This research endeavours to contribute to the body of knowledge about urban sustainability with a focuson urban form in Malaysia and its relationship with social sustainability through a comprehensive study of major cities in Malaysia.

1.5 Scope of Research

The investigation of the relationship between aspects of urban form and social sustainability was conducted in two cities in Malaysia: the Federal Territory of Kuala Lumpur and the Federal Territory of Putrajaya. These two cities were chosen because of their distinctive characters. In brief, the reason for selection was due to the contrast of the two cities, i.e. older and unplanned city (Kuala Lumpur) versus modern planned city (Putrajaya); the experience of rapid growth in both cities and finally, due to the ease for the researcher to facilitate field survey logistically. Table 1.1 provides a summary of

basic information for both cities followed by map of Klang Valley indicating the location of each city (Figure 1.1) and maps (Figure 1.2 and Figure 1.3).

Table 1.1: Basic Information on Federal Territory of Kuala Lumpur and Federal Territory of Putrajaya

	Federal Territory of Kuala Lumpur*	Federal Territory of Putrajaya**
Background Information	An unplanned city, history noted that it was originated in1850s	Newly planned city founded in 1995 and was officially declared a Federal Territory in 2001.
Size of Area	243.65 sq. km (metropolitan region)	49.31 sq.km
Population	1.62 million (2005)	50,000 (2007)
Land Use	Residential : 22.66% Commercial : 4.51% Industrial : 2.28% Institutional : 6.69% Open Space, Recreational and Sports Facilities : 6.52% Community Facilities :5.71% Undeveloped Land : 23.77% Squatters : 2.36% Utilities : 4.73%	Government: 5.8% Commercial :2.8% Housing : 23.8% Civic & Cultural : 0.2% Public Facilities : 9.2% Utility & Infrastructure : 21.2% Open Space: 37%
Urbanisation Rate	100%	89.1%
Density	High Density *(core area)* Low to medium density *(surrounding areas)*	Low to medium density
Map	(Refer Figure1.2)	(Refer Figure 1.3)

Source:
Kuala Lumpur City Hall (2004). Structure plan Kuala Lumpur 2020.
**Putrajaya Corporation, 2007, unpublished article*
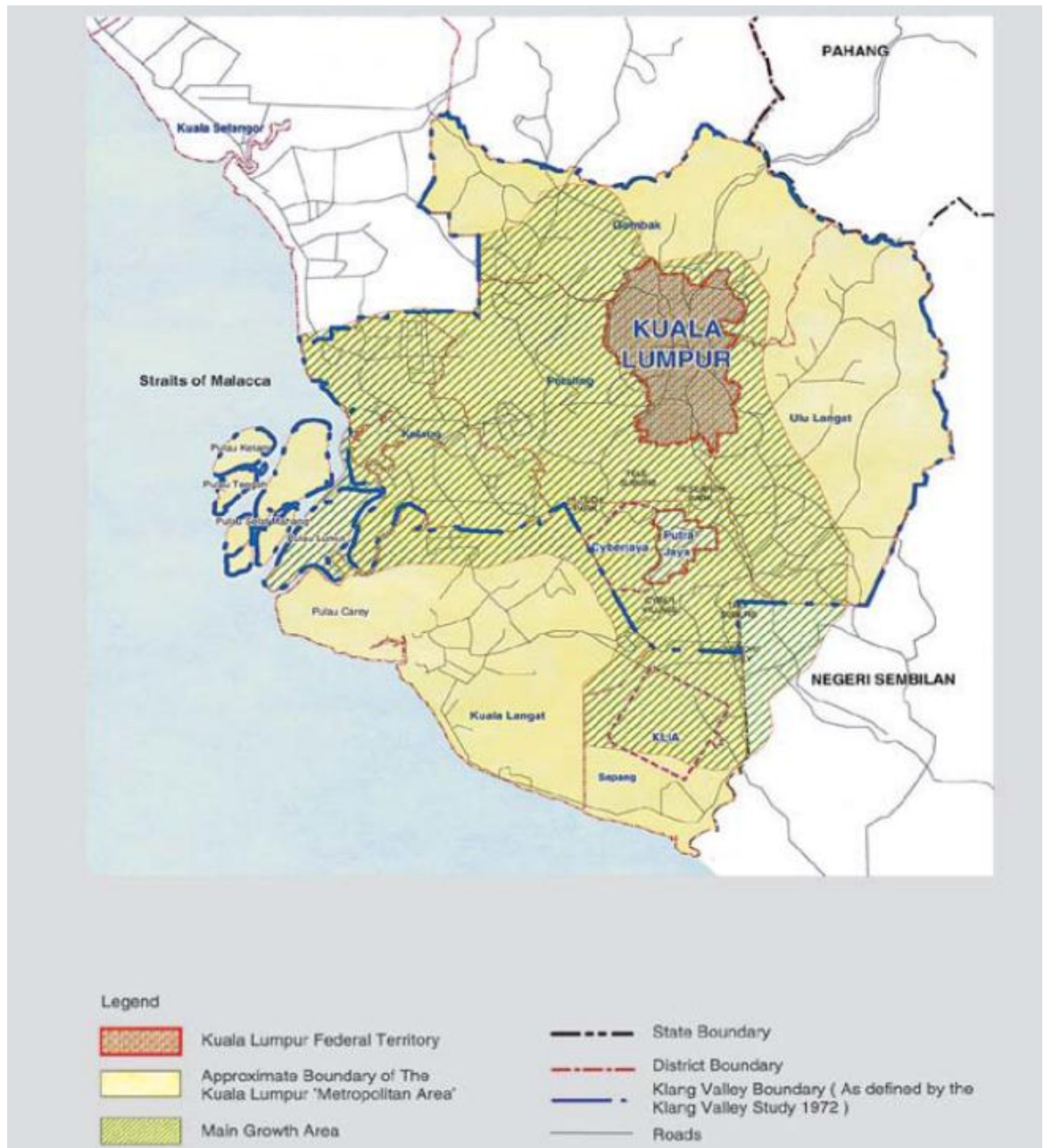
Figure 1.1: Map of Kuala Lumpur Metropolitan Area (Location of Federal Territory of Kuala Lumpur & Federal Territory of Putrajaya) also known as Klang Valley Conurbation.
Source: Kuala Lumpur City Hall, 2004
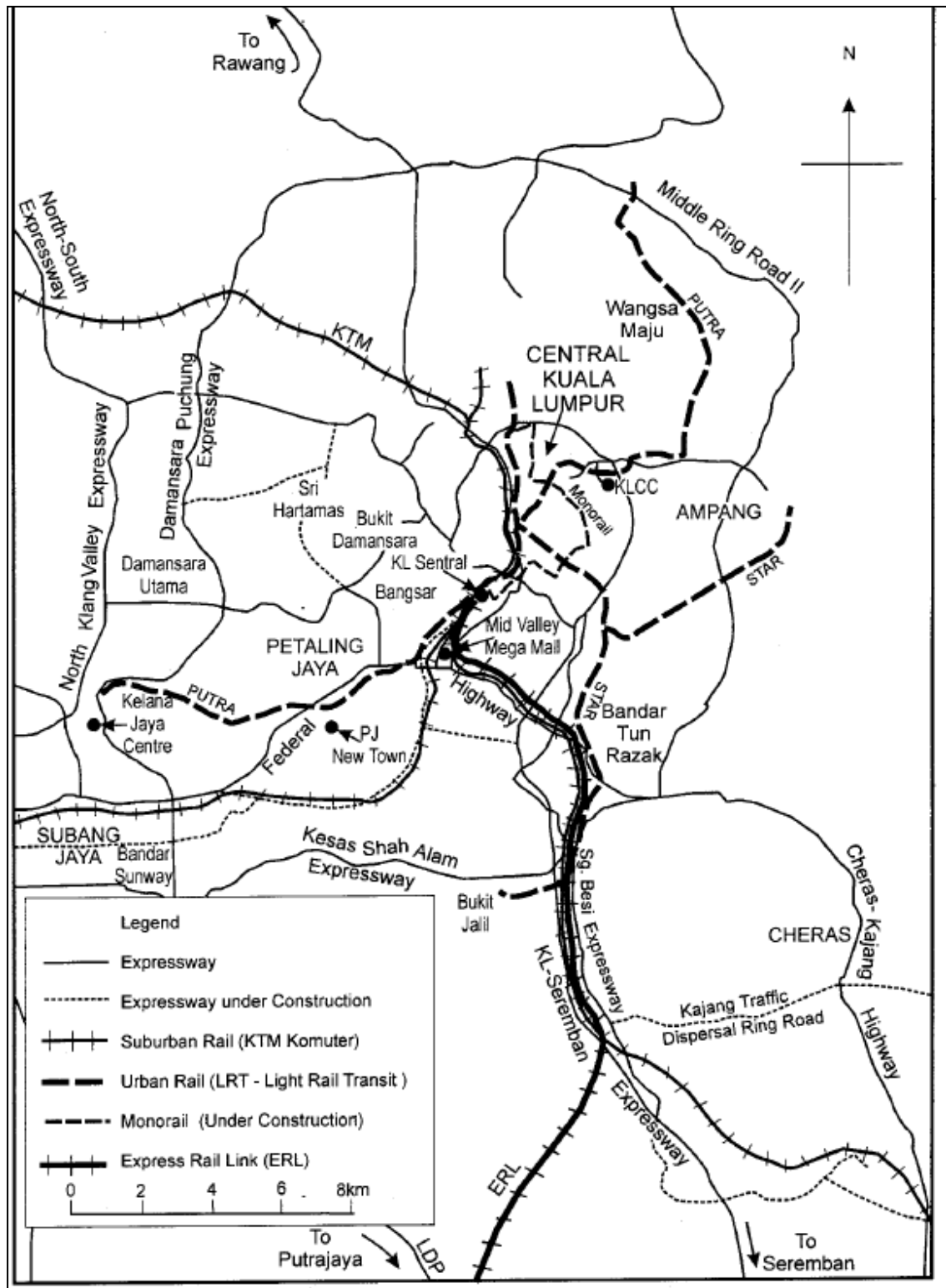
Figure 1.2: Map of Federal Territory of Kuala Lumpur
Source: Bunnel et al. (2002)
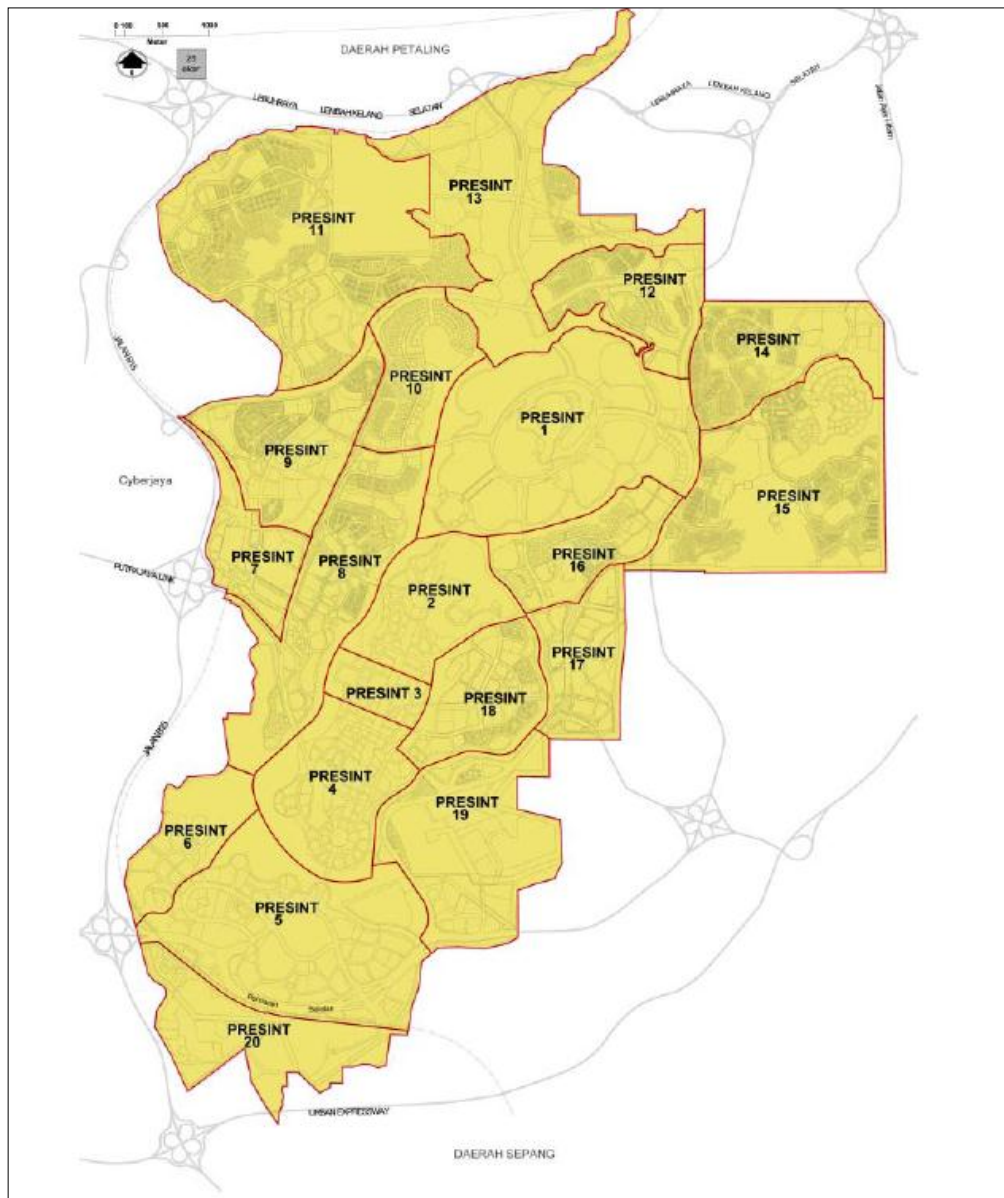
Figure 1.3: Map of Federal Territory of Putrajaya
Source: Putrajaya Corporation (2009)

1.6   Summary of Research Methodology

This section discusses the summary of methodology used in this study covering brief aspects of data collection and data analysis. Detailed aspects of the methodology of this study are further discussed in Chapter Two.

1.6.1   Data Collection

i.   Secondary Data

In the initial stage, it is important to understand the current urban form of the study area and its transformation from the past. This was obtained through secondary sources such as development plans, structure plans, local plan, and other related government publications. Data on social characteristics was collected through a primary survey. Based on the information gathered from both primary and secondary sources, the researcher later evaluated and measured the aspects of urban form on the facilitation of social equity.

ii.   Primary Data

For the purpose of this study, a household survey was conducted in the selected neighbourhood within two study cities of Kuala Lumpur and Putrajaya. The targeted study population were local households/ adults and a random sample within the case study areas were interviewed using a structured questionnaire. These data were complemented by information from analysis of detailed maps/ plans and site observation survey. Detailed maps/ plans were obtained from local authorities (Kuala Lumpur City Hall and Putrajaya Corporation) and official reports. The observation survey was performed by the researcher while the

household survey was being conducted. Detailed aspects of the process are discussed in Chapter Two.

iii. *Data Analysis*

- ### *Descriptive Analysis*

Descriptive statistics such as frequency distribution, cross tabulation, mean and standard deviation were used to analyze the data collected for the social characteristics and the respondents' satisfaction towards different aspects of urban form and access to services. Several findings were further tested using a range of statistical tests of associations (chi-square and Kendall's rank correlation coefficient). The data analyses were also supported by graphical presentations such as bar charts, pie charts, maps and images, wherever necessary.

- ### *Regression Models*

Regression and logistic regression models were used to identify factors affecting social sustainability, particularly urban form elements. This was used to identify and quantify the relationship between several independent variables of urban form and social sustainability indicators while controlling for other factors such as demographics.

1.7 Limitations

This study inevitably has several limitations. Among them are:-

i. The size and nature of the sample, because the study only selects a portion of the whole population in selected areas.

ii.   Financial cost and assistance is another limitation that has been identified. With extra support and assistance, the researcher would have had the ability to manage the household survey more effectively to avoid any bias i.e. bias in ethnic distribution and income segment.

iii.   Time constraints limit the scope of study because; with longer time, the study could have looked at a wider range of case studies as well as possibly looking at changes over time.

iv.   Unavailability of recent information such as updated layout configuration of the study areas, or a complete map database to help contrast urban form measures. Similarly, it also lacked detailed small area census data.

1.8   Thesis Structure

Overall, the thesis is structured to provide a logical flow to the discussions. It starts with the more general methodological and theoretical aspects of the study and moves toward the presentation of the empirical findings and analysis. To fulfil the objectives of this research, this thesis consist of eight chapters, and each chapter has its own aim and objectives.

Chapter One deals with the introductory aspects of the research. It describes the research problem, research objectives and research questions. In line with this, Chapter One also highlight the summary of research and provide some information on the scope of research and its limitations.

Chapter Two describes in detail the methodology used throughout this thesis. It provides detailed information on the research design, data collection, surveys i.e. pilot,

field survey and observation survey. Methods of manipulating the data to create variables for analysis purposes are also explained thoroughly. This refers to some of the urban form variables that cannot be collected directly from either household surveyor researcher observation. The chapter also provide detailed information on how the analysis is performed. This is explained clearly to enable this research to be easily applied to another context or setting.

Chapter Three focuses on the theoretical review of the thesis drawing on a wider academic literature. It basically provides all the necessary theoretical background on all the themes related to this thesis. Each theme or subsection was discussed in detail and how the subject is related to this thesis is also discussed thoroughly. The main themes discussed in this chapter are the subjects of social sustainability, sustainable urban form, social equity and elements of urban form. The researcher also aimed to critically review previous studies related to sustainable urban form and theaccess to local services and public facilities. This content of this chapter is aimed to be the reference chapter for benchmarking the results reported in the analyses chapters (Chapters Six and Seven).

Chapter Four is an extended literature review that focuses on the Malaysian context. Firstly, it provides a glimpse of the planning system in Malaysia before further discussing social sustainability issues in Malaysia. It also highlights policy related to social sustainability and the well-being of urban populations. Focus was given to the content of National Urbanisation Policy (Federal Department of Town and Country Planning, Peninsular Malaysia, 2006), as the researcher realises the impact of it towards the current urbanisation setting in Malaysia. In addition, background information related to housing development in Malaysia is also explained. The researcher focussed on the local context of the neighbourhood setting in Malaysia particularly looking at the

different types of housing form and provision of local services and public facilities within the residential neighbourhoods.

Chapter Five focuses on the case study cities: Federal Territory of Kuala Lumpur and Federal Territory of Putrajaya. This chapter describes the characteristics of the two cities focussing on the socio-economic profile, physical characteristics including the elements of urban forms. Apart from that, it also aimed to explore the findings based on the observation survey on the provision of local services and public facilities in the case study cities.

Chapter Six deals with the research findings and analyses. It basically covers the descriptive analysis, i.e. exploring two-way and/or three way relationships of the variables. Wherever necessary, it also provides significance testing to see if the relationship supports theories developed in previous studies. Aspects concerning the assessment of neighbourhood, i.e. perceptions towards the neighbourhood and respondents' satisfaction towards neighbourhood and local services and public facilities, are the main theme of this chapter.

Chapter Seven concentrates on more detailed analysis of the empirical data. It looks in detail at the influencing factors that have impacted the access and usage pattern of local services and public facilities among the respondents. The factors were modelled using the regression and logistic regression techniques that was achieved through the statistical package software PASW IBM (also known as SPSS version 18).

Chapter Eight discusses the overall findings and how they relate to previous studies that focussed on the same issues. This chapter also provide recommendations

based on the key findings gathered. The recommendations are in the form of guidelines and a framework in order to optimise efforts towards the improvement of access to services and facilities. Finally, the thesis is concluded with the summary, recommendations for future work, limitations of this research and final conclusion. Figure 1.4 illustrates the structure of research applied in this study.

Part I:
Background of study, research problems & methodology

Chapter One: Introduction
Formulation of research objectives& questions

Chapter Two: Research Methodology
Discussion of methods use, scope of research and case study selection

Part II:
Theoretical reviews: Social sustainability, sustainable urban form and case study context

Chapter Three: Sustainable Urban Form and Social Sustainability

Chapter Four: Urbanization & Sustainable Urban Form and Social Sustainability in Malaysia

Establishing theoretical framework for the study

Part III:
Findings, analysis and the contribution to knowledge

Chapter Five: Analysis of the case study cities
Profiles of the neighbourhood areas
Provision of the services and facilities within the neighbourhood areas

Description of the case study cities/ residential neighbourhoods based on observation surveys and literature reviews

Chapter Six: Assessment of the neighbourhood areas
Profile of the respondents
Perceptions of respondents towards neighbourhood areas
Perception of respondents towards facilities provided

Chapter Seven: Modelling the Relationship between Access to Services and Urban Form
Establishing relationship of access to local services and public facilities with the demographic profiles of the case study areas
Establishing relationship of access to local services and public facilities with the urban forms of the case study areas
Modelling access and pattern of usage to services

Analysis on the residential neighbourhood and exploring relationship on access and usage pattern of selected services and facilities in relation to urban form elements

Chapter Eight:
Discussion, recommendation and conclusion

Summary of findings and analysis
Recommendations (guidelines and framework)

Figure 1.4: Research Structure

1.9   Conclusion

This study provides one of the first attempts to investigate the relationship between urban form and social sustainability in Malaysian cities. The researcher believes that the need to pursue this study is a priority with Malaysia being one of the fast growing countries among the developing countries in Asia. Furthermore, it has been realised that as a result of rapid growth, urban problems have been growing extensively (Federal Department of Town and Country Planning, Peninsular Malaysia, 2006). This study was motivated by the fact that it would be of benefit to the municipalities to improve existing cities in order to become more urbanised and at the same time be socially sustainable. And, this study is also expected to contribute to providing valuable knowledge needed for urban planners and policymakers to meet the challenge of urban growth more effectively and to devise a framework and guidelines for sustainable urban form to ensure it is socially sustainable whilst simultaneously improving the quality of urban living. The research findings are expected to add to the existing knowledge base in such a way that future development and growth in metropolitan regions in developing countries can be guided in a manner that enhances long-term sustainability.

Chapter 2: Research Methodology

2.1 Introduction

As discussed in Chapter One, the key research objective is to identify the character of urban form that can improve social sustainability and to look at how urban form elementsimpacts accessand usage of local services and facilities. This chapter explains the methodology used to achieve the four objectives detailed in Chapter One accordingly. The methodology chapter is divided into three main parts. The first part deals with the overall research design, including the general context of the study areas and justification for selecting the two study areas. The second part looks into detail at the methods of the study including the sampling design and data collection for both primary and secondary sources. It also looks into the ethical and practical aspects of the process carried out. Subsequently, part three explains the various aspects of the analyses stage.

2.2 Research Design

Research design refers to a set of guidelines and framework for the process of gathering and analysing data for a particular piece of research (Bryman, 2008 and Yin 2003). It is also a process that helps to establish the research problem and conceptualise the research study (Blaxter et al., 2001). Research design is an important process as it helps the researcher to plan and organize the study (Blaikie, 2000). Yin (2003) lists the five basic components of a research design as: the study's questions, unit of analysis, the logical relationship between the data and the propositions, and the criteria for interpretation of findings. Specifically, the aspects that need to be considered are

sampling, sources of data, method of data collection and analysis. It is important to note that the decisions on the research design are based on specific research problems and research objectives.

This research was initially formulated with the awareness on the issues related to the use of local services such as school, health related facilities, recreational areas, religious centres and others faced by urban populations in major cities of Malaysia. These issues have been highlighted in numerous government publications such as the National Urbanization Policy (NUP) (Federal Department of Town and Country Planning, Peninsular Malaysia, 2006), 5-year Malaysia Plans (Malaysia, 2005 and 2010), as well as reports from the local councils (Kuala Lumpur City Hall, 2008 and Putrajaya Corporation, 1997, 2000 and 2009). Hence, the need to contribute to enlighten the problems is in line with the national aspiration. Figure 2.1 illustrates the research design of this study and the different stages of the research.

RESEARCH PROBLEM	• Rapid urbanisation creates various problems such as social problems, environmental degradation, and economic instability • Urban population being deprived and unequal access to services and public facilities • Understanding on the relationship between aspects of urban form and social sustainability in Malaysia is still vague
DATA COLLECTION I	• **Secondary Data:** • Characteristics of Malaysian cities, • Background on related initiatives & policies • Previous research on efforts toward achieving social sustainability
DATA COLLECTION II	• **Primary Data** • Household Survey **:-** Socio-economic characteristics, Perceptions towards the public services available, perceptions on the living conditions, frequency on using the public facilities/ services • Observation Survey : Urban form elements, first hand experience of the site
ANALYSES I	• Profile of the case study cities : (1) Kuala Lumpur and (2) Putrajaya • Services and facilties available in neighbourhood areas of the case study cities • Malaysian cities, efforts & initiatives toward Social Sustainability in Malaysia
ANALYSES II	• Relationship between aspects of urban form and facilitation of social sustainability Kuala Lumpur and Putrajaya, comparative study between Kuala Lumpur and Putrajaya
ANALYSES III	• Modelling the relationship between access and usage pattern of services and urban form
CONCLUSION	• Summary, recommendations, areas of future research and conclusions

Figure 2.1: Structure of Research Design

2.3   Case Study

Case study method is a research tool, one of many techniques used to collect data, and to build or validate theories (Petra, 2001; Yin, 1994). According to Yin (2003) a case study is an empirical inquiry that investigates a contemporary phenomenon within its real life context when the boundaries between phenomenon and context are not clearly evident. Findings from case study reflect the true activities at that particular moment and can be used to build theories, especially in exploratory types of research. A case study is a record of an event, the persons involved, and other impacting factors, and often has an institutional focus (Rosselle, 1996). Relationships and interactions among these parties are of the utmost importance to the researchers. Conversely, case studies can also be used for exploratory work, with subsequent analysis used for theory building. The case study method is relevant to this research as it provides the ability to explore and be used as a source for evidence.

The thesis selected two case study cities within Malaysia: the Federal Territory of Kuala Lumpur[1] and Federal Territory of Putrajaya[2]. Each of these areas has its own unique characteristics which influenced its selection as the case study areas for this study. One reason is because of their different planning histories. Kuala Lumpur is a historical city, not properly planned. It is compact with various activities, facilities and services serving local communities and people commuting into the city to work. Putrajaya on the other hand, is a newly planned and established city with an expectation to have all the planning principles and theories in place.

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[1] The term *Federal Territory of Kuala Lumpur* and *Kuala Lumpur* is used interchangeably in this thesis

[2] The term *Federal Territory of Putrajaya* and *Putrajaya* is used interchangeably in this thesis

Another reason for selecting these case study areas is because of their different but comparable traits in terms of urban form of the two areas within Malaysia. It would be a significant finding of whether the different types of urban form would contribute to facilitate a socially sustainable city. It was also chosen because of its rapid growth and the areas are best to represent urban cities of Malaysia. Furthermore, it was also selected because of the practicality for the researcher to access the areas.

For the selection of public facilities and local services, the researcher has selected only the most used services within a local neighbourhood. The researcher also referred to previous research such as Burton 2000a, 2000b, 2002, 2003; Dempsey et.al. 2011; Bramley and Power, 2009; Bramley and Kirk, 2003, that has explored issues related to local services in residential neighbourhood.

In order to give more valuable insights in handling the data analysis and interpretations, the case study cities have been divided into three sub areas defined as (i) inner, (ii) intermediate and (iii) outer accordingly. This is similar to the approach used by the CityForm research group. The main criterion for defining the sub areas was geographical proximity to the city centre and local knowledge (Jenks and Jones, 2010).

2.4   Data Collection

The data collection methods used are based on a mixed method approach; qualitative and quantitative data collection. In the initial stage, an in-depth literature review based on the focus of study and current economic, social and spatial trends related to the case study areas explored will be carried out throughout the study.

2.4.1   Literature Review

A literature review is one of the most important processes in conducting any research as it allows the researcher to link the research under study with the current state of relevant knowledge (Blaikie, 2000). Through this process, a researcher is able to grasp the essence with regards to the subject under study. The researcher also noted that the process of literature review is important to guide towards answering the research questions (Blaikie, 2000). There is a wide range of literature available concerning the issues of urban form. The focus of these sources is associated to the research objectives formulated for the study, which is urban form and social sustainability focusing on access and usage of local services and public facilities; and the urbanization trends in the case study areas.

In relation to the case study analysis, background information with regards to the study areas was available in written format such as structure plans, local plans and reports. However, some sources, such as national publications or specific reports would not have been possible to obtain without undertaking the fieldtrips. Therefore, important documents collected from different organisations during the fieldtrips to both case studies' areas: Kuala Lumpur and Putrajaya has been vital to this study. The types of documents in the case studies' data collection include: academic literature, national

policy documents, local planning policy documents, government reports and publications, etc.

2.4.2   *Primary Data Collection: Household Survey*

Generally, primary data collection takes place in either an artificial (laboratory) or natural setting (e.g. field research), where the survey participants may or may not be aware that they are being studied (Nachmias & Nachmias, 2000). These data will be collected first hand, i.e. either the researcher collects the data personally or has trained observers or interviewers to do so. The need to perform household survey is because the study areas do not have detailed small area census data. Hence, through the household survey, the researcher managed to obtain evidence on perception, satisfaction and usage of the facilities and services within the study areas.

The researcher conducted the household questionnaire survey with the assistance of several local university students as interviewers. The survey was funded by CRSIS Research Group, School of Built Environment, Heriot Watt University with the collaboration of Universiti Teknologi Malaysia. Funds from CRSIS Research Group were used primarily to cover the cost of conducting the household survey. Universiti Teknologi Malaysia provided the travel budget for the researcher to return to Malaysia prior to conducting the survey. Due to time and budget constraints, approximately 2500 questionnaire forms were distributed in the two case study areas with 43% response rate (see Table 2.1 and Figure 2.2). With the assistance of several local university students in Malaysia (Universiti Teknologi Malaysia) the researcher managed to complete the field survey within the duration of three months (22nd November 2009 until 25th February 2010). During this period, the researcher was also in Malaysia to manage and supervise

the survey. In managing the survey, the researcher divided the group of 25 students into 3 groups. Each group consisted of approximately 8 students with one leader appointed by the researcher. The role of the leader was to manage the group whenever the researcher was not available. Before the survey took place, the researcher briefed the interviewers on all aspects of conducting the survey. This included risks involved, expectations, dos and don'ts, management of time, and ethical aspects.

Table 2.1: Response rate

Survey Location		Distributed	Returned	Response Rate	Weight Factor
Kuala Lumpur	Inner	341	222	65%	0.665759
	Intermediate	327	150	46%	0.944870
	Outer	336	125	37%	1.165051
Putrajaya	Inner	441	176	40%	1.086029
	Intermediate	582	166	29%	1.519604
	Outer	474	245	52%	0.838548
TOTAL		2501	1084		
Average Response Rate				43%	

Source: Field Survey, 2010
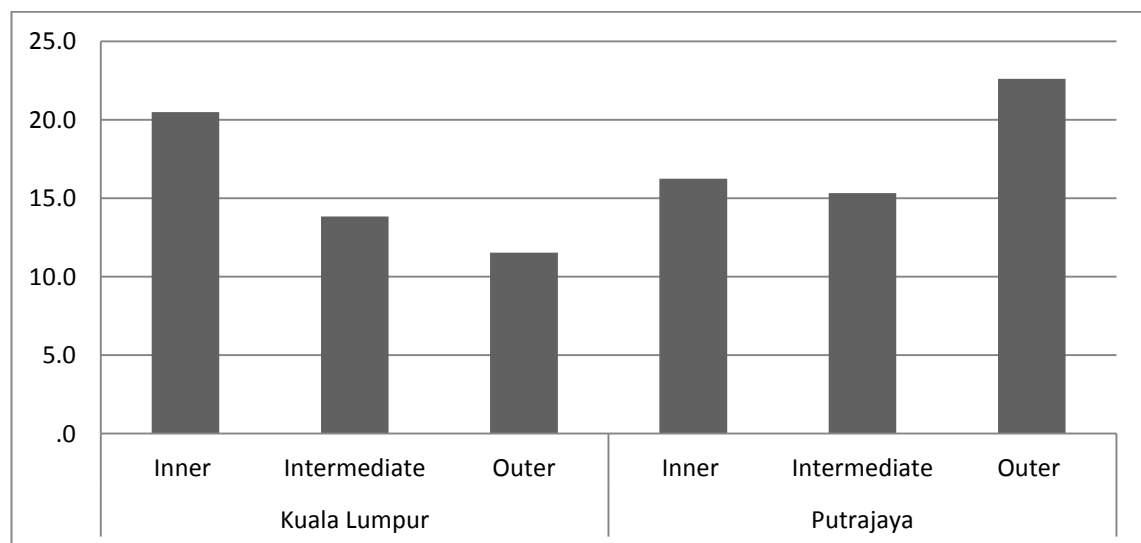
Figure 2.2: Response rate distribution according to case study areas (Total n: 1084)
Source: *Field Survey, 2010*

2.4.3 Sampling Design

In the preparation of the household questionnaire survey, the researcher is required to consider the sampling design. Sampling design is one of the crucial stages in the process of conducting surveys whether they are personal interviews, aided surveys or self-completion surveys. The process of sampling design included the definition of the target population; the identification of the sampling unit, sampling frame and sampling method (e.g. simple random sampling, stratified sampling etc.); determination of sampling error and sampling bias; and the computation of sample size.

The target population refers to the entire group of people whose characteristics/opinions are the focus of the study. The definition of the target population is very important as it will greatly facilitate the study. The target population for this research are the households of selected neighbourhood areas of Kuala Lumpur Federal Territory and Putrajaya Federal Territory. Within the two case study cities, the researcher selected inner, intermediate and outer sub areas to study (see Table 2.2). These sub areas were selected to ensure that they represented major urban areas within Peninsular Malaysia. Details of the case study areas are presented in Chapter Five.

Table 2.2: Case Study Areas

Survey Location	Sub areas (Residential Neighbourhood)	
Kuala Lumpur	Inner	Keramat and Kampung Datok Keramat
	Intermediate	Sri Rampai and Setiawangsa
	Outer	Wangsa Melawati
Putrajaya	Inner	Precinct 8
	Intermediate	Precinct 9 & 10
	Outer	Precinct 11

Source: Household Survey, 2010

In this study, the sample units were the households and a stratified random sampling method was used to select the samples. The sampling frame for the household survey is based on the list of houses located in the case survey areas. The list of houses was derived from the map obtained from Kuala Lumpur City Hall and Putrajaya Corporation. The survey selected several residential schemes which were later categorized according to inner, intermediate and outer sub areas for both Kuala Lumpur and Putrajaya. The definition of the sub areas was defined by the geographical proximity of the sub area to the city. This method was guided by the research conducted by CityForm: Sustainable Urban Form Consortium, funded by the Engineering and Physical Sciences Research Council (EPSRC).

As mentioned earlier, stratified random sampling was used. The samples were stratified according to the housing density i.e. low density housing medium density, medium high and high density housing and types of dwellings i.e. (i) single detached house, (ii) detached house, (iii) terraced house, and (iv) apartments/flats. Respondents were then selected randomly. Selection was made by selecting every second block of houses. From the selected blocks, every third house was selected. For multiple level residential buildings, every other floor was selected and again, from the selected floor, every 3rd house was selected (see Figure 2.3).

Red dots (🔴) represent the selected households
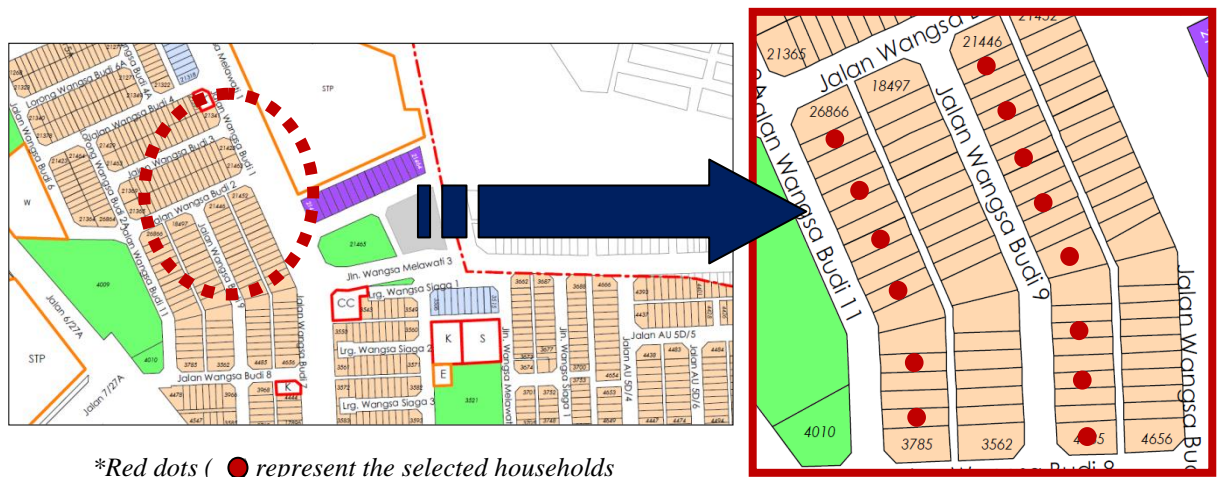
Figure 2.3: Illustration of the map used for sampling purposes (Terraced houses in an outer area
of Kuala Lumpur, Taman Wangsa Melawati)
Source: *Field Survey, 2010*

2.4.4 The instrument

In the preparation of the household questionnaire survey, a lot of aspects needed
to be considered. The researcher went through several stages in the design of the
questionnaire before reaching the final version, including the pilot survey. As
mentioned earlier, the content of the questionnaire survey form is quite similar to the
one used in the CityForm study. The questionnaire survey form prepared for this
research was designed to be capable of self-completion i.e. clear and easy to understand.
The methods of distribution selected for the survey was a combination of face to face
interview and drop and collect. Face to face interviews were the main method used,
while drop and collect was used when the respondents were not at home or the
respondents had opted for it. The questionnaire survey forms were designed to
maximise the response rate. This includes the cover letter, the format, the terms used
and the number of questions. The types of questions were also considered. As a self-
completion type of questionnaire form, most of the questions are close-ended and the
researcher limited the number of open-ended questions. This is to ensure greater
response from the respondents and to save time in the analysis stage.

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The questionnaire entitled '*Your urban living experience'* was divided into four sections with 31 questions (see Appendix B). The first section collected information on the background of current residence. Information on types of ownership, types of accommodation and household members were gathered. The subsequent section gathered the perceptions of respondents towards general aspect of the neighbourhood. The third section of the questionnaire gathered the perceptions of respondents towards various aspects of services and facilities available in the neighbourhood. It also gathered information on the usage of the services and facilities. Finally, the fourth section collected the demographic profile of the respondents such as gender, age group, ethnic group, education qualification, employment status, incomeand vehicle ownership.

2.4.5   *Ethics and Data Protection*

For the purpose of ethics and data protection, one of the procedures that the researcher has to go through prior going out for the field survey is to get approval from the school. Written approvals were obtained from the School Risk Assessor and School Safety Advisor. All procedures and steps performed in the field survey were assessed thoroughly.This was to ensure that the field survey did not involve any potential risk, hazardous work or activity (School of the Built Environment, 2010). As this study involved several assistants to help with the household survey and local people to participate as respondents, all potential risks were clearly informed by the researcher (verbal and written) prior to any involvement and participation. Each of the household questionnaires was supplied with a cover letter that informs all of the potential risk. Finally, to ensure data protection, respondents of the household survey were also informed that all data obtained were only for academic purposes and will not be used

for any other purposes. The survey data is also handled and stored properly and confidentially to ensure that all information is protected.

2.4.6   Pilot Survey

Another important step in a survey research is to carry out a pilot survey of the study. It refers to a small-scale version of a proposed research study run prior to the main event with the intent of catching and correcting any overlooked problems. In other words, a pilot study is conducting trials of questionnaires with representatives groups that can be interviewed. Conducting a pilot study can help to ensure that there is no ambiguity or misunderstanding, as well as providing data to establish an estimate of the reliability of the questionnaire (Seale, 1998).It also allows the researcher to review the survey if the outcome of the pilot survey is not up to the expectation. The review may range from the sampling frame to sampling method and the survey tool – questionnaire survey form. Therefore, the researcher is given another chance to review the adequacy of the sampling frame; to judge the suitability of the sampling method; to assess the reliability and validity of the survey results; etc. before the actual run of the survey commences.

The pilot survey for this research was performed on one of the case study area, Taman Datuk Keramat, Kuala Lumpur, Malaysia. The pilot survey was conducted between 5th July 2009 and 25th July 2009, approximately three weeks with the assistance of the researcher's colleague in Malaysia. The survey managed to get approximately 50 respondents. Subsequently, the questionnaire survey form was revised in light of the findings of this pilot survey. Furthermore, a detailed budget and timeline for the actual survey has been drawn out from this pilot survey. Results from the pilot survey have

guided the researcher to omit schools and nurseries/kindergarten from the list of local services and facilities. This is because this education-type of facilities is not used by every household. It only applies to household with school-aged children. Hence, the researcher decided to limit to only services and facilities that are common to all households.

2.5 Observation and Site Survey

Having adopted a mixed-method approach of data collection, the observation survey is one of the fundamental methods to address the objectives of the study together with other data collection methods. Observation survey generates a wider range of data, if compared to the selection of data only available in written format or household questionnaire survey. It is also considered significant for this study since direct contact with the neighbourhood and local people involved in the case studies permits the researcher to obtain information which would have otherwise been unavailable. Moreover, 'soft' data such as observations and personal views have great value for qualitative research. Prior to conducting the survey, a checklist was prepared to ensure that all elements to be observed and evaluated were clearly set out (see Appendix D-Observation Survey Checklist). The process of conducting the observation survey included the researcher walking around the study areas while referring to maps and plans provided by local authorities. This procedure enabled the researcher to conduct analysis of maps and plans which is important to identify any issues of information inconsistencies. The researcher also took photographs of the areas including the public facilities and local services provided and any issues identified. Additionally, the researcher also engaged informal discussion with planners and officers of the two local authorities involved, Kuala Lumpur City Hall and Putrajaya Corporation. The

discussions were generally concerning issues related to the provision, use, maintenance and the implementation of the public facilities and local services under their jurisdictions.

2.6   Validity and Reliability

Reliability and validity are two aspects of methodology that need to be established in considering the appropriateness and usefulness of measurement instruments. According to Field (2009), validity refers to *"whether an instrument measures what is it designed to measure".* Reliability refers to *"whether an instrument can be interpreted consistently across different situations"* (Field, 2009, p. 11). According to Field (2009), reliability can be approached in several ways. One of the easiest ways to assess reliability is to test the same group of people twice. It is considered reliable when it will produce similar findings after being measured again and again. A research study is then reliable if it is replicable, stable or dependable, meaning that with the same approach the findings of the research will be the same. Another aspect of reliability and validity relates to the element of error of measurement. If there is an error of measurement in a measuring instrument the instrument is said to be unreliable. Thus, reliability in this context can be defined as the relative absence of errors of measurement in the measuring instrument.

This study uses household survey as the main source of data, supported by observation survey. Data from the questionnaire is analysed quantitatively and supported by findings derived from the observation survey. To ensure that the samples from the household survey were representative, the researcher performed sample *weighting*. Sample weighting is one of the steps that the researcher has undertaken to

ensure that the data are reliable. Generally, in statistics, weighting is used to correct disproportional sample size and used to correct for differential response. By performing weighting, the researcher able to adjust the collected data to represent the population better. In this study, the researcher weighted the samples based on the response rate of the six sub areas (Kuala Lumpur; inner, intermediate and outer; Putrajaya; inner, intermediate and outer). Detail of the weight factor is shown in Table 2.1.

Another aspect that the researcher has considered to ensure its reliability and validity are selection of case study areas and representativeness of each sub area. As mentioned earlier, the two case study cities selected for this study were Kuala Lumpur and Putrajaya with a focus in the empirical research on six sub areas . The main criterion on the selection of the areas is that in combination represent the main urban forms commonly found in Malaysian cities. This was achieved through general knowledge and experience of the areas and reference to local authorities' report (Kuala Lumpur City Hall 2008 and Putrajaya Corporation 2009, 2002, 1997).

It is also important to note the nature of this study being a cross-sectional design. According to De Vaus (2001, p. 176) cross sectional designs are the most often used design in social research due to its nature that enable a researcher to obtain results relatively quickly. Such an approach does not require repeated data collection, tracking respondents or experimental intervention. However, the researcher has interpreted the findings of this study with caution, as cross-sectional design has some implications. Among them are that, though the researcher may be able to establish a correlation between two variables, this does not establish their causal direction (De Vaus, 2001, p.180). However, it is aslso suggested that cross sectional designs can have more success than other design in achieving representativeness.

2.7   Data Analysis

As mentioned earlier, the research is designed as a mixed method approach. It is predominantly quantitative with a support ofqualitative references such as maps/ plans and observation survey outputs, i.e. photos. Analysing data with a mixed method approach requires very careful selection of analysis technique.

The analysis of this study was divided into three stages. The first stage refers to extracting findings based on the observation survey. This was a qualitative approach collected data based on the researcher's observations experiences, opinions and photos. This approach was used primarily to describe the profile of the study areas. This was also supported by some quantitative map/ plan based measurement. The second stage was the descriptive analysis of the household survey. It involved exploring the data using simple descriptive analysis. Among the analysis techniques applied were frequency distribution, cross-tabulation and deriving means score. This allowed the researcher to get familiar with the data and explore the data thoroughly before carrying out further detailed analysis. The third stage refers to further exploring relationship of the data using T-test, correlations and chi-square analysis. This final stage refers to testing the hypothesis formulated to answer the aims and objectives of the research study. This stage was divided into the analysis of bivariate and multivariate relationship. Following these different stages, the researcher carefully categorized the data analysis and findings into three parts.

Part I deals with the assessment of the case study cities' profiles. It describes: the socio-economic background; urban form elements within the residential neighbourhood areas; and, services and facilities available to local residents. This

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information was obtained from secondary sources such as local authority reports, structure plan, local plan and the observation survey. This is discussed in Chapter Five.

Part II deals with the assessment of the residential neighbourhood, which is the focus of Chapter Six. Descriptive analyses were carried out describing the socio-demographic profile of the respondents. Following this, the researcher focussed on discussing the perceptions of the respondents towards their residential neighbourhoods. Other information captured in this analysis included the problems and issues of the neighbourhood such as safety of the neighbourhood, traffic congestion and lack of parking. Apart from that, the researcher also captured the respondents' perceptions of local services and public facilities available in the neighbourhood. It looked at both access and usage pattern of selected services and public facilities.

Part III is the most crucial analysis for this study and is reported in Chapter Seven. Formulation of new variables such as layout type, density, sub area location, land use mix (urban form variables), is required to perform the analysis and to test the hypotheses of the study (see p. 52).The variables were created based on combined data input from household survey, observation survey, literature review and local knowledge. Details of the urban form variables created for the analysis purposes of this study are given below:

- *Layout type*

    The layout type variable was created based on layout theory by Biddulph (2007), observation survey (2010) and maps (obtained from local authority) and Google map. Details about this element are discussed in Chapter Three. The different types of layout used in this study are: *(i) cul-de-sac (ii) super block (iii) linear block and (iv) courtyard.*

Having good knowledge of the site also contributes to establishing this variable. This variable enabled the researcher to test whether different layout type have an impact on access and pattern of usage towards selected services and facilities. Table 2.3 illustrates the different layout types that are normally found in Malaysian cities and used in this study. Aspects of layout are further discussed in Chapter Three (see p.82).

Table 2.3: Different layout types (Source: Google maps)

Cul-de sac layout in Putrajaya (Precinct 9 – Intermediate area of Putrajaya)	
Superblock layout in Putrajaya (Precinct 9 – Intermediate area of Putrajaya)	
Linearblock layout in Putrajaya (Precinct 11 –Outer area of Putrajaya)	
Courtyard block layout in Putrajaya (Precinct 10 –Intermediate area of Putrajaya)	

Source: Google Maps

- *Density*

    With the information obtained from observation survey and zoning map obtained from the local authority the density measure wascreated for analysis purposes. Each sub area (sub-block area) was examined to ensure that the categorized density of low, medium and high corresponded with the actual density on ground. After having all the information required, this variable was created and inputted to the SPSS data worksheet.

- *Land Use Mix*

    The land use mix variable created for analysis purposes in this study was categorized into two: single land use (residential) or some land use mix. Since the case study areas are all residential areas, there can be only these two categories. With reference to map-based information and observation survey the variable was created to measure the access and usage pattern of selected services and facilities. Figure 2.4 illustrates a portion of the sub area that indicates some land use mix in the areas in plan. Table 2.4 show images of the different areas of both land use categories.

Figure 2.4:Plan indicating some land use mix within residential development

Source: Local Plan Kuala Lumpur City Hall 2020, Kuala Lumpur City Hall, 2008

Table 2.4: Images of areas with land use mix and single residential use

Retail strip within residential development (Setiawangsa : Intermediate area of Kuala Lumpur)	
Retail strip and recreational facilities within residential development (Setiawangsa: Intermediate area of Kuala Lumpur)	
Single residential use (Wangsa Maju : Outer area of Kuala Lumpur)	

Source: Observation Survey, 2010

- *Sub area location*

Sub area location of inner, intermediate and outer was established based on the information obtained from observation survey, maps and local knowledge of the area (see p. 38). The sub area location was applied to both case study cities. Following the data input, the researcher managed to divide the case study areas into six (6) sub areas; threesub areas for Putrajaya and threesub areas for Kuala Lumpur. This feature of the research design follows the example of previous research conducted by the CityForm Consortium. However, to capture other detailed information, in particular variation in urban form, the sub areas were further divided into 24 sub-blockareas which have incorporated the layout type (super block, linear block, courtyard and cul-de-sac) and other urban form measures including density.

The above variables are important explanatory variables for the analysis and hypothesis testing. Part III of the analysis also looked at modelling the factors that affects the pattern of usage of selected services and facilities through the use of logistic ordinal regression.

2.7.1   Hypotheses Testing

A hypothesis is an informal speculation formulated from information gathered from previous research, set up to be tested (Bryman, 2008). It usually looks into the possibility of relationships between two or more variable. Prior to test the hypotheses, it is important to understand the two types of variables (Bryman, 2008):

(i)   *Dependent variable: a variable that is casually influenced by another variable.*

(ii)   *Independent variable: a variable that has a causal impact on another variable.*

The major task in testing the hypotheses is to look at the process or procedures required to model the relationship between the aspects of urban form and the access and usage of the provided services and public facilities available in the neighbourhood of the case study areas. The preferred technique is the ordinalregression analysis which allows testing models to predict categorical outcomes with two or more ordinal categories, although the research also explored binary logistic and OLS models (Pallant, 2010, p. 168). Based on theoretical reviews and critical understanding of previous research, the researcher has formulated several hypotheses for this study. The results of the hypotheses testing is reported and discussed in Chapter Seven.

Hypothesis 1:

Higher density would result in improved access to certain services and public facilities.

This hypothesis is in line with many previous studies that claimed density is the overall urban form measure that can explain improved access (Bramley, Dempsey et al. 2009; Bramley and Power 2009; Jenks and Jones, 2010). However, findings by Burton (2000a, 2000b and 2003) were mixed across different services.

Hypothesis 2:

Ease of mobility within the neighbourhood would result in better access and usage of selected services and facilities.

This hypothesis relates to the aspect of accessibility within the neighbourhood. Accessibility is a major factor in measuring access and usage of local services (see Chapter Three). Hence the researcher would to test the claim that better accessibility to services and facilities is the key to facilitate and improve social sustainability.

Several studies have claimed that urban form factors alone are not the key determinant to ensure services and facilities within the neighbourhood will be used effectively and efficiently (Evans, 2009; Chapman, 1996). There are cases that people will run their errands while on their way to work or performing several tasks simultaneously. There are also cases where they would opt for better services and facilities which are further from their home. This may be due to having more resources to travel further or having higher income and having more cars. It has been reported that safety, which relates to the psychological factor is also considered as one of the factors that have strong impact on improving access and usage pattern towards facilities within a residential neighbourhood (Evans, 2009). In line with this, the researcher formulated a third hypothesis as follows:-

Hypothesis 3:

Taking account of economic, physical urban form and psychological factors is essential to improve overall access and usage of services and facilities.

2.7.2   Statistical Analysis Package

Data analysis was primarily performed using the Statistical Package for Social Sciences (SPSS, PASW version 18). The researcher decided to use SPSS for this analysis as it is the best established package for conducting analysis of household surveys, manipulating data and generating tables and graphics that summarize data. Microsoft Excel XP was also used to produce graphical outputs. Through the use of the PASW software, data were stored, manipulated and all analyses were performed such as descriptive analysis, cross tabulation, significance testing and logistic regression modelling.

2.8   Conclusion

This chapter discussed the research design and the strategies that were adopted for data collection and analyses for the empirical study presented in this thesis. It has also assessed the methodology used to analyze the set of data that is the core of this thesis. The different methods and stages required to answer the research objectives and to test the research hypotheses were discussed in detail. Variables for the analysis that were created from the combined data of household survey, observation survey, literature review and local knowledge is discussed in great detail. The empirical research is fully supported by the extensive development of the design of the survey which includes questionnaire design, pilot testing, and household survey. This reflects the strong effort by the researcher to ensure that the data collected are of high quality and standard that would translate into better findings. The discussion also highlighted some of the limitations of the cross-sectional design of the survey. With the completion of this chapter, the following chapter looks into providing the theoretical framework for the study. The researcher aims to provide critical review and explore thoroughly the significant literatures important for this study.

Chapter 3: Sustainable Urban Form and Social Sustainability

3.1 Introduction

This literature review chapter focuses on developing the analytical framework of the thesis with the aim to meet the following research objective and answer the associated research questions:

Research Objective: To identify the character of a sustainable urban form that can improve social sustainability.

Research Questions

- *What are the elements / types of urban form?*

- *What are the different methods for measuring the urban form?*

- *How does the urban form influence social sustainability?*

Generally, the central theme of this chapter is assessing and evaluating the theories about sustainability and urban form, and this is developed through four subsections. The first section reviews the background of urban sustainability. The second section covers the concept of urban form and sustainability focussing on the various aspects, elements and types of urban form. The third section deals with the relationship between urban form and social sustainability. Finally, the conclusion summarises the key issues of this chapter before assessing the issues of urbanization and sustainability in Malaysian cities in the next chapter.

3.2   Sustainability and Urban Form

It has been argued that there are strong relationships between urban form and sustainable development (Beatley, 2004; Newman & Kenworthy, 1999). Dispersed urban development has led to environmental deterioration, increased energy consumption for transportation, and pollution (Masnavi, 2000), while compact development was perceived as the solution.   Urban form in one way or another has significant impact on sustainability. The association of urban form and sustainability has evolved after much thought and consideration has been given to the relationship between the environmental impacts and urban forms, particularly around the impact towards energy use and travel (Bramley and Power, 2009; Jenks et al, 1996).   This concern led to a strong assumed association between sustainability and more compact forms of urban development.

3.2.1   Understanding Urban Sustainability

Discussions about urban sustainability[3] emerged in the 1980s and this has become an important urban planning objective ever since. This concept brings a long-term perspective into planning debates and requires holistic consideration on how to meet environmental, social and economic objectives simultaneously (Elkin et al, 1991; Yiftachel and Hedgcock, 1993; Jepson, 2001). To date, the Brundtland (1987) definition of sustainable development is still the most commonly quoted definition:

"Sustainable development is development that meets the needs of the present without compromising the needs of future generations to meet their own needs".

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[3] The terms sustainability and sustainable development will be used interchangeably in this study.

According to the WCED (1987 in Wheeler and Beatley, 2006), sustainable development contains two key concepts which are described as follows:-

- *"The concept of 'need', in particular the essential needs of the world's poor to which overriding priority should be given; and*

- *The idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs".*

The definition by the Brundtland commission seems to be the most comprehensive as it refers to the general aspects of development that includes physical, social, economy and environmental aspects. Furthermore, it reflects that coordination of planning at a number of different scales - such as the region, the city, the neighbourhood, the site, the building, and across a number of different disciplines - such as transportation, land use, housing and environmental planning is an important requirement. Other than that, according to The Brundtland Commission (WCED, 1987 in Wheeler and Beatley, 2006), the concept of sustainable development fundamentally deals with *the satisfaction of human needs and aspirations'* (WCED, 1987 in Wheeler and Beatley 2006, p. 56). They added, *'living standards that go beyond the basic minimum are sustainable only if consumption standards everywhere have regard for long term sustainability'* (WCED, 1987 in Wheeler and Beatley 2006, p. 56).

Sustainable development is conventionally associated with three fundamental principles which are "*inter-generational equity, equity or social justice and principle of transfrontier responsibility"* (Selman, 1996). First the principle of *"inter-generational equity"* implies that "*one generation should hand on the earth to the next generation in at least as good a condition as it inherited it"* (Selman, 1996). This principle reflects the need to consider the ability of future generation to appreciate and experience the

advantages that the current inhabitants acquire. The second principle refers to the concept of "*equity*" or "*social justice*" (Selman 1996). This principle is also known as as "*intra-generational equity*". This principle requires that sustainable development contains within it a "*principle of human needs*" (Pearce and Makandya, 1989 and Selman, 1996). Finally the "*principle of transfrontier responsibility*" states that "*sustainability in one locality, region or country cannot be achieved at the expense of environmental conditions elsewhere*" (Selman, 1996). Thus one must accept responsibility for any impacts that our activities may have on the water and air quality, biodiversity and the condition of the natural resource stock in other areas.

3.2.2 Environment, Economy and Equity

Wheeler (2000) further elaborates and illustrates the concept of sustainability as revolving around "*the concept merging of the three Es', which are 'environment', 'economy' and 'equity' in society*". He explained that this emerging sustainability doctrine holds the importance of the "*preservation of the natural environment*, *the development of economy and achievement in social equity*" (Wheeler, 2000). Referring to Figure 3.1, through the understanding of the emerging three E's, it is important to understand the three main quality of life objectives are met (DETR, 2000 in Cooper et al., 2009):-

- *Social progress that addresses the needs of everyone*

- *The maintenance of stable levels of high economic growth and development.*
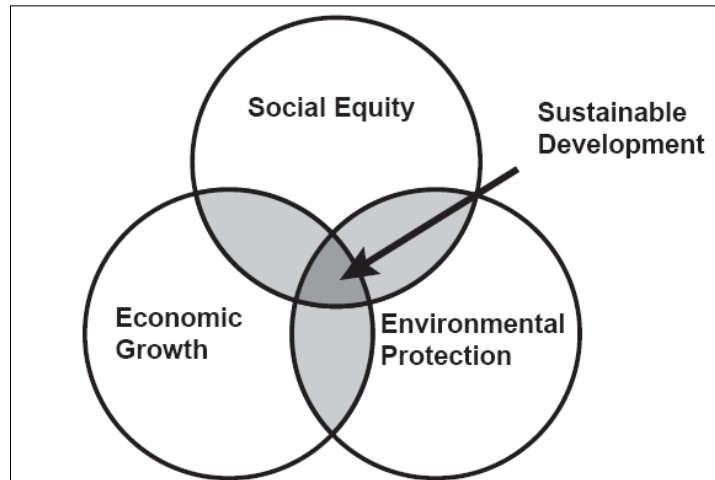
Figure 3.1: Venn diagram - Concept of sustainable development and the interrelationship among the 3Es.
Source: Agyeman and Evans (2003, p. 37)

According to Jepson (2001, p. 503), '*the emerging sustainability doctrine holds that the natural environment can be protected, the economy developed, and the equity achieved all at the same time and that the extent to which we are successful in this simultaneous achievement is the extent to which we will achieve sustainability'*. Through this understanding, it important to know how to balance the objectives of the efforts towards sustainability as it will determine the success and the extent of sustainability achieved. In relation to the social equity dimension, Jepson (2001, p. 503) stated that "*there tends to be a focus on the part of many mainstream advocates on the intergenerational side of the equity coin, with its call for natural resources conservation and environmental protection for the good of future generations*".

Environmental protection has always been the major concern in sustainable development. In any particular development, planners, architects and developers has to ensure that it has the least impact towards the environmental. Bullard (2004, p.144 in Wheeler and Beatley, 2004) mentioned that environmental justice "*embraces the principle that all people and communities are entitled to equal protection of*

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environmental, health, employment, housing, transportation, and civil rights laws."
This suggests that there is a strong mission through the environmental protection paradigm that all people regardless of race, income or origin shall bear the unavoidable negative impacts and consequences resulting from any particular development.

In relation to the economic aspect of sustainability Jepson (2001, p. 504) pointed out that *'there has tended to be a focus on valuing the benefits of economic development, defined as a qualitative increase in the conditions of life, as welfare, as an alternative to valuing the benefits of economic growth, defined as a quantitative increase in the consumption of goods and services or affluence'* (Jepson, 2001, p. 504). Economic vitality plays an important role to ensure that the impact to the environment and social can be sustained. Good economic growth would translate to better social welfare, better management of the environment hence would impact overall urban sustainability.

3.3   Social Sustainability and Urban Form

Social sustainability is a term which is hard to define because it is considered as a dynamic concept and may be seen as hard to measure (Dempsey et al. 2011 and Littig and Griesler, 2005). It is also considered as subjective and qualitative. This is because social sustainability is closely related to the behaviour of people and how people respond to change in their surrounding environment. It also suggests that sustainability addresses the question of how societies can shape their modes of change so as to ensure the preconditions of development for future generations. In this context, there is a need to understand how people perceive the environment and how they can actively participate in developing a quality environment. Social sustainability also refers to the

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viability of socially shaped relationships between society and nature over long periods of time (Becker et al 1999, p. 4). It is also known to be a wide-ranging multi-dimensional concept focussing on the social goals of sustainable development (Dempsey et al, 2011). A socially sustainable society is one that is just, equitable, inclusive and democratic, and provides a decent quality of life for current and future generations.

Barton (2000) identifies four aspect of social sustainability: equity, community safety, health and choice. Others have associated social sustainability with equity, community and participation (Jacobs, 1999, Yiftachel and Hedgcock, 1993). Littig and Griessler (2005) identified three core dimensions of social sustainability which focussed on satisfaction of basic needs and the quality of life, social justice and social coherence. Bramley et al. (2009) suggested that social sustainability comprises two main dimensions, (i) social equity and (ii) sustainability of community. The first dimension basically deals with the aspects of urban form focussing on access to services and opportunities such as local services, public transport and affordable housing. The second dimensions deals with broader aspects that include social interaction, satisfaction with the home and neighbourhood, safety, and participation (Bramley et al, 2009). Ancell and Thompson-Fawcett (2008, p. 432) explains that access to facilities is part of the overall social sustainability model which make up the intermediate social needs related to housing (see Figure 3.2). This framework somehow seems to be inspired by the Maslow's hierarchy of human need. In this case, Ancell and Thompson-Fawcett (2008) described that the overall social sustainability can be classified into three types of need; *'fundamental needs', 'intermediate need', and 'ultimate needs'*. Referring to the Maslow's hierarchy of human need (see Figure 3.3); housing or shelter is under the first tier of psychological need which is *'to sleep'* or rather to have shelter

to have proper food/ meal each day (Maslow, 1943; Stum, 2001). It also relates to the second tier where human need of '*safety*'. In this situation, the quality of the living environment and the house that is lived in is important to have the feeling of safety. In the end, these eventually would have great impact on the quality of life, which is also the main goal of the understanding of Maslow's hierarchy of human need. This is supported by Gratton (1980) as he mentioned, "*Maslow's Hierarchy of Needs is often cited as a possible basis for a fuller understanding of the individual's needs, particularly with regard to Quality of Life*".
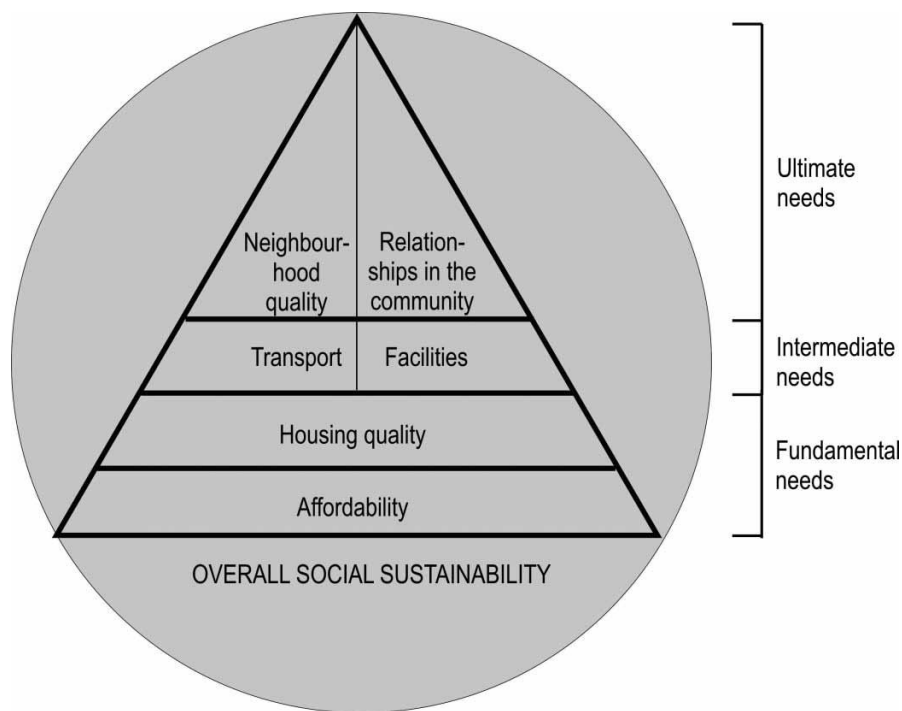
Figure 3.2: Conceptual evaluation model of the social sustainability of housing
Source: Ancell S. and Thompson Fawcett (2008, p.432)
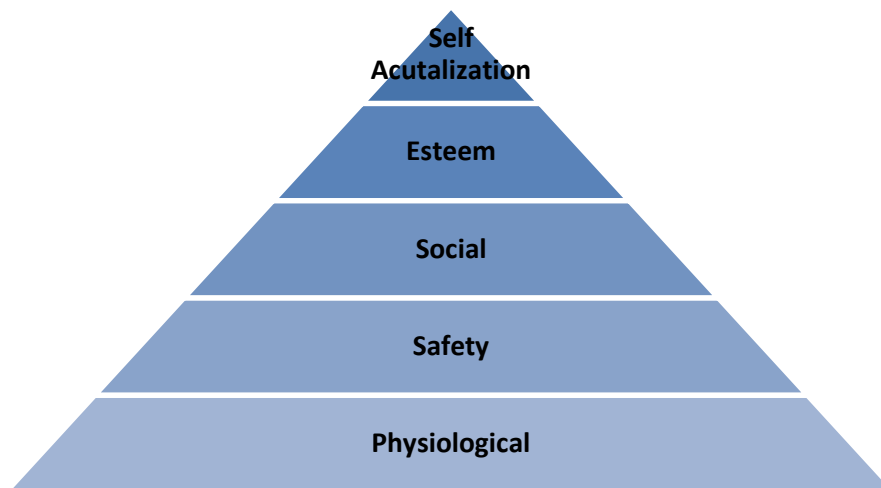
Figure 3.3: Maslow's hierarchy of need
Source: Wheeler (2000)

Other studies that explore the links between urban form and social sustainability include Mead et al. (2006) which aimed to provide a comprehensive review of the relationships between urban environment and health/social sustainability outcomes. The findings suggested that neighbourhoods which provide safe, convenient and attractive environments for walking are associated with higher levels of walking. It also suggested that there is a possible link between suburban sprawl and better quality of life and well-being. Butterworth (2000) summarised research relating to the importance of the built environment to health and well-being. It was found that participation and empowerment in the neighbourhood environment had been identified as being essential to the overall social sustainability, particularly quality of life and well-being. Butterworth (2000) mentioned that the built environment plays a key role in influencing participation in local neighbourhood life. Barton and Tsourou (2000) explain that quality of life also relates to having a good relationship between housing and local employment, retail, education and health facilities. This relationship facilitates better social interactions and sense of community within the built environment.

Another important aspect connecting urban form and social sustainability is safety of the built environment. Burton and Mitchell (2006) explained that 'safety' within the built environment context is related to the extent people can use enjoy and move around the outside environment while feeling safe. Burton and Mitchell (2006) also explained several categories of fear that relate to the built environment. Among them are fear of being attacked, fear of being run-over and fear of falling. These feelings usually constrain people's willingness to participate and behaviour at a certain level in the outside environment. To ensure a safe environment, Burton and Mitchell (2006, p. 128) identify several aspects that need to be considered. Among them are: a mix of uses, pedestrians separated from traffic by trees; on-road parking or bicycle lanes;spaces and buildings designed and oriented to avoid areas of dark shadow or bright light; adequate street lighting; wide, well maintained footways; and proper traffic calming measures.

To conclude, social sustainability directly impacts on the quality of life. To understand the different categories of need is essential as this allows planners to prioritize which services and facilities to provide within a neighbourhood. In this study, the focus is on social sustainability and how physical urban form may facilitate moves towards improving social sustainability. The researcher specifically focuses on the aspect of access and usage pattern of local services and public facilities.

3.4   Assessment of Sustainable Urban Form

Sustainable urban form is currently a widely discussed topic in the notion of urban sustainability. The understanding of sustainable urban form or even urban sustainability is nothing without the understanding on the notion of the general aspects of sustainability. Previous research has revealed that urban form has significant

implication for most aspects of urban sustainability with great emphasis on social sustainability (social equity, integration and cohesion) and environmental sustainability (energy reduction and travel patterns (Bramley and Kirk 2005). Masnavi (2007) developed a conceptual framework on the transition of bridging the gap between theoretical levels and the operational level of assessing the urban form's sustainability. He carefully defines the different conceptual components and operational components of urban form as presented in the following Figure 3.4. It illustrated the different components involved at theory level such as building types, street patterns and land use and the associated concepts related to it such as compact, dispersed layout patterns and land use. Following the theory level, Masnavi (2007) linked it to the research level in which he provide the related variable to measure each aspects of the conceptual components such as, among others, density measure of housing, higher density, lower density, diversity of activity and mostly residential. At the observational level, Masnavi (2007) illustrates how integration of conceptual components and operational definition is done to form definition for the selection of case study areas. The understanding of this conceptual framework is essential prior to perform any research related to urban form as it would allow the researcher to understand and comprehend the subject better.

There have been numerous studies on the subject of sustainability and urban form around the world, including in Asian countries. Most of the time the research focuses on specific type of urban form i.e. compact city form. A study in Taiwan,testing the hypothesis that compact city attributes foster sustainability, revealed that density has significant influences on all aspects of sustainability i.e. environmental, social and economic sustainability (Lin and Yang, 2006, p. 37). This study also suggested that density and the process of intensification positively influence economic sustainability and negatively influence environmental and social sustainability. On the other hand,

mix of land uses create positive effects for economic sustainability and have non-significant influence on environmental and social sustainability. In China, Yin and Xu (2009) stressed that Chinese cities is experiencing more severe conditions to problems of access to public spaces as compared to other developing countries. Particularly in the urban park provision, Yin and Xu (2009) highlighted that the number and area of parks in Chinese cities does not satisfy the increasing needs of urbanresidents. This has led to the realization to further improve the policy to develop and optimize the allocation of these public spaces to meet the increasing demand. Pardano and Martha (2009) conducted a study on the influence of urban form on travel behaviour in Bandung, Indonesia. The focus of the study was on travel behaviour to several elementary schools in Bandung. Travel behaviour of the students was assessed using mode of transport and distance from their residence to school. Based on the survey conducted, the authors revealed that non-motorized travel behaviour was significantly influenced by urban form element, particularly road layout, number of intersections, cul-de-sacs, and pedestrian paths (discontinued) (Pardano and Martha, 2009). For cases where students opt for schools further from home (exceeds walking distance), it indicates that schools located closer to home were not utilized as they opt for better quality. It was also revealed that the school location choice is correlated with income. The understanding of the Asian literature is important because it indicates the context in which Malaysia stands. Other Asian cities also have similar characteristics, i.e. climate and culture that might be useful to apply as a reference. It is also important to assess the impact of the study and make comparison on the solutions and efforts to improve policies and strategies towards social sustainability as a whole.

Fig. 1. Transition from the conceptual to observational level, the case of urban form
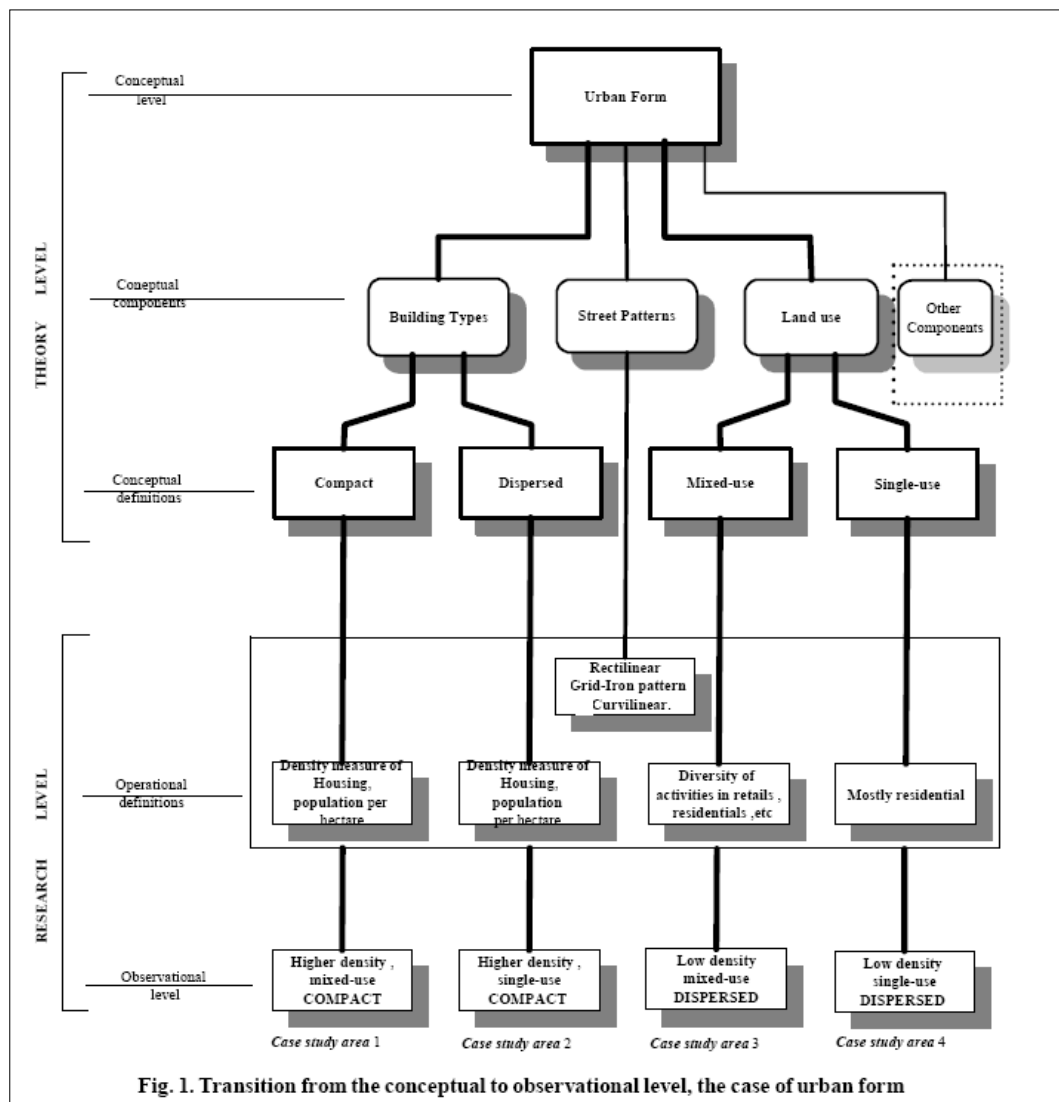
Figure 3.4: Assessment of urban form: Transition from the conceptual to observational level
Source: *Masnavi (2007, p. 191)*

3.4.1 Understanding Urban Form

There seems to be various attempts to define the term 'urban form'. However, to date, there is no single definition of the term and different researchers have interpreted urban form differently. According to Anderson et al. (1996) urban form has been defined as the configuration of several fixed elements within a region. This generally refers to the various elements such as street layout, building configurations, land use, urban spaces and so on. Earlier, Lynch (1981) defined urban form as the spatial pattern of the large, inert, permanent physical objects of the city. Jabareen (2006) further

developed the definition by explaining that urban form is a result of combining different elements and concepts of the urban pattern. In simpler terms, urban form is defined as size, shape, and intensity of urban settlements and the spatial organization of different types of land use (Bramley and Kirk, 2005). Barton and Tsourou (2000) defined urban form as the distribution and pattern of human settlement within the city region and described that the key variables are density, shape, degree of dispersal or concentration and the quality of the infrastructure for public transport.

Clifton et al. (2008) pointed out that perspectives on urban form can be classified into five categories: landscape ecology, economic structure, transportation planning, community design and urban design. Clifton further explains that these categories have eventually managed to provide a framework for the discussion of rapidly growing literatures in the area of sustainable urban form.

Urban form is generally a composite of multitude characteristics which comprise land use patterns, transportation system and urban design (Handy, 1996). In the discussion of achieving sustainable urban form, it is important to consider all these elements as urban form evolves over time. Various concepts to achieve a good urban form have emerged such as the 'new urbanism', 'compact city' and 'smart growth'. The following subsection discusses these concepts briefly.

3.4.2 Theories of Urban Form

- *New Urbanism*

The concept of new urbanism was developed in United States by Andres Duany and Elizabeth Zyberk. The concept is more of reinventing the design of community of the previous twentieth century movements and it is also about reviving the earlier typologies and patterns (Kelbaugh, 1997). It was also initiated and built upon the ideas of several potent visions such as the garden city and modernist urbanism (Kelbaugh, 1997, 2000 and Grant, 2006). Grant (2006) stated that the "*origin of new urbanism started since the nineteenth century as it can be seen that certain ideas about the city was incorporated in nineteenth and twentieth century's neighbourhood planning*". The concept of new urbanism focuses on the promotion of mixed uses at a fine grain and quality design. It advocates provision of affordable housing integrated with other uses in neighbourhoods and the promotion of a sense of community (Talen 1999; Grant, 2006). New Urbanism is basically a reaction to urban sprawl, intended to encourage sustainable growth and to facilitate infill development based on planning and architectural principles (Grant, 2006; Garde, 2004). It also focuses on providing a diverse range of job opportunities and pedestrian friendly neighbourhoods. Problems which new urbanism claims to overcome are sprawl, car oriented development and ugliness. Other values that new urbanism incorporated within the theory are amenity, equity walkability, promoting mixed use and mixed demographics as well and increased density (Grant, 2006). Furthermore, new urbanism also emphasises social community, in which its community are set in a gate-free environment and it does not support the use of automobiles (Sanders, 2002). It was also explained that the community has accessible and useful public space, has safe and inviting streets and well connected to the public transportation networks (Sanders, 2002).

Talen (1999) discusses the social principles of new urbanism explaining *'that attempt to build a sense of community was made through two aspects: integrating private residential space with surrounding public place and placement of public space'*. The specific design elements pertaining to build the sense of community are found to be in works by Duany and Plater-Zyberg (Towns and Town-Making Principles, 1991); Calthrope (The Next American Metropolis, 1993), and Langdon (A Better Place to Live, 1994), among others (Talen, 1999). Most of the design elements were found to be aspects of architecture and site design; density and scale; streets; public space; and mixed land uses.

- *Compact city*

The idea of the compact city has been advocated as a solution to achieve urban sustainability (Burton, Williams and Jenks, 1996). It is perceived that the intensity of activities, such as traffic and industry, is one of major factors affecting sustainability (De Roo and Miller, 2000). As Burton (2000) and Nueman (2005) have characterized, the main characteristics of the compact city include the following elements;

- *High residential and employment densities,*
- *Contained growth, demarcated by legible limits,*
- *Mixed land uses,*
- *Fine grain of land uses,*
- *Contiguous development (some parcels or structures may be vacant or abandoned, or surface parking),*
- *Multi-modal transportation,*
- *High degrees of accessibility,*
- *Sidewalks, kerbs, bicycle lanes,*
- *High degree of impervious surface coverage,*
- *High open space ratio,*
- *Population diversity,*
- *Increased social interaction,*

- *Unitary control of planning of land development, or closely coordinated control, and*
- *Sufficient government fiscal capacity to finance urban facilities and infrastructure.*

According to De Roo and Miller (2000), the compact city policy has been a response to the outward movement of growth called urban sprawl. It is believed that the classic response to urban sprawl has been compact urban development.Previous researchers have claimed that low density development, which is often associated with decentralization, can lead to increased automobile travel and fuel consumption, and reduced effectiveness of public transportation (De Roo and Miller, 2000; Newman & Kenworthy, 1992). As a solution, Neuman (2005) reasoned out that higher densities and mixed uses, in which compact city promotes, have the ability to reduce trips length and make public transport an attractive option. With this scenario, compact city can be seen as more energy efficient and less polluting as the urban dwellers will tend to live nearer to places to shop and work. In the United States, compact cities are also called transit-oriented developments and are promoted through the smart growth movement (Neuman, 2005). Despite the advantages compact city can give, development at higher densities may also result in unsustainable externalities and impacts in those higher density areas. Among them are air pollution, traffic congestion, loss of amenity space, loss of vacant green areas within cities, and reduction of privacy (Burton, Williams and Jenks, 1996; De Roo & Miller, 2000). Previous research has also claimed that increased density does not necessarily result in reduced car dependency and reduced trip making (De Roo and Miller, 2000; Breheny, 2001; Burton and Jenks, 2000). Williams, Burton and Jenks (2000) explained that it is difficult to explain how physical design alone is able to reduce travel demands of energy-rich transport mode with increasing car ownership, air travel, leisure and business and dispersed life patterns. Hence, the deficiencies of the

compact city must be addressed if the compact city is to compete with the attractiveness of low-density areas.

- ***Smart growth***

The concept of smart growth originated in the United States initiated by the US Environmental Protection Agency (EPA). According to Miller and Hoel (2002), the main objectives of smart growth are to enhance the communities, strengthen the economy and protect the environment. These three elements fits well with the Venn diagram mentioned earlier (see Figure 3.1) that covers the three interrelated aspect of sustainability. Generally the concept of smart growth is based on mass transit and onenvironmental impacts of developments being limited (Miller and Hoel, 2002; Filion and McSpurren, 2007). Many scholars believed that the sustainable urban form under the theory of smart growth refers to a city being more compact and has less dependency on the automobile (Filion and McSpurren, 2007*).* According to EPA (2001), 10 principles of smart growth are as follows:-

- *Mix land uses*
- *Take advantage of compact building design*
- *Create a range of housing opportunities and choices*
- *Create pedestrian-friendly neighbourhood*
- *Foster distinctive attractive communities with a strong sense of place*
- *Preserve open space, farmland, natural beauty and critical environmental areas*
- *Strengthen and direct development towards existing communities*
- *Provide a variety of transportation choices*
- *Make development decisions predictable, fair and cost effective*
- *Encourage community and stakeholder collaboration in development decisions.*

Source: United States, Environmental Protection Agency (EPA), (2001).
http://www.epa.gov/smartgrowth/pdf/whtissg4v2.pdf, Last retrieved: 18.08.2011)

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To conclude, the three concepts of urban form i.e. new urbanism, compact city and smart growth, seems to have similar objectives, which is to address the sustainability issues through the three elements; environmental protection, social equity and economic viability. It is believed that, regardless of the particular concept or label used to regenerate or redevelop the city, there are key aspects that need to put into consideration to ensure its feasibility and success in achieving sustainability. The interrelated key principles are mixed land uses, multi-modal transportation, and preservation of open space, a good range of housing opportunities, job opportunities and facilities. In this study, understanding of these key principles is crucial as a foundation to develop the key elements that would impact on the overall social sustainability. It is also used as a basis to assess and to identify the issues and problems faced by each case study city.

3.4.3   Elements of Urban Form

As mentioned earlier, urban form is defined as the spatial configuration of fixed physical elements within an urban area (Anderson et al., 1996). The physical elements that make up the urban form are density, housing/ building types, layout, land use and transport infrastructure (Dempsey et al. in Jenks and Jones, 2010). Referring to Figure 3.5, these elements are interrelated and important factors to consider in ensuring a sustainable city. The following subsection discusses in detail the elements of urban form which is the main aspect used to define the urban form variables of this study.
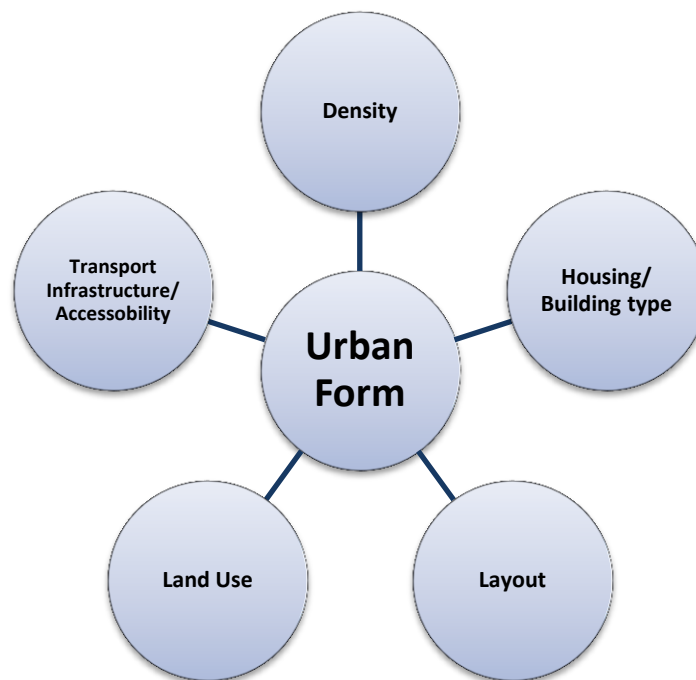
Figure 3.5: Elements of Urban Form
Source: Dempsey et al., in Jenks, M., C. Jones (eds.). (2010)

i.   *Density*

Density is the aspect of urban form that has been received most attention in the literature with regard to its social impact. This is due to the fact that density of any particular development has the potential to impact upon all aspect of social

sustainability (Bramley and Power, 2008). Furthermore, density is also effectively the overall summary measure of urban form, particularly when related to the concept of compactness in opposition to sprawl. According to Jabareen (2006, p.41), *"the relationship between density and urban character is also based on the concept of practicable threshold"*. This implies that to make an urban area functional or viable, there needs to be certain level of densities with certain numbers of people to generate the interaction needed. Density typically refers to a measure of the number of people living on a given area of land although it can also be measured in physical terms (e.g. number of dwellings) (Towers, 2005). According to Towers (2005) density can be measured according to four hierarchies;-

- *Dwellings per ha– the numbers of houses or flats. Early definitions of density used this measure and it is still in use to denote basic standards.*
- *Persons per ha– the number of people. This has been generally used to define density standards for planning purposes. To be a useful measure though, it needs to be converted into numbers of dwellings. The usual means of conversion is to measure bedspaces per ha/acre. This measure can be used to convert a persons' per ha/ acre standard into a range of conversion measure but this is now regarded as less useful than bedspaces since it is more variable and therefore more confusing.*
- *Net residential density – measures the area of a housing site up to the surrounding roads include facilities for the immediate benefit of the housing such as small areas of open space, community centres a few shops and so on.*
- *Gross residential density – measures a residential area and includes – in addition to housing – parks, schools, the road and transport network and other mixed used.*

Density also hassome cultural dimensions as the density at where people live may be considered as relative (Dempsey, et al. in Jenks and Jones, 2010, p. 23). In United

Kingdom, the recent English housing policy stated that new residential development should have a minimum of 30 dwellings/ ha. This is considered high in some areas and low to some others (Dempsey, et al in Jenks and Jones, 2010, p.23). On the other hand, Hong Kong, a minimum of 300 dwellings/ha is still considered as low density (Jenks, 2000; Jenks and Dempsey, 2005). Richardson et al (in Burgess and Jenks, 2000) affirmed that densities in developing countries are much higher compared to developed countries, especially in the core cities. He further explained the factors which among them are due to the following (Richardson et al. in Burgess and Jenks, 2000, p.26):

- *Higher rates of population and urban growth,*
- *Lower income meant much smaller dwelling size and lots. Also larger household size,*
- *Housing preference of the 'modern' sector were found to have favoured high-rise apartments, rather than single family housing*

Malaysia, as one of the developing countries also has significantly higher density in most of its major cities i.e. Kuala Lumpur. In Malaysia, most of the local councils are guided by the following table for density classification (Kuala Lumpur Local Plan). Referring to Table 3.1, it shows that what is considered low density in Hong Kong is considered as medium density in Malaysian cities. In comparison to UK cities, for a residential building of a minimum of 30 dwellings/ ha in Malaysia, this would be considered within the range of low density. This indicates that cultural dimension of density in Malaysia can be regard as moderate.

Table 3.1: Density Control in Residential Zones in most Malaysian Cities

	Maximum Density Allowable	
	Person/ha(pph)	Unit/ha
Low density	10	2
	30	7
	45	15
	100	20
Medium density	100	30
	200	50
	300	75
High density	300	80
	600	150
	850	200
	900	250
Public Housing	900	250

Source: Kuala Lumpur City Hall, (2008) Kuala Lumpur Structure Plan

There are several ways density may impact on sustainability. Areas with higher density would give the opportunity to have better access to services and local facilities (Haughton and Hunter, 1994; Towers, 1996; Burton, 2000). Bramley et al. (2010, p. 111) stated that *"there are reasons to expect access to services to be better in denser urban forms, while quality of neighbourhood environment, community and social interaction may be less good in denser areas".* It was also claimed that higher density would promote commercial viability and therefore revived public realm (Talen, 1999). However, Bramley and Power (2009) argued that in terms of quality of neighbourhood environment, community, and social interaction it may be better in lower density areas. In terms of social interaction, higher density may provide more possibilities for people to meet each other on the street than s lower density areas. However, beyond a certain level, high densities may make people feel that their personal space is compromised and the sheer number of people makes for anonymity (Dempsey et al. 2011). Lower densities provide less potential for spontaneous interaction and lead to greater dependency on car travel (Bramley and Power, 2009). As Jabareen (2006, p.44) stated that *"as density increases, automobile ownership declines and automobile travel- as measured by automobile travel – as measured by gasoline consumption or per capita vehicle miles of travel (VMT) also decreases"*. Public transport becomes more viable

and necessary as the density increases. Also, more trips can also be made by walking or cycling that eliminates fuel consumption and pollution hence contributes to better environment while also promoting personal health and wellbeing (Barton and Tsourou, 2000).

Bramley and Power (2009) explained that the way to measure the impact of density is to look at the density measures in terms of gross residential, which can be measured in terms of dwellings or habitable rooms per hectare. This is because using people per hectare would lead to confusion in terms of occupancy with physical form. Furthermore, it is difficult to measure net density because of the nature of the census data that covers all types of land use and not only residential use (Bramley and Power 2009, p. 35). They further suggested that density is considered as the most important aspect of urban form because it is a general summary measure which many other features will be partly correlated with.

In this study, density is one of the urban form variables used to assess the usage pattern and access to the selected local services and public facilities. A three level density measure was applied i.e. low density, medium density and high density. The three categories were referred to and guided by the density levels provided by the Kuala Lumpur City Hall (see Table 3.1). The density variable was created based on assessment of the plans for each case study areas.

ii.   *Housing or Building type / Urban Design*

Housing is one of the most important aspects in urban planning. It is considered as having an important bearing on everyday living (Dempsey et al. in Jenk and Jones

2010). It was also noted that residents living in different environments or building types would have different experiences. As Dempsey et al. (2010) described, those *"living in low-density detached dwellings with large gardens will have a distinct experience of the human environment from high-rise city centre apartment dwellers"*. In a low density setting, a house with a garden able may give better quality of living to its residents than a high density flat or apartment. This indicates that different types of building have different impacts on the built environment and the people. Different forms and physical aspect such as the number of floors/ height, mass form and design impacts the way people act towards its surrounding. At a certain point, it also affects perception of safety. The urban design of public spaces such as semi-public and semi-private would play a significant role in shaping perceptions of people towards different types of space. In relation to building types, Newman (1996) has categorized three building types which are often found in residential areas i.e. single-family houses (detached house, semi-detached house, row houses and town houses); walk-ups; and high-rises. These categories are easier to show differences when relate to social implications, which is also applicable to this study. Newman (1996) also explains the impact of different building types on people's behaviour. One of the key findings in his research was the relationship between building types and behaviour. It was revealed that building height is highly correlated with crime rates, which also correlates highly with the number of shared entry to a building (Newman, 1996, p. 24). Building size was claimed to have direct causal effect on people's behaviour i.e. *"use of public spaces"*, *"social interaction"* and *"sense of control of the interior and exterior public spaces"* (Newman, 1996, p. 29).

It is important to note that it is quite hard to distinguish the way urban design or building type would have social impacts without understanding the underlying

principles behind any particular design. Therefore, it is crucial to understand what urban design and building type will impact the environment and its people.Krizek (2003) mentioned that, *"a good urban design will positively influence levels of physical activity"*. This certainly implies that a good urban environment allows positive physical activity, good levels of social interaction and facilitates a friendly neighbourhood. Biddulph (2007, p. 43) explains that to create urban form, individual buildings are brought together through design and as a result of the buildings arrangements, streets and squares are formed, which people will use. Under the theory of new urbanism, Talen (1999) explained that the connection between community and design comes through designing residences in a way that encourages residents to get out into the public sphere. Specifically, designs of housing units are encouraged to be closer to the street with smaller lots and setbacks, a porch facing the street and smaller private spaces (Talen 1999; Duany and Plater-Zyberk, 1991).

Alongside this information, this study has categorized the different building types within the case study areas. Based on the observation and maps/plans, initially, the researcher has defined seven types of dwelling types i.e. detached, semi-detached, terrace, flat (walk-up), apartment and shop houses[4] (see Chapter Four, p. 114) . Later, for analysis purposes, the researcher has grouped into three main categories i.e. detached/ semi-detached, terrace and flat/ apartment. This grouping was made to allow easier interpretations of the different impact each building type may have.

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[4] Shop house refers to a dwelling type of typically two storeys, with shop on ground floor and reseidential unit on top floor (Valuation and Property Services Department, Ministry of Finance Malaysia, 2010)

iii.   *Layout*

Layout can be defined as the way buildings, routes and open spaces are arranged in relation to each other (Cowan, 2005). There are basically two aspects of urban layout: the structure and the grain. Layout structure is more concerned with the framework of routes, areas and how it relates to each other (Cowan, 2005). Urban grain is concerned with the layout of street patterns, housing patterns and building patterns. Urban grain can be further classified into fine grain and coarse grain.

"The pattern of streets and squares has a greater impact on a city than any other element of its arrangement".

(Cowan, 2005)

In terms of classic urban form, there are basically three types, the concentric city, the multi-nuclei city, and the sectoral model or also known as the radial or the lobe city. These layout types refer to the higher level of urban structure and of a higher hierarchy. On a smaller scale, layout concerns the arrangement of building types and spaces that directly refers to blocks and structures. In addition, layout also influences the level of permeability of an area. Biddulph (2007) explains that the important aspect of layout to measure is its level of permeability. This refers to the connection to access. It basically refers to the amount of access that is possible within the adopted residential block structure. Biddulph (2007) further explains that a more permeable environment offers people a wider number of more direct routes between various possible destinations. On a smaller scale, there are specific types of layout, which refer to a range of residential block structures. Among them are freestanding blocks, culs-de-sac layout, linear block layout, super block layout and courtyard (Biddulph, 2007, p. 49-54). These types of layouts are more practical when discussing residential layout. Given the fact

that the case study sub areas for this study are residential neighbourhoods, these types of layouts are the most appropriate way to categorize the different type of layout for this study. However, based on the observation and field surveys, not all types of layout are available within the study areas. Hence, the researcher has categorized these different types of layout with great care (see Chapter Two, Table 2.3, p. 48).

iv.   *Land use*

Beatley (2004, p. 250) pointed out that land use pattern and urban form are "*primary determinants of urban sustainability"*. In planning practice, typical of most developed countries and Malaysia, for a new development proposal, urban planners initially plan the land use zoning to ensure that there would not be any conflict between land uses which are close to each other. For planning a residential neighbourhood for instance, to ensure its sustainability and liveability, only land uses that are compatible to each other are allowed. For example, industrial use is not allowed close to a residential use as it would have a negative impact on the surrounding environment without a proper buffer. Furthermore, Aurand (2009) explained that in most research that promotes mixed use neighbourhoods; industrial uses are not included in the mix. In terms of compatibility, residential use would normally be surrounded by commercial, services and/ or recreational use. These sort of mixed land use was perceived to be sustainable because of its impact that can allow for easy access to other services and facilities as claimed by many researchers that promotes compact city and smart growth (Miller and Hoel, 2002; Burgess, 2000; McGranahan, Songsore, & Kjellen, 1999). A commitment to mixed use development is often observed in successful urban areas due to the fact that people would have the advantage to live nearer to places where they shop and work, hence facilitating amore viable city. This is one of the main reasons that in a compact

city, mixed use is encouraged, bringing homes, retail shops and offices close to each other. Mixed land use is also encouraged in smart growth. According to Aurand (2009, p. 1023), mixed use is highly encouraged as it is defined as a diversity of compatible land uses that serve the need of the local population. Mixed uses within a residential uses include public services, retail, entertainment and professional services. It is also recommende that these uses are located within walking distance or public transit (Aurand, 2009, p. 1023). However, despite all these advantages of mixed land use, it is important to understand that at different neighbourhood scale it would have different impacts. At certain spatial scales, particularly below the neighbourhood scale, the advantage of mixed use would reduce as it somehow affects sociability among the local community. The relationship between land use and social aspects was first articulated by Jane Jacobs (1961). It was claimed that when places of residence is juxtaposed with places to work, shop, recreate, social integration of different background is encouraged since it would encourage people to walk more and drive less (Talen, 1999). Furthermore, it is also realized that mixed use likely to generate some conflicts or externalities which would adversely affect the environmental quality and access to amenity for some residents.

In this study, land use is one of the important variables used to analyze in distinguishing the pattern of local services and public facilities access and usage. Since the focus of the study is within a residential neighbourhood area, the researcher classified two types of land use mix category which are (i) single residential use and (ii) some land use mix. The latter refers to blocks or several groups of blocks that have some commercial or services facilities within the residential neighbourhood.

v.   Transport Infrastructure and Accessibility

Dempsey et al. (in Jenk and Jones, 2010) regards transportation infrastructure as closely related to accessibility. With good infrastructure and transit options, people would have the advantage of reaching their destinations such as buildings, spaces and places easily. Accessibility is a result of the interaction of the different elements of urban form. It coincide the elements of layout, urban design, building types and land use. Accessibility refers to the ease with which a building, place or facility can be reached by people and/or goods and services (Cowan, 2005). The concept spans a variety of aspects, such as the physical, mental, economic, and financial, depending on the nature of the land use and transport in question (Doi et al., 2008). It can thus be said to measure the relative opportunity for interaction with a given situation such as recreational facilities (Gregory, 1986 in Lotfi and Koohsari 2009). Lynch (1981) defined accessibility as contributing to the ability of urban residents to have good access to activities, resources, services, information and the like. He considers accessibility as one of the main functional characters of urban spatial form. Dempsey (2010) added that aspect of accessibility is also linked to land use and layout. It is important for services; facilities and open spaces are arranged in terms of its layout, as these aspects contribute to the level of accessibility of a particular neighbourhood. However, Lotfi and Koohsari (2009) mentioned that having close proximity which relates to having good access does not guarantee the utilization of the services or spaces. Barton et al. (2020) explains that accessibility criteria for access to services and facilities are more than walkability. It also depends on the need to consider the *scale of the facility*, *the number of people to support, the density of the area and the vagaries of geography* (Barton et al, 2010, p. 121). People always have the option to use a particular services or facilities further away or choose different type of service which sometimes they use while performing

other errands or maybe just because its convenience for them. This is explained as *local convenience* and *trip chaining* (Barton et al. 2010, p. 123). This relates to the aspect of quality of life and in line with Evans (2009). He described how accessibility has become an important feature of sustainable development and sustainable communities which directly impact the quality of life. However, as technology improves, physical distance seems to lessen its importance (Talen, 2003). Through experience, technology, particularly internet technology has lessened the need to perform errands at a post offices, banks, and even grocery shopping. Hence, this will reduce the dependency on physical proximity to services and facilities that impacts some quality of life aspect and allows people to live in low density suburbs further from the city centre. However, the impacts would be different by socio-economic status, age and culture.

3.5 Access to Services and Public Facilities

Having access to services, public facilities and other places is claimed to have significant impact on quality of life, especially when living in urban areas (Lotfi and Koohsari, 2009). Economic disadvantage and poverty may be among the issues that contribute to poor access to facilities and services which can be denied by the physical form of the places, inadequate transport and the inappropriate distribution of services and resources. The level of access can be further restricted and this may differ according to age, gender, health and economic circumstances.

Barton et al. (2010) pointed out that access to local facilities is an important concept in neighbourhood design or planning. Accessibility is the central concept behind this; either accessibility by foot, bicycle, motorised wheelchair or local bus. He also elaborated that localised provision of public facilities with ease access by foot, bike

and local bus should be fundamental to the planning of every neighbourhood, urban district or small town. It should be noted that where local facilities are missing or in decline, then strategies for neighbourhood revival (such as densification, social diversity, increased connectivity, social infrastructure investment, and environmental improvement) are essential for health and sustainability.

According to Chapman (1996), access to public facilities which people often visit in the developed world greatly depends upon private and public transport systems. It was also explained that the availability to many people of affordable private transport, in the form of the automobile has had a profound effect upon the distribution of services and facilities in the late twentieth century. This has led to dispersed settlement and development patterns which depend on high levels of motorized mobility. Based on the theoretical reviews, it can be summarized that access to services and facilities are influenced by factors that can be categorized to 3 broad elements;-

- *Economically*

It refers to socio-demographic aspects such as income, vehicle ownership, number of household members, number of income provider. Being poor and economically disadvantages is the key factor that falls in this category.

- *Physically*

Shape and pattern of development such as the urban form, layout, road network and etc. can determine the ease of access to services. Services and facilities that are well connected and are physically accessible either by foot, bicycle and car are the main target of every neighbourhood intent on becoming a quality neighbourhood. It was also explained that physical form is able to influence the level of physical activity and social interaction within an environment. Frank et al. (2003) mentioned that physical built

environment influences physical activity. This includes using the local services and public facilities within a residential neighbourhood.

- *Psychologically*

In terms of the psychological factors, this relates to the perceptions of the individuals. It refers to the perceptions of safety and security or fear of danger in certain places. Also, having highly regards or attracted to the area or towards the people/community of a particular neighbourhood would eventually affect how people behave within the neighbourhood. It is also obvious that, when the quality of the dwelling or area is poor, it is logical for a person to have negative or bad perception of the area. Perceptions and satisfactions will gradually improve as the quality and environment improves (Dekker et al. 2007). According to Evans (2009), it is important to remove the psychological barriers to accessibility i.e. fear of crime, safety in order to improve the level of liveability within a neighbourhood. Different people have different experiences with their urban environment or residential neighbourhood. Besides that, perception to a place is also influenced by physical factors such as the layout of the street and footpath. In relation to this, it is important to note the ways in which public, semi-public and private spaces relate to one another is explored strategically and in terms of detailed design to give an increasing sense of ownership and control over the semi-public and private space outside each dwelling. The existence of variety of choices of movement pattern to the users of a place may also increase their perception of their personal safety by choosing the path or routes to take and avoiding unwelcome experiences.

As a conclusion, it suggests that there is a need to look at these emerging factors in this study and how far each factor relates to each other. This has become one of the

hypotheses of this study. Variables to fit each category were formulated in cases where it has not been captured directly in the household surveys. The variables were created through combination of several variables. Among the variables created to look at this agglomeration are: land use mix, density, dwelling type, income, education background, perception towards safety in the neighbourhood, perception of mobility and satisfaction towards neighbourhood.

3.6   Conclusions

The range of literature gathered in this chapter focussed on the broad theme of urban and social sustainability on the aspects of urban form and its relationship with social equity. Reviews of previous research revealed that there seems to be a strong relationship between urban form and sustainable development (Beatley, 1995; Kenworthy, 1999; Bramley and Power, 2008 and Jenks et al, 1996). This awareness is important before further assess the relationship of the two subjects. It was also suggested that urban form could have a great influence on social sustainability (social equity, integration and cohesion) as well as on environmental sustainability (energy reduction and travel patterns) (Bramley and Kirk 2005). However, the actual hard evidence on how far the alleged social sustainability benefits of particular urban forms, notably compact forms, is more limited, and provides a rather mixed picture.

Using the services and facilities within a residential neighbourhood is considered as one of the generators of physical activity, particularly if it involves walking or cycling. In addition, using local neighbourhood facilities increases the opportunities for and likelihood of social interaction with neighbours and others in the area. Residents who know more of their neighbours and interact more with them can act to deter crime and anti-social behaviour and increase feelings of security. Using local services increases footfall and activity in streets and public spaces and this further reinforces that benefit. Hence, it can be seen that not just access but more particularly actual use of local factilities should have a positive association with key aspects of social sustainability (health, interaction, safety).

It is important also to understand that physical environment may have a significant impact on physical activities and social interaction in local public spaces, and hence be able to influence indirectly the usage pattern of the local services and facilities within the residential neighbourhood. Thus there may be a two-way and reinforcing relationship between usage of local services/facilities and social sustainability. Following this, the researcher has embedded this issue in this study and has become its central theme, which is to assess equitable access to services and facilities. In relation to having access to public facilities, among the important urban form elements that would have the most impact are density and land use mix. However, it was revealed that urban form elements may not stand alone as the factor to improve access to public facilities. The researcher has concluded that having equitable access to public facilities is unlikely to depend to only on urban form/ physical factors, but it is expected to be much influenced by the agglomeration of other economic factor such as income; and education background and psychological factor such as neighbourhood satisfaction; and feeling secure and safe. Following this, some questions may arise, for example:

- *How far do urban form factors alone can improve access to public facilities?*
- *Does the impact of urban form factors changes after other factors (i.e. economic factor and psychological factor) are being controlled for in improving access to public facilities?*

In conclusion, this chapter accomplished the second objectives of this study which require the researcher to identify and describe the character of sustainable urban form that can facilitate and improve social sustainability. In the next chapter, the researcher looks at the aspect of social sustainability in Malaysian cities, where it would look into the profiling of the cities before continuing with the discussion on main findings of the study with the aim to answer all of the research questions and issues.

Chapter 4: Urbanisation, Sustainable Urban Form and Social Sustainability in Malaysia

4.1 Introduction

This chapter provides background information on planning practice in Malaysia and aspects of social sustainability policies. This chapter is divided into four sections. The first section deals with the status of urbanisation in Malaysia. It concentrates on describing the setting, progress of urbanisation and outlines the issues and problems. The second section discusses the Malaysian planning system. It looked into the historical background and practice of planning in Malaysia. The aspect of implementation is also discussed to obtain a better understanding of the system. Section three discusses the housing provision in Malaysia. To support the understanding of planning in Malaysia, the researcher also discussed briefly the implementation of development strategies and policies. The third section looks into the efforts that have been made towards achieving better neighbourhood living for social sustainability. Background information relating to housing development in Malaysia is also discussed in the fourth section.

4.2 Urbanisation in Malaysia

Urbanisation refers to the process of becoming urban. Lee (1991, p. 12) explains that most planners and statisticians prefer using demographic measures as criteria to measure urbanization. Therefore, urbanization is best defined as a process of growing population concentration whereby the proportion of the total population which is classified as urban is increasing. He also provide the method to measure urbanization (U%) (Refer to the following equation).

$$U\% = 100 \times Pu/Pt$$

Where
Pu : urban population
Pt : total population

<div align="right">

(Goh Ban Lee, 1991: 12)

</div>

Following the understanding of the definition of urbanisation as explained earlier, the process of urbanisation requires the development of new areas for housing, social amenities, commercial and other urban land uses (Federal Department of Town and Country Planning Peninsular Malaysia, 2006).

Malaysia has undergone rapid urbanisation particularly during the last two decades. The rate of urbanisation, which is indicated by the growth in urban population, has risen from 54.3% to 65.4% between 1991 and 2000 (Federal Department of Town and Country Planning Peninsular Malaysia, 2006). In general, the most rapid urbanisation is concentrated in major conurbations such as Kuala Lumpur, Georgetown, Johor Bahru and Kuantan (Federal Department of Town and Country Planning Peninsular Malaysia, 2006). The urbanisation rate in Malaysia is expected to increase to 75% by year 2020. One of the issues and problems of urbanisation in most Malaysian cities is the impact of urban sprawl and the encroachment on environmentally sensitive areas unsuitable for development. Other issues related to rapid urbanisation in Malaysia, as mentioned in the National Urbanisation Policy, include: environmental pollution, traffic congestion, brown field areas, loss of inner city attractions, infrastructural decay, lack of social amenities and green areas (Federal Department of Town and Country Planning Peninsular Malaysia, 2006). These ultimately result in the degradation in the quality of urban living. Figure 4.1 shows the trend of population increase in Malaysia between 1950 and 2030 (projected). The trend also indicated the rural population and urban population. The trend illustrates that urban population continues to increase from

1950, and by the year 2030 it is projected that the urban population in Malaysia will reach more than 80%. In contrast, rural population remains low and is expected to decrease gradually to approximately 23% in 2030.
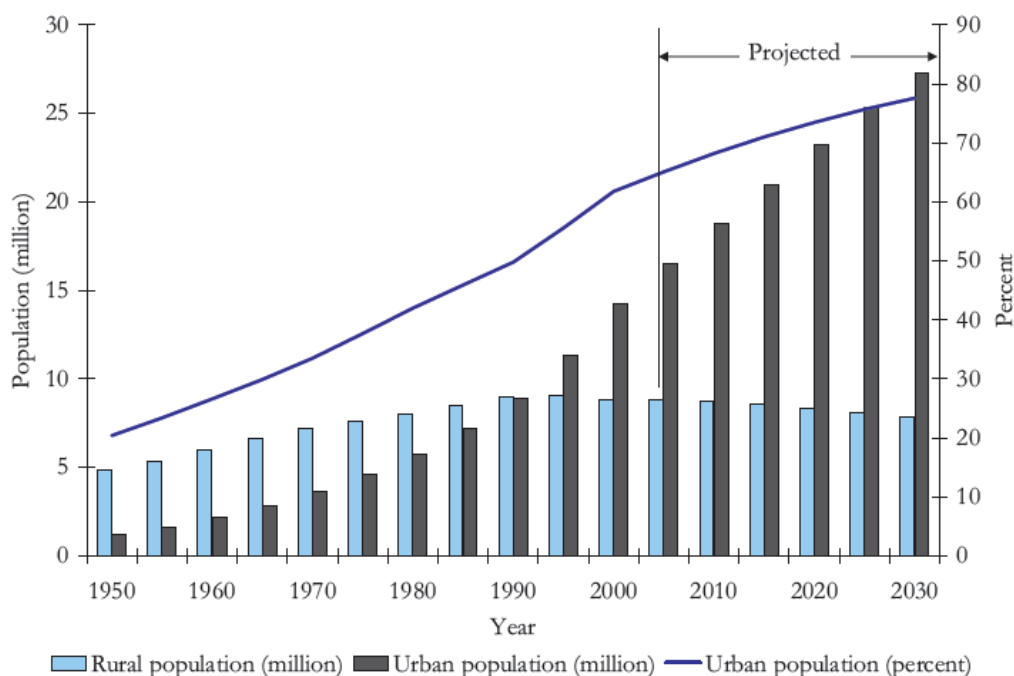
Figure 4.1: Trends in Urban and Rural Population, Malaysia
Source: Yuen et.al (2006).

Asia comprises 60% of the world's population (Robert and Kanely, 2006). As one of the countries in Asia, Malaysia contributes a small percentage to the Asia's total population (less than 1%). The largest percentage of the Asian population is accounted from the world's two most populous countries; China (34%) and India (28%) respectively (Robert and Kanely, 2006). In comparison to other countries in Asia, the urban-rural proportion in Malaysia in 1950 was quite moderate. However in 2005, it was reported that Malaysia's urban-rural proportion was the highest among all this group of countries and is expected to remain the highest until year 2030 (see Table 4.1). Therefore Malaysia is particularly interesting as an example of an Asian developing country with a high level and rapid growth of urbanisation.

Table 4.1: Urbanization Trends in Asia, 1950 – 2030

	GDP per capita (PPP, $) 2003	Population (million) 2005	Urban Population (million) 2005	Proportion Urban			Estimated Increase in Urban Population	
				(%) 1950	(%) 2005	(%) 2030	(million) 2005–2030	(%) 2005–2030
World		6,453.6	3,172.0	29	49	61	1,772.7	56
Asia		3,917.5	1,562.1	17	40	55	1,102.2	71
Malaysia	9,512	25.3	16.5	20	65	78	10.8	66
Thailand	7,595	64.1	20.8	17	33	47	14.6	70
PRC	5,003	1,322.3	536.0	13	41	61	341.6	64
Philippines	4,321	82.8	51.8	27	63	76	34.8	67
Sri Lanka	3,778	19.4	4.1	14	21	30	2.4	59
Indonesia	3,361	225.3	107.9	12	48	68	80.0	74
India	2,892	1,096.9	315.3	17	29	41	270.8	86
Viet Nam	2,490	83.6	22.3	12	27	43	24.5	110
Pakistan	2,097	161.2	56.1	18	35	50	79.3	141
Cambodia	2,078	14.8	2.9	10	20	37	5.8	197
Bangladesh	1,770	152.6	38.1	4	25	39	48.4	127
Lao PDR	1,759	5.9	1.3	7	22	38	2.3	177

GDP = gross domestic product, Lao PDR = Lao People's Democratic Republic, PPP = purchasing power parity, PRC = People's Republic of China.

Source: Roberts and Kanaley (2006)

Urbanisation in Malaysia can be divided into three major phases. It began with the development of new growth areas during the era of British colonial rule around late 19th and the first half of the 20th century i.e. before independence (Goh Ban Lee, 1991). The second phase of Malaysia's urban development was marked by the rapid industrialization and the establishment of new growth areas. This can be considered as the second phase of post-independent development, i.e. beginning from the early 1970s until the present. Some scholars argued that the rapid urbanization was an impact of globalization (Ooi, 1976). As shown in Figure 4.1, the urban population increased dramatically over 30 years (1970 to 2000). This increase in urban population is explained by the massive urban development in Malaysia since independence in 1957. Since then an increase in economic growth has attracted people fromrural areas to migrate to the cities for better job opportunities and services. In addition, this situation is also compounded by the two million foreign workers, particularly in the construction sector and services industries (Malaysia, 2005). Among those workers are groups of

professional expatriates and unskilled labour workers. With such huge urban population, it requires physical expansion of major cities. The expansion of major cities has pushed urban land uses to extend the urban landscape use (urban footprint) which spread into the surrounding agricultural areas. The effect of the urban expansion is as predicted, which is the conversion of more rural or agricultural lands to urban uses; commercial, industrial complexes and buildings (Federal Department of Town and Country Planning Peninsular Malaysia, 2006).

Urbanization has also had an impact on the socio-cultural life of the people. The new structure of the residential neighbourhood areas has transformed the demographic pattern and socio-cultural set-up in the urban area. It is believed that the effect of internal migration in the country (rural –urban/ interstate migration) has shaped the population settlement in most major cities in Malaysia (Mohd Jali, 2009). The internal migration has eventually brought changes to the socio-cultural of the urban areas. Increase in urban population has contributed to the growth of economic and services sector. With these changes and better job opportunities, the urban population's purchasing power has improved. This also has impacted on the demand for a well-planned commercial centre and retail shopping complexes in major cities throughout Malaysia. Certainly, urban planners have to respond to these demographic and physical changes of the cities. In light of the issues related to urbanisation, the National Urbanisation Policy was created by the federal government. The NUP has established six thrusts which are listed as follows (Federal Department of Town and Country Planning Peninsular Malaysia, 2006);-

i. *An efficient and sustainable urban development*
ii. *Development of an urban economy that is resilient, dynamic and competitive*
iii. *An integrated and efficient urban transportation system*
iv. *Provision of urban services, infrastructure and utilities*

v.   *Creation of a conducive liveable urban environment with identity and*

vi.   *Effective urban governance*

To sum up, NUP has become an important document in relation to urban sustainability including social sustainability. It has highlighted critical urbanization issues and challenges faced by major cities in Malaysia. NUP has also provided strategies to overcome the problems through its 6 main thrusts and it's *Implementation Action Plan* (Federal Department of Town and Country Planning Peninsular Malaysia, 2006). In this study, the issues revolves mainly around thrust number iii, iv and v, where the researcher focuses a lot on the assessment of access to local services and facilities and its provision within the urban neighbourhood towards creating a liveable urban environment.

4.3   Understanding the Planning System in Malaysia

The planning system in Malaysia began in 1921 with the establishment of a town planning department in Kuala Lumpur (Goh, 1991). Planning was brought into the Federated Malay States by Charles Reade (Goh, 1988). The department was a response to the haphazard development in Kuala Lumpur. It was claimed that the objective of the department was to reduce unnecessary financial expenditure on overcoming problems and to set out a systematic and orderly arrangement of towns in line with the modern town planning practice (Goh, 1988). Historically, Malaysia (formerly known as Malaya) gained independence from the British in 1957, and due to this historical tie, the modern town and country planning in Malaysia has its origins in the United Kingdom (Goh, 1991; Mohd Sukuran Tain and Ho Chin Siong, 2008). The urban planning was originally introduced to improve the living conditions of the people. Similar to the UK,

urban planning in Malaysia is not merely layout plans of residential, industrial, commercial or recreational activities but a combination of components and elements which help to facilitate conducive living and determine that quality of life of its inhabitants. The adoption of the structure plan and local plan system in Malaysia as embodied in the Town and Country Planning Act of 1976 is considered as a total adoption from the structured system applied in England and Wales in after 1968 and Scotland (Goh, 1988). However, this system is no longer operative in either country.

4.3.1   *Physical Planning*

As mentioned earlier in section 4.3, planning in Peninsular Malaysia as a whole is embodied in the Town and Country Planning Act, 1976 (Act 172). This Act was amended 4 times from 1993 to 2007 (Federal Department of Town and Country Planning, 2011). The most crucial amendments were made by the Town and Country Planning Act (Amendment) 2001 (Act A1129) which established a *Regional Planning Committee* and added a *National Physical Plan* to the development plans system (Federal Department of Town and Country Planning, 2011). The regional planning committee functions to advise and assist the State Planning Committee and local planning authorities within the region related to the development plans suitable for the country in line with the national policy (Act 172, 2003).

While the Federal Territory of Kuala Lumpur is guided by the provisions of the Federal Territory (Planning) Act 1982, the Putrajaya area is guided by the Town and Country Planning Act 1976 (Act 172) (Modification) 2010 for the Federal Territory of Putrajaya (Putrajaya Corporation, 2011). Although it is a different act, the general

planning system is similar; difference is only with regards to the governing body, and members of the council committee.

Physical planning refers to a form of urban land use planning which attempts to achieve an optimal spatial coordination of different human activities in order to improve quality of life. Physical development planning in Malaysia is guided by the development plans system which consists of three major levels (tiers) of development planning (see Figure 4.2).
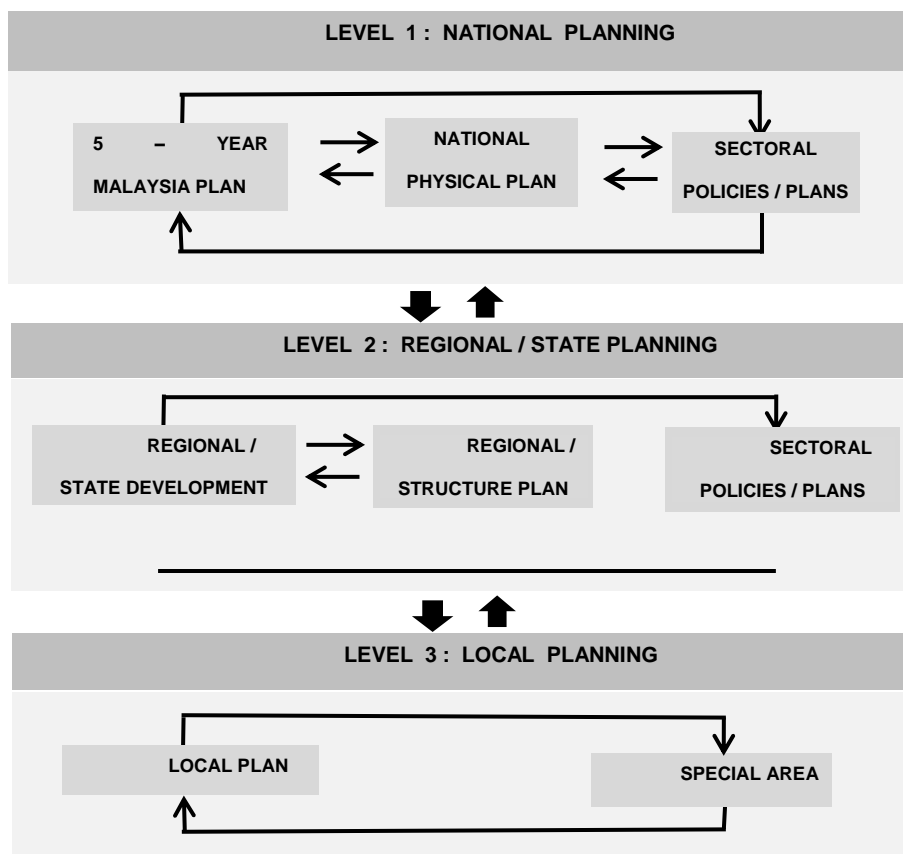
Figure 4.2: National Development Planning Framework
Source: Federal Department of Town and Country Planning, 2010

Mohd Sukuran Tain and Ho (2008) described that, generally, the role of physical planning is important to understand how it can contribute to achieve balanced development. They also pointed out that the physical planning in Malaysia has the following roles (Mohd Sukuran Tain and Ho, 2008):

a. *Translating socio-economic and other policies into spatial and physical forms;*

b. *Emphasizing of environmental quality in physical planning;*

c. *Providing facilities to ensure an equitable and higher standard of living for all; and*

d. *Taking into consideration the latest development in science and technology, to help achieve a higher quality of living.*

Another important aspect of the physical planning is the fulfillment of national integration. The national government's policy is largely set out in the National Development Plans comprising of the National Development Policy, Five Year Development Plans and Vision 2020 issued by the National Government. These policies are further complemented by the guidelines from the Federal Department of Town and Country Planning Peninsular Malaysia (FDTCP).

a. *National Physical Plan (NPP)*

The National Physical Plan (NPP) consists of national policy and general proposals for the development and use of land in the country and plays an important role to assist the function of the National Physical Planning Council in promoting within the framework of the national policy. Basically, NPP is a foundation to provide the national long-term strategic spatial planning policies and measures neededwith regards to the general direction and broad pattern of the land use, biodiversity

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conservation and physical development up to the year 2020 in Peninsular Malaysia (Federal Department of Town and Country Planning, 2010) According to Act 172 (2003), in the preparation of the national physical plan, any current policy such as national urbanization policy or other similar policies is required to be referred to. It is the responsibility of the Director of the Federal Government and the Government of every state to ensure that the aims and objectives outlined in the National Physical Plan is achieved. Subsequently, the National Physical Plan is subject to review every five years (Act 172, 2003).

The National Physical Plan is important for this study because of the long term policies that have been formulated to guide local authorities and other implementing bodies to achieve the national goals and objectives. In this study, the National Physical Plan (Government of Malaysia, 2006) is referred to for the policies related to the efforts that have been made towards the improving social sustainability. With reference to the National Physical Plan, it enables the researcher to assess the direction of the Malaysian Government towards the improvement of quality of life for social sustainability. The National Physical Plan has highlighted that NPP also aimed to add a *"spatial or geographic dimension to the more purely economic and social biased aspects of the development plans"* (Government of Malaysia, 2005). It was emphasized that the spatial element incorporated in NPP is one of the strategies to ensure sustainable and efficient utilisation of the natural resources and existing capital as well as the human resources. NPP also seeks to provide equitable access to the opportunities and services available through development of the country (Government of Malaysia, 2005).

b.   *Structure Plan (SP)*

The main functionsof the structure plans are interpreting national and regional policies; establishing aims policies and general proposals; providing the framework for local plans; indicating special area plans and providing guidance for development control and indicating main planning issues and decisions to community and State Planning Committee (SPC). The structure plan generally details out the policies and proposals concerning development and land use of a specific local authority in accordance with Section 7 and Section 11 of the Town and Country Planning Act 1976. All structure plans are subjected to a review every five years.

In this study, the structure plans prepared for Kuala Lumpur and Putrajaya are relevant. For Kuala Lumpur, The Kuala Lumpur Structure plan has been completed in 2004. As a newly formed city, previously, Putrajaya's development and policies were outlined in the Selangor State Structure Plan. The master plan for Putrajaya as the new Federal Government Administrative Centre was approved in 1995 by Malaysian Government (John, 2006). Putrajaya Draft Structure Plan 2025 is currently at the stage of review of publicity feedbacks on the preliminary findings of a survey (Putrajaya Holdings, 2011)

c.   *Local Plan (LP)*

The local plan consists of written statement and illustrations setting out the detailed planning and manner of carrying out the proposals set out in the structure plan for a particular local planning authority area. According to the Kuala Lumpur Structure Plan 2020 (Kuala Lumpur City Hall, 2004), details of the local plan shall include detail guidelines and framework for landowners' and developers' perusal of specific sites. As

detailed out in the Kuala Lumpur's local plan, each specific plot of land has the zonings set out, including its land use allocation and density.

This study utilizes the density zonings set out in the local plan as a benchmark to the observation survey as mentioned in Chapter Two (methodology). A combination of data from the two sources of information was later used to establish the density variable used for analysis purposes.

d.   *Special Area Plan (SAP)*

The plan takes the form of and has the same effect to that of a local plan. The need to prepare Special Area Plan is indicated in the Structure Plan. Special area plans are quite limited. In Malaysia, areas for special area plan are identified in the Structure Plan. *Kampung Datuk Keramat* and *Kampung Bharu, Kuala Lumpur* are among the examples of Special Area Plans detailed in the Kuala Lumpur Structure Plan 2020, (Kuala Lumpur City Hall, 2008). *Kampung Datuk Keramat and Kampung Bharu* are reserved as Malay Reservation Areas (MRA) and any development to be built within the area is given careful consideration. *Kampung Datuk Keramat* is a Malay Reserved Area which has been identified and guided by *Malay Reservation Enactment of* 1913 and the *Land Enactment of 1987* (Kuala Lumpur City Hall, 2008). The aim is to preserve and protect the area that belongs to the local Malays. For *Kampung Bharu*, historically, it was established during the British colonization era where a big piece of land given to the Malay to protect their ethnic Malay lifestyle during a time when lots of Chinese were migrating into the country.

This study has selected *Kampung Datuk Keramat* as one of the case study areas under the case study city of Kuala Lumpur. The main reason for its selection is its

special character and the different urban form features that it has compared to other residential developments in Kuala Lumpur and Putrajaya.

4.4   Efforts towards Social Sustainability in Malaysia

Malaysia is a developing country striving hard to move forward to achieve the status of a developed country without compromising the ability to provide quality urban living. Malaysia is currently facing high rate of urbanization hence the need to achieve quality urban living.

4.4.1   National Efforts

Efforts towards sustainable development in Malaysia began with the establishment of Agenda 21 in 1993 which calls on countries, organizations, and non-governmental organizations to develop and use indicators of sustainable development (Sham, 2001 and United Nation, 1993). Initiatives and programmes associated with sustainable development were incorporated and identified in various levels of development planning and monitoring systems such as the five-year Malaysia Plans and the Outline Perspective Plans (Hasan and Adnan, 2002). Furthermore, Hasan and Adnan (2002) claimed that works on sustainable development indicators (SDIs) started in 1995 by the Institute of for Environment and Development (LESTARI), Universiti Kebangsaan Malaysia to support the federal, state and local government agencies to help guide and control the impact of urbanizations.

The promotion of sustainable development was further strengthened by the integration of the economic, social and environmental dimensions, as highlighted in the

National Physical Plan. In line with this, the government implemented measures to improve the quality of life; promote sustainable consumption and the overall environmental considerations including enhancing human; institutional and infrastructure capacity.At the national level, through *the current Five-Year Malaysia Development Plan;* Tenth Malaysia Plan (10MP) (2011-2015), the Malaysian Government is committed to ensure that everyone has access to a proper place to live, with electricity, access to clean water and health services (Malaysia, 2010). Among the key strategies provided in the 10MP towards ensuring social sustainability are as follows (Malaysia, 2010, p.247):-

- *Building vibrant and attractive living spaces to make the attractive places to live, work and play.*

- *Developing a 'rakyat' (people)-centric public transport system*

- *Transforming healthcare to improve quality and provide universal access.*

- *Ensuring access to quality and affordable housing*

- *Providing efficient public utilities and services*

- *Making streets and communities safer*

The Tenth Malaysia Plan (Malaysia, 2010) has also aimed to promote a human-scale development approach. This implies major cities will be further improved in order to reduce the need for travel and to encourage the presence of people centric activities within urban areas through concentrating a wide range of activities and amenities within walking distance (Malaysia, 2010, p.255). Hence, state and local authorities are encouraged to facilitate a higher proportion of mixed use developments in their development plans particularly within residential zonings (Malaysia, 2010).

Alongside the Malaysia Plan, and as a step towards achieving social sustainability in Malaysia, the National Urbanisation Policy was formulated with the aim of facilitating the economic and social transformation process (Federal Department of Town and Country Planning, Peninsular Malaysia, 2006). It is known that the process of urbanisation is an intrinsic dimension of economic and social development. Focus was given to city planning as the most viable and achievable level to realise the aims and objectives in embedded in the National Urbanisation Policy. This is reflected in the way the key players plan the cities to be the centres of economic growth.

4.4.2   Local Efforts

As part of the strategies highlighted in National Urbanisation Policy (Federal Department of Town and Country Planning, Peninsular Malaysia, 2006), local authorities in Peninsular Malaysia are required to prepare an Urban Profile Study. Putrajaya and Kuala Lumpur were among the first to prepare the report. The joint urban profile study of Kuala Lumpur and Putrajaya started in October 2007 and was conducted in three stages. Stage one involved the identification of the urban boundaries based on the urban definition and other criteria set by the Federal Department of Town and Country Planning, Malaysia. The study has identified 150 urban areas in Peninsular Malaysia (Federal Department of Town and Country Planning, Peninsular Malaysia, 2006). Stage two of the study involved data collection and analysis. Analysis of the study involved the assessment of the existing condition of the urban areas based on existing policies, land use pattern and population. Subsequently, stage three involved finalizing the Urban Profile Report based on the data compiled, analysis and findings achieved. The Urban Profile Report basically has two parts. Part one deals with the background of the area; history, and functions of the area. It also provides information

on the assessment of the population, land use, economy, environment, transportation system, public and community facilities and recreational facilities (Federal Department of Town and Country Planning, Peninsular Malaysia, 2006). Part two deals with the analysis of the current urban hierarchy achievement. It basically reports the comparison between the current status and the proposed hierarchy as outlined in the National Urbanisation Policy (Federal Department of Town and Country Planning, Peninsular Malaysia, 2006). The Urban Profile Report has been very useful for this study because of the information on the available facilities and services in selected urban areas. Ideally, the report included both Kuala Lumpur and Putrajaya, as both cities were the case study cities of this study. It has given richer information in relation to the conditions and status of the urban areas.

4.4.3   *Local Agenda 21*

Another effort identified is Local Agenda 21 (LA21). LA21 was created following the *1992 Rio de Janeiro 'Earth Summit'* (Evans and Theobald, 2003, p. 781). It aimed to implement policies to achieve urban sustainability at the local level by encouraging local authorities establish strategies to promote more environmentally, socially and economically sustainable communities. Local agenda 21 (LA21) for Malaysia was initially established by the Department of Town and Country Planning Malaysia (JPBD) for the community, private sector and local authorities to cooperate in planning and managing their areas under jurisdiction towards sustainability (Federal Department of Town and Country Planning, Peninsular Malaysia, 2006). Figure 4.3 illustrates the approach Local Agenda 21 (LA21) is practiced and implemented in Malaysia. Through the LA21, the local community within the area are given the chance to participate in order to identify the sustainability issues, to formulate action plans to

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rectify the issues and to implement the plan. With the bottom up approach, local people will have the chance to participate in the planning of their own neighbourhood for better satisfaction. In other parts of the world, including in the UK and Malaysia, public participation in the planning of any developments is very important. With good implementation, urban developments will be more people-oriented because throughout the process the stakeholders involved have already taken the people's opinion. This could also lead to higher satisfaction from the local population towards a particular neighbourhood or urban area.

Private Sector
Industry and Commercial

Local Authorities
City Hall/ Local Council
District Authority
Government Agencies
Other related agencies

LOCAL AGENDA 21
SUSTAINABLE DEVELOPMENT
THROUGH PUBLIC PARTICIPATION

Public
Public community
Consumers
NGO
Local community union
Professionals
Mass Media
Community
representative
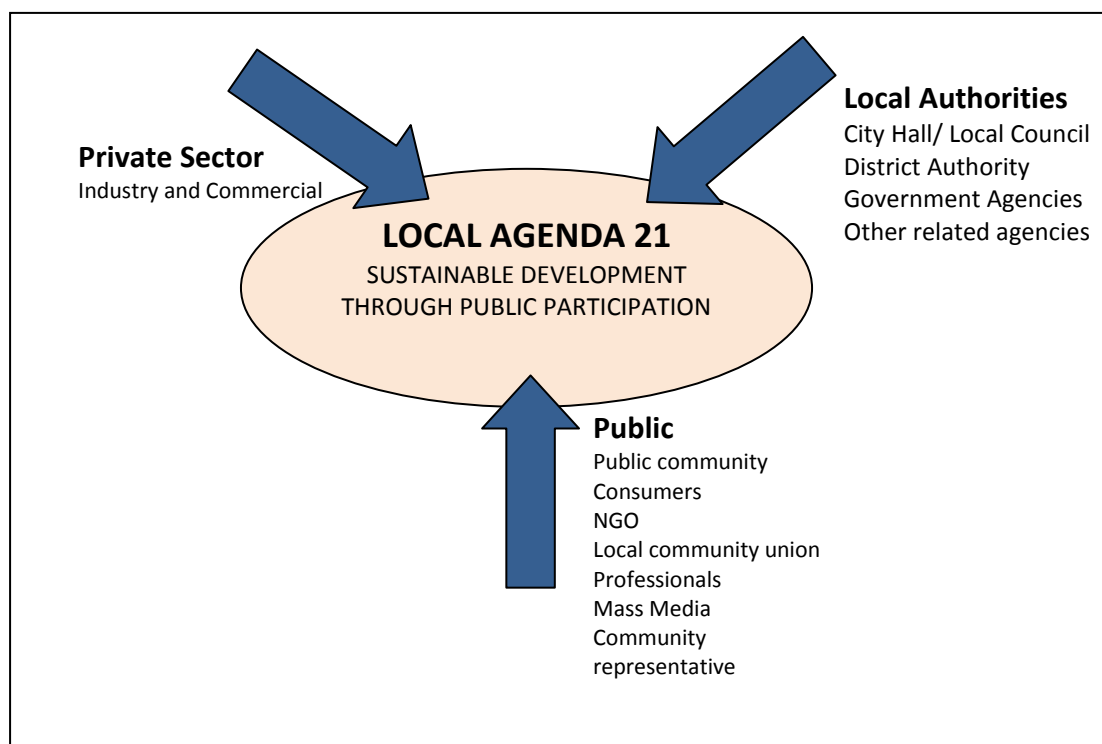
Figure 4.3: Diagram of the Implementation of Local Agenda in Malaysia
Source: Federal Department of Town and Country Planning, Peninsular Malaysia, 2006

Related to this study, efforts towards the facilitation of social sustainability can be observed in the two case study cities. Development of residential areas in Putrajaya focussed to provide adequate community facilities and in a form that will encourage the social integration of different communities and the development of a caring society. Housing in Putrajaya has been designed to encouraged neighbourhood living as well as

blending with the concept of Garden City of Putrajaya (Putrajaya Corporation, 2009). Garden houses with low fencing have been introduced to comply with the policy. Planning in Putrajaya emphasizes the preservation of its eco-system while promoting an active, lively and caring society. Walkways, green links and promenade are interlinked within and between precincts and neighbourhood areas in order to encourage walking and cycling.

On the other hand, for Kuala Lumpur the focus of effortis to improve the overall quality of life and revitalise residential areas. Planning of community facilities has been given a priority. These shall be planned according to their intended catchment population and should also be well served by public transport. For new developments, the local council aims to provide priority and incentives to development in areas around transit terminals; this is to ensure greater access to facilities and services. Hence, it would able to facilitate the reduction of the dependency on private vehicles as the dependency on both private cars and motorcycles is an alarming issue in Kuala Lumpur (see Chapter Five, Table 5.11, p. 139).

4.5   Implementation

On the implementation side, 55 agencies have been identified to play a major role in implementing the policies and strategies towards better quality neighbourhood living hence achieve social sustainability (Federal Department of Town and Country Planning, Peninsular Malaysia, 2006). Five key players are as follows:

1. Ministry of Housing and Local Government, Malaysia

2. Federal Department of Town and Country Planning

3. Local Government Departments

4. State Authorities

5. Local Authorities

The five key players are expected to consistently ensure their actions and strategies are in line with the policies towards achieving social sustainability. Yuen et al (2006, p.242) explained that there are clear efforts made by the Federal Town and Country Planning Department and local authorities to curb undesirable development and promote sustainability efforts. However, based on researcher's informal discussion with planners and officers in Kuala Lumpur City Hall and Putrajaya Corporation it is argued that without stringent monitoring mechanism of implementation, these efforts will fail (Field Survey, 2010).

4.5.1   Local Implementation

- *Kuala Lumpur*

Kuala Lumpur is managed by Kuala Lumpur City Hall, headed by the Mayor of Kuala Lumpur (Kuala Lumpur City Hall, 2004).. The Federal Capital Act 1960 provides for the appointment of an Advisory Board to advise the Mayor (Kuala Lumpur City Hall, 2004). Generally, Kuala Lumpur City Hall are responsible for providing and maintaining roads, drains and community facilities such as public open spaces, parks and cemeteries (Kuala Lumpur City Hall, 2004). It also functions to perform activities such as urban planning, traffic management as well as management and enforcement of business premises, hawkers and petty traders and public housing (Kuala Lumpur City Hall, 2004). Despite the clear implementation system, issues of implementation coordination still exist. It was reported that coordination problems have arisen with authorities both from within and outside Kuala Lumpur (Field Survey, 2010 and Federal

Department of Town and Country Planning, Peninsular Malaysia, 2006). It was observed that ineffective coordination arises in land use planning, urban design, implementation of infrastructural projects, traffic management, flood mitigation, housing and squatter management, waste collection and disposal, enforcement and monitoring of the environment (Kuala Lumpur City Hall, 2004, p.18-2). In terms of financial sources of funding to manage the city of operating revenue for Kuala Lumpur City Hall is mainly from property assessment (approximately 62% of the total revenue). Other sources of revenue were reported to be returns on investment, charges for development planning and, rentals from public housing, grants from the federal government (about 6%) and licences and fines (Kuala Lumpur City Hall, 2004, p.18-3). These sources of revenues go to operating expenditures which include cost of provision of services that accounts for approximately 43% of the cost. Others goes to public housing (18%), social, sports, recreation and enforcement and licensing (9%) (Kuala Lumpur City Hall, 2004, p.18-3).

- *Putrajaya*

Putrajaya Corporation as Putrajaya's local authority has taken initiatives to ensure effective implementation management. The function of Putrajaya Corporation is the same as of Kuala Lumpur City Hall. As embodied in the Putrajaya Act, Section 4 (Act 536), Putrajaya Corporation functions as to promote, stimulate, facilitate and undertake commercial, infrastructure and residential development in the area; to promote and undertake economic and social development; and to control and coordinate all the activities in the area (Putrajaya Corporation, 2009). Like other local authority, source of revenue for Putrajaya are from both tax-based revenues and non-tax based revenues.

Managing facilities and services can be complex. To overcome this issue, Putrajaya adopted a strategy called *"Alert, Alarm and Action Strategy"* that allows to manage the city from a central location identified as Putrajaya City Control Room (CCR) (John, 2006, p.12). According to John (2006), the CCR incorporates a hub and nerve centre which monitor, surveillance, control and manage key urban infrastructure including the facilities and services. The application involved three components (John, 2006, p.13):

- *Intelligent Transportation System (ITS): management of traffic and transportation.*

- *Facilities Management System (FMS): maintenance and security of public buildings, grounds, open spaces and urban infrastructure.*

- *Public Information and Emergency System:providing amenities for a well informed society and to address readiness and mitigation measures to overcome hazardous and emergency situations.*

Apart from the above components, CCR also functions as a call centre that forms the direct link between community and general public to Putrajaya as the manager of the city. Through effective implementation strategy and management, policies and aims can be achieved.

4.6   Housing Provision

Housing in Malaysia is recognized as a basic human need and the housing industry is regarded as an important component of the urban economy. The realization of this has led to the formulation of policies and programmes aimed at ensuring that all Malaysians have proper adequate shelter and access to the basic amenities and facilities (Rameli, 2006). Housing development in Malaysia is undertaken by both public and private sector. However, both sectors are licensed and regulated by the Ministry ofHousing and Local Government through the Housing Developers and ControlAct 1966 (Awil, 2007). In the public sector, stakeholders involved are the state and federal government with the supervision and monitoring of the Ministry of Housing and Local Government, Malaysia (Salleh, 2008). Whereas, in the private sector, stakeholders involved are private developers, co-operative societies, and individuals or a group of individuals. These private developers are controlled and governed by Housing Developer's Act (Control and Licensing) 1996.

The housing sector does not concentrate solely on the provision of different types of housing for all level of societies; it also focusses on other aspects that affect residents such as the provision of services and facilities (Salleh, 2008). These needs generally refer to things that can enhance the quality of life for residents. The Tenth Malaysia Plan has indicated that previously issues in the housing sector revolve around housing stock in general, but currently, the issue is about providing proper housing for various segments of society (Malaysia 2010). This also includes providing comfortable, safe and healthy environments. One of the most important factors is the provision of local services and public facilities within the neighbourhood. With such fulfilment, it would have positive impact on the level of satisfaction among the residents. The local plan for

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each local authority has provided detail guidelines on these provisions. Usually, a local plan for each local authority area would indicate the catchment areas of the different facilities and services required to be provided within the residential development. However, the implementation aspect is one of the issues that need to be resolved.

4.6.1 Housing Types

Housing types in Malaysia are normally classified according to their cost; high, medium and low cost housing. This is because the government takes affordability very seriously in the provision of housing. In line with this, for any housing development, policy requires that 30% of the housing shall be of low-cost, specifically for low income groups, typically private housing for sale or rent (Salleh, 2008). Apart from that, there are also classifications of housing type based on built form, which are as follows (Valuation and Property Services Department, Ministry of Finance Malaysia, 2010) :-

- **Detached house**

  Typically one unit standalone house

- **Semi-detached house**

  Two units of houses linked together.

- **Terrace house**

  Typical linked house of three or more units per row.

- **Townhouse**

  A landed property normally on two floors. One unit per floor.

- **Flat**

  A walk-up multiple floor residential building of a maximum of 5 floors.

- **Apartment**

  Highrise residential building of more than 5 floors and equippedwith elevators

- **Condominium**

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High-rise residential building that is supported with services and facilities for higher standard of living such as swimming pool,

- **Shophouse**

Located at commercial lots, with shop on ground floor and dwelling unit on top floor.

The different types of housing built form give better options to the people on which type of housing form that suits them best. This is because different built form would have different implication towards the living style hence different level of residential satisfaction. For example, those living in apartments, shophouses or condominiums would have better access to kiosk or retail facilities, as these facilities are normally provided at the ground level of the building or block. Moreover, those living in condominiums have better advantage of having more facilities such as community hall, swimming pool, gymnasium and gardens. It is a different scenario if living in terrace house or detached house but may have other advantages such as personal driveway, backyard and front lawn. This different built form would also have different social implications. In this study, the different housing built form is used as one of the variables in the analysis (see Chapter Two for details).

4.7   Conclusion

This chapter looks at providing the background information related to the planning system in Malaysia. It has also described the urbanisation process and the provision of housing in Malaysia. Basically, it has been identified that Malaysia has undergone rapid urbanisation over the years that has impacted almost all aspect of sustainability. Significant issues that has been identified and as highlighted in the National Urbanisation Policy (2006), are environmental pollution, traffic congestion, brownfield areas, loss of inner city attractions, infrastructural decay, lack of social

amenities and green areas and on the whole, degradation of quality of urban living. Through the understanding of the planning system and housing provision in Malaysia, it aids the researcher to provide a clear background regarding the process of governance and implementation in Malaysia especially with regards to social sustainability and housing provision. In this study, the issue of lack of social amenities, green areas and the degradation of quality of urban living has become the central theme of the study. Subsequently, focus of the study has been identifying the factors the impede access and use of the social amenities and facilities hence impact the overall quality of urban living.

Following this chapter, the next chapter focuses on the profile of the case study cities and areas. This describes the socio-economic profile; physical characteristics i.e. land use, housing, population density, and elements of urban form.

Chapter 5: Profile of Case Study Cities - Federal Territory of Kuala Lumpur and Federal Territory of Putrajaya

5.1   Introduction

The previous chapter focussed on describing the planning system in Malaysia and the policy on achieving sustainable development, specifically social sustainability. Consequently, this chapter deals with the characteristics of the case study cities focussing on the socio-economic profile, physical characteristics, i.e. land use, housing, population density, and description on the elements of urban form. It also explores the findings based on the observation survey on the provision of local services and public facilities in the case study cities.

As stated in Chapter Two (Research Methodology), the study focusses on two major cities in Malaysia, i.e Federal Territory of Kuala Lumpur and Federal Territory of Putrajaya for detailed assessment related to the research issues and problems. Both Kuala Lumpur and Putrajaya are part of a bigger conurbation called Klang Valley. Geographically, Klang Valley is a region comprising Kuala Lumpur and all its suburbs and adjoining cities and towns in the State of Selangor including Putrajaya (see Figure 1.1, p, 19). Klang Valley is also referred as Kuala Lumpur Metropolitan Area or Greater Kuala Lumpur. The population in Klang Valley is estimated to be 6 million in 2010 (Department of Statistics, Malaysia, 2009).

5.2   Federal Territory of Kuala Lumpur

Historically, Kuala Lumpur originated in the 1850s when a royal family, Raja Abdullah, established the area for tin mining activities. Most of the tin miners were Chinese migrants, and mining activities attracted numerous traders (King, 2008). Subsequently, the trading activities increased and from there a city was formed starting at the congruence of Klang and Gombak River. The congruence of these two rivers is where Kuala Lumpur got its name, as it literally means *"muddy confluence"*. Federal Territory of Kuala Lumpur now is the busiest and most populated city in Malaysia with 1.6 million population reported in 2010 (Department of Statistics, Malaysia, 2010). As the capital city of Malaysia, Kuala Lumpur Federal Territory is the most prominent financial and business centre of the country. In terms of architecture, Kuala Lumpur started as a Chinese town, mixed with British colonial towns with some Malay and Islamic architecture (King, 2008). King (2008, p. 16) points out that in the early years of Kuala Lumpur, there was a marked distinction between the dispersed, uncrowded, colonial landscape of institutions and the dense uncontrolled development which threatened the Chinese city town. In the other part of the city, was the unmapped Malay village. The division and difference in architecture was obvious. However, from the late 1990s onwards, development in Kuala Lumpur has been growing rapidly with many new post-modernist architect-designed buildings conquering the core of the city centre. Bunnel et al. (2002) highlights the most spectacular development, the Kuala Lumpur City Centre (KLCC) project, a "city within a city" development which includes the world's tallest building, the Petronas Twin Towers.

Over the years, Kuala Lumpur Federal Territory has undergone a period of rapid economic growth that has significantly affected overall development in the metropolitan

region. According to the Kuala Lumpur Structure Plan (Kuala Lumpur City Hall, 2004), Kuala Lumpur City Hall is aiming to transform Kuala Lumpur Federal Territory into a "World-Class City". To achieve this, four principal constituents of a world-class city were established which are: (i) a world-class working environment, (ii) a world-class living environment, (iii) a world-class business environment, and (iv) world class governance (Kuala Lumpur City Hall, 2004). Basically, the policy concentrates on enhancing the role of Kuala Lumpur Federal Territory as an international commercial and financial centre. In terms of location, Kuala Lumpur is strategically located at the core of the larger planningentity of the Klang Valley. It is approximately 55km from Kuala Lumpur International Airport (KLIA) and situated within the Multimedia Super Corridor (MSC)[5] zone. Figure 5.1 shows the map of Federal Territory of Kuala Lumpur, Malaysia.

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[5] Multimedia Super Corridor (MSC) Malaysia was conceptualized in 1996 and full support of the Malaysian government, established as a global ICT hub, modelled after the Silicon Valley *(Source: MSC Malaysia - http://www.mscmalaysia.my/topic/1207305790812*
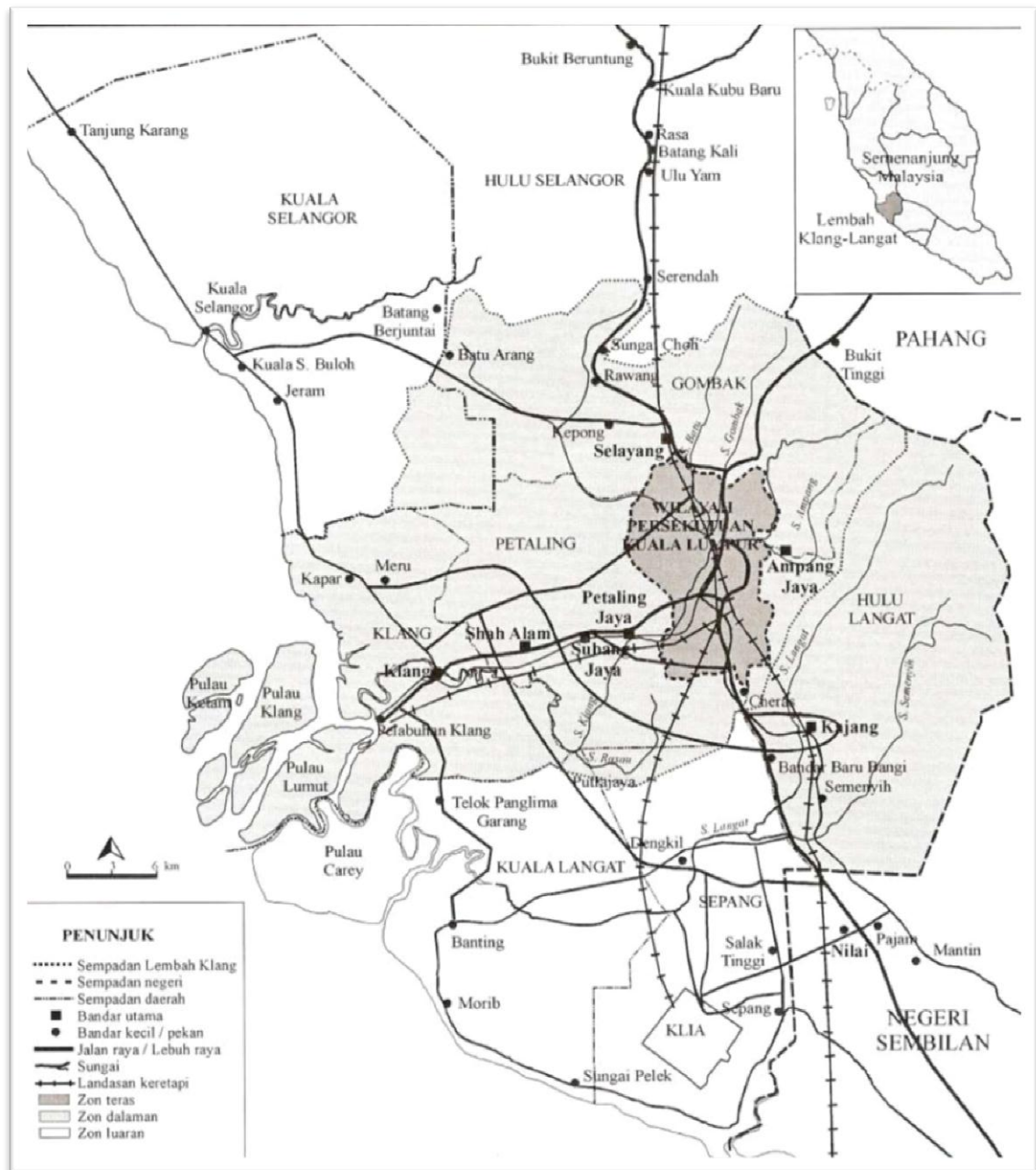
Figure 5.1: Map of Federal Territory of Kuala Lumpur, Malaysia
Source: Bunnel etal (2002)

5.2.1　Socio-economic Characteristics

As shown in Table 5.1 and 5.2, the population of Kuala Lumpur Federal Territory for the year 2010 was reported at 1.6 million with an average growth rate of 2.2% since year 2000 (Department of Statistics, Malaysia). This is reported to be higher for the average growth for Malaysia as a whole. This indicates that, every year, the population

in Kuala Lumpur Federal Territory has gradually increased. The population density in Kuala Lumpur Federal Territory was reported to be the highest among the states in Malaysia with 5,374 persons per square kilometre in year 2000 and 6,696 in year 2010 (Department of Statistics, Malaysia) (see Table 5.3).

Table 5.1: Population in Malaysia and Federal Territory of Kuala Lumpur

State	Population			
	1980	1991	2000	2010
MALAYSIA	13,136,109	17,563,420	22,198,276	27,565,821
Kuala Lumpur	919,610	1,145,342	1,305,792	1,627,172

Source: Department of Statistics, Malaysia, 2010

Table 5.2: Average annual population growth rate in Malaysia and Kuala Lumpur

State	Average annual population growth rate (%)		
	1980-1991	1991-2000	2000-2010
MALAYSIA	2.64	2.60	2.17
Kuala Lumpur	2.00	1.46	2.20

Source: Department of Statistics, Malaysia, 2010

Table 5.3: Area and population density by state 1980, 1991, 2000 and 2010

State	Area (sq.km)	Population density by sq. Km.			
		1980	1991	2000	2010
Malaysia	330803	40	53	67	83
Kuala Lumpur	243	3784	4713	5374	6696

Source: Department of Statistics, Malaysia, 2010

Being the capital city of Malaysia, Kuala Lumpur Federal Territory has attracted a lot of local and international investors to establish their organizations within the city. This has resulted in high job opportunities, which contribute to the rapid increase in the labour force each year. In the year 2000, the labour force in Kuala Lumpur Federal Territory was 838,400. The tertiary or service sector, which include sub-sectors such as utilities; wholesale and retail trade; restaurant & hotel; transport; storage and communication; finance, insurance, real estate and business services; personal services; and government services, formed the largest component of employment with 83%. In

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terms of average monthly income for Kuala Lumpur Federal Territory, it was reported to have increased from RM3371 in 1995 to RM4105 in 1999. This figure is much higher than the average for Malaysia with RM2472 in 1999. The increase in average monthly income for residents of Kuala Lumpur Federal Territory indicates the high cost of living in the city.

5.2.2   *Physical form*

Over the years, Kuala Lumpur has faced rapid urbanization, although Table 5.2 shows it has grown less quickly than the rest of the country up to year 2000. With a population target of 2.2 million in 2020, the city is expected to continue to grow (Kuala Lumpur City Hall, 2004). Kuala Lumpur Federal Territory is also facing rapid urban decentralization of land uses, especially residential development, which has direct impacts on the increase in travel demand and longer commute distance for those working in the city centre. The residential areas within the city centre boundary constituted 390.58 hectares in the year 1984 and it has decreased to 287.6 hectares by the year 2000 (Kuala Lumpur City Hall, 2004). The commercial areas have increased from 474.63 hectares in 1984 to 533.05 hectares in the year 2000 (Kuala Lumpur City Hall, 2004). This is detailed in Table 5.4. This situation occurs because of high land value in the city centre which has pushed most of the residential lands to be converted into commercial use. Hence, the traditional role of Kuala Lumpur City Centre as a major residential and commercial area of Kuala Lumpur Metropolitan Region (KLMR) has been eroded by new developments in other urban and suburban centres such as Wangsa Maju-Maluri, Sentul-Manjalara, Damansara-Penchala, Bukit Jalil-Seputeh and Bandar Tun Razak-Sungai Besi (Kuala LumpurCity Hall, 2004). Basically, the development of these growth areas is one of the strategies to reduce the concentration in

the city centre. In addition, the relocation of the federal government to Putrajaya was also meant to serve the same purpose (Kuala Lumpur City Hall, 2004). On the whole, Kuala Lumpur is a compact city with most development concentrated within the core city centre. In the inner area of Kuala Lumpur, the majority of the residential developments are high density high-rise apartments and flats (Observation Survey, 2010). There are also earlier settlements that also fall under the category of high density as the housing units are situated closer to each other compared to the more recent residential developments. Moving further from the inner area, developments within the intermediate areas are more integrated, with most of the areas having their own commercial centre and business centre (Observation Survey, 2010). According to the Kuala Lumpur Structure Plan 2020 (2004), the main reason for such development is to reduce the overcrowding of Kuala Lumpur City Centre. This is also one of the reasons for its local planning authority; Kuala Lumpur City Hall has defined six strategic zones (City Centre; Wangsa Maju- Maluri; Sentul-Menjalara; Damansara-Penchala; Bukit Jalil-Seputih; & Bandar Tun Razak – Permaisuri) for Federal Territory of Kuala Lumpur (KualaLumpur City Hall, 2004).

Table 5.4: Breakdown of Land Use in Kuala Lumpur, 2000

Category	Kuala Lumpur Federal Territory		Kuala Lumpur City Centre	
	(Hectares)	(%)	(Hectares)	(%)
Residential	5489.56	22.66	287.6	16.8
Commercial	1091.71	4.51	318.99	18.6
Industry	553.05	2.28	0.93	0.05
Institution	1620	6.69	163.06	9.5
Open Space/ Recreational	1579.56	6.52	170.25	9.9
Community	1382.44	5.71	35.79	2.09
Undeveloped Lands	5740.61	23.70	137.89	8.05
Squatters	570.63	2.36	31.46	1.8
Other Uses *(Roads and rail reserved, utility, agriculture, terminal)*	6192.69	25.57	566.68	33
Total	24 221.05	100	1712.65	100

Source: Kuala LumpurCity Hall (2004), Kuala Lumpur Structure Plan 2020.

5.2.3 Survey areas

The research survey focuses on three sub areas which have been categorized according to inner, intermediate and outer sub area located within Wangsa Maju-Maluri Strategic Zones. Wangsa Maju-Maluri Strategic Zone is defined in the north by the boundary of Kuala Lumpur, which separates the City from Batu Caves, Gombak, and Ampang areas in Selangor. In terms of physical characteristics, generally the area is undulating with the terrain of the eastern area being hilly, culminating in Bukit Dinding (Dinding Hill), Kuala Lumpur. In terms of land use, the area is predominantly residential. Industry is spread across the zone and, to the north, is contiguous with the industrial estate in Batu Caves. Two institutes of higher learning are located in the zone namely Universiti Teknologi Malaysia and Tunku Abdul Rahman College.

As stated in Chapter Two (research methodology), definition of the sub areas was defined by the geographical proximity of the sub area to the city centre (CBD) and local

knowledge, which was also applied in the CityForm UK study (Jenks and Colins (ed),

2010). Inner sub area refers to the Datuk Keramat which is also known as the village in

the town (see Figure 5.3). It is one of the oldest residential villages in Kuala Lumpur.

Intermediate sub area refers to Taman Setiawangsa which is located approximately 5km

from Kuala Lumpur City Centre (see Figure 5.4). Finally the outer sub area refers to

Taman Wangsa Melawati which is approximately 7-10 km from the city centre (see

Figure 5.5).
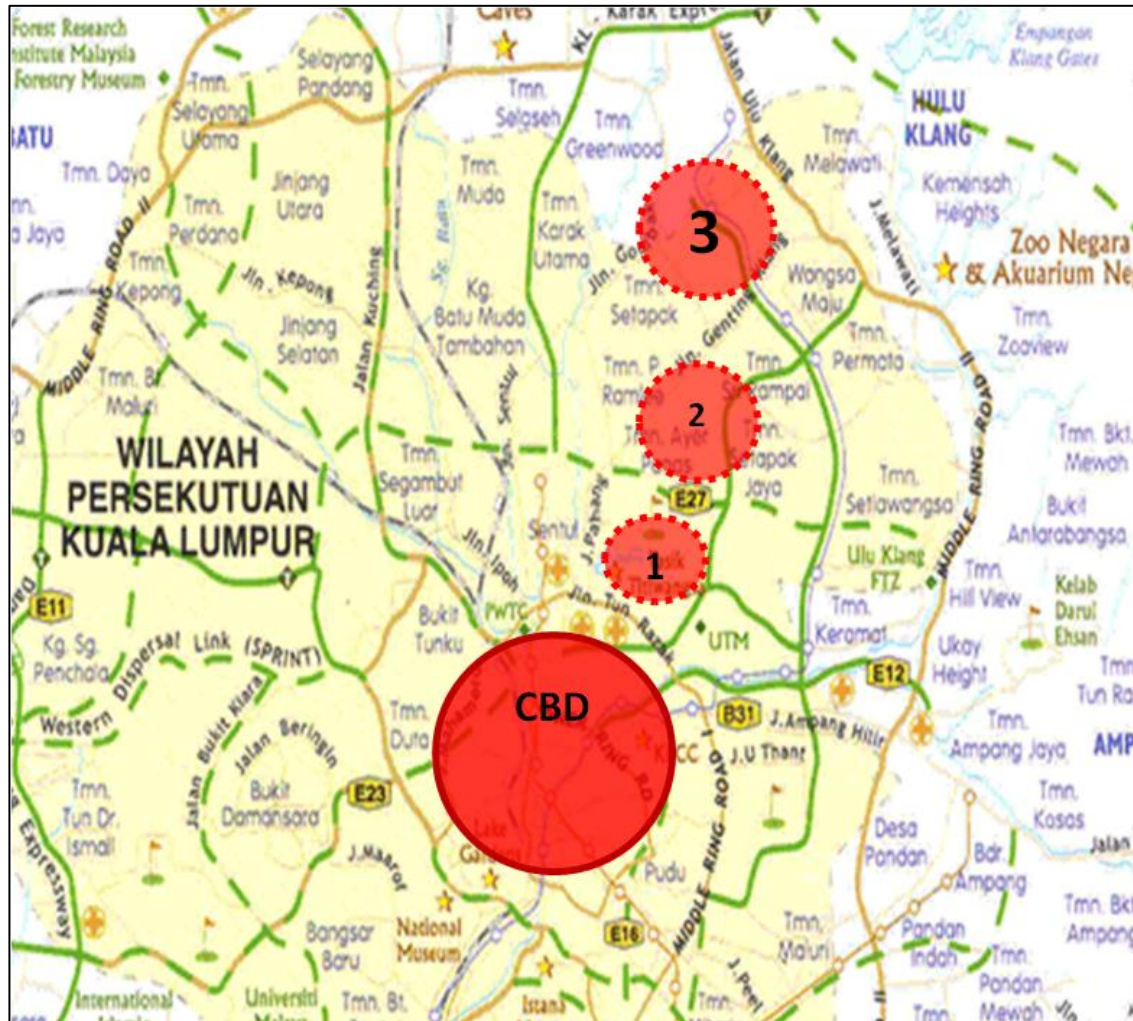
Figure 5.2: Case study city: Kuala Lumpur, Wangsa Maju-Maluri Strategic Zone,
Indicating the 3 sub areas
* 1: Inner area; 2: Intermediate area; 3 Outer area

Figure 5.3: Image 1- inner area

Figure 5.4: Image 2 – Intermediate area

Figure 5.5: Image 3- outer area

Table 5.5: Profile of sub areas in Kuala Lumpur

Inner Kuala Lumpur	
Density : Medium : 24 - 50 units per ha High : 74 – 170 units per ha	
Land use mix: Predominantly residential with services and facilities to support the local area.	
Residential type: An old established residential area with detached, terrace and public housing areas Scale 1: 10000	

Intermediate Kuala Lumpur	
Density : Low : 15 units per ha Medium : 30 – 60 units per ha High : 74 – 172 units per ha	
Land use mix: Predominantly residential and supported by local commercial centre that contains facilities and services.	
Residential type: Terrace, semi-detached, apartments. Scale 1: 15000	

Outer Kuala Lumpur	
Density : Low : 15 units per ha Medium : 30 – 60 units per ha High : 74 – 172 units per ha	
Land use mix: Predominantly residential with services and facilities to support the local area.	
Residential type: Terrace, semi-detached, apartments and public housing. Scale 1: 15000	

Legend :

Zoning

City Centre Commercial
District Centre Commercial
Neighbourhood Centre Commercial
Commercial
Mixed Use Commercial
Mixed Use Residential
Mixed Use Commercial & Industry
Residential 1
Residential 2
Residential 3

White Zone

Established Housing Area
Public Housing
Industrial
Technology Park
Public Institutional
Private Institutional
Public Open Space
Private Open Space
Forest Reserve

M Mosque
S Surau
T Temple
C Church
WH Welfare Home/Building
PS Police Station
FS Fire Station
H Hospital
GC Government Clinic
CC Community Centre
K Kindergarten

PO Post Office
SC School
PM Market
Cemetery
STP Sewerage Treatment Plant
TS Transfer Station
TMS Telecommunication Station
E Electricity Supply
W Water Supply
G Gas Supply
Overhead Transmission Line

Others

Terminal/ Station/ Parking
River, Drain, Lake & Retention Pond
Road Reserves & Rail
Existing Rail Line
Proposed Rail Line
Existing Transit Stations
Proposed Transit Stations
Kuala Lumpur Federal Territory Boundary
Index Boundary

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5.3   Federal Territory of Putrajaya

Federal Territory Putrajaya is Malaysia's new Federal Administrative capital city for Malaysia, which was first initiated in early 1990s by the former Prime Minister, Tun Dr Mahathir Mohamad. The development of this city was motivated by the government's desire to improve the urban environment and quality of life, and to ease the pressure on the infrastructure in Kuala Lumpur and the Klang Valley in general (John, 2006). By establishing a new administrative centre at a new site, the opportunities to have a well-planned urban centre with modern facilities and technology to enhance Government efficiency and productivity was boundless. The project is named after the country's first Prime Minister, YTM Tunku Abdul Rahman Putra al-Haj. Construction of the new city began in August 1995, and is now targeted for completion by 2015 (John, 2006).

While Kuala Lumpur will remain as the country's capital city as well as premiere financial and commercial centre, Putrajaya will play the role of the new Federal Government Administrative Center. It is expected that most of the Federal Government agencies will have moved to Putrajaya by 2010(John, 2006). Putrajaya is being developed based on the theme of City in A Garden or *"The Garden City"* developed by Ebenezer Howard (Moser, 2010). In Putrajaya, the principle adopted from the garden city was the provision of gardens and parks around the city. In the Garden City of Ebenezer Howard, a town should be supported with many lawns with wide roads ranging from 120 to 400 feet for the grand avenue, and the layouts are radial rather than linear. Also, it is clear in the garden city principle that land use categories, i.e. commercial, industrial, residential, and public uses are clearly differentiated from each other spatially (Ward, 1992). In the master planning of Putrajaya, the undulating nature of the land lends itself to the creation of a city of this identity. It has allowed for

the creation of generous open spaces and parks, and a 600 hectare man-made lake as its principal landscape feature (John, 2006).
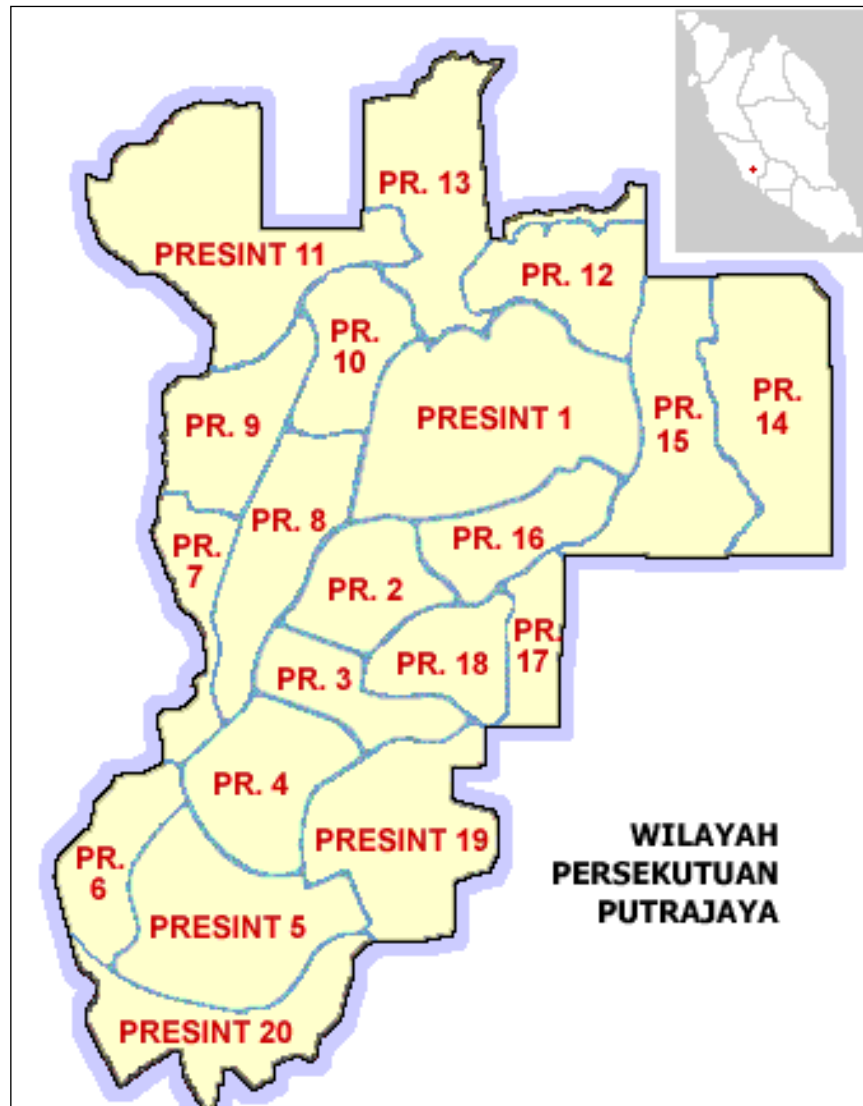
Figure 5.6: Map of Putrajaya, Malaysia (Putrajaya, 2000).

Being a planned city, Putrajaya was developed based on series of comprehensive policies and guidelines for land use, transportation system, utilities, infrastructure, housing, public amenities, information technology, parks and gardens. The planning of Putrajaya emphasizes the preservation of its eco-system while promoting an active, lively and caring society. The city is designed to provide opportunity for retreat from the pressures and stress of modern living. In line with this, the urban planning of Putrajaya was guided by the following principles (Putrajaya, 2006:):

     i.   Efficient accessibility to facilities, services and place of work

     ii.   Integrated neighbourhood and community atmosphere

     iii.   Close to nature and urban ecology

     iv.   Ample amenities for recreation

     v.   Dynamic, lively and economic vitality

     vi.   A city with identity and character

     vii.   Conducive urban environment for quality & healthy lifestyle

Based on the list of the policies and guidelines for Putrajaya, Moser (2010) noted that Putrajaya has borrowed some New Urbanism principles such as dense building and walkability. However, it is argued that Putrajaya is still a generally low density city and to encourage walking in the city is quite difficult as it is hot to walk in and around the city. Furthermore, the situation is a result of the fact that the city has not been fully developed or reaches its maturity state. On top of that, it was further stressed that even cycling is not well supported as it is more for recreational purposes rather than a form of mode of transportation. Moser pointed out that a there is still lack of contiguous bicycle path on the key routes towards the city.

5.3.1   Socio-economic Characteristics

The population of Putrajaya is 67, 964 based on the statistical figure obtained for year 2010 (Department of Statistics, Malaysia, 2010) and it is targeted to reach 330,000 population after the full completion in 2015 (see Table 5.6). In terms of population density, Putrajaya is considered quite low density compared to Kuala Lumpur with only 1,387 people per square kilometre in 2010 (Department of Statistics, Malaysia, 2010) (see Table 5.8).

Table 5.6: Population of Putrajaya

State	Population			
	1980	1991	2000	2010
MALAYSIA	13,136,109	17,563,420	22,198,276	27,565,821
Putrajaya	*	5,730	11,501	67,964

Source: Department of Statistics, Malaysia, 2010

Table 5.7: Average Annual Population Growth Rate (%)

State	Average annual population growth rate (%)		
	1980-1991	1991-2000	2000-2010
MALAYSIA	2.64	2.60	2.17
Putrajaya	*	7.74	17.77

Source: Department of Statistics, Malaysia, 2010

Table5.8: Population Density in Putrajaya

State	Area (sq.km)	Population density by sq. km.			
		1980	1991	2000	2010
Malaysia	330803	40	53	67	83
Putrajaya	49	*	117	235	1,387

Source: Department of Statistics, Malaysia, 2010
* Putrajaya was part of Selangor State at this period, thus no record specifically for Putrajaya

5.3.2   Physical Form

Federal Territory Putrajaya sits on 4,931 hectares of land within the Multimedia Super Corridor. It is located 25km south of Kuala Lumpur and 20km north of the Kuala Lumpur International Airport (KLIA) (Yuen, et al., 2006). Being the new administration centre of federal government of Malaysia, Putrajaya marks a new chapter in the history of modern city planning in Malaysia. It is set to be a model garden city with sophisticated information network base. Termed as Malaysia's first intelligent garden city, Putrajaya is designed to become a vital development catalyst - as the nerve centre of the nation and an ideal place to live and work. Lush greenery, botanical gardens and parks are spread across landscapes to provide a comfortable and quality lifestyle for its residents.It is Malaysia's largest urban development project on a greenfield site, set to be a model city of sustainable development. The size is about one third the size of Kuala Lumpur. Being located within the Multimedia Super Corridor, and in line with the

Government's e-Government initiative, Putrajaya is also developed as an intelligent city. Multimedia technologies will be in place to facilitate communication and interaction between Government offices, between the Government and the business community, as well as between the Government and local population and general public.

In terms of land use distribution, in line with the garden city concept, approximatelyone-third (37.6%) of the area is preserved as open space. To be more specific, it hasa total area of 1826.5 hectares for open space, which includes metropolitan park, urban park, city parks, wetland, buffer areas and water bodies (Yuen, et al., 2006, Ho Chin Siong, 2006).

Table 5.9: Planned Land Use Distribution in Putrajaya

Land Use Category	Hectares	%
Government	284.6	5.8
Commercial	139.4	2.8
Housing	1173.7	23.8
Civic & Cultural	10.6	0.2
Public Facilities	452.0	9.2
Utility & Infrastructure	1044.2	21.2
Open Space	1826.5	37.0
Total	4931.0	100.0

Source: Putrajaya Holding 2005.

Residential land use constituted the second largest land use category (25.5%) with a total area of 2,888.8 acres (Yuen, et al. 2006). This residential land is divided into 14 exclusive precincts in the Periphery (1098 hectares with 57,033 units) with some parcels within the Core area (71 hectares with 10,119 units). A total of 52% of the total housing units will be allocated for Government servants and the remaining 48% or 32,000 units for private sector. Due to premier location of the Core area, the housing density permitted in these areas is all high density housing i.e. Plot Ratio of 3.2 or more than 100 units per hectares. However, the numbers of residential units in the core area are quite limited. The gross housing density within the periphery areas ranged from low density (Plot ratio to 1.0 or density of 2 to 20 unit per hectares), low medium density

(Plot ratio to 1.5 or density of 22 to 32 units per hectare), medium density (Plot ratio up to 2.1 or density of 35 to 50 units per hectare), medium- high density (Plot ratio up to 2.5 or density of 50 to 100 units per hectare) and Plot ratio of 3.2 or more than 100 units per hectare (Putrajaya, 2009). Referring to the map-based information and observation survey, outer areas of Putrajaya comprise more high density type of residential as compared to other location. This may be due to the reason of not overcrowding the core areas.

Putrajaya is divided into twenty Precincts with the "core employment and commercial precinct" (core area) being located on an island surrounded by Putrajaya Lake. The core area is surrounded by "peripheral precincts" planned based on the neighbourhood planning concept to accommodate a mixture of residential areas, local commercial activities and public amenities (Yuen, et al. 2006). Government use; mixed development; and civic, cultural, commercial sports, and recreational precincts are located in the central area (Precincts 1-5), while the residential areas and diplomatic enclave are on the periphery. As at 2003, there are approximately 9,711 units completed and 10,991 units are under construction (Yuen et al, 2006). Again the research concentrates only within the areas that have been previously defined by the researcher as inner, intermediate and outer. The inner area defined in this research is the residential neighbourhood of Precinct 8 and part of Precinct 10. The intermediate area refers to Precinct 9 and the outer area refers to Precinct 11.

5.3.3 Survey areas

Using a similar approach to Kuala Lumpur City, the research survey also focuses on three sub areas within Putrajaya City with areas defined as inner, intermediate and outer area based on their proximity to the Putrajaya core area (Precinct 1-3) and local knowledge (see following map- Figure 5.7). As mentioned earlier, Putrajaya is a planned city which aimed to relieve the overcrowding and congestions of Kuala Lumpur by becoming its new satellite city, focussing on administrative functions for the country. Being a planned city, Putrajaya aimed to offer the latest in infrastructure and technological amenities.
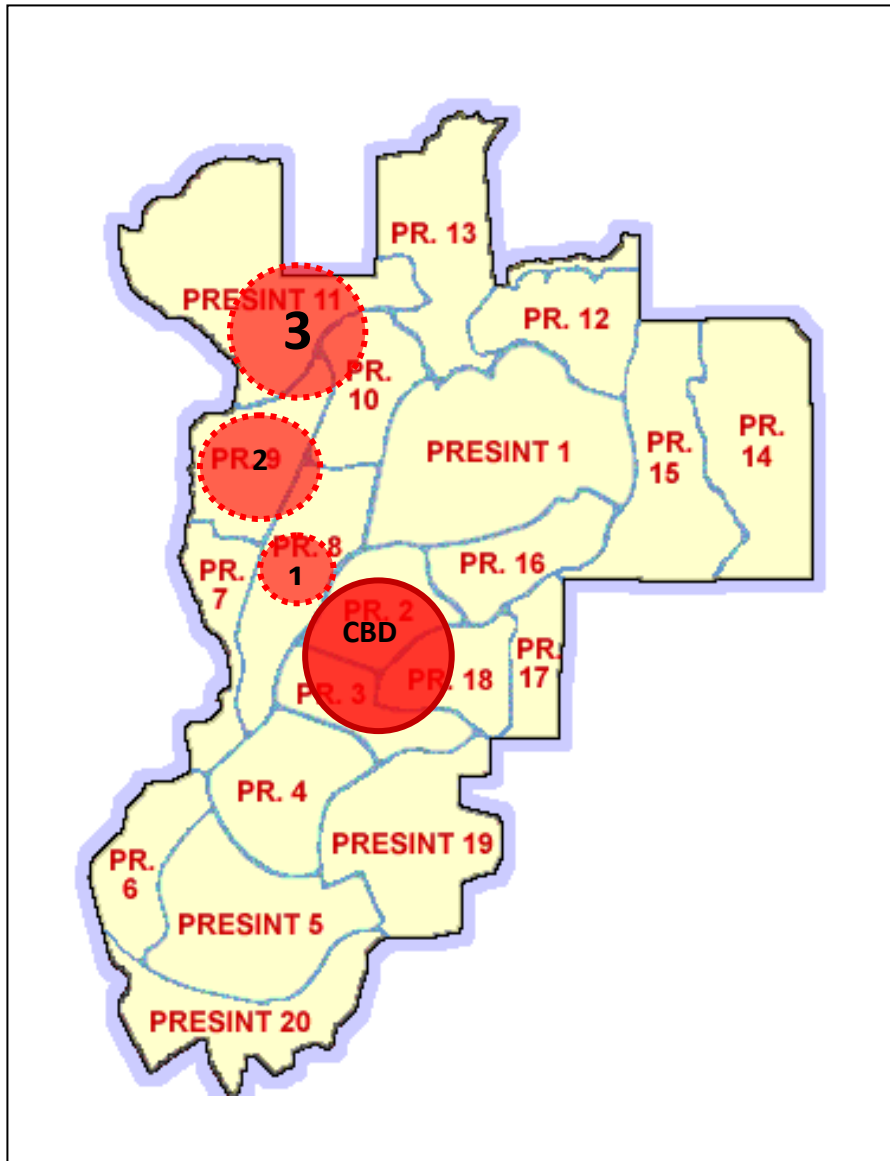
Figure 5.7: Case study city 2 – Putrajaya, indicating the 3 sub areas
1 : Inner area; 2: Intermediate area; 3 Outer area

Figure 5.8: Image 1 – Inner area : High
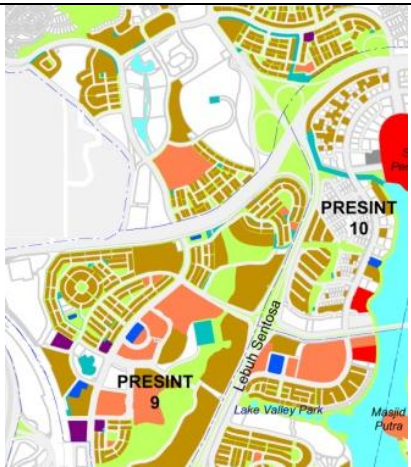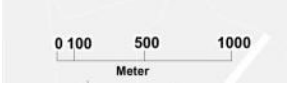
Figure 5.9: Image 2 – Intermediate area: Medium

Figure 5.10: Image 3 – Outer area: Medium

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Table 5.10: Profile of Sub area in Putrajaya

Inner Putrajaya	
Density : High : 100 – 150 units per acre	
Land use mix: Predominantly residential with services and facilities to support the local area.	
Residential type: Terrace, semi-detached, apartments and public housing.	

Intermediate Putrajaya	
Density : Low : 7 -15units per acre Medium : 30- 50units per acre High : 60 – 125 units per acre	
Land use mix: Predominantly residential with services and facilities to support the local area.	
Residential type: Terrace, semi-detached, apartments and public housing.	

Outer Putrajaya	
Density : Medium : 30- 50units per acre High : 60 – 125 units per acre	
Land use mix: Predominantly residential with services and facilities to support the local area	
Residential type: Terrace, semi-detached, apartments and public housing	

Legend :

🟥 Government use	🟪 Service Industry
🟫 Residential	🟦 Infrastructure and utility
🟦 Commercial	🟩 Open space and recreation
🟧 Special use	🟪 Public facilities

5.4 Transport Infrastructure and Network

Transportation infrastructure is one of the important components of a city. It is considered as the key component for socio-economic development of the world (Shuler, 1992). The interaction between transport system and the land use or urban system is interrelated (Barter, 2004). Efficient, quality and sustainable transport system has the ability to influence the range of possibilities for the urban system and vice versa (Barter, 2004). Hence, it is important to understand the profile and characteristic of transportation infrastructure and network available for a particular city.

5.4.1 Kuala Lumpur

"For the residents of Kuala Lumpur, the City must be able to provide an efficient and equitable city structure that, as far as possible, allows all members of the community equal accessibility to all areas and facilities so that everyone may enjoy the maximum benefits of city living" (Kuala Lumpur City Hall, 2004, p.10-1)

Kuala Lumpur is a busy city and is currently highly dependent on private transportation. Development of the basic transportation system, which refers to a comprehensive road and rail network in Kuala Lumpur has been built up since 1984 (Kuala Lumpur City Hall, 2004). The current efforts and initiatives are to focus on the development and integration of the transportation system to accommodate the city's expansion and increasing population until 2020 (Kuala Lumpur City Hall, 2004). In terms of public transportation, the usage of all journeys has declined from about 37% in 1970 to 33% in 1980 and to 32% in 1990. It continued decreasing to only approximately 19.4% in 1997 (Kuala Lumpur City Hall, 2004). Barter (2004) stated that the public transport use in Kuala Lumpur is comparable to the level found in most of the relatively automobile dependent cities of Australia, Canada and some US cities. Despite the

decreasing figures on the use of public transport, Kuala Lumpur City Hall is determined to achieve the target of 28% in year 2020. This projection has considered the policies and strategies formulated for Kuala Lumpur, which include an area pricing scheme, highway development, trunk bus system and Damansara-Cheras LRT development in 2020 (JICA, 1999). Currently, Kuala Lumpur City Hall (2004) noted that the failure to achieve the target modal split was due to the lack of integration between the various modes of public transportation and between land use planning and the rail-based public transport. The summary of modal shares for 1997- 2020 is shown in Table 5.11.

Table 5.11: Modal shares in Kuala Lumpur 1997 – 2020

Year	Metropolitan Region		City Centre	
	Private Transport (%)	Public Transport (%)	Private Transport (%)	Public Transport (%)
1997	80.6	19.4	83.5	16.5
2000*	76.1	23.9	81.3	18.7
2010*	74.6	25.4	70.7	29.3
2020*	71.1	28.9	59.7	40.3

Source: JICA (JAPAN INTERNATIONAL COOPERATION AGENCY) (1999), A Study of Integrated Urban Transportation Strategies for Environmental Improvement in Kuala Lumpur (SMURT-KL), Summary, Volume I & Volume II, February 1999.
* Projected figures

Figure 5.11: Bus and LRT service available in Kuala Lumpur Federal Territory and the Klang Valley

Kuala Lumpur is served by several modes of public transportation. Among them are buses, taxis, light rail transit (LRT) and monorail. The issues related to the provision of public transportation in Kuala Lumpur are management. Since November 2004, Rangkaian Pengangkutan Deras (Rapid) KL was established to manage operation of public transportation previously operated by Syarikat Prasarana Negara Berhad (SPNB) (Chin, 2005). Through new management and policies to improve the public transport system and the transportation infrastructure as a whole, Kuala Lumpur City Hall has targeted to achieve a modal split of 28.9% for private transportation and 71.1% for public transportation in year 2020. It is also expected to address the complaints and issues reported such as long waiting time and inefficient service (Kuala Lumpur City Hall, 2004). Specifically, the target of Rapid KL is to increase the efficiency of the bus services by reducing the waiting time to 15 minutes for the busiest routes (Chin, 2005). Currently, the Rapid KL bus service covers 94 routes throughout the Klang Valley, ferrying about 1.3 million passengers each week (Nuradzimaah Daim, 2005). The integrated public transport agency is one of the strategies to encourage greater use of public transportation in order to reduce traffic congestion. As reported, the main issue concerning public transportation in Kuala Lumpur was the lack of focus and coordination at all levels throughout the system (Kuala LumpurCity Hall, 2004). Specifically, the issues were the central location of the main bus terminal which contributes to traffic congestion, the underutilisation of bus services and the unreliable and poor quality of public services. For LRT users, among the issues were inadequate interchange facilities at LRT stations including car and motorcycle parking, pedestrian linkages, lack of integration between rail-based stations and poor support services such as bus frequency and service coverage (Kuala Lumpur City Hall, 2004). These issues were a setback for public transportation which has led to high dependency on private vehicles. Thus, the establishment of Rapid KL is expected to overcome the various

issues concerning the different modes of public transportation and reduce the dependency on private vehicles. The low usage of public transport and high dependency on private vehicles is one of the main factors that contribute to traffic congestion in the city centre, which is another problem in Kuala Lumpur. It is also important to note that the level of car ownership in Malaysia as a whole is high, particularly in Kuala Lumpur. In year 2000, statistics for private vehicles were reported that for every 1,000 population, there are 985.7 cars and motorcycles (Kuala Lumpur City Hall, 2004). Furthermore, the low usage of public transportation is also influenced by the local climate, which is hot and humid all year round. Most of the time, people would prefer to use air-conditoned private vehicles that can offer comfort and peace of mind.

5.4.2   *Putrajaya*

According to the transportation policy, Putrajaya aims to provide a modern, efficient and sustainable transportation system through its long and short term efforts (Putrajaya Corporation, 2009). Among the transportation strategies outlined in the Putrajaya Transport Action Plan (PTAP) is an urban rail system forming the backbone for the public transport infrastructure, supported by bus services, park and ride facilities and strict control over the number of parking spaces (Putrajaya Corporation, 2009). However, because the urban rail system has not yet been implemented, Putrajaya is facing a number of transport issues. The reasons for opting urban rail system as the main mode in Putrajaya are due to its minimum emission of greenhouse gases and other pollutants; reduce dependency on non-renewable energy, higher transport efficiency and less traffic noise (Putrajaya Corporation, 2009). However, because of some problems concerning cost and management, this project has been deferred. This delay has led to a major problem of lack of parking for most government offices in the core area of Putrajaya. In addition, the dependence on private vehicles is also causeing peak hour

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traffic congestion (see Figure 5.12). To overcome this problem and to also achieve the target of 70:30 modal split, particularly in the core area, Putrajaya Corporation has diverted its focus to further improve bus services. This is to be achieved by providing a total of 7 park and ride facilities. The facilities will play a major role as a node to integrate the different mode of transportation that is also linked with pedestrian network and bicycle path (John, 2006; Putrajaya Corporation, 2009).

Figure 5.12: Images of parking problems around Government Offices in Putrajaya

Further improvement to the bus services include purchase of more buses, the use of fleet management system (FMS), electronic ticketing and payment, development of bus lanes, development of more bus stop shelters and the use of Automatic Vehicle Locater System (AVLS) (Putrajaya Corporation, 2009). The challenge faced by Putrajaya Corporation is to improve the existing public transportation system - bus services - while waiting for the rail system to be fully implemented.

Figure 5.13: Image of typical bus stop in Putrajaya

5.5   Provision of Local Services and Public Facilities

Local services and public facilities are basic components within a particular neighbourhood and include recreational facilities, health facilities, banks, post offices, educational facilities and other communal facilities. Their provision has a significant impact on enabling, sustaining and enhancing societal living conditions and improving quality of living (Witten et al., 2003). Hence, it is very important that that the provision of such services and facilities should be available to all citizens regardless of income. The government is the main player in ensuring these basic components are well provided within an area. In Malaysia, through the local planning authority, zonings for the local services and public facilities provide an important impact towards the availability of these services within a neighbourhood. The rest depends on the supply and demand of each services and facilities required by the residents. There are various issues concerning the provision of these local facilities and public facilities especially in developing countries like Malaysia. Most of the time, the issues revolves around quality and catchment area; usage and accessibility. As mentioned in Chapter Two, the research focuses on the investigating the access and usage of services and facilities within the case study cities.

5.5.1   *Local Services and Public Facilities in Kuala Lumpur*

The Federal Territory of Kuala Lumpur through its local authority, Kuala Lumpur City Hall aims to promote social cohesiveness among its inhabitants. One of the strategies to achieve this is the provision of communal facilities and recreational facilities which could bring people together and further enhance the city living environment. As the planning authority for Kuala Lumpur, Kuala Lumpur City Hall is responsible for ensuring that facilities for the community are distributed in a fair and

equitable manner so that all areas and sectors of Kuala Lumpur are equally served according to their requirements.

The research focussed on only several local services and public facilities that the researcher defined as the most commonly used facilities within a neighbourhood. Dempsey et al. (2011) provide a summary of facilities and services that are considered as a necessity in which residents require frequent access. These services and facilities were also being examined in the CityForm Research: doctor/ GP surgery, post office,, chemist, supermarket, bank/ building society, corner shop, primary school, restaurant, cafe/takeaway, pub, library, sports/ recreation facility, community centre and facility for children (Dempsey et al., 2011). With reference to this list, the type of services and facilities focussed in this research are grouped as follows:

- commercial facilities,
- recreational facilities,
- health facilities,
- religious facilities and
- other key services such as bank, post office.

At present, based on the observation survey conducted in early January 2010, the provision of local services and public facilities in the case study areas are in moderate condition. The definition of moderate in this context is that most facilities are facing some issues or problems related to their provision. The following subsections will look into detail on these issues which was captured during the observation survey conducted in January/ February 2010.

i. *Commercial Facilities*

The commercial facilities available in the case study areas within Kuala Lumpur are evenly spread. In terms of location and accessibility, a supermarket or convenience

store is located in all sub areas within a walking distance of around 5- 15 minutes. The most common issues concerning commercial facilities in the study areas are lack of parking. This is becausemost of the users are using personal vehicle, either cars or motorcycle. Based on the researcher's observation, walking was only evident between the vehicle and the shops or between shops. Figure 5.14 illustrate the images of the commercial facilities in the three sub areas of Kuala Lumpur city. In the inner case study area, as shown in the figure, there is a contrast of two types of retail services: traditional wooden retail area and a new shopping complex that also provide other support services. Residents within the area have a wider selection of retail services. However, in the intermediate and outer areas, it shows that retail services are more localised which is located closer to the residential areas.

Inner area:

Traditional commercial strip Datuk Keramat & new shopping complex at the edge of Datuk Keramat

Intermediate area:

Typical view of shophouses

Outer area:

Shophouses located closer to residential areas

Figure 5.14: Images of the commercial facilities in the study areas in Kuala Lumpur
Source: Observation Survey, 2010

iv.   *Health Facilities*

Health facilities in the case study areas can be divided into two types; public health facilities and private health facilities. In Malaysia, typically, private health facilities are usually used for visits of common illness, while public healthcare facilities are more common to be used for emergencies and hospital treatments. Based on the observation survey, provisions of private health facilities can be found in most commercial strips within the neighbourhood. In several areas, there is more than one facility. Public facilities can only be found at certain allocated locations, in standalone building units. Within the case study city of Kuala Lumpur, public health facilities can only be found in the inner sub area. In other areas, only private health facilities are available. The findings from the observation survey correspond well with the actual situation as highlighted in the Kuala Lumpur Structure Plan. Kuala Lumpur City Hall identified that one of the main issues concerning the provision of healthcare facilities is that although there are government clinics such as polyclinics, dental clinics and maternity and children's clinics and hospitals in all areas of Kuala Lumpur, they are not distributed evenly according to population distribution (Kuala Lumpur City Hall, 2004). This issue affects the lower income groups who are unable to afford treatment at private clinics and who live at a further distance from the public facilities. In terms of access to these facilities, it was observed that most of the residents use private vehicles. Again, like commercial facilities, walking was only made between their vehicles to the facilities. The use of corridors along the rows of shop or facility is very significant to the pedestrian due to the weather factors. Figure 5.15 shows the images of the health facilities in the case study city of Kuala Lumpur.

Inner area:

Public Healthcare facilities (standalone building)

Intermediate area:

Private healthcare facilities (among the shophouses)

Outer area:

Private healthcare facilities (among the shophouses)

Figure 5.15: Images of the health facilities in the study areas in Kuala Lumpur
Source: Observation Survey, 2010

v.   Recreational Facilities

It is generally known that recreational facilities are some of the most important aspects in neighbourhood planning due to their impact on the physical and psychological well-being of the residents as well as serving as elements which reinforce a sense of community. Provision of recreational facilities in Kuala Lumpur is one of the issues faced by its local authority, Kuala Lumpur City Hall (Kuala Lumpur City Hall, 2004). It is noted in Kuala Lumpur Structure Plan that although there are neighbourhood and local parks, children's playgrounds, soccer fields, public swimming pools and tennis courts in all strategic zones, including the areas under study, these facilities are not distributed evenly according to population distribution (Kuala Lumpur City Hall, 2004). The lack of recreational facilities was identified due to the limited space and high land value within the city. During the observation survey, the researcher has made several visits to recreational facilities around the study areas at different times. Based on the visits, there are quite a number of recreational facilities that are provided but underutilized (Observation Survey, 2010). This situation has arisen due to inadequate maintenance, vandalism and poor accessibility and has particularly affected some children's playgrounds, soccer fields and sports facilities. This is also supported by claims highlighted in the National Urbanization Policy (Federal Department of Town and Country Planning, Peninsular Malaysia, 2006). The following Figure 5.16 gathered several images of the recreational facilities in the case study city of Kuala Lumpur.

Inner area:

Urban park

Intermediate area:

Playground located at residential areas

Outer area:

Playground and football field

Figure 5.16: Images of the recreational facilities in the study areas in Kuala Lumpur
Source: Observation Survey, 2010

vi.   *Other Support Services*

Provision of support services such as banks and post offices in the neighbourhood is essential to ensure local residents have a convenient place to run their errands. In Malaysia it is common to have these types of services at rows of shophouses within the neighbourhood. This scenario also applies in both case study cities. However, it was also observed that when there is a shopping complex within the area, these services are also being provided within that building. It is believed that, in order to provide more convenience to the users, mainly in terms of comfort and ease of carrying out the errands, these services are provided within the shopping building together with other retail tenants. Specifically, in terms of the provision of banks and post offices within the three areas in Kuala Lumpur, it was revealed that there is not much option within the inner areas. It was observed that residents within the inner sub areas would have to travel either to the city centre or to the intermediate areas for better options (Observation Survey, 2010). However, in mid-year 2010, the residents of the inner study area were blessed with the opening of a new shopping complex 'Jusco AU2' (Observation Survey, 2010). Apart from retail services the complex also offers other support services such as post office and ATM machines. The following Figure 5.17 illustrates the different types of services provided in the case study city of Kuala Lumpur.

Inner area:

Shopping complex providing various services

Intermediate area:

Post office within a shopping mall and bank provided within the shophouse

Outer area:

Banks located along the shophouses

Figure 5.17: Images of the services in the study areas in Kuala Lumpur
Source: Observation Survey, 2010

5.5.2   *Local Services and Public Facilities in Putrajaya*

As mentioned earlier subsection, Putrajaya is a planned city built based on a greenfield development. Hence, it is expected to meet all the basic neighbourhood planning principles. Based on the inception report, Putrajaya Corporation, its local authority has reserved approximately 344.27 hectares for the provision of local services and public facilities for its local residents (Putrajaya Corporation, 2009). These provisions include educational facilities, healthcare facilities, religious facilities, safety and security and other facilities (Putrajaya Corporation, 2009). Again, the researcher would like to highlight that the types of services and facilities considered in this research include or are limited to commercial facilities, recreational facilities, healthcare facilities, and other services such as banks, post offices and religious facilities. Based on the observation survey conducted in January/ February 2010, provision of the services and facilities are inadequate and not well distributed. This may be due to it being a newly planned/ built city. The city is still developing and the population is still growing with new buildings coming up and residential areas developing in and around the area.

i.   *Commercial Facilities*

Commercial facilities in Putrajaya are divided into 4 levels; (i) Core Commercial Centre; (ii) Semi-commercial centre; (iii) Neighbourhood commercial centre; and (iv) local commercial centre. However, this research focussed only on the last two hierarchies, which is more localised to its residents. Based on the aims and objectives of the Putrajaya Corporation, the provision of commercial facilities within the area not only targeted for the neighbourhood residents but also for the working population that works in Putrajaya and its neighbouring residents (Putrajaya

Corporation, 2000 and 2008). This is the main reason majority of the facilities are more centralised.

Overall, Putrajaya Corporation provides 15 sites for its neighbourhood commercial facilities. These are located at Precinct 5, 6, 8 (3 units), 9 11, 12, 14 (2 units), 16, 17, and 19. In addition, there are two locations for the local commercial facilities; which are in Precinct 9 and Precinct 10 (Lanai Commercial Centre). Figure 5.18 shows the various commercial facilities available in Putrajaya.

Inner area

The Souq & Alamanda Shopping centre

Intermediate area

Shophouses and Freestanding Market

Outer area:

Shophouses and Shopoffices

Figure 5.18: Images of the commercial facilities in Putrajaya
Source: Observation Survey, 2010

ii. ***Healthcare Facilities***

Similar to Kuala Lumpur City, the healthcare facilities in the area can be divided into two types: public healthcare facilities and private clinics. There is one public hospital in Putrajaya which is located in Precinct 7, an intermediate location that would ensure it is equally accessible to all its residents. Based on the planning guidelines for Putrajaya, the provision of this public hospital is sufficient to cater the need of the current population and also its target population until year 2023. For the public clinics, there have been 5 areas zoned as healthcare. However, currently, only one has been built, located in Precinct 9, the most populated residential precinct at present. Figure 5.19 shows the healthcare facilities available in Putrajaya.

Inner / Intermediate/ Outer

Public healthcare clinic   Public hospital

Figure 5.19: Images of healthcare facilities in Putrajaya
Source: Observation Survey, 2010

iii.   *Recreational Facilities*

As a newly planned city, Putrajaya can be claimed as one of the successful cities in terms of its provision of recreational facilities. The recreational facilities in Putrajaya have been planned on an integrated approach and based on hierarchies. There are basically 8 levels of recreational facilities i.e.: metropolitan park, urban park, local park, neighbourhood park, playgrounds, green belt, buffer zones and water bodies. The focus of this research is the recreational facilities in the neighbourhood areas such as playground, pocket gardens, football field and other sports recreational (see Figure 5.20). According to its planning guidelines, the catchment for playground is typically every 1000 population.

Inner

Intermediate/ Outer

Figure 5.20: Images of recreational facilities in Putrajaya
Source: Observation Survey, 2010

iv.   *Other Support Services*

Provisions of support services in Putrajaya are still quite limited due to the currently small size yet growing population. It was observed that most of the support services are still not within walking distance. Another reason for this is its character which is more dispersed than the compact Kuala Lumpur. Figure 5.21 illustrate some of the support services provided in Putrajaya.

Inner

Bank   *Building with post office*

Intermediate/ Outer

Petrol station   *Musolla – Religious centre*

Figure 5.21: Images of other supports facilities in Putrajaya
Source: Observation Survey, 2010

5.6 Conclusion

This chapter provides the profile of the two case study cities; Federal Territory of Kuala Lumpur and Federal Territory of Putrajaya and their sub areas. As the capital city of Malaysia, Federal Territory of Kuala Lumpur is the most busiest and populous city. This is different to Putrajaya, as the city is still growing and has not reached its maturity stage. The chapter has detailed the profile of the case study cities including socio-economic background, physical form, and details of the survey areas. In terms of size, on the whole, Federal Territory of Kuala Lumpur (metropolitan region) is five times bigger than Putrajaya. Due to this, the researcher has selected one or two residential neighbourhood in three sub areas (inner, intermediate and outer) in each case study cities. Subsequently, the chapter also discussed transportation infrastructure of both cities in which managed to capture the existing situations and related issues and challenges. The researcher also discussed the local services and public facilities provided within the case study areas. The discussions were based on different categories of the services and facilities i.e. commercial facilities, health facilities, recreational facilities and other support services. It was revealed that services and facilities within residential neighbourhood within Kuala Lumpur are located closer to the residential areas as compared to Putrajaya. Services and facilities within Putrajaya were observed to be more centralised and quite a distance from the residential areas. Another distinct feature is regarding the healthcare facilities where there are more private healthcare facilities in the residential neighbourhoods of Kuala Lumpur. Whilst in Putrajaya, the healthcare facilities are quite limited and there is only one public healthcare facility which is located in Precinct 9 (intermediate area). Following this, the next chapter looks at assessment of residential neighbourhood of the two case study city focusing on information based on the household survey and supported by the observation survey of this study.

Chapter 6: Assessment of Residential Neighbourhood

6.1   Introduction

This chapter explores the residential neighbourhood of the two case study cities with three main goals. First, the assessment focussed on addressing the research aim in general. Secondly, the researcher aimed to understand the character of the residential neighbourhood in Malaysian cities. Finally, the researcher focussed on capturing the perceptions and levels satisfaction of the residents. In recent years, there has been interest among scholars in researching residential neighbourhood satisfaction. This is due to fact that given the time that residents spend in their neighbourhood in which they live, somehow intrigues scholars to focus on what factors influence their satisfaction with their neighbourhood (Hipp, 2009, p. 2517). It is also claimed that to understand urban sustainability, it is best done at the neighbourhood level. The neighbourhood is one of the end products of urban planning. The success and failure can be measured by observing and assessing the neighbourhood itself. The most obvious in this sense is to understand and assess the perceptions of its neighbourhood community. Assessment can be made on various grounds among others satisfaction towards environment and community, participation in the community, usage of facilities and services and perceptions towards issues and problems. According to McCray and Day (1977) in Djebarni and Al-Abed (2000, p. 230), assessment of housing satisfaction was claimed to be related to the level of contentment experience by an individual or household/ family with regard to the current housing situation. Hourihan (1984) also explained that there are many studies of residential satisfaction have shown that the effect of residents'

personal characteristics is mediated through their perceptions and evaluations of attributes of their neighbourhoods.

One of the objectives for this research was to establish the relationship between aspects of urban form and efforts of improving social sustainability in Malaysian cities. Prior to assessing the information on this matter, understanding the perceptions of the local residents about their neighbourhood should help to give better insights on how it has affected their behaviour in accessing the services and public facilities available. This information was collected primarily from the household survey entitled '*Your urban living experience'*. Findings presented here aim to show the difference between the two case study cities with three different sub areas in each city.

As mentioned in Chapter Two (research methodology), the total number of questionnaire survey forms distributed was approximately 2500 for both case study cities; Kuala Lumpur and Putrajaya. With an overall response rate of 43%, the total number of households involved in the survey was 1084. The response rate is quite high due to the chosen technique of conducting the survey, which is a combination of face-to-face interview and drop-and-collect technique. Furthermore, as the household survey involves getting the respondents to be at home, the survey was only conducted on Fridays, Saturdays and Sundays. By doing so, majority of the residents of the study area were at home during the survey. The researcher also avoided long weekend holidays as typically, residents would take the opportunity to go on a holiday. In terms of the breakdown of the response rate in Kuala Lumpur, a larger number of the respondents were captured from the inner sub area (45%), followed by intermediate sub area (30%) and outer sub area (25%). Whereas for Putrajaya, a greater share of the respondents were from outer sub area (42%), followed by inner sub area (30%) and finally

intermediate sub area (22%) (see Figure 6.1). One of the reasons for such pattern is because of the population distribution in Putrajaya where there are greater populations at the outer area of Putrajaya as compared to other areas.
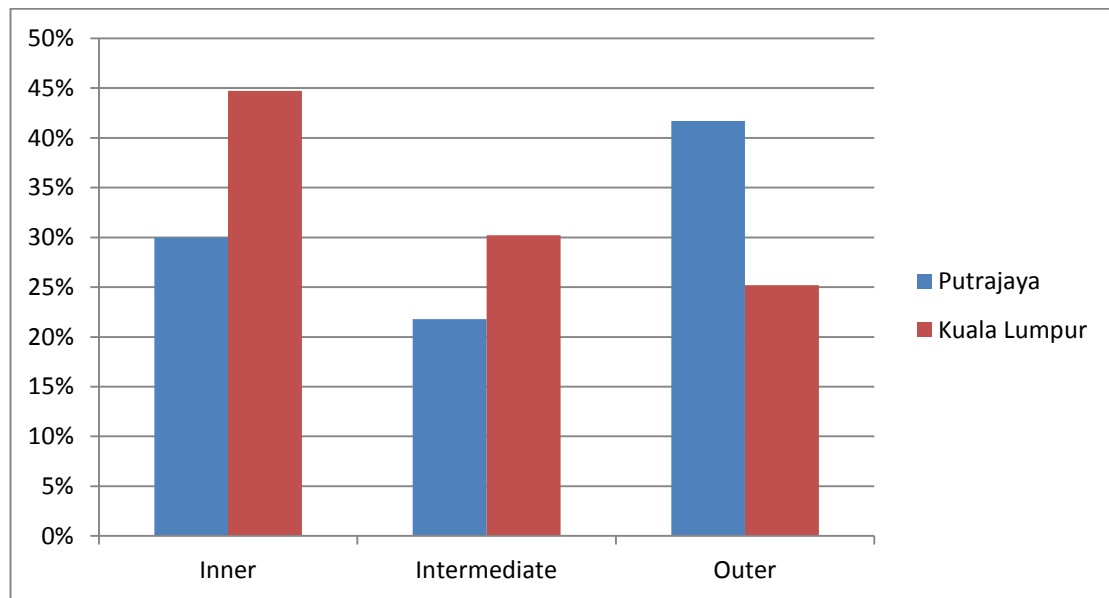
Figure 6.1: Distribution of respondents according to location of survey
Source: Household Survey, 2010

6.2   Socio-demographic profile

In any particular social research study, it is important to understand the socio-demographic background of the respondents under study. This is because these factors often have a strong influence on needs, preference and behaviour. It is necessary to allow or control for this variables when studying the influence of environment and urban form. This subsection looks into greater detail on the socio-demographic background of the respondents within the case study areas. The socio-demographic variables discussed in this subsection includes age group, ethnic distribution, educational qualification, employment status, household income, home ownership and ownership of different types of vehicle.

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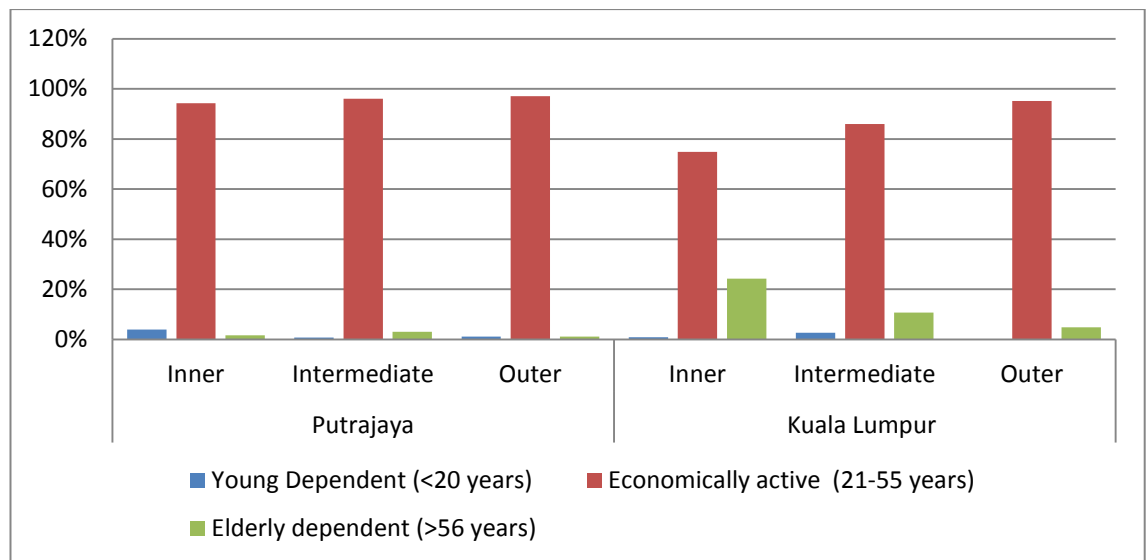
6.2.1   Age Group

Figure 6.2: Distribution of respondents according to age group
Source: Household Survey, 2010

A large majority of the respondents were from the age group of economically active population with an average of 84% for Kuala Lumpur and 96% for Putrajaya (see Figure 6.2). The reason behind this is because of the design of the survey that targeted only the head of household or their spouse or partner. For the elderly dependent population group, an average of 15% was reported for Kuala Lumpur while there was only a small proportion of 0.2% reported for Putrajaya. It is also important to note that the current retirement age for Malaysia is 56. Findings regarding the age group distribution for both case study cities reveal a higher proportion of economically active age group as compared to the actual distribution. According to the census for both cities, based on the most recent data, majority of population falls under the economically active group with 67% for Kuala Lumpur and 61% for Putrajaya (Putrajaya Corporation, 2006 and Kuala Lumpur City Hall, 2004). For the elderly age group, there are higher proportion in Kuala Lumpur (4%) compared to Putrajaya (0.6%) (Putrajaya Corporation, 2006 and Kuala Lumpur City Hall, 2004). For Malaysia as whole, the pattern is quite similar. It was recorded that percentage for young dependants

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are 26%, economically active are 68% and elderly dependant are 16% for year 2010 (Department of Statistics, 2010).

6.2.2   Ethnic Group Distribution
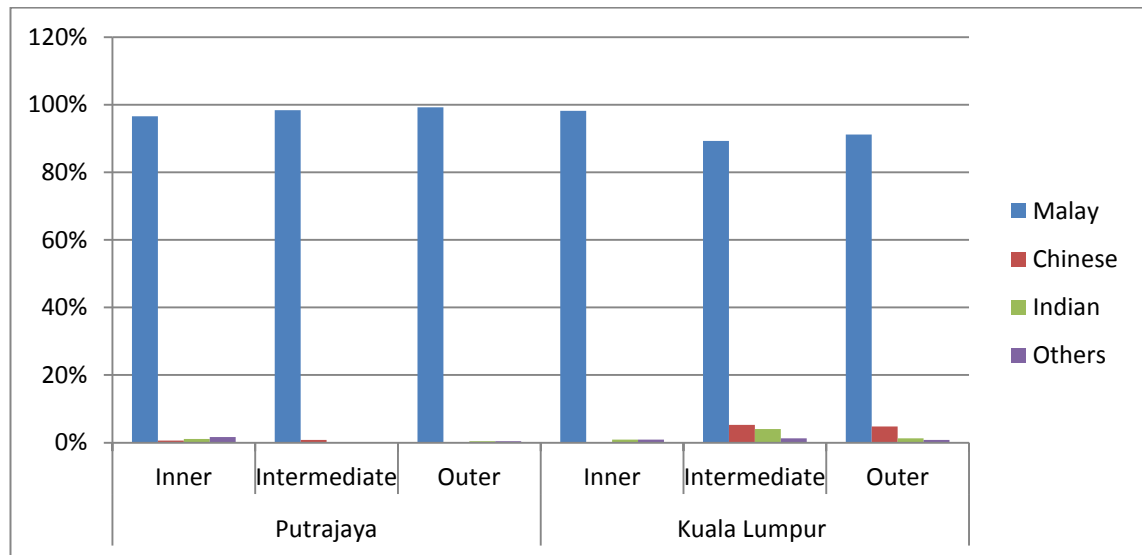
Figure 6.3: Distribution of respondents according to ethnic group
Source: Household Survey, 2010

The ethnic distribution derived from the survey does not represent the actual distribution for Kuala Lumpur City (see Figure 6.3). It was revealed that the actual ethnic distribution for Kuala Lumpur City in year 2000 was 41% for Malays, 39% for Chinese, 10% for Indians and 7% for foreign residents (Kuala Lumpur City Hall, 2004) (see Figure 6.4). The reason for such unequal distribution is due to the way the household survey was managed. The researcher believes that it was a result of having only Malay ethnic interviewers and Malay version of questionnaire. Other ethnics such as Indians and Chinese residents were more difficult to approachwithout having interviewers of the same ethnicity. The researcher realised that the low response rate from other ethnics may be overcome by having interviewers of other ethnics as well and by having the questionnaires translated to their native languages.

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However, the finding of the survey for Putrajaya does correspond to the ethnic distribution for Putrajaya where it was reported that Malays form the largest composition with 95.5% in 2007. This number has increased from 83.1% in 2000 (Putrajaya Corporation, 2008). This is followed by other ethnicities with 3.5%, Indian with 1.3%, and Chinese were only reported to be 0.3% (Putrajaya Corporation, 2008) (see Figure 6.5).
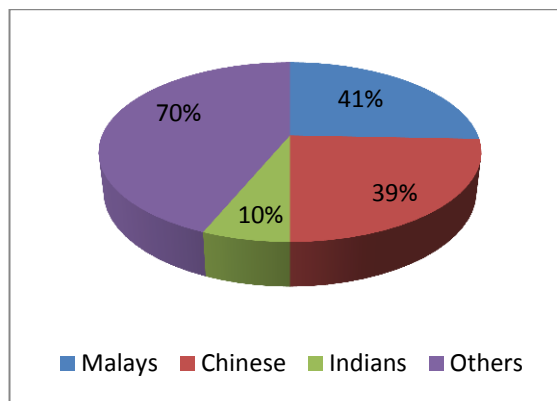
Figure 6.4: Distribution of ethnic group in Kuala Lumpur, 2000
(Source: Kuala Lumpur City Hall, 2004)
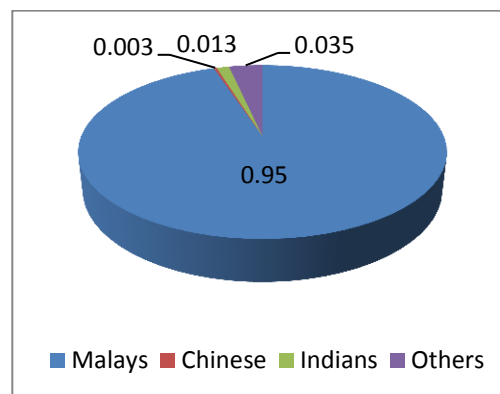
Figure 6.5 Distribution of ethnic group in Putrajaya, 2007
(Source: Putrajaya Corporation, 2008)

6.2.3 Household Size

In terms of average household size, a great number of the respondents for all areas have approximately 2-5 occupancy (see Figure 6.6). Looking at the distribution pattern, Putrajaya does not have any single occupancy household except for the outer area (a slight 1%). There is also pattern for 'more than 5 occupancy household'. It appears to be that as it move further from the core area, there would be fewer households with 'more than 5 occupancy'. This finding is expected as it also reflects the national average household size of 5.
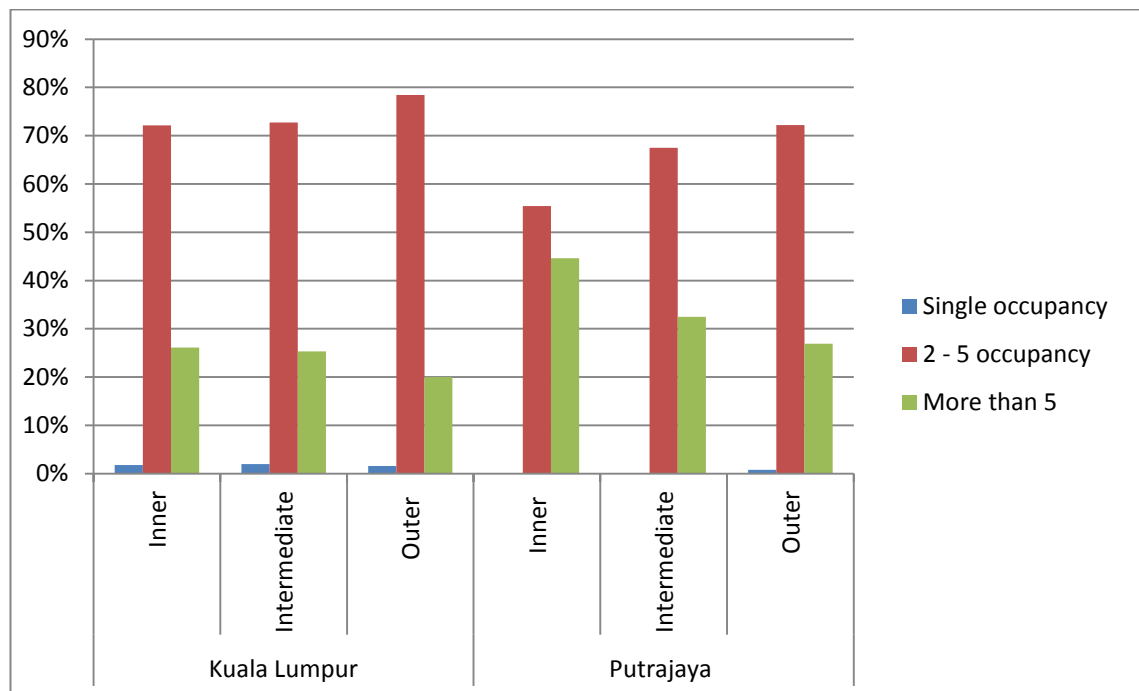
Figure 6.6: Distribution of respondents according household size
Source: Household Survey, 2010

6.2.4 Employment

The majority of the respondents who participated in the survey are working full-time in all areas, with an average of 88% for Putrajaya and 69% for Kuala Lumpur. Also, for highest education qualification attained, most of the respondents in both case study cities have achieved formal education, which has been the national aspiration to

have an educated nation. However, Kuala Lumpur recorded to have higher percentage of those without any formal education (4%) compared to Putrajaya (1%) (see Figure 6.7). Putrajaya noted to have lesser percentage of those without formal education because of its character being a new administrative city and majority of the population are government servants.
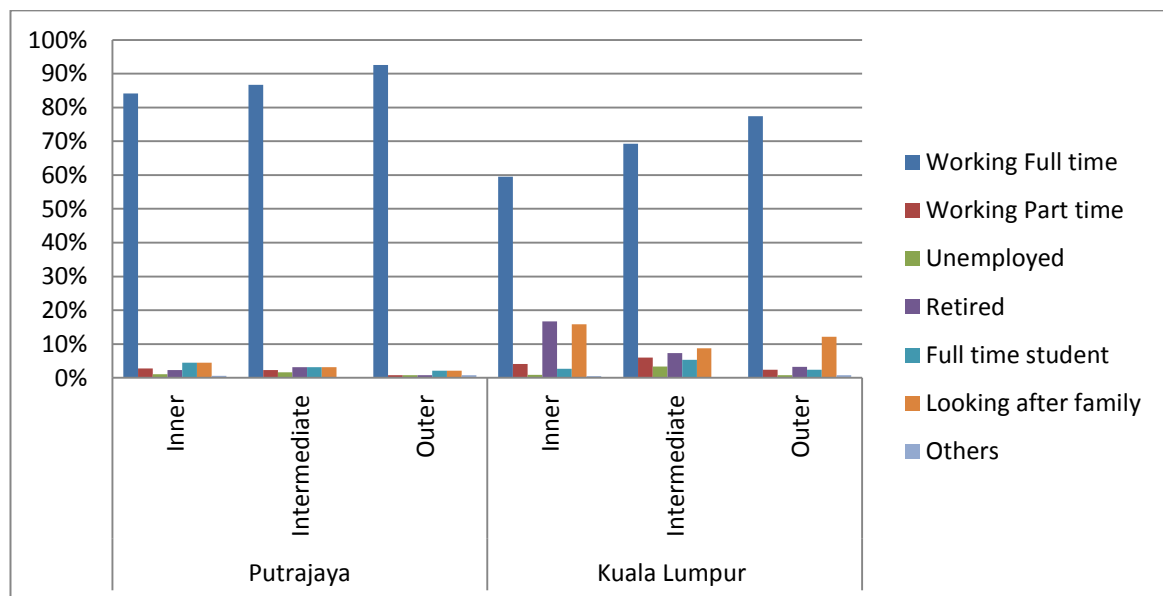
Figure 6.7: Distribution of respondents according to employment status
Source: Household Survey, 2010

6.2.5   Household Income
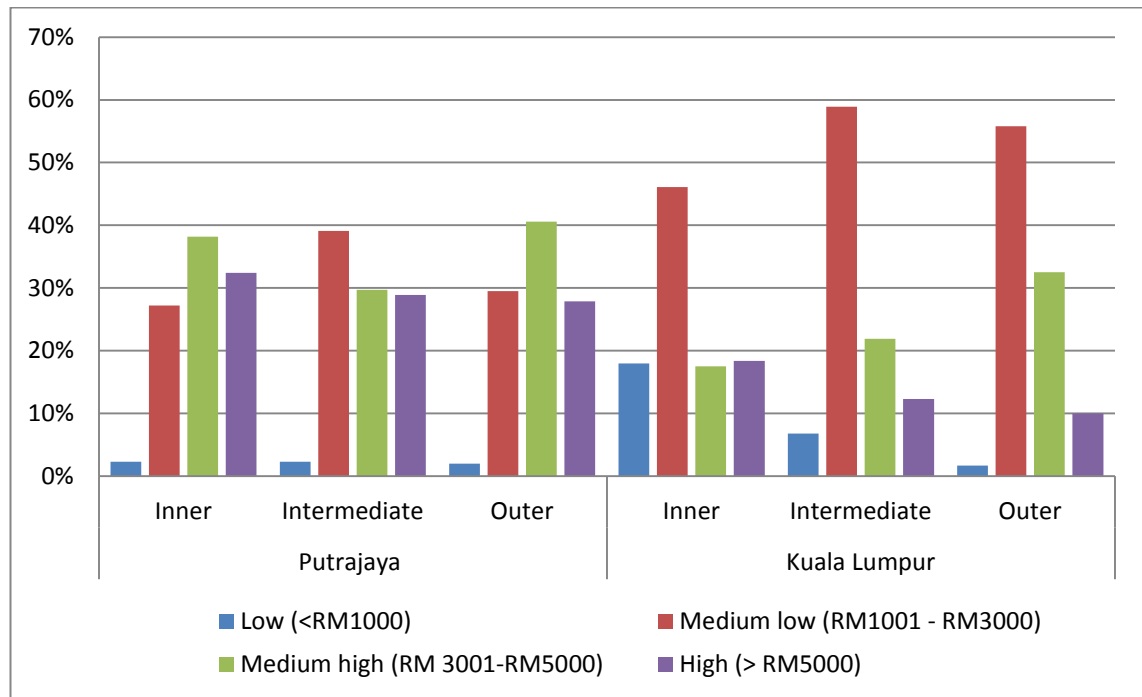
Figure 6.8: Distribution of respondents according to gross monthly household income
Source: Household Survey, 2010

Regarding gross monthly income, the majority of the respondents in Kuala Lumpur fall under the category of medium low income group (RM1000 – RM 3000) (see Figure 6.8). However for Putrajaya, the distribution of medium low, medium high and high income group is well distributed with a notable higher percentage of respondents fall under the category of medium low income group in intermediate area (39%). Figures reported by Putrajaya Corporation (2007) regarding the average household income was at the high side of RM7000 and RM4105 for Kuala Lumpur (Kuala Lumpur City Hall, 2004). Furthermore, compared with the national average of RM2472 recorded in 1999, Kuala Lumpur's average household income is higher by 60% and Putrajaya's is higher by 183%. General pattern based on the survey does not correspond well with the statistics reported by Kuala Lumpur City Hall and Putrajaya Corporation. The researcher believes that under-reporting the actual income may be the strong reason behind such finding. This is quite a common occurrence in any survey in relation to revealing information on income especially when the income range is pre-

coded in the questionnaire (Peterson and Kerin, 1980). Most probably, the income reported was for only the head of household, but not the total household.

6.2.6 Home Ownership
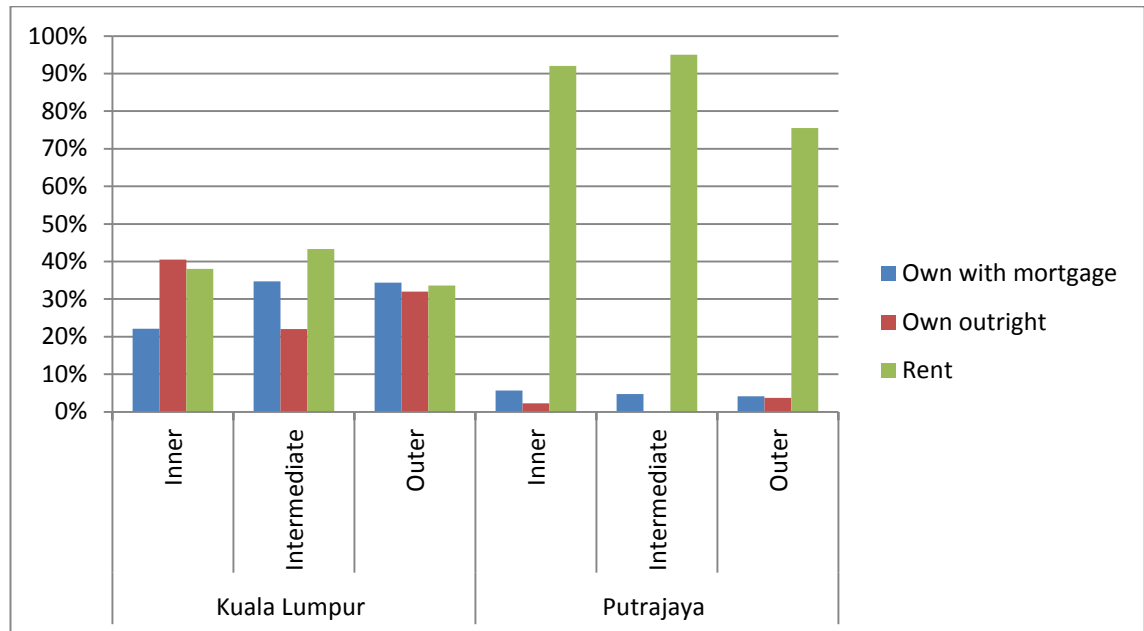
Figure 6.9: Distribution of respondents according to home ownership
Source: Household Survey, 2010

The majority of the respondents in Putrajaya are renting in all sub area with an average of 92% (see Figure 6.9). This pattern is due to the high population of government employees that are utilizing the house subsidy benefits. The pattern is different for Kuala Lumpur where the distribution is quite evenly spread, especially in the outer area. On average, in Kuala Lumpur, it was reported that 29% own the house with mortgage, 33% owns outright and 39% are renting. However, it is noted that in the inner area of Kuala Lumpur, the percentage owning the house outright is slightly higher at 41% as compared to other type ownership and in other sub area location throughout the survey areas.

6.2.7   *Car Ownership*

Car ownership is regarded as one of the most important socio-economic indicators. Generally, it is claimed that owning a car is a sign of prosperity because of its high cost (Goodwin, 1997). It is also a key factor to ascertain the level of accessibility enjoyed by household members (Ferguson and Woods in Jenks and Jones, 2010, p. 57). On average, most of the respondents in Putrajaya have 2 cars and in Kuala Lumpur have 1 car (see Figure 6.10). The maximum number of cars owned by the respondents in both case study cities is 6. Moreover, the inner sub area of Kuala Lumpur shows the highest percentage of those that does not own any car (16%). The high car ownership in both case study cities corresponds well with the current national data of rising car ownership especially in Kuala Lumpur. As reported in Chapter Five (p, 144), it was reported that Kuala Lumpur has 985.7 cars and motorcycles per 1,000 populations in 2000 as compared to 421.9 per 1,000 populations for Malaysia as a whole (Kuala Lumpur City Hall, 2004). The rapid increase in the use of private vehicle driven by inadequate and poor public transport has resulted in increased traffic congestion, accidents, inadequate parking space and air pollution. The researcher also attempted to investigate whether income has any influence on car ownership as proven by previous research. Again, based on the chi-square analysis performed, income is significantly a major determinant of car ownership (95% confidence level) in both case study cities.
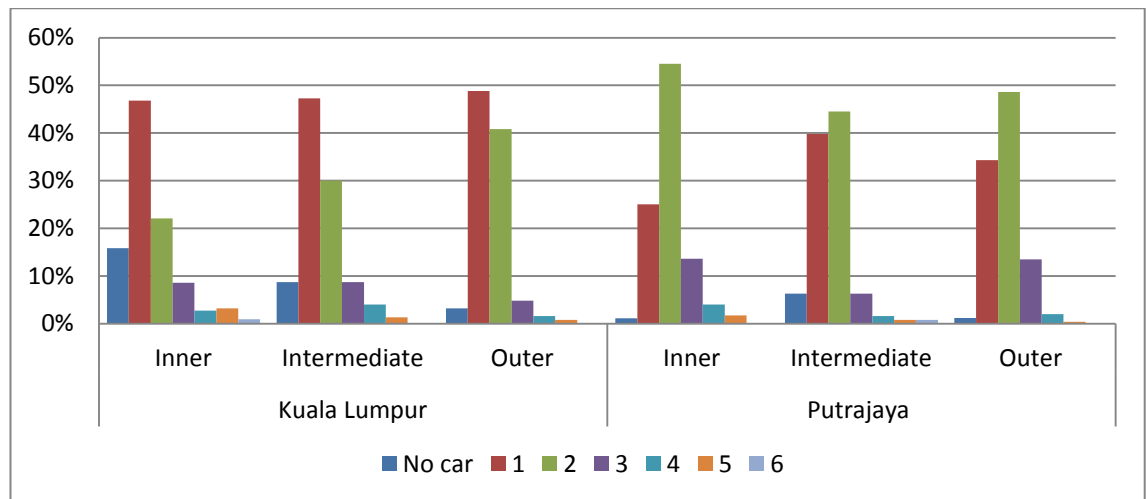
Figure 6.10: Car Ownership
Source: Household Survey, 2010

6.2.8   *Motorcycle Ownership*

The motorcycle is a common mode of transport in Asian countries due to its fuel efficiency. The survey reveals that on average 66% of the respondents own at least one motorcycle in Kuala Lumpur and 57% in Putrajaya (see Figure 6.11). It is a common practice in major cities in Malaysia that motorcycle is used as a substitute for a car in commuting to work. Among the major factor of this substitution is because of the advantage of low cost to buy, able to avoid traffic congestion and fuel efficiency. The bicycle on the other hand, is not a common mode of transport to commute to work mainly because of the hot tropical climate that Malaysia experiences throughout the year (see Chapter Five, p. 141). The usage of bicycle is more for recreational purposes. This is the main reason why both case study cities reported high percentage of households that does not own any bicycle (59%, Putrajaya and 74%, Kuala Lumpur).
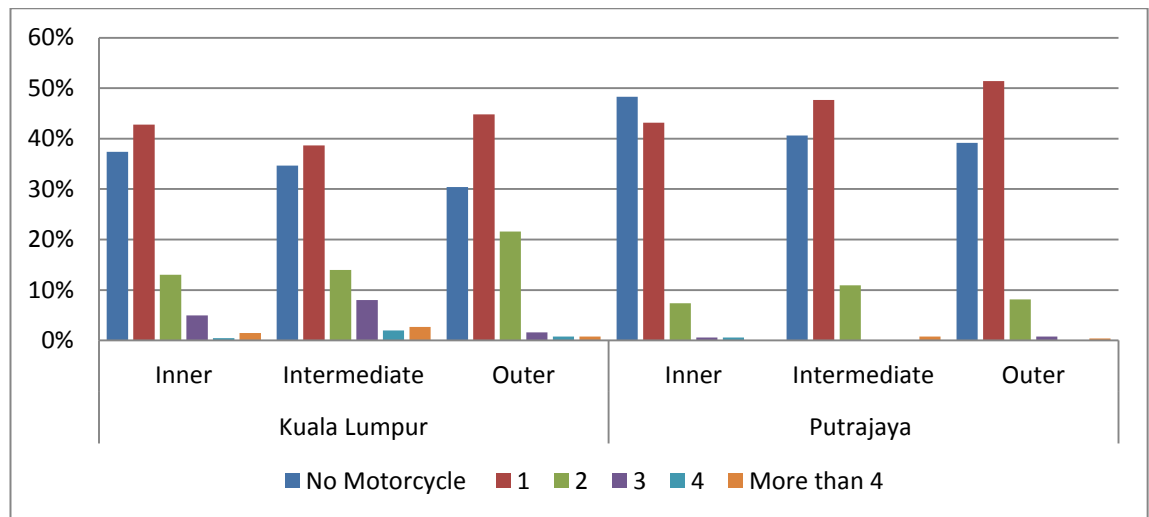
Figure 6.11: Motorcycle Ownership
Source: Household Survey, 2010

6.3 Satisfaction with Residential Neighbourhood

Generally, satisfaction with the residential neighbourhood is an important indicator of housing and neighbourhood quality and condition that may affect an individual's quality of life. Identification of factors which determine the satisfaction are important inputs in monitoring the success of policies to achieve sustainable development. Furthermore, satisfaction scores in a particular housing study have been deemed to be indicators of service quality or organizational success and effectiveness (Satsangi & Kearns, 1992). In this research, the respondent's perception and behaviour in their neighbourhood is important due to the fact that it may have also impact their usage and behaviour in accessing the facilities and public services within their neighbourhood.

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6.3.1 *General Satisfaction*

Figure 6.12 presents general satisfaction of the respondents towards their neighbourhood. It shows that in all case study areas, around 80% of the respondents are generally satisfied with their neighbourhood. With regards to general dissatisfaction, the inner area of Kuala Lumpur reports greater percentage as compared to the outer area. Whereas for Putrajaya, respondents of intermediate area report a higher level of dissatisfaction. Previous studies in Malaysia indicated that residential satisfaction is highly dependent on home ownership and socio-demographic factors (Tan, 2012). The study also suggests that greater social networks may further improve general satisfaction towards housing and its neighbourhood. Following this, the researcher tested several socio-demographic variables against the general satisfaction variables. Findings revealed only income variable was reported significant at 99% confidence level (see Table A6.1 in Appendix). Higher income households are more likely satisfied with their residential neighbourhood compared to lower income households.
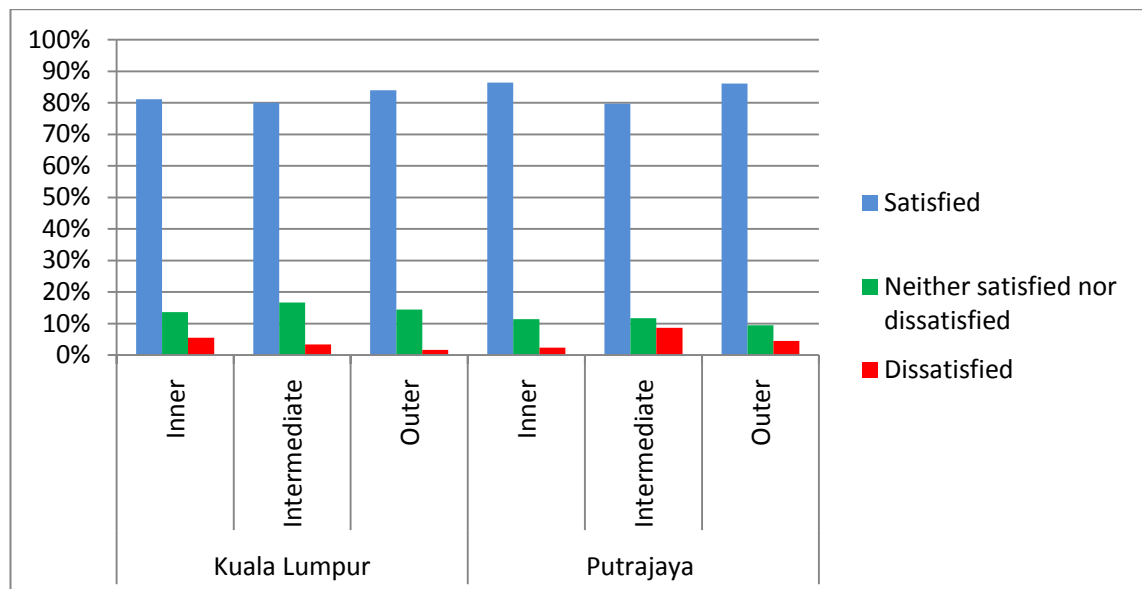
Figure 6.12: General satisfaction towards neighbourhood area
Source: Household Survey, 2010

6.3.2 Neighbourhood Community

The survey also looked into the respondents' opinions about the community within their neighbourhood. Based on the findings reported, it showed that the respondents have slightly higher satisfaction with their community as compared to their satisfaction with theneighbourhood environment with an average of 83% for Kuala Lumpur and 84% for Putrajaya (see Figure 6.13). However, in general, there is no obvious pattern on satisfaction towards neighbourhood community between the two cities. Furthermore, based on the test of association performed, the difference is not statistically significant.
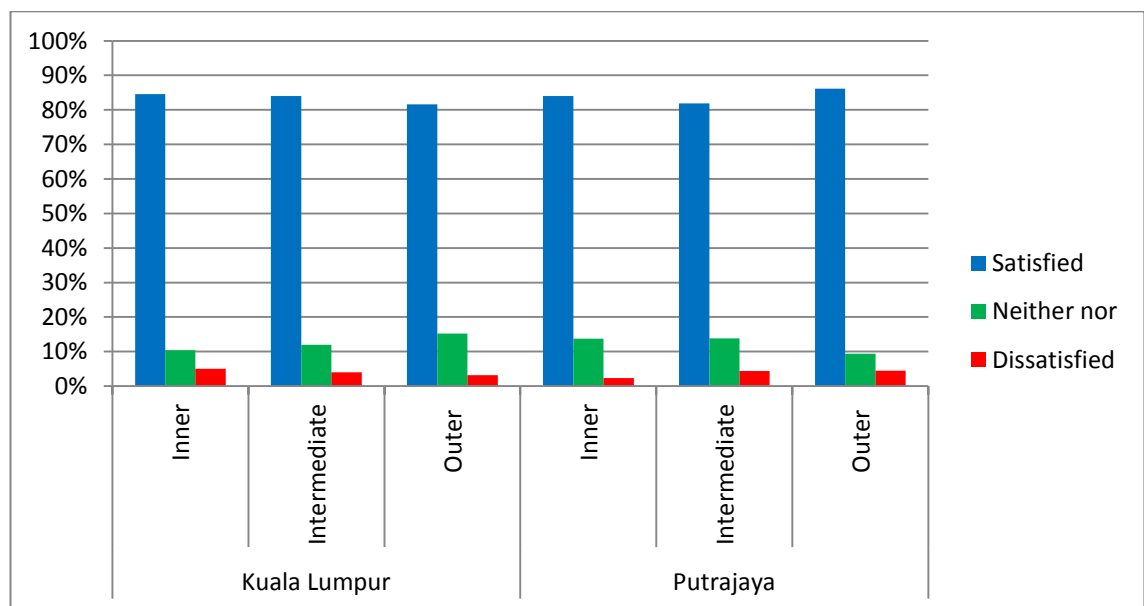
Figure 6.13: General satisfaction towards community in neighbourhood
Source: Household Survey, 2010

6.3.3 Social Interaction

Most of the time, it is expected that a well-planned neighbourhood would influence or initiate some kind of social interaction among the local communities. Jacobs (1964) advocated mixed land use and pedestrian friendly streets in order to

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induce social interaction and provide some sense of neighbouring community. This concept has been applied in the New Urbanism concept that supports among others mixed use and pedestrian-friendly streets. In terms of level of sociability within the local community, the researcher investigated the matter by approaching the respondents with several questions in the questionnaire survey form. The respondents were prompted to provide information on the level of interaction based on different scenarios. 5 point Likert scale was used to capture the information with score 1 represents *'None'* and score 5 represents *'All'*, hence, higher score represents better social interaction.Table 6.1 presents the findings of the 4 variables that summarises the level of social interaction among the respondents within the case study cities. The finding indicates that the levels of social interaction among the community in the areas are quite wide-ranging. On the aspect of meeting socially on average of once a week, it was reported to be more common in the inner areas (both cities). In terms of having a chat or greeting, for both cities, it was revealed to be better in the outer areas. In the CityForm study, it was revealed that social interactions tend to improve as location moves away from the city centre (Bramley et al. in Jenks and Jones, 2010). The study also revealed that aspects of physical layout of housing, provision of services and facilities (schools, shops and bus stops) also supports and encourages social interactions. Previous research has also proven that better social interaction in a neighbourhood would have significant influence on individual's well-being as well as community (Bramley et al. in Jenks and Jones, 2010, Talen, 1999 and Rudlin and Falk, 1999). It also reduces the feeling of fear in the neighbourhood hence able to live more comfortably (Bramley etal. in Jenks and Jones, 2010). Several studies also suggestthat some level of interaction within the neighbourhood would influence the level of satisfaction towards the residential neighbourhood (Debarring & Al-abed, 2000 and Xi Jin & Bo Gao, 2010).

Table 6.1: Level of social interaction between local communities (Mean score)

Kuala Lumpur	You see socially on average once a week		You have a chat with/ greet		You would ask to borrow food / tools from		You have contact with	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Inner	2.81	1.05	2.88	1.00	1.54	0.82	2.84	1.07
Intermediate	2.55	1.07	2.64	0.93	1.98	0.90	2.60	0.92
Outer	2.56	1.03	2.90	0.79	1.96	1.15	2.86	0.81
Putrajaya	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Inner	2.57	0.80	2.54	0.77	1.53	0.79	2.49	0.90
Intermediate	2.41	0.86	2.46	0.84	1.57	0.84	2.31	0.94
Outer	2.54	0.89	2.69	0.88	1.73	0.95	2.49	0.96

Source: Household Survey, 2010

Table 6.2: Problems in the neighbourhood

Kuala Lumpur	Amount of traffic		Littering		Vandalism		Safety	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Inner	1.50	0.69	1.76	0.77	1.60	0.749	1.60	0.76
Intermediate	1.47	0.65	1.63	0.79	1.64	0.77	1.79	0.79
Outer	1.71	0.64	2.10	0.81	1.78	0.75	1.99	0.73
Putrajaya	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Inner	1.66	0.679	1.69	0.78	1.74	0.77	1.64	0.69
Intermediate	1.87	0.76	1.87	0.78	1.76	0.78	1.76	0.74
Outer	1.63	0.67	1.44	0.61	1.38	0.61	1.48	0.65

Source: Household Survey, 2010

Table 6.2: Problems in the neighbourhood (cont.)

Kuala Lumpur	Noise from neighbours		Noise from traffic		Disturbance		Lack of parking	
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
Inner	1.50	0.60	1.51	0.60	1.47	0.62	1.83	0.80
Intermediate	1.62	0.55	1.49	0.63	1.54	0.59	1.76	0.74
Outer	1.56	0.51	1.46	0.53	1.39	0.51	2.02	0.74
Putrajaya	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
Inner	1.47	0.54	1.47	0.54	1.54	0.56	2.11	0.76
Intermediate	1.57	0.58	1.58	0.61	1.76	0.60	2.19	0.82
Outer	1.28	0.47	1.32	0.50	1.32	0.50	1.84	0.75

Source: Household Survey, 2010

Different neighbourhoodswill have different problems. Rapid urbanization leads a neighbourhood to face numerous problems. In this study, eight common neighbourhood problems were identified in advance by the researcher based on reference to reports provided by the local authorities (Kuala Lumpur City Hall, 2004 and Putrajaya

Corporation, 2008). Subsequently, respondents were required to respond to these problems based on whether it is a *not a problem* (1), *minor problem* (2) or *serious problem* (3) of their neighbourhood. Higher scores denote serious problems and vice-versa. Tables 6.2 and 6.3 detailed out the mean score of these problems according to the sub areas of each case study city. Based on the findings, in general, lack of parking was reported as the main problem for all sub areas. Problems of safety and littering are more noticeable in Kuala Lumpur as compared to Putrajaya. This finding corresponds with to the observation survey as the researcher also observed similar pattern.

6.4   Assessment on the Provision of Local Services and Public Facilities

The research collected information from the household survey regarding the perception on the provision of local facilities and services. This subsection unravels respondents' ratings on provision of several facilities, the availability of facilities within ease of access and aspects on the usage pattern of the local facilities and services. The following figures reveal the general perception of the respondents towards the provision of shops, recreational facilities, parking facilitiesand public transport within their neighbourhood. Overall, ratings towards the provision of commercial facilities are better in Kuala Lumpur as compared to Putrajaya (see Figure 6.14). For recreational facilities, referring to Figure 6.15, it was observed that 'bad' rating is high in intermediate area. In Putrajaya, 'good' rating decreases as it moves further away from the core area. On the other hand, 'bad' rating is high in outer area followed by the intermediate area.
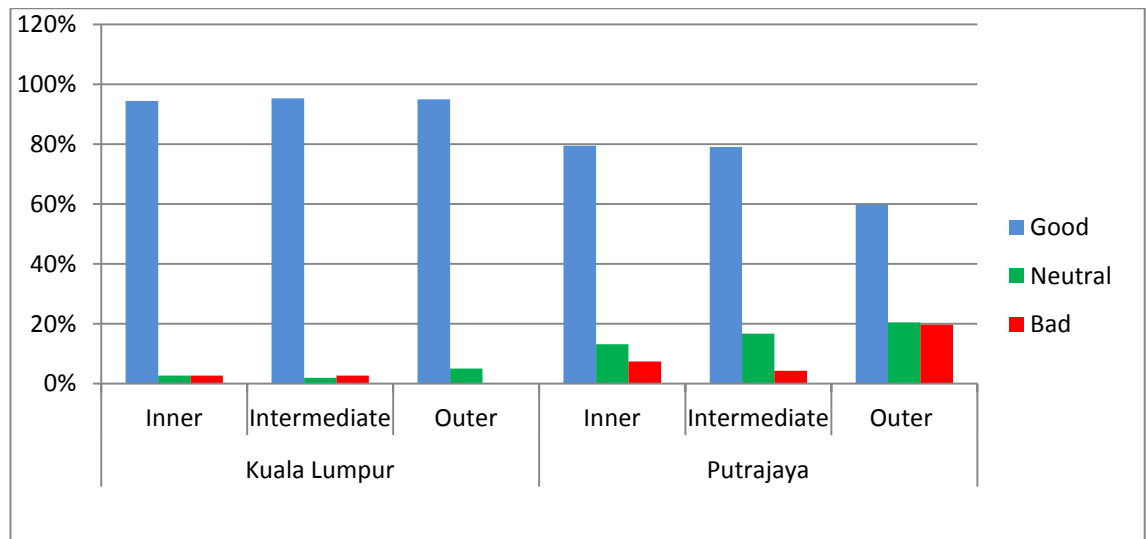
Figure 6.14: Rating towards commercial facilities
Source: Household Survey, 2010
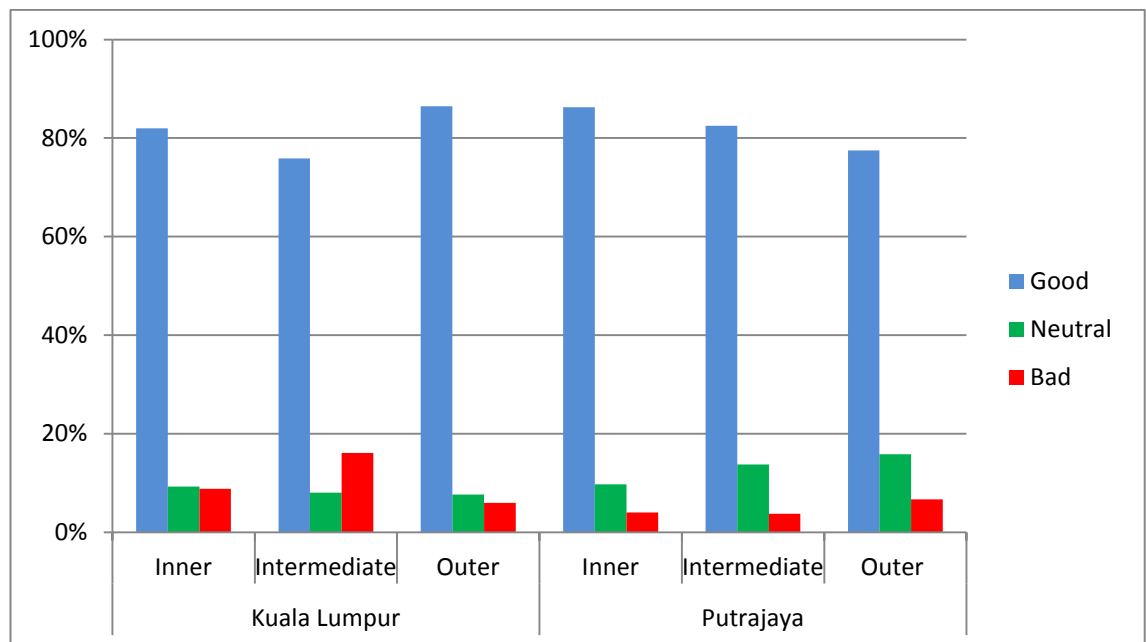
Figure 6.15: Rating towards recreational facilities
Source: Household Survey, 2010
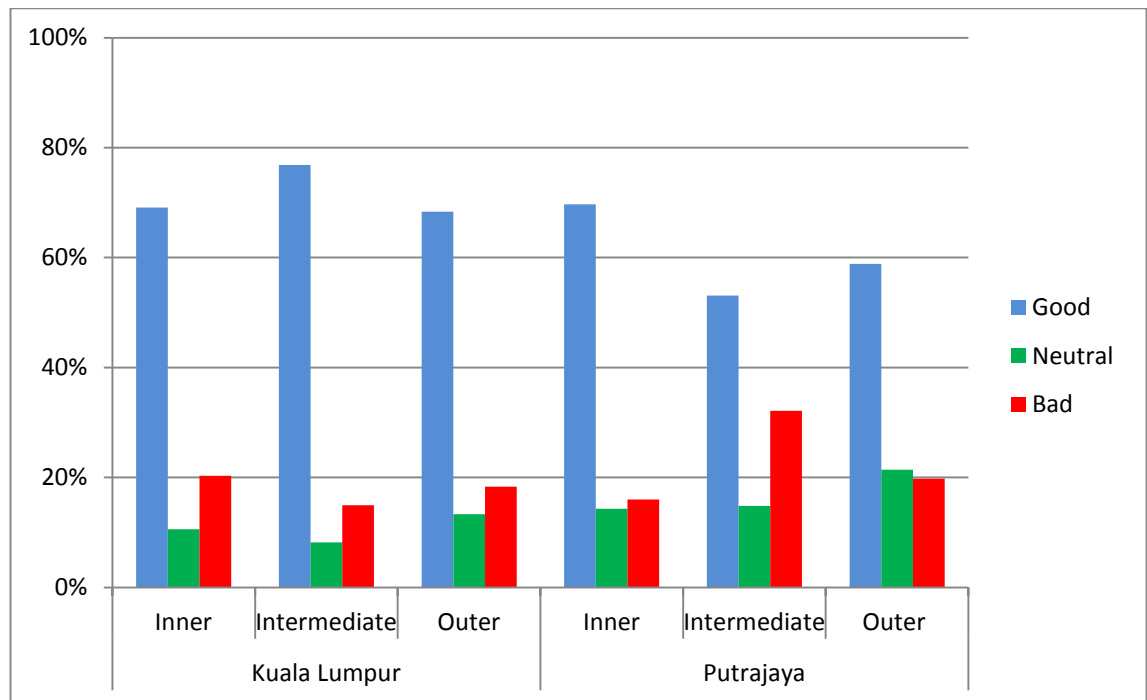
Figure 6.16: Rating towards parking facilities
Source: Household Survey, 2010

Regarding the perception of parking facilities in the case study cities, it revealed quite an interesting finding. Referring to the Figure 6.16 above, it shows that there is a high 'bad' rating for the intermediate sub area of Putrajaya. This corresponds with the fact that being a newly developed city, an area would expect to experience problems related to parking because not all areas are fully developed. Furthermore, as mentioned in Chapter Five (p.141), Putrajaya Corporation has planned that Putrajaya is going to be fully supported by urban railsystem hence does not support private vehicles. As the system is not yet in operation, it has caused massive parking problems to the area.With regards to provision of public transport, options are wider in Kuala Lumpur as compared to Putrajaya. In Kuala Lumpur, there seems to have none 'bad' rating for the outer area and a noticeably high 'bad' rating in the intermediate area. However, in Putrajaya, high 'bad' rating was reported in the outer area. Again, it is due to fact that Kuala Lumpur being a well-developed city and Putrajaya a newly developed city. (see Figure 6.17).
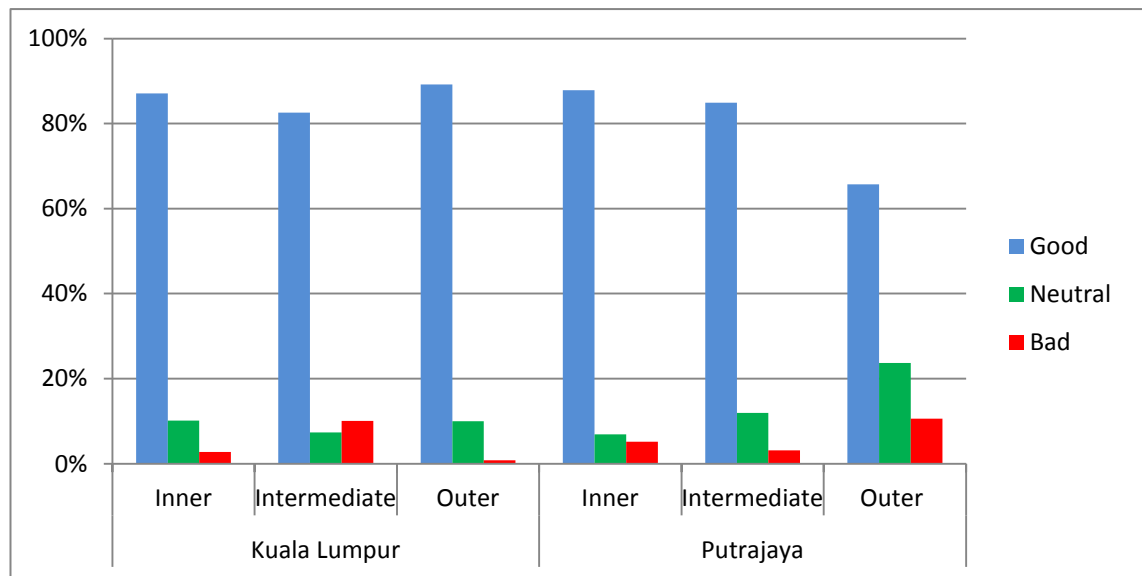
Figure 6.17: Rating towards public transport
Source: Household Survey, 2010

6.4.1 *Local services and public facilities within easy access*

The household survey also collected information on the availability of local services and facilities within easy access based on the perception of the respondents. The definition of easy access in this context refers to the ability of the respondents to reach the services or facilities within 5 to 15 minutes travelling time using their usual mode of transport. In terms of commercial facilities, response towards its availability in Kuala Lumpur City is quite constant for sundry shop with more than 90% reported it is within easy reach for all sub areas. However, there is quite a different pattern on the provision of commercial facilities in Putrajaya. Easy access to both sundry shop and supermarket decreases as it moves further from the core area with an average of 86% and 36% accordingly (see Figure 6.18). This pattern reflects the level of compactness in Putrajaya, besides the fact that provisions of facilities are more concentrated in the core area of Putrajaya (Observation Survey, 2010). Provisions of healthcare facilities are

reported to be quite similar for both Kuala Lumpur and Putrajaya with an average of 67% reported to have easy access (see Figure 6.19). Based on the observation survey, even thoughit was observed that healthcare facilities were located further from residential areas, the researcher believes that a notably high vehicle ownership gives the flexibility for the residents to have easy access (Observation Survey, 2010).
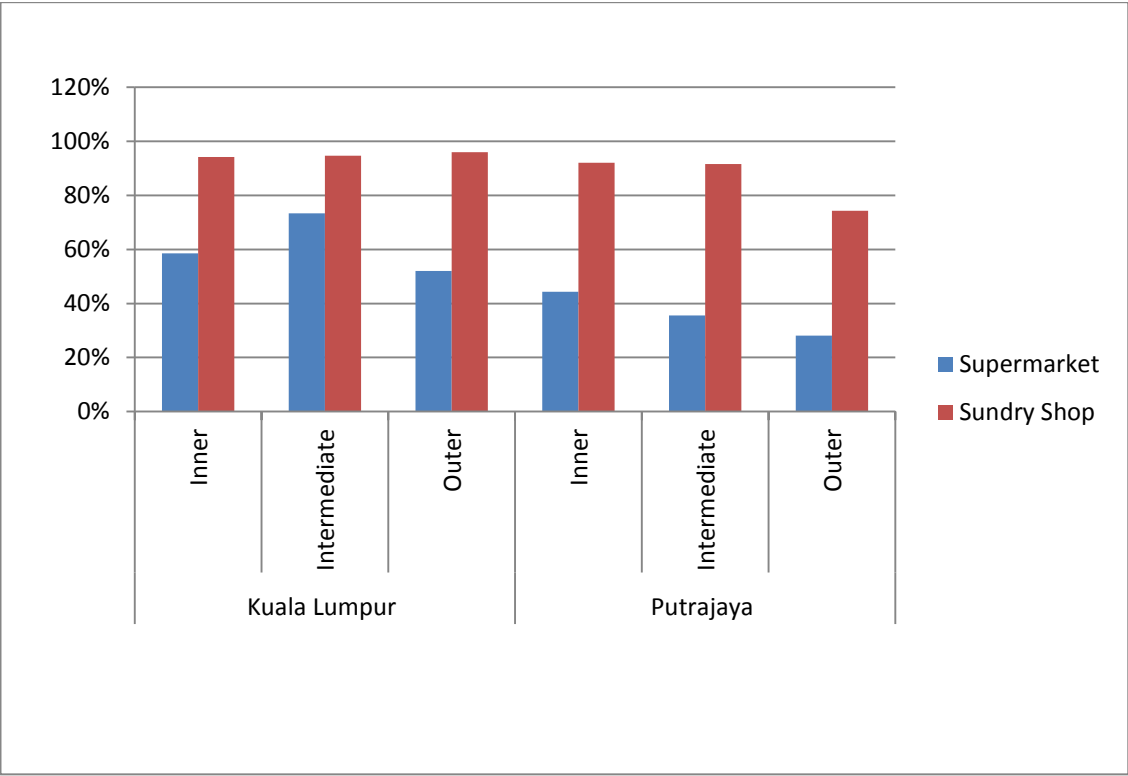
Figure 6.18: Commercial facilities within easy access
Source: Household Survey, 2010
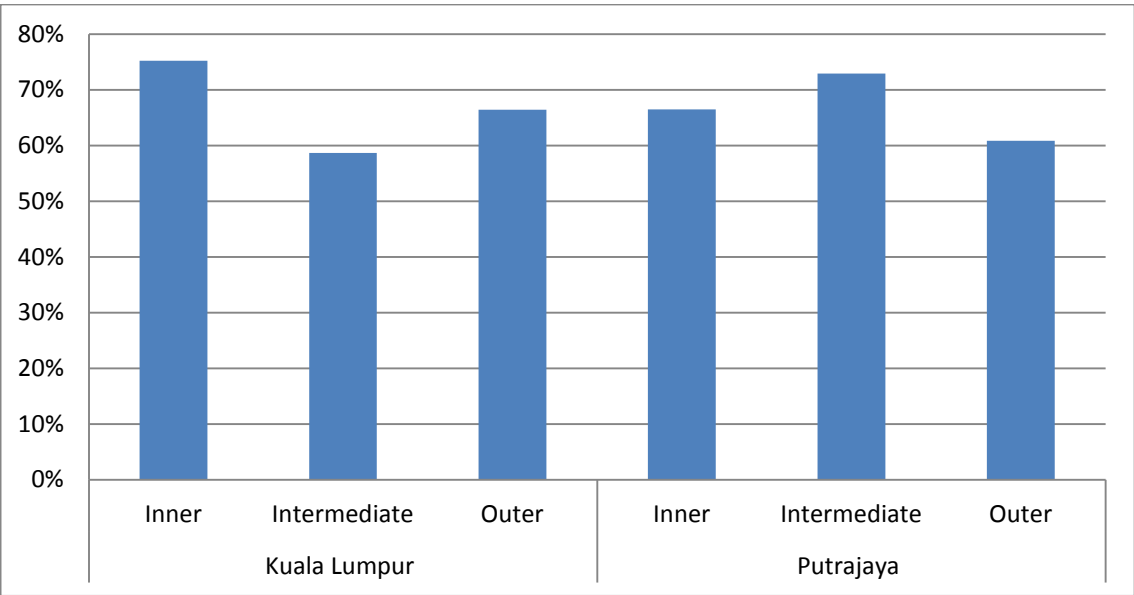
Figure 6.19: Healthcare facilities within easy access
Source: Household Survey, 2010

Following the discussion on the provision of recreational facilities in previous sections, this section also reports availability of this facility based on the response from the respondents. Overall, it was reported that Putrajaya has better access to recreational facilities as compared to Kuala Lumpur, with 'playground' as the highest percentage to have easy access (94%) (see Figure 6.20). This finding corresponds well with the observation survey and the principle behind the planning of Putrajaya where it puts green space / recreational facilities as a top priority. Apart from that, for Kuala Lumpur, it has always been an issue of lack of open space/ recreational facilities, as it has also been highlighted in the National Urbanisation Policy (2006).

Figure 6.21 reports finding on the availability of other support services within easy access. These support services are post office, banks, and petrol station. For Kuala Lumpur, the pattern shows that access to the support services is generally better in the intermediate sub areas. On the other hand, in Putrajaya, overall, the access is better in the inner sub area and decreases as it moves towards the outer sub area. This corresponds with the observation survey as most support services in Putrajaya are provided centralised (Observation Survey, 2010).
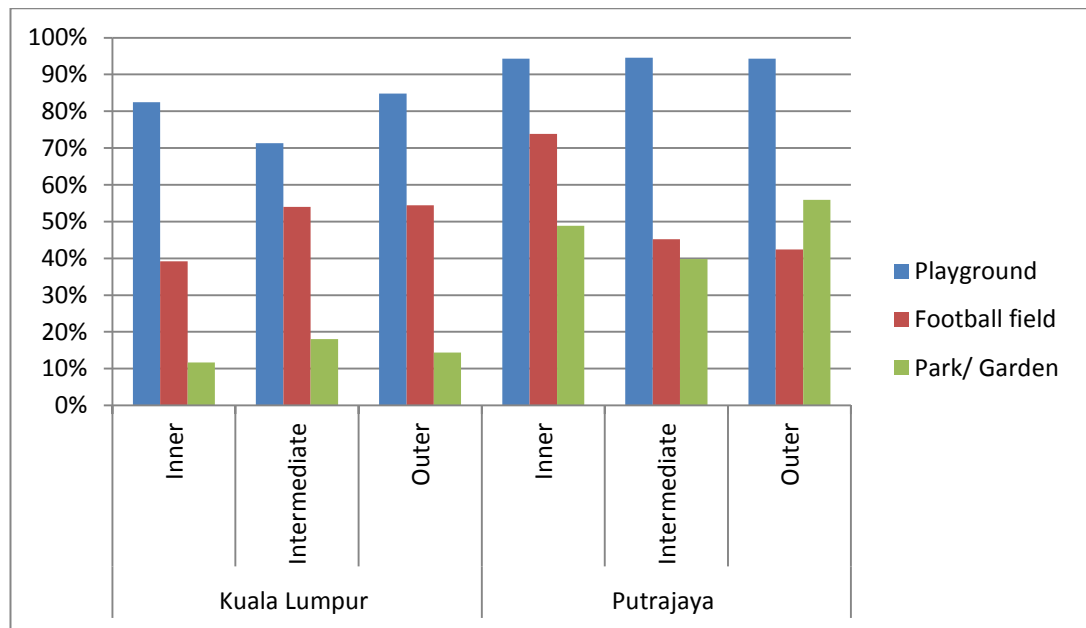
Figure 6.20: Recreational facilities within easy access
Source: Household Survey, 2010
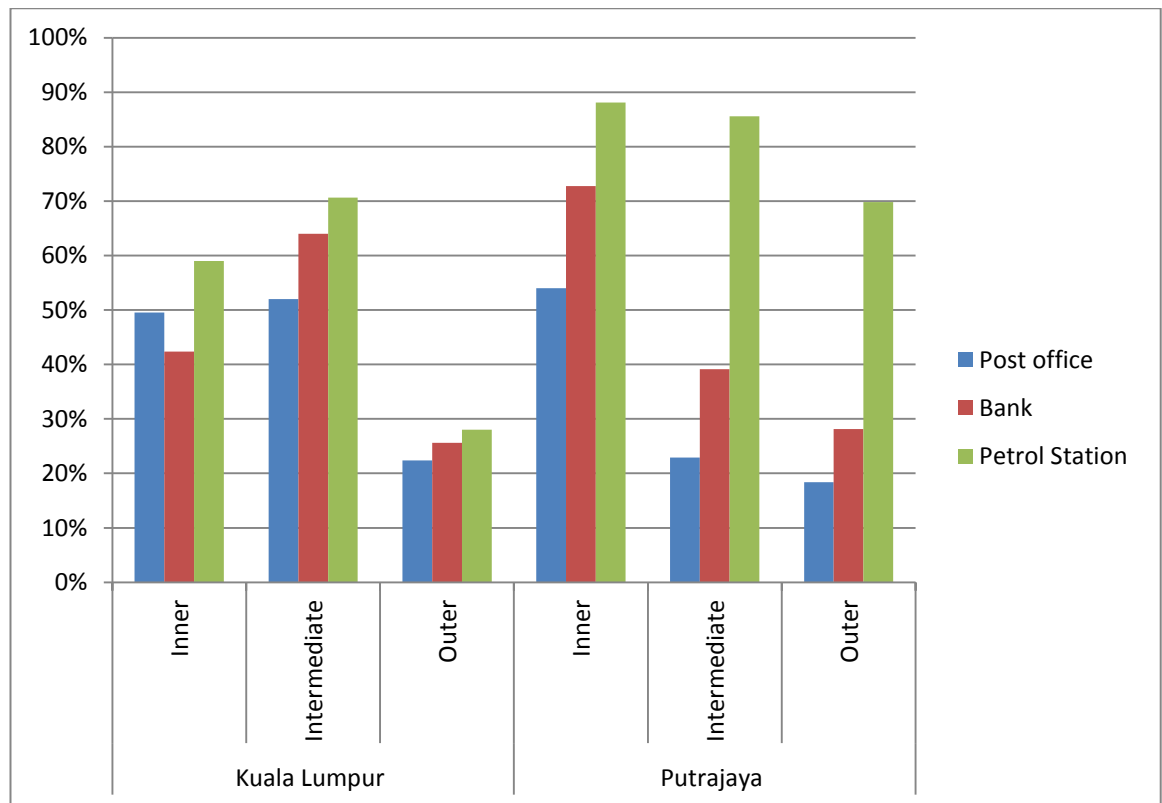
Figure 6.21: Other support services within easy access
Source: Household Survey, 2010

6.4.2 *Perception of local services and public facilities – location and quality aspect*

The local services and facilities in the study areas are further assessed based on two criteria; location and quality. Based on 5-point likert scale, the researcher derives the mean score of each facility within the study areas. Based on the scores, higher number indicates that they are highly regarded in terms of the criteria (location/ quality aspect) it is assessed upon. Table 6.4 and 6.5 shows the mean score of rating for the location and quality aspect accordingly. In terms of location, overall results indicate that post offices seems to have quite a low rating as compared to other services and facilities with an average mean score of 2.1. Good location rating was reported for religious facilities in all sub areas in both cities with an average mean score of 4.5. In Kuala Lumpur, there seems to be quite a poor rating for recreational facilities particularly park or garden (average mean score 3.8). In contrast, Putrajaya reports higher location rating

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for all recreational facilities with an average mean score of 4.31 for playground, 4.11 for football field and 4.20 for park/ garden.

Table 6.3: Rating of the local services and facilities according to location

	Kuala Lumpur		
	Inner	Intermediate	Outer
Commercial Facilities			
Supermarket	4.25	4.30	4.17
Sundry Shop	4.28	4.22	4.14
Healthcare facilities	4.17	4.02	4.03
Recreational facilities			
Playground	4.05	4.05	4.06
Football field	4.05	3.94	4.00
Park/Garden	3.97	3.64	3.86
Other Support Services			
Post office	1.89	2.06	2.16
Bank	4.09	4.20	4.05
Petrol Station	4.20	4.29	4.07
Religious	4.58	4.43	4.39
	Putrajaya		
	Inner	Intermediate	Outer
Commercial Facilities			
Supermarket	4.25	4.20	3.96
Sundry Shop	4.22	4.22	3.90
Healthcare facilities	4.30	4.34	4.08
Recreational facilities			
Playground	4.30	4.24	4.36
Football field	4.23	4.05	4.05
Park/Garden	4.25	4.04	4.26
Other Support Services			
Post office	1.88	2.15	2.45
Bank	4.30	4.12	3.88
Petrol Station	4.44	4.51	4.36
Religious	4.58	4.58	4.31

Source: Household Survey, 2010

Rating of quality for local services and facilities revealed that there is a poor rating for recreational facilities in Kuala Lumpur, particularly in the inner sub area. Park/ garden revealed to have the poorest quality rating among all services and facilities in Kuala Lumpur. Whereas, religious facility (mosque) revealed to have the best quality rating for all areas of both cities with an average mean score of 4.45 for Kuala Lumpur and 4.49 for Putrajaya.

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Table 6.4: Rating of the local services and facilities according to quality

	Kuala Lumpur		
	Inner	Intermediate	Outer
Commercial Facilities			
Supermarket	4.31	4.28	4.22
Sundry Shop	4.06	4.23	4.02
Healthcare facilities	4.14	4.15	3.99
Recreational facilities			
Playground	3.95	4.05	4.00
Football field	3.91	3.99	3.93
Park/Garden	3.88	3.93	3.74
Other Support Services			
Post office	4.10	4.13	3.96
Bank	4.13	4.29	4.09
Petrol Station	4.17	4.32	4.11
Religious	4.49	4.47	4.36
	Putrajaya		
	Inner	Intermediate	Outer
Commercial Facilities			
Supermarket	4.28	4.35	4.23
Sundry Shop	4.05	4.08	4.00
Healthcare facilities	4.25	4.27	4.15
Recreational facilities			
Playground	4.12	4.04	4.25
Football field	4.06	4.03	4.07
Park/Garden	4.13	4.08	4.23
Other Support Services			
Post office	4.06	4.09	3.82
Bank	4.29	4.25	4.13
Petrol Station	4.43	4.41	4.37
Religious	4.53	4.49	4.46

Source: Household Survey, 2010

6.5   Conclusion

The investigation on the residential areas of the case study cities were the main focus of this chapter. The discussion of the chapter was based on three sources, (i) observation survey, (ii) secondary sources and (iii) the household survey. In the initial stage, the chapter looks at profiling the case study cities according to the defined sub areas (inner, intermediate and outer). Subsequently, the researcher extracted findings from the observation survey to provide information on the provision of local services and public facilities. This chapter also looked into the details of the socio-demographic profile of the respondents before going into the assessment of residential aspects and their perceptions of local services and public facilities provided in their neighbourhood. With regards to the satisfaction with residential neighbourhood, approximately 80% are generally satisfied in all case study areas. For general dissatisfaction, the inner area of Kuala Lumpur reports higher percentage compared to the outer sub area of Kuala Lumpur. In Putrajaya, intermediate sub area revealed higher percentage of dissatisfaction as compared to other sub areas in the city. The study also captured information on social interaction within the case study cities. Findings indicate that meeting socially was more common in inner areas of both cities. While chatting or greeting were better in outer areas. This somehow indicates mixed findings, which depend on the type of activity people engaged in. The study conducted by CityForm indicated that social interaction improves as it moves away from the city centre (Bramley et al. in Jenks and Jones, 2010). Perceptions of problem and issues within the residential areas revealed that littering and lack of parking were the main problem in Kuala Lumpur. Putrajaya revealed to only have serious issues with lack of parking. Ratings of the services and local facilities also revealed mix findings. Generally, access of services and local facilities in Kuala Lumpur were reported better in inner and

intermediate areas, except for recreational facilities. However, in Putrajaya, access to most services and facilities are better in inner and intermediate. Access to recreational facilities was noted to be good at all sub areas in Putrajaya. Having studied these findings, the next chapter looks into detailed discussion of the respondents with regards to the pattern of usage and access to the local services and public facilities. It also further investigates the findings and tests its relationship with several elements of urban form.

Chapter 7: Modelling Access to and Use of Local Services and Facilities

7.1 Introduction

Access to local services and facilities is one of the indicatorsto assessquality of life (Pacione, 1989, p.12). Lotfi and Koohsari (2009, p.133) in their research of measuring objective accessibility to neighbourhood facilities stated that the public spaces are important locations that could have great impact on quality of life and the welfare of people. Different type of local services have different functions and usage, hence, it is expected that they would have different outcome with regards to perception of access and usage from the respondents. Data from the household survey was further analysed to capture significant findings related to access and usage of the local service and local facilities in the case study cities. The earlier part of this chapter explores the factors that influenced access to local services and facilities guided by three categories; economic, physical (include urban form elements) and psychological factors. These three categories were summarized from Chapman (1996, p.99) as he explains the factors that would impact equitable access to local services and facilities. Apart from that, the researcher also believes that it is important to understand the different aspects of having access, i.e. having physical access, costs and means of access and accessible services and facilities (aspect of quality). These different aspects have important implication on each other. Chapman (1996) explains that having greater distance would increase the need to travel, which implies having important environmental and equity implications. He clearly explains that *"the greater the distance, the more limited may be the choice of modes and the greater the resource and human costs"* (Chapman, 1996, p. 97). To have equitable access ensures that no one is denied access to opportunities and benefits that their physical environment offers. Hence, it is important to note that *"Equitable*

built environments minimize the elements and characteristics which limit their occupants' opportunities to use and move through it, irrespective of their particular levels of mobility" (Chapman, 1996, p.107).

The chapter follows with modelling the factors that influences the use of local services and facilities. As mentioned in earlier chapters, aspects of urban form that are being assessed in this study are density, building/housing type and mixed of use.Referring to the list of objectives in Chapter One and hypotheses formulated in Chapter Two, this chapter addresses the key objectives of the study and tests the key hypotheses formulated.

7.2   Access to Local Services and Facilities

7.2.1   Economic Factors

Several previous studies have indicated that socio-economic variables would have a relationship with access to certain local services and public facilities. Chapman (1996) stated that to increase the distance between resources and facilities may imply it would be more accessible only by private vehicle or certain mode of public transport. People that do not have access to private vehicles and means to travel on public transport may be excluded to benefit from their environment. Larsen and Gilliland (2008) explored the relation of access to supermarket with neighbourhood location, socio-economic characteristics and access to public transit in a midsized Canadian City (London, Ontario). Findings of the research indicated that residents of inner neighbourhoods of low socio-economic character have the poorest access to supermarket (Larsen and Gilliland, 2008). It is believed that a deprived community may lose access to certain facilities because they do not have access to the means of getting

there i.e. travel cost, when there is an increase in physical distance. However research conducted by Lotfi and Koohsari (2009) indicated the opposite. A research conducted in Tehran revealed that neighbourhoods with higher deprivation had more access to public spaces compared to the lesser deprivation (Lotfi and Koohsari, 2009, p.133). They justified their findings by arguing that poor household normally opt to use the nearest facilities due to limited resources. However, the high income groups have the resources and options to travel further distance that offers better quality facilities.

Having noted this variation, it is important for this research to establish the pattern of relationship between access to local services and socio-economic characteristics for Malaysian cities. The following analysis looks into the relationship of access to local services and facilities with several socio-economic variables. In this study, the perception of having good access may be influence by a mixture of physical, economic, quality and psychological factors. Hence, the researcher interprets the findings with these considerations. The variables that were tested against the perception of having good access to the selected local services and facilities are household income level, car ownership and residential ownership. These three variables were selected due to its nature to associate the data with the aspect of having the means and resources to access the selected services and facilities.

Table 7.1 presents the finding on the bivariate relationship between perceived access to local services and facilities with the household income group in the case study cities. For commercial facilities, finding revealed that for Kuala Lumpur, medium high income group (RM3001-RM5000) is the most likely to report good access to supermarket with 67%. However, for the sundry / convenience shop, the medium low income group (RM1001-RM3000) is more likely to report having good access (96.4%).

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The pattern is quite different for Putrajaya, where the lower income group (50.0%) were more likely to report having good access to supermarket as compared to the higher income group (27.5%). Through the chi-square analysis performed, this relationship was reported to be significant at 95% confidence level. No significant pattern was reported for the healthcare facilities. However, for the recreational facilities, in both case study cities, playground was the most reported facility that has good access especially among the low income group with 92.2% for Kuala Lumpur (95% confidence interval) and 100% for Putrajaya). Findings for other support services revealed an interesting finding for the religious facility (mosque),where more people among the lower income group (94.1% for Kuala Lumpur and 85.7% for Putrajaya) reports to have good access as compared to higher income group (90% for Kuala Lumpur and 82.6%) for both case study cities.

Table 7.1: Cross tabulation between household income level and access to local services and facilities (%)

		Low income group	Medium low income group	Medium high income group	High Income group
		(N=51)	(N=253)	(N=109)	(N=70)
Kuala Lumpur (N=483)	*Commercial Facilities*				
	Supermarket*	54.9	60.5	67.0	64.3
	Sundry Shop	90.2	96.4	95.4	92.9
	Healthcare facilities				
	Private and Public Clinics	72.5	70.0	65.1	65.7
	Recreational facilities				
	Playground	92.2	78.3	79.8	80.0
	Football field	45.1	47.0	54.1	45.7
	Park/Garden*	11.8	14.6	12.8	18.6
	Other Support Services				
	Post office	52.9	45.1	36.7	44.3
	Bank	37.3	45.1	45.9	47.1
	Petrol Station***	33.3	55.7	54.1	65.7
	Religious	94.1	91.7	91.7	90.0
		(N=14)	(N=182)	(N=219)	(N=167)
Putrajaya (N=582)	*Commercial Facilities*				
	Supermarket*	50.0	34.6	39.7	27.5
	Sundry Shop	64.3	87.4	83.6	85.0
	Healthcare facilities				
	Private and Public Clinics**	64.3	59.9	63.9	76.0
	Recreational facilities				
	Playground*	100.0	91.2	94.5	97.6
	Football field	35.7	46.7	54.8	56.9
	Park/Garden*	50.0	44.5	47.5	56.9
	Other Support Services				
	Post office	28.6	28.6	32.4	29.3
	Bank	21.4	41.8	47.0	46.7
	Petrol Station***	64.3	73.6	79.9	86.8
	Religious	85.7	84.6	82.2	82.6

indicates statistically significant at 10% level
*** statistically significant at 5% level*
****statistically significant at 1% level*
Source: Household Survey, 2010

Table 7.2: Cross tabulation between car ownership and access to local services and facilities (%)

		No Car	Owns one car	Owns two or more cars
		(N=52)	(N=236)	(N=209)
Kuala Lumpur (N=497)	*Commercial Facilities*			
	Supermarket	57.7	64.0	59.3
	Sundry Shop	98.1	93.6	95.2
	Healthcare facilities			
	Private and Public Clinics	71.2	71.2	63.6
	Recreational facilities			
	Playground	82.7	79.7	78.9
	Football field	48.1	45.3	49.8
	Park/Garden	7.7	13.1	17.2
	Other Support Services			
	Post office	46.2	43.6	42.6
	Bank	38.5	46.2	44.5
	Petrol Station***	36.5	54.2	59.8
	Religious	94.2	91.9	89.5
		(N=17)	(N=194)	(N=376)
Putrajaya (N=587)	*Commercial Facilities*			
	Supermarket	29.4	35.1	35.4
	Sundry Shop	82.4	83.5	85.1
	Healthcare facilities			
	Private and Public Clinics	58.8	62.4	68.1
	Recreational facilities			
	Playground	100.0	94.3	94.1
	Football field*	29.4	50.0	55.1
	Park/Garden	35.5	45.9	51.6
	Other Support Services			
	Post office	17.6	23.7	34.3
	Bank*	23.5	34.0	51.1
	Petrol Station	64.7	74.7	83.0
	Religious	76.5	85.1	82.7

indicates statistically significant at 10% level
*** statistically significant at 5% level*
****statistically significant at 1% level*
Source: Household Survey, 2010

Generally, car ownership in a particular household is regarded as one of the important factors that would determine the level of accessibility gained by household members (Ferguson and Woods in Jenks and Jones, 2010). Section 6.2.7 in Chapter Six has detailed out the car ownership status of this study. As reported earlier, on average, most of the respondents in Putrajaya have 2 cars and Kuala Lumpur have 1 car.Table 7.2 reports the findings of the relationship between car ownership and access to local

services and public facilities. However, overall, findings for Kuala Lumpur revealed that there is not much significant pattern on the relationship between car ownership and having good access. This may be due to the various options of public transportation available to serve the residents of Kuala Lumpur besides only a small fraction of household have no car. However, in Putrajaya, for most facilities except for playground, having at least one car seems to be important to access these facilities. This finding is somehow expected due to the fact that there is limited public transport option and the nature of the zoned layout. On the whole, access towards recreational facilities is better among those that own a car. This finding was reported significant for access to park/ garden at 95% confidence level. For other support services, the pattern of findings is quite similar except for religious facilities. For motorcycle ownership, although it is a popular use in most Malaysian cities, owning one does not imply having better access to most of the facilities. It was only reported significant to Putrajaya city specifically to have access to playground (see Table A7.1 in Appendix).

Figure 7.1: Playground with parking facilities in intermediate sub area of Putrajaya
Source: Observation Survey, 2010.

The researcher also looked into the influence of different home ownership on the perception of having good access local facilities and facilities in both case study cities

(see Table 7.3). In general, the findings revealed no significant pattern of relationship for either case study city. Hence, it cannot be concluded that home ownership has an impact on the perception of having of good access to facilities. However, when combining both cities' data, there seems to be significant relationship between home ownership and access to certain local services and public facilities (see Table A7.2 in Appendix). In this case, it is important to note that in Putrajaya, there are a high percentage of higher income socio-economic groups living in rented housing provided by the Governments to its civil servants. For some Putrajaya residents, it was observed that they already own a property at a different location, however, but live in Putrajayafor work purposes. For commercial facilities, only 41% of the respondents that are renting perceived to have access as compared to those that owns the property either owns with mortgage (61.5%) or owns outright (95%). Through the chi-square analysis performed, these findings were reported significant at 95% confidence level. Among the recreational facilities, playground was reported to have significant pattern and relationship. 90.2% of the respondents that are renting perceive to have good access to playgrounds. Whereas those that owns with mortgage and outright were only 77.6% and 87.1% accordingly. Finally, among the other support services category, petrol station was reported to have significant pattern and relationship at 95% confidence level. Finding indicates that 73.4% of the respondents that are renting perceive to have good access as compared to only 54.6% that owns with mortgage and 60.7% that owns outright.

Table 7.3: Cross tabulation between home ownership status and access to local services and facilities (%)

		Own with mortgage	Own outright	Renting
		(N=144)	(N=163)	(N=190)
Kuala Lumpur (N=497)	Commercial Facilities			
	Supermarket	62.5	57.1	64.2
	Sundry Shop	93.8	95.7	94.7
	Healthcare facilities			
	Private and Public Clinics	62.5	71.8	68.9
	Recreational facilities			
	Playground*	75.0	85.9	77.9
	Football field	53.5	41.7	47.9
	Park/Garden**	11.1	14.1	16.8
	Other Support Services			
	Post office	38.2	45.4	45.8
	Bank**	38.9	41.7	51.6
	Petrol Station	48.6	58.9	55.8
	Religious	91.0	92.0	90.5
		(N=30)	(N=15)	(N=542)
Putrajaya (N=587)	Commercial Facilities			
	Supermarket***	56.7	66.7	33.0
	Sundry Shop*	83.3	86.7	84.5
	Healthcare facilities			
	Private and Public Clinics	63.3	46.7	66.6
	Recreational facilities			
	Playground	90.0	100.0	94.5
	Football field	60.0	53.3	52.2
	Park/Garden	66.7	53.3	48.2
	Other Support Services			
	Post office	30.0	40.0	30.1
	Bank	46.7	40.0	44.6
	Petrol Station	83.3	80.0	79.5
	Religious	76.7	80.0	83.8

*indicates statistically significant at 10% level
** Statistically significant at 5% level
***Statistically significant at 1% level
Source: Household Survey, 2010

7.2.2   Physical Factors

Physical factor refers to the physical elements of urban neighbourhood which also can be referred as the urban elements/ urban forms. The assessment of physical factors on the access to local services and public facilities is essential to capture the significant findings that would provide solutions to improve the urban neighbourhoods in order for the local services and public facilities to be more equitable to all. Evans

(2009) mentioned that accessibility and mobility within urban neighbourhood is influenced by the design and layout of the physical built environment- the buildings and road infrastructure. Erkip (1997) stressed that for most of the fixed urban services such as parks, libraries and public health facilities, physical proximity is required.

This subsection looks at the analysis of the relationship between physical elements i.e. housing type, density, mixed land use and layout with the access to the local services and public facilities. The findings are derived from the combination of household survey and observation survey.

- *Housing type*

Table 7.4 reveals the finding of the relationship between case study cities, housing type and access to the local facilities and services. For the access to commercial facilities, it revealed that respondents that lived in the flat/apartment are more likely to perceive having access to both supermarket and sundry shops as compared to other housing type. These findings were reported significant at 99% confidence level for Kuala Lumpur city and access to supermarket and 95% confidence level for access to sundry shop for both case study cities. This pattern also applies to access to religious facilities and it is reported significant for Putrajaya's case at 99% confidence level. On the other hand, the pattern for access to healthcare facilities was quite different. This revealed that those living in detached/semi-detached houses are greater to perceived having access to either public or private healthcare facilities compared to those living in terrace houses or flat/apartments. This finding may be influenced by the fact that those living in semi-detached/detached are of better economic status, hence, have wider options in choosing between private healthcare facilities. Conversely, residents of flat/apartment are usually among the low income group hence, would find difficult to

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visit the private clinic which were observed to more accessible in both case study cities compared to public healthcare facilities (Observation Survey, 2011).

Table 7.4: Relationship between case study cities, housing type and access to local facilities and services (%)

		Detached/ Semi-detached	Terraced	Flat/ Apartment
		(N=31)	(N=165)	(N=298)
Kuala Lumpur (N=497)	Commercial Facilities			
	Supermarket***	61.3	48.5	68.8
	Sundry Shop**	90.3	91.5	97.0
	Healthcare facilities			
	Private and Public Clinics***	77.4	53.3	75.2
	Recreational facilities			
	Playground	83.9	78.8	79.9
	Football field	45.2	44.8	49.7
	Park/Garden	3.2	14.5	15.4
	Other Support Services			
	Post office**	67.7	40.0	43.0
	Bank	41.9	41.8	46.6
	Petrol Station	61.3	57.6	52.3
	Religious	90.3	88.5	93.0
		(N=51)	(N=324)	(N=210)
Putrajaya (N=587)	Commercial Facilities			
	Supermarket	33.3	34.3	37.1
	Sundry Shop**	86.3	80.9	89.5
	Healthcare facilities			
	Private and Public Clinics**	76.5	67.9	60.0
	Recreational facilities			
	Playground	98.0	94.8	92.9
	Football field**	70.6	53.1	47.6
	Park/Garden**	47.1	53.7	42.9
	Other Support Services			
	Post office	35.3	29.0	30.5
	Bank	54.9	42.3	45.2
	Petrol Station	84.3	80.9	76.7
	Religious***	90.2	76.2	92.4

*indicates statistically significant at 10% level
** Statistically significant at 5% level
***Statistically significant at 1% level
Source: Household Survey, 2010

- *Density*

As the literature unravels, density has always been associated with access to services because of its influence on the aspect of viability of a service or facility (Burton

2000; Burton 2003; Rokicka and Warzywoda-Kruszyńska 2006; Bramley, Dempsey et al. 2009; Bramley and Power 2009; Jenks, Jones et al. 2010). Most research hypothesized that density plays a significant role in determining access to particular service or facilities. The following table reveals the three way relationship between case study cities, density and access to local facilities and services. For Kuala Lumpur, finding for commercial facilities were reported significant. Since total n for low density in Kuala Lumpur is very low (n=7), the researcher only considered results for medium density and high density sub areas. As expected, access to sundry shop facilities was better within the high density areas (96.9%). Relationship for access to sundry shop in Putrajaya also reports the same finding (89.6%) and it was also reported to be confidence at 99% confidence level. Access to recreational facilities was also reported to be significant for Putrajaya's case. Findings revealed that easy access to recreational was greater among those living in low density areas (98% and 71%) particularly the playground and football field followed by medium density (95% and 53%) and finally the high density (93% and 48%). However, after combining data for Kuala Lumpur and Putrajaya, patterns for access to most facilities are more clear and distinct (see Table 7.6). Access to commercial facilities was reported to be easier in high density areas. In lower densities, it was revealed that there are better access to not only recreational facilities but also healthcare facilities, banks and petrol stations. This may also be influenced by the high car ownership in both cities. Through the use of private cars, residents can easily access services and facilities at a greater distance despite living in low density areas. Previous research such as Breheney (1992), Knight (1996); Stretton (1994); Burton (1997, 2000); Williams (2000); and Bramley et.al. (2009) claimed that higher density areas have better access to services and facilities due to its compactness and proximity. Williams (2000, p.40) claimed that intensification of urban areas *"improve accessibility to services and facilities"*. It was further added that for retail

facilities, higher densities improved access best to shops that serves *everyday need* (Williams, 2000, p.40).Hence, the researcher would likely accept the hypothesis that density is a significant factor towards having access to certain services and facilities.However, the mixed findings may be further improved when other variables such as demographic variables are being controlled for.

Table 7.5: Relationship between case study cities, density and access to local facilities and services

		Low density (N=7)	Medium density (N=201)	High density (N=289)
Kuala Lumpur (N=497	Commercial Facilities			
	Supermarket***	85.7%	47.8%	70.2%
	Sundry Shop***	85.7%	92.0%	96.9%
	Healthcare facilities			
	Private and Public Clinics***	71.4%	59.2%	74.0%
	Recreational facilities			
	Playground	57.1%	81.6%	78.9%
	Football field	28.6%	44.8%	49.8%
	Park/Garden		14.4%	14.5%
	Other Support Services			
	Post office	71.4%	42.3%	43.6%
	Bank*	71.4%	39.8%	47.4%
	Petrol Station	85.7%	55.2%	53.6%
	Religious	85.7%	89.6%	92.4%
		(N=51)	(N=324)	(N=212)
Putrajaya (N=587)	Commercial Facilities			
	Supermarket	33.3%	34.3%	36.8%
	Sundry Shop***	86.3%	80.9%	89.6%
	Healthcare facilities			
	Private and Public Clinics**	76.5%	67.9%	60.4%
	Recreational facilities			
	Playground	98.0%	94.8%	92.9%
	Football field**	70.6%	53.1%	47.6%
	Park/Garden**	47.1%	53.7%	42.9%
	Other Support Services			
	Post office	35.3%	29.0%	31.1%
	Bank	54.9%	42.3%	45.8%
	Petrol Station	84.3%	80.9%	76.9%
	Religious***	90.2%	76.2%	92.5%

*indicates statistically significant at 10% level
** Statistically significant at 5% level
***Statistically significant at 1% level
Source: Household Survey, 2010

Table 7.6: Relationship between density and access to local facilities and services

	Low density (n=58)	Medium density (n=525)	High density (n=501)
Commercial Facilities			
Supermarket***	39.7%	39.4%	56.1%
Sundry Shop***	86.2%	85.1%	93.8%
Healthcare facilities			
Private and Public Clinics***	75.9%	64.6%	68.3%
Recreational facilities			
Playground**	93.1%	89.7%	84.8%
Football field*	65.5%	49.9%	48.9%
Park/Garden***	41.4%	38.7%	26.5%
Other Support Services			
Bank**	56.9%	41.3%	46.7%
Petrol Station**	84.5%	71.0%	63.5%
Religious***	89.7%	81.3%	92.4%

indicates statistically significant at 10% level
*** Statistically significant at 5% level*
****Statistically significant at 1% level*
Source: Household Survey, 2010

- ***Mixed land use***

Land use is one of the elements of urban form claimed to have impact on access to services and facilities. Table 7.7 reports the finding for the relationship between land use and access to local facilities and services. To perform this analysis, the researcher has divided the samples into two categories; i.e. single land use and some land use mix. The category was derived from map-based information and observation survey. Relationship between land use and access to commercial facilities revealed that areas with some land use mix have greater access to facilities (61.6% for supermarket and 95.4% for sundry shop). Based on the chi-square analysis, it was likely to have significant relationship with most of the services and facilities except for bank and petrol station. This finding corresponds to the previous research that claims having land use diversification would lead to having good access (Burton, 1997; 2000a; 2000b).

Table 7.7: Relationship between land use and access to local facilities and services

	Single land use -residential (n=696)	Some land use mix (n=388)
Commercial Facilities		
Supermarket***	39.1%	61.6%
Sundry Shop***	85.8%	95.4%
Healthcare facilities		
Private and Public Clinics*	64.8%	70.6%
Recreational facilities		
Playground***	91.2%	81.2%
Football field*	52.4%	46.4%
Park/Garden***	44.1%	13.7%
Other Support Services		
Post office**	32.8%	42.8%
Bank	45.7%	42.8%
Petrol Station***	75.6%	55.2%
Religious***	83.5%	93.0%

indicates statistically significant at 10% level
*** Statistically significant at 5% level*
****Statistically significant at 1% level*
Source: Household Survey, 2010

7.2.3 Psychological Factors

As Evans (2009) explains, psychological factors may impact on access to services and facilities when there are psychological barriers such as fear of crime and safety towards their neighbourhood surrounding. This may cause people to avoid using services and facilities within their neighbourhood and chose to go further where they consider safer environment. On another note, psychological factors also relates to physical factors which involve the people's perceptions towards layout and condition of the physical environment (Chapman, 1996). This also led to feeling of fear and safety towards their neighbourhood. Better social interactions among the neighbourhood community also claimed to have impact on access to local facilities and services. Hence, the researcher believes that strong social network improves the sense of belonging to the environment that facilitates better participation within the neighbourhood.

Previous studies have suggested that urban form does have significant relationship with social interaction (Dempsey et al, 2011; Bramley and Power, 2009; Burton, 2000a, 2000b; 2003). For example, denser urban form increases the opportunities for spontaneous interactions in the streets because of the greater range of people (Dempsey, et al. 2011). However, it is also argued that with an increased population density, there is a loss of sensitivity (Macionis and Parrillo, 2010). Macionis and Parillo (2010, p. 136) states *"physical closeness tends to increase social distance"*. It is also claimed to be positively related to area dissatisfaction (Bramley and Power, 2009). These aspects indirectly influence the feeling of sense of ownership towards a place, and would impact how a person interacts within their neighbourhood. Hence, it may be concluded that higher social activity within their own community or neighbourhood may also indicate their attitude towards using and accessing services and facilities in the vicinity. As a result, the research aims to test whether there is a significant relationship between certain psychological variables and access to services and facilities for the case study areas. The variables involved are self-reported response towards questions in the household questionnaire survey forms. Among the variables are satisfaction towards community, perception of feeling safe, social interaction level and perception of mobility.

An independent sample T-Test was performed to capture the relationship between level of satisfaction towards community and access to services and facilities. Satisfaction towards community was analysed based on 3 point scale (*3: Satisfied, 2: Neutral and 1: Not satisfied*). Based on the findings reported in Table 7.8, the relationship are not obvious. Mean score for the access for all services and local facilities seems to be very close with an average of 2.79 which falls under the '*satisfied*' category. The differences for all variables were not significant. These suggest that

satisfaction towards community within the neighbourhood does not impact perception of easy access to services and local facilities.

Table 7.8: Satisfaction towards community and perceived access towards selected facilities and services

	Easy access	No easy access	Levene's Test (sig.)	t-test (sig.)
Commercial Facilities				
Supermarket (n=508)	2.81	2.80	0.55	0.75
Sundry Shop (n=960)	2.80	2.78	0.39	0.69
Healthcare facilities				
Private and Public Clinics (n=721)	2.80	2.79	0.47	0.67
Recreational facilities				
Playground (n=941)	2.80	2.79	0.84	0.88
Football field (n=544)	2.80	2.81	0.66	0.82
Park/Garden (n=359)	2.77	2.80	0.00	0.12
Other Support Services				
Post office (n=394)	2.78	2.81	0.02	0.23
Bank (n=483)	2.78	2.82	0.02	0.24
Petrol Station (n=737)	2.79	2.82	0.09	0.38
Religious (n=935)	2.80	2.81	0.41	0.71

Source: Household Survey, 2010

Social interaction within the neighbourhood gives the ability to indicate the level of participation in the local community. As mentioned in the earlier subsection, better social interaction can improve perceived access to services and facilities. To capture this essence, the researcher performed Independent T-Test to assess its relationship between the respondents' level of social interaction in the neighbourhood with perceived access to services and facilities. The range of scores for level of social interaction variable is 1 for *"none at all"* and 5 for *"almost all"*, which refers to the number of people or neighbours they socialize with within the neighbourhood. This denotes, higher mean score indicates greater social interaction. Table 7.9 shows the different level of satisfaction towards community between those that reports to have easy access and no easy access. Overall, findings indicate a weak relationship between satisfaction towards

community and perceived access. However, most of the facilities that were perceived to have good access on average have higher score of social interaction level as compared to those that perceived have no easy access. Though the difference is marginal, it can be considered as an indication that better social interaction improves perception towards perceived access and possibly that better access to facilities encourages more social interaction i.e. mutual and two way communications.

Table 7.9: Level of social interaction and perceived access to selected facilities and services

	Easy access	No easy access	Levene's Test (sig.)	t-test (sig.)
Commercial Facilities				
Supermarket (n=511)	2.58	2.59	0.814	0.826
Sundry Shop (n=967)*	2.57	2.73	0.018	0.084
Healthcare facilities				
Private and Public Clinics (n=725)	2.61	2.54	0.562	0.267
Recreational facilities				
Playground (n=949)	2.57	2.68	0.743	0.236
Football field (n=545)	2.59	2.58	0.805	0.768
Park/Garden (n=360)	2.58	2.58	0.000	0.985
Other Support Services				
Post office (n=394)**	2.70	2.52	0.520	0.002
Bank (n=484)	2.60	2.57	0.094	0.555
Petrol Station (n=739)	2.59	2.57	0.029	0.716
Religious (n=941)	2.59	2.55	0.320	0.615

Source: Household Survey, 2010

The researcher further investigates the relationship between easy accesses to services with safety variables. Previous studies have proven that perceived safety is considered as a fundamental part of social sustainability (Dempsey et al., 2011; Burton and Mitchell, 2006; Burton 2000a). Dempsey et al. (2010) explain that perceived safety of a neighbourhood tend to have a lot of advantages. As Macionis and Parrillo explain, it enhances trust and reciprocity between residents which contribute to better social interactions and generate sense of community in the neighbourhood. In this study, the

range of score for perceived safety is 3 for *"good"*; 2 for *"neutral"* and 1 for *"bad"* Hence, higher mean scores indicate better perceived safety. With reference to Table 7.10, findings indicate that aspect of safety does not impact much on the access to most services and facilities except for access to healthcare facilities (mean score of 2.73) that indicates a difference from the average at the 90% confidence level. However, overall, it was revealed that those that have easy access have better perceived safety (average mean score 2.71) as compared to those that does not have easy access (average mean score 2.68).

Table 7.10: Perceived safety and perceived access to selected facilities and services

	Easy access	No easy access	Levene's Test (sig.)	t-test (sig.)
Commercial Facilities				
Supermarket(n=509)	2.70	2.71	0.80	0.82
Sundry Shop (n=960)	2.71	2.68	0.03**	0.64
Healthcare facilities				
Private and Public Clinics (n=719)	2.73	2.67	0.04**	0.07*
Recreational facilities				
Playground (n=941)	2.72	2.63	0.01**	0.17
Football field (n=544)	2.75	2.67	0.01**	0.07*
Park/Garden (n=358)	2.67	2.73	0.07*	0.23
Other Support Services				
Post office (n=393)	2.68	2.73	0.09*	0.28
Bank (n=483)	2.71	2.71	0.41	0.89
Petrol Station (n=738)	2.73	2.67	0.03**	0.18
Religious (n=934)	2.71	2.69	0.59	0.72

indicates statistically significant at 10% level
*** Statistically significant at 5% level*
****Statistically significant at 1% level*
Source: Household Survey, 2010

The aspect of mobility seems to have significant relationship with easy access to majority of the services and local facilities (see Table 7.11). Access to sundry shop, healthcare facilities, football field, post offices, banks and petrol station were reported significant at least 95% confidence level whereas, easy access to sundry shop was reported significant at 90 % confidence level. This also relates to car ownership as all of the respondents in the case study cities were reported to have at least one car (see

Chapter Six). It is important to note here that aspect of mobility which refers to how well respondents can move about in the neighbourhood and access is somewhat similar measures; this is the reason for the high correlation between the two variables. However, it is still worth noting the findings that the aspect of mobility is important for residents to have access to local facilities and services. Hence, the researcher would likely support the second hypothesis of this study that states; *"ease of mobility within the neighbourhood would result to better access and usage of selected services and facilities".*

Table 7.11: Perception of mobility in neighbourhood and perceived access to selected facilities and services

	Easy access	No easy access	Levene's Test (sig.)	t-test (sig.)
Commercial Facilities				
Supermarket (n=488)	2.68	2.64	0.27	0.28
Sundry Shop (n=935)	2.69	2.37	0.00***	0.00***
Healthcare facilities				
Private and Public Clinics (n=696)	2.70	2.58	0.00***	0.00***
Recreational facilities				
Playground (n=911)	2.67	2.59	0.02**	0.24
Football field (n=521)	2.70	2.62	0.01**	0.06*
Park/Garden (n=334)	2.61	2.68	0.00***	0.12
Other Support Services				
Post office (n=374)	2.73	2.62	0.00***	0.01**
Bank (n=464)	2.74	2.59	0.00***	0.00***
Petrol Station (n=706)	2.69	2.60	0.00***	0.06*
Religious (n=910)	2.68	2.51	0.00***	0.00***

*indicates statistically significant at 10% level
** Statistically significant at 5% level
***Statistically significant at 1% level
Source: Household Survey, 2010

7.3 Use of Services and Local Facilities

Previous research in United Kingdom has shownthat useof local services and facilities is often influenced by urban form, in terms of their location in relation to residents which also relates to method of transport used and frequency of usage (Bramley et al in Jenks and Jones, 2010, p. 122). Other research mentioned factors that would impact utilization of public spaces are accessibility, comfort, safety and physical attractiveness (Erkip, 1997 and Pasaogullari and Doratli, 2008, p. 227). Erkip (1997) also stated that certain user characteristics also affect the utilization of public space i.e. demographic background. Location-wise, services and facilities located closer to home are more likely to be reached by foot or bicycle. However, findings from previous research revealed that having services closer to home does not necessarily imply that residents will use those services. It only implies that they have the convenience to just walk or cycle to use those services. Most of the time, people opt for other factors such as the quality of the services rather than convenience (Bramley et al in Jenks and Jones, 2010, p.122). It can also be argued that usage frequency increases with density mainly due to greater accessibility of more central areas. Previous research also revealed two key factors that have significant impact on the use of public space, which are related to perceived safety and maintenance (Bramley et al in Jenks and Jones, 2010, p. 122). Hence, besides modelling the factors that affect the use of services and local facilities, it would also look into testing the hypothesis that the use of services and facilities are related to safety and quality of the services and local facilities. It is also expected that this research would have quite a different finding due to different context in several aspects. Among them are the local weather/climate and the culture of the local people. In the UK walking a relatively short distance is regarded as something normal to access services and facilities. However, this situation cannot be applied to Malaysia, due to the hot tropical climate. It has also been the local culture that, most of the time; Malaysian

people would prefer to drive (in an air-conditioned vehicle) as it would give more comfort and less stress. Variation of the result as compared to previous research might occur due to these significant differences. The assessment on the use of selected local services and facilities was attempted to look at whether they use the facilities provided within the neighbourhood. Analysis was done through the assessment of two and three way relationship and was further tested using chi-square analysis. Following these findings, the researcher will further established the usage pattern in the later subsection through logistic ordinal regression modelling.

7.3.1 Economic Factor

The assessment on the relationship between use of services and facilities and economic variables revealed that only certain variables were significantly related. Referring to Table 7.12, in terms of household income level, in Kuala Lumpur, it was revealed that all income groups used the sundry shop within the neighbourhood except for the medium low income group (97%) (significant at 90% confidence level). For Putrajaya, it was noted that healthcare facilities and were used more by the lower income households (93%) as compared to other income groups (significant at 95% confidence level. It was also revealed that recreational facilities i.e. playground and parks were used more by the higher income and middle high income households (91% for playground and 59% for parks). This finding is reported significant at 90% confidence level. With regards to car ownership, overall, the three-way relationship revealed that the use of services within the neighbourhood in Putrajaya is highly dependent on car ownership as it revealed higher use among those that owns at least one car (see Table 7.13). This is different for Kuala Lumpur as several selected facilities (i.e. sundry shops, healthcare facilities, banks, playground, football field and religious

facilities) report to have higher usage among those that have no cars. This indicates that Putrajaya's resident is greatly dependent on private vehicles as compared to Kuala Lumpur. This finding also corresponds to previous finding on perceived access in Putrajaya (see Table 7.2, p. 193).

Table 7.12: Cross tabulation between household income level and use of local services and facilities (%)

		Low income group	Medium low income group	Medium high income group	High Income group
		(N=51)	(N=253)	(N=109)	(N=70)
Kuala Lumpur (N=483)	*Commercial Facilities*				
	Supermarket	88%	84%	88%	89%
	Sundry Shop *	100%	97%	100%	100%
	Healthcare facilities				
	Private and Public Clinics*	94%	82%	81%	90%
	Recreational facilities				
	Playground	73%	67%	72%	74%
	Football field	47%	40%	49%	34%
	Park/Garden*	25%	19%	17%	25%
	Other Support Services				
	Post office**	82%	74%	66%	83%
	Bank	86%	77%	75%	80%
	Petrol Station	76%	79%	78%	86%
	Religious	96%	93%	93%	94%
		(N=14)	(N=182)	(N=219)	(N=167)
Putrajaya (N=582)	*Commercial Facilities*				
	Supermarket*	86%	77%	81%	80%
	Sundry Shop	93%	91%	93%	95%
	Healthcare facilities				
	Private and Public Clinics**	93%	77%	88%	87%
	Recreational facilities				
	Playground*	79%	82%	88%	91%
	Football field	36%	44%	52%	36%
	Park/Garden*	50%	54%	60%	59%
	Other Support Services				
	Post office	71%	70%	79%	75%
	Bank	86%	79%	85%	84%
	Petrol Station	86%	90%	94%	95%
	Religious	93%	90%	93%	92%

*indicates statistically significant at 10% level
** statistically significant at 5% level
***statistically significant at 1% level
Source: Household Survey, 2010

Table 7.13: Cross tabulation between car ownership and use of local services and facilities (%)

		No Car	Owns one car	Owns two or more cars
		(N=52)	(N=236)	(N=209)
Kuala Lumpur (N=497)	*Commercial Facilities*			
	Supermarket	84.6%	85.2%	87.6%
	Sundry Shop	100.0%	99.2%	97.6%
	Healthcare facilities			
	Private and Public Clinics	88.5%	83.1%	84.7%
	Recreational facilities			
	Playground*	78.8%	67.8%	67.5%
	Football field	50.0%	43.2%	35.9%
	Park/Garden	17.3%	20.3%	16.3%
	Other Support Services			
	Post office	78.8%	70.8%	78.0%
	Bank	84.6%	75.0%	79.9%
	Petrol Station*	69.2%	78.4%	83.3%
	Religious	94.2%	92.4%	93.3%
		(N=17)	(N=194)	(N=376)
Putrajaya (N=587)	*Commercial Facilities*			
	Supermarket	70.6%	80.4%	79.8%
	Sundry Shop	88.2%	91.8%	93.4%
	Healthcare facilities			
	Private and Public Clinics**	58.8%	82.0%	86.7%
	Recreational facilities			
	Playground**	64.7%	83.0%	88.8%
	Football field	70.6%	55.2%	50.0%
	Park/Garden*	35.3%	57.2%	59.0%
	Other Support Services			
	Post office**	41.2%	73.2%	76.9%
	Bank	76.5%	79.4%	85.1%
	Petrol Station***	47.1%	92.8%	94.7%
	Religious ***	64.7%	91.2%	92.8%

*indicates statistically significant at 10% level
** statistically significant at 5% level
***statistically significant at 1% level
Source: Household Survey, 2010

Table 7.14 looks at the relationship between home ownership and use of local services and facilities. Pattern of the relationship revealed mixed findings. It was noted that none of the use of services and facilities are significantly related to home ownership in Putrajaya. This may be due to the high renting households as mentioned earlier (p, 195).

Table 7.14: Cross tabulation between home ownership status and use of local services and facilities (%)

		Own with mortgage	Own outright	Renting
		(N=144)	(N=163)	(N=190)
Kuala Lumpur (N=497)	Commercial Facilities			
	Supermarket	81.9%	90.2%	85.8%
	Sundry Shop	99.3%	97.5%	98.9%
	Healthcare facilities			
	Private and Public Clinics***	91.0%	91.4%	73.2%
	Recreational facilities			
	Playground	68.8%	70.6%	67.4%
	Football field*	48.6%	38.0%	37.4%
	Park/Garden	19.4%	16.0%	19.5%
	Other Support Services			
	Post office***	77.8%	81.6%	66.3%
	Bank	75.7%	81.0%	77.4%
	Petrol Station**	75.0%	86.5%	76.8%
	Religious	94.4%	92.0%	92.6%
		(N=30)	(N=15)	(N=542)
Putrajaya (N=587)	Commercial Facilities			
	Supermarket	90.0%	86.7%	79.0%
	Sundry Shop	93.3%	86.7%	92.8%
	Healthcare facilities			
	Private and Public Clinics	86.7%	66.7%	84.7%
	Recreational facilities			
	Playground	80.0%	93.3%	86.3%
	Football field	50.0%	53.3%	47.4%
	Park/Garden	70.0%	66.7%	56.8%
	Other Support Services			
	Post office	76.7%	66.7%	74.7%
	Bank	90.0%	80.0%	82.7%
	Petrol Station	90.0%	80.0%	93.2%
	Religious	86.7%	100.0%	91.5%

*indicates statistically significant at 10% level
** Statistically significant at 5% level
***Statistically significant at 1% level
Source: Household Survey, 2010

7.3.2 Physical Factors

Analysis of the relationship between the usage and physical factors or urban form variable revealed some interesting findings. Based on the result of the bivariate analysis, it revealed some mixed findings. However, for housing type, it is noted that in both case study cities, playground were used more by households of detached/ semi-detached with

90.3% in Kuala Lumpur and 90.2% (significant level of 95% in Kuala Lumpur and 99% in Putrajaya). On the other hand, in relation to density, as low density only reports a marginal response, only medium and high density is considered for interpretation. Overall, medium density shows higher percentage of respondents using the services and facilities in both cities except for sundry shop; religious facilities and banksin Putrajaya and sundry shop in Kuala Lumpur (see Table 7.16).

Table 7.15: Three way relationship between case study cities, housing type and use of local facilities and services (%)

		Detached/ Semi-detached	Terraced	Flat/ Apartment
		(N=31)	(N=165)	(N=298)
Kuala Lumpur (N=497)	Commercial Facilities			
	Supermarket	93.5%	87.9%	84.6%
	Sundry Shop	100.0%	98.2%	98.7%
	Healthcare facilities			
	Private and Public Clinics***	100.0%	91.5%	79.2%
	Recreational facilities			
	Playground**	90.3%	71.5%	65.4%
	Football field	45.2%	41.2%	40.6%
	Park/Garden	32.3%	18.8%	16.8%
	Other Support Services			
	Post office***	96.8%	87.9%	65.4%
	Bank***	90.3%	87.9%	71.8%
	Petrol Station***	87.1%	90.9%	72.1%
	Religious	96.8%	92.1%	93.3%
		(N=51)	(N=324)	(N=210)
Putrajaya (N=587)	Commercial Facilities			
	Supermarket	74.5%	80.9%	79.5%
	Sundry Shop	88.2%	92.3%	94.3%
	Healthcare facilities			
	Private and Public Clinics**	84.3%	88.3%	78.1%
	Recreational facilities			
	Playground***	90.2%	90.1%	79.0%
	Football field*	49.0%	51.5%	41.9%
	Park/Garden	56.9%	61.1%	52.9%
	Other Support Services			
	Post office	72.5%	75.3%	73.8%
	Bank	86.3%	81.8%	84.3%
	Petrol Station	92.2%	94.1%	90.5%
	Religious	92.2%	91.0%	92.4%

*indicates statistically significant at 10% level
** Statistically significant at 5% level
***Statistically significant at 1% level
Source: Household Survey, 2010

Table 7.16: Relationship between case study cities, density and use of local facilities and services

		Low density (N=7)	Medium density (N=201)	High density (N=289)
Kuala Lumpur (N=497	**Commercial Facilities**			
	Supermarket	100.0%	87.6%	84.8%
	Sundry Shop	100.0%	98.5%	98.6%
	Healthcare facilities			
	Private and Public Clinics***	100.0%	91.5%	78.9%
	Recreational facilities			
	Playground**	71.4%	75.1%	64.4%
	Football field*	42.9%	41.3%	40.5%
	Park/Garden	28.6%	21.4%	15.9%
	Other Support Services			
	Post office***	100.0%	87.6%	65.1%
	Bank***	100.0%	86.6%	71.6%
	Petrol Station***	100.0%	88.6%	72.7%
	Religious	85.7%	93.5%	92.7%
		(N=51)	*(N=324)*	*(N=212)*
Putrajaya (N=587)	**Commercial Facilities**			
	Supermarket	74.5%	80.9%	79.2%
	Sundry Shop	88.2%	92.3%	94.3%
	Healthcare facilities			
	Private and Public Clinics**	84.3%	88.3%	78.3%
	Recreational facilities			
	Playground***	90.2%	90.1%	79.2%
	Football field*	49.0%	51.5%	41.5%
	Park/Garden	56.9%	61.1%	52.8%
	Other Support Services			
	Post office	72.5%	75.3%	74.1%
	Bank	86.3%	81.8%	84.0%
	Petrol Station	92.2%	94.1%	90.6%
	Religious	92.2%	91.0%	92.0%

indicates statistically significant at 10% level
*** Statistically significant at 5% level*
***Statistically significant at 1% level*
Source: Household Survey, 2010

Table 7.17 shows the bivariate relationship between use of local facilities and services and land use (single residential use and some land use mix). For commercial facilities, as expected, households within areas of some land use mix shows higher use as compared to households within single residential use areas. Recreational facilities use is greater within single residential use areas (significant at 95% and 99% confidence

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level). These findings correspond well with previous research that noted some mix of land use have better usage of services and facilities particularly the retail services.

Table 7.17: Relationship between land use and use of local facilities and services

	Single land use -residential (n=696)	Some land use mix (n=388)
Commercial Facilities		
Supermarket	81.5%	84.8%
Sundry Shop**	93.8%	98.2%
Healthcare facilities		
Private and Public Clinics	85.1%	83.0%
Recreational facilities		
Playground***	83.5%	68.8%
Football field**	47.6%	39.2%
Park/Garden***	51.7%	18.0%
Other Support Services		
Post office	76.1%	71.9%
Bank**	83.5%	75.8%
Petrol Station***	91.7%	77.6%
Religious*	91.1%	94.1%

indicates statistically significant at 10% level
*** Statistically significant at 5% level*
****Statistically significant at 1% level*
Source: Household Survey, 2010

Table 7.18 shows relationship between layout types and use of local facilities and services. The findings indicate that respondents with dwellings within courtyard-type of layoutshave higher use of recreational facilities. Subsequently, supermarket facilities were used more by respondents with dwelling within both linear and superblock layout. This finding corresponds to results of the housing type which indicate similar pattern.

Table 7.18: Relationship between layout types and use of local facilities and services

	Superblock (n=511)	Linear block (n=494)	Cul-de-sacs (n=25)	Courtyard (n=52)
Commercial Facilities				
Supermarket	82.6%	84.2%	72.0%	75.0%
Sundry Shop**	96.9%	94.7%	92.0%	88.5%
Healthcare facilities				
Private and Public Clinics	78.5%	91.1%	68.0%	84.6%
Recreational facilities				
Playground***	70.8%	85.0%	68.0%	90.4%
Football field	41.1%	47.8%	40.0%	51.9%
Park/Garden	31.7%	45.1%	56.0%	57.7%
Other Support Services				
Post office ***	68.7%	81.8%	56.0%	73.1%
Bank**	76.7%	85.2%	64.0%	86.5%
Petrol Station***	79.6%	93.3%	84.0%	92.3%
Religious**	92.8%	92.5%	76.0%	92.3%

*indicates statistically significant at 10% level
** Statistically significant at 5% level
***Statistically significant at 1% level
Source: Household Survey, 2010

7.3.3 Psychological Factors

Based on previous research and as discussed in earlier subsections, psychological factors were also argued to have influence on the use of the services and facilities (Evans, 2009; Chapman, 1996). As shown in Table 7.19, satisfaction towards community and neighbourhood was found positively impact the use of majority of the facilities and services except for petrol station. This finding also applies to social interaction, as higher level of social interaction positively impacts the use of majority of facilities and services except for sundry shop (see Table 7.20). Also, as expected, feeling safe would also give a positive impact to the behaviour of the residents within a residential neighbourhood. In this study, results shown that it has improved the use of services and facilities except for post office (see Table 7.21). This corresponds with previous findings that suggest similar patterns. Findings from the CityForm research

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suggested that respondents were less likely to use facilities, i.e. parks, if they felt unsafe

(Bramley et al. in Jenks and Jones, 2010).

Table 7.19: Satisfaction towards community and use of selected facilities and services

	Use	Does not use	Levene's Test (sig.)	t-test (sig.)
Commercial Facilities				
Supermarket	2.81	2.76	0.03**	0.21
Sundry Shop	2.81	2.69	0.00***	0.10
Healthcare facilities				
Private and Public Clinics	2.82	2.69	0.00***	0.00***
Recreational facilities				
Playground	2.81	2.75	0.00***	0.10
Football field	2.83	2.77	0.00***	0.04**
Park/Garden	2.81	2.80	0.27	0.70
Other Support Services				
Post office	2.80	2.80	0.87	0.86
Bank	2.81	2.76	0.03**	0.17
Petrol Station	2.80	2.81	0.49	0.77
Religious	2.80	2.78	0.49	0.67

Source: Household Survey, 2010

Table 7.20: Level of social interaction and perceived use of selected facilities and services

	Use	Does Not Use	Levene's Test (sig.)	t-test (sig.)
Commercial Facilities				
Supermarket	2.63	2.43	0.64	0.01
Sundry Shop	2.58	2.66	0.19	0.57
Healthcare facilities				
Private and Public Clinics	2.63	2.33	0.04**	0.00***
Recreational facilities				
Playground	2.60	2.54	0.02**	0.43
Football field	2.66	2.52	0.17	0.02**
Park/Garden	2.64	2.55	0.00***	0.14
Other Support Services				
Post office	2.64	2.41	0.48	0.00***
Bank	2.61	2.47	0.66	0.05**
Petrol Station (n=739)	2.60	2.50	0.09*	0.26
Religious (n=941)	2.60	2.39	0.01**	0.06*

Source: Household Survey, 2010

Table 7.21: Feeling safe and use of selected facilities and services

	Use	Does Not Use	Levene's Test (sig.)	t-test (sig.)
Commercial Facilities				
Supermarket	2.72	2.66	0.23	0.27
Sundry Shop	2.72	2.56	0.01**	0.11
Healthcare facilities				
Private and Public Clinics	2.72	2.64	0.15	0.18
Recreational facilities				
Playground	2.73	2.62	0.00***	0.03**
Football field	2.76	2.67	0.00***	0.04
Park/Garden	2.77	2.67	0.00***	0.02**
Other Support Services				
Post office	2.70	2.74	0.04**	0.43
Bank	2.72	2.66	0.23	0.24
Petrol Station	2.71	2.69	0.79	0.71
Religious	2.72	2.59	0.01**	0.08*

*indicates statistically significant at 10% level
** Statistically significant at 5% level
***Statistically significant at 1% level
Source: Household Survey, 2010

7.4   Modelling the Usage Pattern of Services and Local Facilities

Following the analysis of the bivariate analysis of access and use of selected services and local facilities for the study as presented in the earlier subsections, deeper investigation is required to capture further important findings of the relationship between the variables involved. As stated in Chapter One (see p.15), the third objective of this study is to evaluate the factors that would improve social sustainability with focus on access and usage pattern of local services and facilities. This objective requires the researcher to establish relationships between aspects of urban form and patterns of usage of the respondents of this study. The main objective is to capture the most significant urban form variables that affect the access and usage of services and local facilities the most, while controlling for other socio-demographic factors which also influence these outcomes.

The researcher has selected the use of logistic modelling through the use of SPSS-PASW (version 18) software to obtain the model of usage pattern of selected services and local facilities. According to Pallant (2010), logistic regression is a method that allows a researcher to test model to predict categorical outcome with two or more categories. It basically assesses how well a set of predictor variable predicts or explains the categorical dependent variable. Prior to performing the method, in order to make sense of the logistic regression results, it is essential to recode all the categorical or ordinal independent and dependent variables into binary code responses (recode in 0 and 1). The value of 0 indicates lack of response and value of 1 indicates a '*Yes'* answer (Pallant, 2010). Furthermore, the response to the usage question is in a series of frequency bands, this can clearly be seen to be an *ordinal* type of data. The researcher believes that it is most appropriate to perform the modelling of the usage pattern of the individual local services and public facilities in the two case study cities using ordinal

logistic regression. In this case, this technique was selected because it can take account of the different degrees of usage in the dependent variable to obtain a better explanatory model from the same set of independent variables[6].This model is also supported by OLS regression (refer Table A7.3-7.5 in Appendix). Findings extracted from the OLS regression also revealed somewhat similar findings.

This subsection discusses the relationship between urban form variables and the usage pattern of selected facilities. Prior to interpret the findings of the analysis, it is important to note the different character of each services and facilities. Each of the selected local services and public facilities has their own expectations of the usage pattern.It is also important to note that low usage of the selected services and facilities also imply that they use such services outside the neighbourhood.The analysis is categorized according to the different types of facilities and services i.e. retail services, recreational facilities and key support services (health facilities, banks and post offices). In the regression model, the effect of urban form characteristics such as land use mix, density, dwelling type and layout type as pre-defined for the study is being assessed towards the pattern of usage. Several socio-economic variables such as income, education background are being controlled in each model accordingly. There are basically a lot of variables available for the analysis, however, due to insignificant results reported in the initial models, the researcher has decided to weed these variables out of the model and only select variables which are significant or close to significant. The reason for weeding out certain variables from the model is due to the issues of *multicollinearity* where there is strong correlation between the independent variables. The researcher has to carefully select the most appropriate variable that best explains the model based on the objectives and hypothesis of this study. This is because, the

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[6] CityForm study also used banded frequency measures for individual local services

variables that were weeded out were reported significant at two-way relationship analysis, and however, when included in the regression model, it performs the least. The following Table 7.22 reports the full set of variable used in performing the modelling including those that were discarded.

Table 7.22: List of variables used in Regression Modelling

Category	Variables	Remarks (include in model)
Urban form	Low density	✓
	Medium density	✓
	High density	✓
	Mixed land use	✓
	Linear block	
	Superblock	
	Cul-de-sac	
	Terrace	
	Flat/Apartment	✓
	Semi-detached	
	Detached	
	Inner	
	Intermediate	
	Outer	
Socioeconomic	Gender	
	Have no formal education	
	Have some formal education	
	Married	
	High income	✓
	Low income	✓
	Owns at least one car	✓
	Owns at least one motorcycle	✓
	Owns at least one bicycle	✓
Psychological	Perceived safety – feeling safe	✓
	Perceived ease of mobility	✓
	Satisfaction towards neighbourhood	✓
	Satisfaction towards community	✓

Many previous studies have reported that density is one of the most important single factors that have impact on social sustainability. Following this, the researcher formulated a hypothesis that looks at the impact of density and its relation to usage patterns. It is hypothesized that higher density will lead to better usage of selected services and facilities. One of the hypotheses for this study is high density is one of the urban forms that has a strong impact on access and impact the frequency of usage of

selected services and facilities. As it refers to the ratio of people to the land area, higher density as claimed by Burton (2002) would result to residents being closer to amenity and services. It is also been promoted in many cities around the world including UK (Burton, 2002). Jabareen (2006) on the other hand mentioned that density is closely related to transit use or better transportation infrastructure. He described that in higher density areas people were more likely to commute by transit, walking, cycling or combinations thereof, as compared to those living in lower density (Jabareen, 2006, p. 41). In the following tables, there are basically two models. Model 1 represents the pattern of usage with density as the only variable. Whereas model 2, represents the usage of selected services and facilities with several urban form variables and socio-economic variables as the explanatory variables.

7.4.1 *Usage Pattern of Commercial Facilities*

The following Table 7.23 indicates the result of the ordinal regression models (model 1 and 2) on the usage of commercial facilities with the effect from urban form variables in the case study cities. As mentioned earlier, model 1 presents the pattern of usage with only the density variable. There seems to be quite a strong relationship for both types of commercial facilities. For supermarkets, both low and high density is associated with higher usage, implying lowest usage in medium density areas; whereas for sundry shop the usage is higher in low density and lower in high density (although not statistically significant at 10% level). The sundry shop result corresponds with previous findings and can further support the first hypothesis of this study on density; however, the finding for supermarkets only partly supports it. For supermarkets, medium density increases usage over low density, but high density does not increase it further over medium density, but rather the reverse. In the sundry shop case, medium

density increases usage over low density, while the positive effect of high density over medium density is less strong or significant.

In the second model, the variables included are density, mix of land uses, safety perception and low income group as the categorical variables. The results of the model suggested that, after controlling for these other variables; *density* is again the most significant factor that influences the usage pattern of the commercial facilities. Again model 2 confirms that for supermarkets usage is highest in high density while for sundry shops usage is highest in lower density areas. Of the control variables, feeling safe is significant at the 10% level, while the other two are not. In model 2, for the sundry shop segment, which refers to a more localised facility, apart from lower density, feeling safe, were also found to be significant at 5% significance level.

Table 7.23: Effect of urban form variables on the impact towards usage pattern of commercial facilities

Ordinal logit models	Supermarket				Sundry Shop			
	Model 1		Model 2		Model 1		Model 2	
	Coefficients	Significance	Coefficients	Significance	Coefficients	Significance	Coefficients	Significance
Low density	0.468	0.080*	0.408	0.131	0.681	0.029**	0.626	0.047**
High density	0.257	0.043**	0.292	0.026**	-0.188	0.279	-0.111	0.534
Land use mix			0.130	0.578			-0.118	0.710
Feeling safe			0.241	0.132			0.533	0.009**
Low income			0.146	0.574			-0.100	0.801
Cox and Snell R	0.005		0.013		0.006		0.018	
Nagelkerke R	0.006		0.015		0.010		0.027	
Pseudo R^2	0.003		0.007		0.006		0.017	

Note: Usage pattern categories: 3 – Use often; 2 – Use occasionally; and 1 – Use outside neighbourhood / not use at all
*Statistically significant at 10% level (2-tailed)
**Statistically significant at 5% level (2-tailed)
***Statistically significant at 1% level (2-tailed)
Source: Household Survey, 2010

7.4.2 *Usage pattern of recreational facilities*

This subsection reports the findings on the ordinal regression of recreational facilities usage. Result of the models particularly model 2 seems to be very significant (see Table 7.24). As shown in model 1, *high density* was shown to have significant positive impact on the use of recreational facilities regardless of cities. Subsequently in model 2, it is indicated that there is a significance difference between the usage patterns of recreational facilities in Putrajaya as compared to Kuala Lumpur. Being in Putrajaya, residents would tend to use playground and parks more often as compared to residents in Kuala Lumpur (95% and 99% confidence level accordingly). On top of that, other important factor that impact the usage pattern most are aspect of *safety, bicycle ownership* and those living in *flats* or *apartments*. These results stressed the necessity to increase the safety measure within the residential areas and further improve links or access to the recreational facilities such as bicycle lanes. In contrast, for football field, apart from *safety* aspect and *own a bicycle*, another factor that have impact its usage pattern is *mixed land use*. This may be resulted to the nature of activity which quite often an occasional event involves male adult from various places and not local residents. Hence, a football field located close to other services and facilities is often the first option.

Table 7.24: Effect of urban form variables on the impact towards usage pattern of recreational facilities

Ordinal logit models	Playground				Football Field				Park/Garden			
	Model 1		Model 2		Model 1		Model 2		Model 1		Model 2	
	Coefficients	Significance	Coefficients	Significance	Coefficients	Significance	Coefficients	Significance	Coefficients	Significance	Coefficients	Significance
Putrajaya	-	-	0.659	0.001**	-	-	-	-	-		1.802	0.00***
Low density	0.013	0.962	0.211	0.452	-0.014	0.958	-	-	0.298	0.264	0.115	0.675
High density	0.647	0.00***	1.409	0.002**	0.384	0.002***	0.254	0.045**	0.737	0.000***	0.513	0.000***
Mixed land use			-0.209	0.698			0.339	0.012**			-0.015	0.959
Feeling safe			0.579	0.000***			0.567	0.000***			0.301	0.095*
Low income			-0.208	0.420			-0.294	0.261			-0.388	0.201
Flat/Apartment			-0.982	0.029**			-	-			-	-
Owncar			-0.072	0.772			0.183	0.482			-0.271	0.400
Ownbike			-0.440	0.001**			-0.306	0.017**			-	-
Cox and Snell R	0.028		0.081		0.010		0.037		0.037		0.190	
Nagelkerke R	0.032		0.093		0.011		0.043		0.044		0.223	
Pseudo R^2	0.014		0.041		0.005		0.019		0.020		0.110	

Note: Usage pattern categories: 3 – Use often; 2 – Use occasionally; and 1 – Use outside neighbourhood / not use at all
*Statistically significant at 10% level (2-tailed)
**Statistically significant at 5% level (2-tailed)
***Statistically significant at 1% level (2-tailed)
Source: Household Survey, 2010

7.4.3 *Usage pattern of key support services and facilities*

Table 7.25 reports the findings on the ordinal regression of the usage pattern of selected key support services and facilities i.e. healthcare facilities, post office and bank. Overall, results of the regression modelling revealed that high density alone appears to impact the usage pattern for healthcare facilities and post office but not banks.For healthcare facilities, though it would suggest that older people would more likely visit/ use the healthcare facilities, findings indicate that the use are lesser among the elderly, low income people and those living in flats or apartment. Feeling safe and owning a bicycle increases the chance to improve the usage pattern. On the other hand, as indicated in Chapter Five (p. 158), the provision of post offices in Putrajaya is limited. Subsequently, the result of the regression model has shown that respondents residing in Putrajaya and owning a bicycle have lower chance to use post office within their neighbourhood at 95% confidence level. Those living in *flats and apartments* on the other hand report to use post office more.

The varied result implies that urban form variables only impact certain services and facilities. Particularly for healthcare facilities, amalgamation of other factors is equally important to explain its usage pattern. This also suggests that the findings may vary according to different circumstances, such as different socio-economic background. Furthermore, as Putrajaya has not reached a mature state of development, results may further improve in future.

Table 7.25: Effect of urban form variables on the impact towards usage pattern of key support services and facilities

Ordinal logit models	Healthcare facilities				Post office				Banks			
	Model 1		Model 2		Model 1		Model 2		Model 1		Model 2	
	Coefficients	Significance	Coefficients	Significance	Coefficients	Significance	Coefficients	Significance	Coefficients	Significance	Coefficients	Significance
Putrajaya			0.265	0.317			-0.497	0.040**			-	-
Low density	0.08	0.80	-	-	0.03	0.92	-	-	-0.42	0.106	-	-
High density	0.59	0.00***	-	-	0.53	0.00***	-	-	0.42	0.687	0.494	0.242
Elderly			0.546	0.079*			0.414	0.141			-	-
Low income			-0.703	0.042**			-0.279	0.364			0.182	0.482
Mixed land use			0.164	0.553			0.309	0.223			0.195	0.138
Feeling safe			0.493	0.010**			0.141	0418			0.586	0.000***
Flat/Apartment			0.520	0.002**			0.433	0.003**			-0.555	0.194
Owncar			0.181	0.564			-0.247	0.378			-0.082	0.744
Ownbike			0.319	0.057*			-0.467	0.002**			-0.233	0.067*
Cox and Snell R	0.01		0.034		0.02		0.033		0.003		0.023	
Nagelkerke R	0.02		0.048		0.02		0.043		0.003		0.026	
Pseudo R^2	0.01		0.027		0.01		0.022		0.001		0.011	

Note: Usage pattern categories: 3 – Use often; 2 – Use occasionally; and 1 – Use outside neighbourhood / not use at all
*Statistically significant at 10% level (2-tailed)
**Statistically significant at 5% level (2-tailed)
***Statistically significant at 1% level (2-tailed)
Source: Household Survey, 2010

7.5 Summary

Essentially, this chapter covers the key findings and corresponds to the third objective of study. The first part of this chapter explored factors that influenced access to selected services and facilities guided by three categories; economic, physical and psychological. The second part dealt with the use of the services and facilities. Following this, the researcher further explored regression models of the relationship between the key urban form variables with the usage pattern of the residents within the two case study cities. In doing this, this chapter also looked into the testing the hypotheses established earlier.

Among the key findings highlighted in this chapter, based on the bivariate analysis, include: lower income households generally reported having better access to selected services and facilities within their neighbourhood areas compared to higher income households; this applied particularly to commercial services and recreational facilities in both case study cities. However, the relationship was not as strong as expected. Chi-square results of these relationships were reported only significant for access to supermarket, park, garden and petrol station. In Putrajaya, having one car is generally an important factor to have good access. This corresponds well with the claim made by Ferguson and Wood (in Jenks and Jones, 2010, p.57) that car ownership is an important factor in determining the level of accessibility. In terms of physical factor and having good access, the researcher has looked into a number of urban form variables (housing type, density and layout) and their relationships with the access to the local services and facilities. For density, as expected, household in higher density areas reported to have greater access to selected services and facilities, particularly the retail services. For recreational facilities, households in lower density areas within Putrajaya

reported to have better access as compared to households of higher density. Households in medium density were reported to have better access to retail facilities. Apart from that, findings of the two-way relationship have also suggested that the second hypothesis of this study which states *"ease of mobility within the neighbourhood would result to better usage of selected services and facilities"* can be supported.

On the other hand, results of ordinal regression revealed that overall, the relationship between usage pattern of the selected services and facilities and key variables were not as strong as expected. As mentioned earlier (see p.222), low usage of selected services and facilities may not only imply that they do not use such services at all but they may use such services outside the neighbourhood. Findings based on the OLS regression also revealed similar resultsto the ordinal regression models.Significant relationships were found to be for commercial facilities, playground, football field and healthcare facilities. Model 1, that reports only density as the variable revealed somewhat strong relationship across almost all services and facilities. On the other hand, for Model 2, where it relates the usage of selected services and facilities with several urban form variables, socio-economic variables and psychological factors, revealed somewhat weaker relationships. This allows the researcher to only partly support the hypothesis of this study which is *"higher density would result to improved access to certain services and public facilities"*. The regression model revealed that *feeling safe* appears to be a significant factor to improve the overall usage of services and facilities. This is also been supported by the OLS regression in Appendix A (p, 272). For healthcare facilities, it was revealed that respondents who live in a flat or apartment and own a car use the services the most. Low income and being old reduces the use of healthcare facilities.Among the recreational facilities, playground was the most used facilities especially in Putrajaya of high density areas. However, living in

flats and apartment decreases the use playground. Hence, this allows the researcher to support the third hypothesis "*taking account of economic, physical urban form and psychological factors is essential to improve overall access and usage of services and facilities*".

Subsequently, the next chapter provides some discussion on the key findings of this study, recommendations and limitations. It also provide summary and further conclude this study.

Chapter 8: Towards Social Sustainability: Discussion of Findings, Results, and Conclusion

8.1 Introduction

This chapter discusses the research objectives, hypotheses and conclusion, which is based on the secondary data collection, household survey and observations surveys, conducted in the two case study cities; Kuala Lumpur and Putrajaya. This chapter also produces a sub-set of policy and guideline recommendations based on both case-study examples. The focus of this study is to ascertain the relationship between urban form elements and access and usage of local services and public facilities. This study provides a better understanding of the prospects and problems of moving towards sustainability in a rapidly growing metropolitan region in Malaysia by dealing with some the social sustainability impacts associated with urban form. Being a country located in one of the tropical climate regions, Malaysia's weather is hot and humid all year round. This makes it a bit more complicated in ensuring local facilities and services are accessible by walking or cycling, which most developed countries try to encourage, for example United Kingdom and United States. The researcher believes that the role of urban design and landscape can be further explored to complement the urban planning policy in order to achieve better accessible local facilities and services particularly in a hot and humid country like Malaysia. This approach has been commonly practiced in United States through the *"Smart Growth"* and *"New Urbanism"* concept. To enhance the city's accessibility and walkability, the roads are designed to be relatively narrow and well-shaded with trees which create a suitable environment to walk and cycle more (Grant, 2006; Talen, 1999).

This study has focussed on the relationship between elements of urban form and having access to and using local services, healthcare facilities and recreational facilities. The study was motivated by the fact that it would be of benefit to the municipalities to improve existing cities in order to become more urbanised and at the same time be socially sustainable. Another important implication of this study is it contributes to providing valuable knowledge needed for urban planners and policymakers to meet the challenge of urban growth more effectively and to devise a framework for sustainable urban form to ensure it is socially sustainable. The research findings also contribute to the existing knowledge in such a way that future development and growth in metropolitan regions in developing countries can be guided in a manner that enhances long-term sustainability.

8.2 Discussion of Research Objectives and Hypotheses

This subsection discusses the key findings of the research that correspond to the objectives and hypotheses of this study. Findings related to the four research objectives as established in Chapter One are discussed as follows:-

8.2.1   *Profile of case study areas: types of urban form & urban form elements*

In Chapter Three, the researcher discussed the different types of urban form. Focus was given to critically review the general types of urban form and also the specific types in of the two case study cities; Kuala Lumpur and Putrajaya. On a general note and as mentioned in Chapter Two, Kuala Lumpur and Putrajaya each has its own unique characteristics to be selected as the case study in this research. Federal Territory of Kuala Lumpur is the capital city for Malaysia; hence, undoubtedly, it is the busiest and the most populous city in Malaysia. On the other hand, Federal Territory of Putrajaya is a newly planned city which was established in 1995. As mentioned in Chapter Five (p. 123) Kuala Lumpur generally can be considered a compact city with its high density in the core area and varied density (high to medium density) in the residential areas. In contrast, Putrajaya on the whole has quite a low density. In terms of land use mix within the residential areas, Kuala Lumpur was observed to have higher percentage of land use mix as compared to Putrajaya. Residential areas within Putrajaya were mostly single residential land use with its services and facilities are located in centralised precincts. However, though the location of the local services is within the catchment of the residential areas and intended to be within walking distance, it has been observed that not many local residents walk to the local services and facilities. Due to the hot climate, the areas are not comfortable to explore on foot as they are not well-shaded. This character has made it different from the findings as reported by research conducted in countries which have cooler weather e.g. UK, as reported by the findings by the CityForm research for example. The following Table 8.1 summarises the profile of the residential neighbourhood of Kuala Lumpur and Putrajaya according to the sub area categories for this study based on the primary and secondary source of data. The details of the area are limited to the selected study area of this study.

Table 8.1: Summary of the case study areas based on urban form elements

General Profile	Moderately compact city based on ad-hoc planning.	Moderately dispersed city. A planned city based on the theory of *Garden City.*
INNER		
Density	Range of density is higher as compared to other areas.	Moderately high density
Housing/ Building	Typically, high rise apartment, old terrace houses, public housing	Typically apartment, detached houses/semi-detached houses and terrace
Layout	Typically linear and radial	Linear, cul-de-sac and radial
Services and facilities	Most of the services and facilities are located dispersed however, closer to the residents.	Services and facilities are located centralised
Land use	Greater mixed of land use	Single residential use
Transportation network	Supported with better options of transportation; public bus, light rail transit system (LRT-system).	Limited transportation option – public bus and feeder bus to train station.
INTERMEDIATE		
Density	Range of density is between low, medium to high density	Moderately medium and high density, and some low density
Housing/ Building	Typically terrace houses, semi-detached houses and apartments (4-5 storeys), and high rise apartments (more than 5 storeys).	Typically terrace houses, high rise and low rise apartments, townhouses
Layout	Typically linear, radial	Linear, cul-de-sac and radial
Services and facilities	Generally more centralised compared to inner. Some residential units have the benefits of walking distance.	Services and facilities are located centralised
Land use	Mainly residential use with some form of land use mix (retail and services)	Single residential use
Transportation network	Transport options are limited to public bus and LRT-system (feeder bus).	Limited transportation option – public bus and feeder bus to train station.
OUTER		
Density	Range of density is between low, medium to high density	Medium and high density
Housing/ Building	Typically terrace houses, semi-detached houses and apartments (4-5 storeys), and high rise apartments (more than 5 storeys).	Typically terrace houses, apartments
Layout	Typically linear, radial	Cul-de-sac, radial
Services and facilities	Generally more centralised compared to inner. Some residential units have the benefits of walking distance.	Services and facilities are located centralised (intermediate area)
Land use	Mainly residential use with some form of land use mix (retail and services)	Single residential use
Transportation network	Transport options are limited to public bus and LRT-system (feeder bus).	Limited option (currently only limited bus stop for public buses)

8.2.2   Character of urban form that can facilitate social sustainability

In Chapter Three, the researcher discussed literatures on social sustainability. Several previous studies have shownstrong relationships between urban form and aspects of sustainable development, studiessuch as Beatley, 1995; Kenworthy, 1999; Bramley and Power, 2008 and Jenks et al, 1996. In this study, the researcher discusses five elements of urban form: density; housing/ building type; transport infrastructure/ accessibility; land use; and layout - see among others Dempsey, etal. (2010) Jenks, Jones, etal. (2010); Bramley and Power, (2008); and Talen (1999, 2003).   These elements are expectedto have significant impact on social sustainability within urban areas. As argued by Barton (2000) and Burton (2000), the access to and usage of local services and public facilities in the urban neighbourhood context is a significant aspect of urban social sustainability. This refers to having good access to the services and facilities essential to fulfil everyday needs such as groceries, postal services, healthcare facilities and others, and may be regarded as an aspect of social equity. On top of that, good access to services and facilities is also being referred as one of the indicators of quality of life, and is suggested to contribute to health, safety and community (social interaction, relationships and participation).

Subsequently, as the research goes deeper into the assessment of factors that impact on access and usage pattern of services and facilities within the neighbourhood, it is revealed that there are other equally important factors that need to be taken into consideration.These factors include socio-economic or demographic factors and psychological factors. The researcher has concluded that having equitable access to and use of public facilities does not only depend on urban form or physical factor, but it is much influenced by the interaction of other factors such as socio-economic factors

(income, education background and etc.) and psychological factors (neighbourhood satisfaction; and feeling secure and safe). This view is supported by Chapman and Donovan in Chapman (ed.) (1996, p. 99) as they mentioned that *"access can be denied economically, as well as physically; it can also be denied or limited psychologically"*. These factors were also being taken consideration in the analysis. The researcher has also discussed further concepts of urban design or planning such as *new urbanism,* initiated by Andres Duanyand Elizabeth Plater Zyberk, *compact city and smart growth* initiated by US Environmental Protection Agency (EPA). Generally, these concepts of urban planning have similar goals and objectives. They claim to provide support for local employment opportunities, pedestrian friendly neighbourhood, increased density, pedestrian friendly neighbourhood, encouraginga sense of community, protecting the environment and improving access (Talen 1999; Grant, 2006; Miller and Hoel, 2002; Neuman, 2003; De Roo and Miller, 2000; Burton, Williams and Jenk, 1996; Burton, 1996 and 2000). Overall, the researcher has concluded that urban form has a great potential influence on social sustainability. Nonetheless, it is quite difficult to actually measure and assess which particular form brings out the best as currently; most of the findings provide a rather mixed picture.

8.2.3 Relationship between urban form and social sustainability in Malaysian cities

As mentioned in Chapter One, Kuala Lumpur and Putrajaya were the two cities selected to represent Malaysian cities in this study. Selection of the case study cities was made based on the criteria of they should represent Malaysian cities and be exemplars of Asian cities. This overarching objectivewas complemented with three hypotheses. These were;

> *H1: Higher density would result in improved access to certain services and public facilities*
>
> *H2: Ease of mobility within the neighbourhood would result in better usage of selected services and facilities.*
>
> *H3: Takingaccount of economic, physical urban form and psychological factors is essential to improve overall access and usage of services and facilities.*

The hypothesis formulation was also guided by claims made by previous research focussed on similar issue. As discussed in Chapter Seven, the research has partly supported the hypothesis that *"higher density would result in improved access to certain services and facilities"*. Findings revealed that access improved in higher density areas in both case study cities, particularly for commercial facilities. This supports the claims of previous research, including among others, Williams et al (2000, p.40) who mentioned that intensification of urban areas has the advantage of improving access to services and facilities and other opportunities. However, it is important to note that higher density can have negative impactson community and quality of life (Bramley & Power, 2009, Bramley et al, 2009). Hence, sacrifice of one aspect to prevail in another is a compromise in this situation.

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Based on the findings extracted from the household survey, it was revealed that the aspect of safety has become a major obstacle to the overall use of the local services and facilities.Undoubtedly, in higher density areas, the aspect of safety has often been the most critical issue faced by urban areas, and it is clearly a factor to which residents are sensitive. On top of that, the bivariate relationships revealed that mixed land use and densities have significant impacts on the propensity of the residents to use services and local facilities located within their neighbourhood. Results of the ordinal regression modelling, however, revealed generally weaker relationships between the urban form variables and their impact on the usage pattern of the selected local services and facilities. Nevertheless, overall, the key outcome of the model revealed that high density impacts the usage pattern the most. In terms of housing types or built form, the findings indicated that respondents living flats and apartments have poorer access torecreational facilities, and hence reduced use of these.The courtyard type of layout, particularly in Putrajaya, seems to be associated with a tendency to use playgrounds more.This study has suggested that in higher density areas, residents used services and facilities within their neighbourhood more often. The aspect of mixed land use does not impact to the usage pattern much. However, the researcher believes that, the selection of mainly residential-only neighbourhoods has caused the findings to be insignificant in this respect. With a broader selection of residential neighbourhoods across a larger scale, it would probably be possible to obtain more significant results. This can be addressed in future research. Apart from that, the researcher also believes that the local climate and local culture also play a role on the outcome of this study. The hot and humid weather does significantly influence the way people access the services and facilities. There is also a big contrast of culture difference between developing Asian countries and developed countries, i.e. UK.

8.3 Recommendations

Based on the results and findings of this study, the researcher would like to put forwardseveral recommendations. The recommendations are directed to the local planning authority and other relevant government agencies to improve access and usage of local services and facilities within residential neighbourhood areas. It is also targeted to improve the overall quality of life in urban areas. Guidelines, policies and strategies suggested are intended to improve and complement the existing policies for social sustainability. Though some of these recommendations have already been included in existing national and local policies, the researcher would like to stress the importance of the implementation and monitoring process to ensure steps and efforts are taken seriously.

8.3.1   Recommendation on policies and strategies in development plans

The researcher has targeted several areas for the improvement of current existing development plans related to residential neighbourhoods. Ideally, the policies involve the following aspects:

- To improve the overall access to services and facilities within the residential neighbourhood

- To encourage residents to walk or use public transport to services and facilities located closer to their home and not depend so much on private vehicles.

- To improve the quality, safety and maintenance of the services and facilities located within the residential neighbourhood to improve usage pattern by the residents.

- To facilitate improvement in the implementation strategies

8.3.2   Recommendation to encourage usage of local services and facilities

Based on the empirical findings, it has been shown that though certain facilities are located within easy access, use of some of these services and facilities is quite low. Among the factors that have been identified is the importance of feeling safe, and that higher income household prefer to use services and facilities outside the neighbourhood. This implies that they opt for perceived quality of services and hence are willing to travel further. Prior to this, there are several measures that need to be undertaken to encourage usage of local services and facilities within the neighbourhood. Below are the recommended efforts:-

P1: Ensure the provision of local services and facilities are located at accessible locations

Measures:

i.   Enhance the existing quality of the local services and facilities within the neighbourhood.

ii. To support the promotion of some aspect of land use mix within residential neighbourhood to make room for the provision of the basic facilities.

iii. Encourage local authority and governing bodies to provide facilities closer to the residents, particularly for new developments.

P2: Encourage the use of services and facilities located within the residential neighbourhood

Measures:

i.   Improve the access through enhancing the features of pedestrian paths, for example through planting trees for shade or use of water features

ii. Provide better public transport or links between home and the centralised services and facilities .

iii. To increase public awareness on the need to utilize local services and facilities to enhance the vitality of the local neighbourhood.

8.3.3   Recommendation to increase safety measures

As mentioned earlier, feeling safe in the neighbourhood is one of the main contributing factors of access and use of almost all services and facilities within the residential neighbourhood. The current policies i.e. structure plans, local plans, National Urbanisation Policy (Federal Department of Town and Country Planning, Peninsular Malaysia, 2006) has already highlight the need to increase safety measure. However

based on the empirical findings and informal discussion with stakeholders, the issue of safety within residential neighbourhood is still high (Field Survey, 2010). One of the contributing factors towards this issue is the implementation measures (Field Survey, 2010).

P3: Enhance the safety measures of residential neighbourhood to encourage residents to utilize the services and facilities within the residential areas.

   i.   To further improve the spaces through soft landscape, allowing the residents to differentiate the difference between public, semi public and private spaces.

  ii.   To further improve existing pedestrian paths and lanes to transform into a more safe, comfortable and user-friendly environment.

 iii.   To ensure continuous link of pedestrian networks and cycle paths

 iv.   To create awareness within the local community to encourage safer neighbourhood environment.

  v.   To further facilitate the implementation strategies to ensure all efforts towards safer neighbourhood are implemented.

8.3.4 Recommendation to reduce dependency on private vehicles

Results of the empirical findings revealed that most of the local community in both case study cities are highly dependent on private vehicles. The situation is worse in Putrajaya where respondents rely on private vehicle to access and use most services and facilities except for playgroundold Survey, 2010). This is very upsetting, because Putrajaya was planned to be a walking and cycling friendly neighbourhood. The residential neighbourhood has already incorporated proper facilities such as wide pedestrian network and cycle paths. However, the use of these facilities is still minimal. Residential neighbourhoods in Kuala Lumpur, on the other hand, lacks this kind of environment, due to limited space and high land value cost. The following recommendation is a response to this issue.

P4: Encourage residents to walk or cycle to access facilities and services located near to home

Measures:

i. Provide and enhance the safety of the paths

ii. Through the use of soft landscape, enhance the environment to provide better shade for comfort of the pedestrians and cyclist.

iii. Enhance public awareness on active living through encouraging more walking and cycling within the residential neighbourhood.

Figure 8.1: Campaign to further encourage the use of cycling is one of the main strategies – Putrajaya intermediate sub area.
Source: Observation Survey, 2010

Overall, the stakeholders and other responsible agencies need to ensure that the policies and strategies in the development plans are effectively implemented to ensure that the objectives are achieved accordingly. It is very important to note the importance of implementing an efficient, cost effective and affordable approach in managing and maintaining the local services and facilities. This aspect is also highlighted in the National Urbanisation Policy (Federal Department of Town and Country Planning, Peninsular Malaysia 2006). Furthermore, NUP also stresses the need to encourage the involvement of society, non-government organizations and private sector in the management and provision of urban services, infrastructure and utilities.

The policies, strategies and measures recommended in this study correspond well with the existing policies in government reports and development plans such as National Urbanisation Policy (Federal Department of Town and Country Planning, Peninsular Malaysia 2006), National Physical Plan (NPP2, 2010), Kuala Lumpur Structure Plan 2020 (Kuala Lumpur City Hall, 2004), Putrajaya Master Plan (Putrajaya Corporation, 1995). Hence, it is strongly believed that this study has provided a

significant contribution to the efforts towards improving social sustainability in Malaysian cities. In comparison to other Asian cities, as mentioned in Chapter Four (p, 94), Malaysia (specifically the Peninsular of Malaysia) is facing rapid urbanisation and among all countries in Asia, it was reported to have the highest proportion of urban population and is expected to remain the highest until year 2030 (Yuen et al, 2006). This indicates that the need to look at the overall impact of urbanisation is crucial andeven, potentially, alarming. Reference tothe success of efforts from developed countries to promote more sustainable cities, such as the ideas of compact city, smart growth and new urbanism,it should be interpreted with caution due to the differences in environment characteristics and culture. This has also been supported by Schiller and Evans (2000 in Burgess and Jenks, 2000, p.124) as they point out the importance of differential solutions as a response to the environmental and cultural differences in developing countries as opposed to developed countries.

8.4   Areas of Future Research

This study aimed at exploring the impact of urban form on improving social sustainability in large urban areas. Following this, there are several ways to extend the studies exemplified in this thesis.Assessment of selected case study areaswas undertaken to understand theircharacter, alongside the household survey involving the local residents. The researcher believes that the issuesraised in this study are very important and the findings are strongly suggestive but not completely definitive. This approach has the potential to be further developed. There are several areas that can be expanded from this study for the scope of future research. Firstly, this study only refers to several selected services and facilities that the researcher believes to be relevant to all groups of people. However, it would be very useful if other services and facilities were

to be included, such as education facilities. In the National Urbanisation Policy it has highlighted that the implementation and the governance aspect of the provision of services and facilities is also one of the urbanization issues that most Malaysian cities are facing (Federal Department of Town and Country Planning, Peninsular Malaysia 2006). The need to study the implementation part of the system is undeniably important.

8.5   Limitation ofthis Research

There are several limitations of this study that the researcher believes have had some impact on the overall outcome. Firstly, the researcher is aware that the nature of the samples for the household survey is one of the limitations in this study. It is noted, that if more time and budget were available, the researcher would have richer data, both in the quantitative sense of having more observations and more variation within the data, and in the qualitative sense that it would be feasible to conduct focus group discussions from local residents of the selected case study areas. Furthermore, the researcher would also gain more information if the scope of the study covered a wider range of locations and types of area. Another important limitation noted is the unrepresentative distribution of ethnic groups captured in the household survey. As mentioned in Chapter Six (p. 164), the researcher believes that it was an impact from the limitation of having only Malay ethnic interviewers and Malay version of questionnaire. The researcher realised that the low response rate from other ethnic groups may be overcome by having interviewers of other ethnicity as well and by having the questionnaires translated to their native languages.

The findings obtained with regard to the access and usage of the services and facilieswere only on a perceptual or self-reported basis. Respondents were required to

respond to questions in the questionnaire that corresponded to whether they have access to the services and facilities within their neighbourhood. On the usage pattern, it was a self-reported usage. The respondents were given full responsibility to report their usage pattern. However, the researcher believes that if the actual usage was recorded through a method which the researcher can further validate, for example with the use of GPS, it would somehow add more strength to this study.

Another important aspect to note is the part of this study being a cross-sectional design in nature. As mentioned in Chapter Two (see p. 45), cross sectional design has several limitations. The key issueisthat although the researcher may be able to establish a correlation between two variables; it does not establish their causal association or direction (De Vaus, 2001, p.180). Another issue is the fact data is only collected at one single time point, which may not be fully representative and will not reveal changes over... Given these limitations, the findings and implications of the study need to beinterpreted with caution. The limitations identified in this study are also aspects that can be consider for future research. For example, a future survey might interview households at 1-2 year intervals or ask about use of services 1-2 years previously, to pick up the aspect of change.

8.6   Final Conclusion

Essentially the research provides one of the first attempts to assess the relationship between urban form and its impact upon social sustainability in Malaysian cities.The focus of this study is on understandingsome aspects of social sustainability in the residential neighbourhood level. The thesis was guided by four research objectives and research questions to be answered. Chapter One provided background to the study and

the motivations to pursue research on this area. It has been realised that Malaysia, as one of the fast growing and urbanizing countries in Asia, needs to address issues that can act as a setback to the achievement of overall urban sustainability and to the improvement of the quality of life. Subsequently, Chapter Two detailed out the methodology used throughout the study. Details of method and stages of analysis to answer the each of the research objectives were explained. This process is essential to provide the justification for the aspect of reliability and validity of the study. It is also useful to ensure that this study can be replicable or referred to for further research. Chapter Three discussed the theoretical perspectives of the subject that covers the broad theme of urban and social sustainability. The chapter has managed to support and accomplish the second objective of this study which is to identify and describe the character of sustainable urban form that can facilitate social sustainability. In the fourth chapter, the researcher has narrowed the scope of literature to capture the essence of social sustainability in Malaysian cities. Chapter Six and Seven discusses and explained the findings of this study. As the key findings revealed, the aspect of safety was suggested the most influential factor towards the overall use of services and facilities. Relationship between density and use were rather mixed. It was reported highdensity contributes to higher usage of the selected facilities such as sundry shops.This finding also supports other previous studies such as Breheney (1992); Knight (1996); Stretton (1994); Burton (1997, 2000a, 2000b); Williams (2000); and Bramley et al. (2009). Given the fact of the different characteristics of the two case study cities, differences on the findings are marginal. It was revealed that findings and differences in terms of the urban form elements at a neighbourhood level were more relevant rather than of the two case study cities. Overall, key findings of this study have provided mixed findings on the factors that are able to improve access and usage of local services and public facilities. Findings of the study also suggested that each type of local services and

public facilities has different criteria and expectations. Hence, different local services would have different relationship with the aspects of urban form.Finally, it is hoped that with this indication, policy makers and planner able to make vital decision to further improve access and improve the usage of local services and facilities in residential neighbourhood.

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APPENDICES

Table A6.1 Cross tabulation between general satisfaction towards residential neighbourhood and household income level (%)

General Satisfaction towards Residential Neighbourhood	Low income	Medium income	High income
Satisfied	84.40%	82.60%	89.80%
Neutral	14.10%	13.30%	5.10%
Dissatisfied	1.60%	4.10%	5.10%
Pearson Chi-Square : 0.009***			

Table A7.1 Cross tabulation between motorcycle ownership and access to local services and facilities (%)

		Owns at least one motorcycle
		(N=324)
	Commercial Facilities	
	Supermarket	63.9
	Sundry Shop	64.8
	Healthcare facilities	
	Private and Public Clinics	66.3
	Recreational facilities	
Kuala Lumpur (N=497)	Playground	66.2
	Football field	67.8
	Park/Garden	66.2
	Other Support Services	
	Post office	64.8
	Bank	64.9
	Petrol Station	62.9
	Religious	65.3
		(N=339)
	Commercial Facilities	
	Supermarket	60.2
	Sundry Shop	58.3
	Healthcare facilities	
	Private and Public Clinics	58.4
	Recreational facilities	
Putrajaya (N=587)	Playground**	59.0
	Football field	58.3
	Park/Garden	58.8
	Other Support Services	
	Post office	60.1
	Bank	58.8
	Petrol Station	58.5
	Religious	57.5

indicates statistically significant at 10% level
*** statistically significant at 5% level*
****statistically significant at 1% level*
Source: Household Survey, 2010

Table A7.2: Cross tabulation between home ownership status and access to local services and facilities *(percentage)*

	Own with mortgage	Own outright	Renting
Commercial Facilities			
Supermarket***	61.5	57.9	41.1
Sundry Shop***	92.0	94.9	87.2
Healthcare facilities			
Private and Public Clinics	62.6	69.7	67.2
Recreational facilities			
Playground***	77.6	87.1	90.2
Football field*	54.6	42.7	51.1
Park/Garden***	20.7	17.4	40.0
Other Support Services			
Post office**	36.8	44.9	34.2
Bank*	40.2	41.6	46.4
Petrol Station***	54.6	60.7	73.4
Religious	88.5	91.0	85.5

indicates statistically significant at 10% level,
*** statistically significant at 5% level*
****statistically significant at 1% level*
Source: Household Survey, 2010

Table A7.3: OLS Regression model: Commercial facilities

| | Supermarket | | Sundry Shop | |
	Coefficients[1]	Significance	Coefficients[1]	Significance
Feeling safe	.073	.020**	.030	.342
Land Use Mix	.029	.380	.068	.041*
SuperBlock	.020	.851	.065	.533
CulDSc	-.049	.113	-.011	.711
Courtyard	-.097	.179	-.092	.199
LowDensity	.070	.415	.030	.724
MediumDensity	.047	.655	.004	.967
Low Income	.028	.378	.018	.572
HIgh Income	.004	.910	.071	.031*
Means of mobility	.053	.095*	.116	.000***
Car_Ownership	.027	.400	.002	.957
Motor_own	.002	.939	-.014	.635
Bicycle_Ownership	-.021	.508	-.001	.985

[1] - *Standardized coefficients*

Statistically significant at 10% level
*Statistically significant at 5% level
** Statistically significant at 1% level

Table A7.4: OLS Regression model: Recreational facilities

| | Playground | | Football field | | Park/ Garden | |
	Coefficients[1]	Significance	Coefficients[1]	Significance	Coefficients[1]	Significance
Feeling safe	.105	.001**	.073	.019	.057	.053*
Land Use Mix	-.132	.000***	-.076	.022**	-.306	.000***
SuperBlock	.040	.691	.045	.671	.128	.203
CulDSc	-.072	.017**	-.035	.260	.010	.739
Courtyard	.048	.491	.084	.238	.077	.257
LowDensity	.020	.806	-.035	.683	.012	.886
MediumDensity	.153	.128	.097	.349	.180	.068
Low Income	.005	.859	.008	.806	.031	.308
HIgh Income	.020	.525	-.057	.082*	-.008	.797
Means of mobility	.000	.990	.030	.341	-.005	.875
Car_Ownership	-.027	.381	-.018	.565	.037	.229
Motor_own	.098	.001**	.082	.007**	.002	.939
Bicycle_Ownership	.133	.000***	.096	.002**	.053	.077*

[1] - *Standardized coefficients*

Statistically significant at 10% level
*Statistically significant at 5% level
** Statistically significant at 1% level

Table A7.5: OLS Regression model: Key support services

	Healthcare		Post office		Bank		Petrol station		Religous Facilities	
	Coefficients[1]	Significance	Coefficients[1]	Significance	Coefficients[1]	Significance	Coefficients[1]	Significance	Coefficients[1]	Significance
Feeling safe	.081	.001**	-.004	.907	.064	.038	.041	.172	.057	.068*
Land Use Mix	.002	.000***	-.032	.326	-.094	.004**	-.139	.000***	.049	.143
SuperBlock	-.146	.691	-.117	.261	-.022	.832	-.224	.028**	.133	.206
CulDSc	-.094	.017**	-.089	.004**	-.085	.005**	-.057	.059*	-.089	.004**
Courtyard	-.066	.491	-.089	.210	-.057	.419	-.052	.454	.041	.565
LowDensity	.032	.806	.054	.524	.081	.338	-.016	.845	.008	.922
MediumDensity	.014	.128	.007	.944	.046	.655	-.093	.353	.118	.252
Low Income	.083	.859	.046	.143	.044	.160	.012	.696	.037	.245
HIgh Income	-.002	.525	-.023	.484	-.032	.323	-.015	.650	-.003	.933
Means of mobility	.038	.990	.105	.001**	.098	.002**	.058	.056*	.048	.121
Car_Ownership	.033	.381	.028	.375	-.021	.497	.140	.000***	.071	.026**
Motor_own	-.008	.001**	.003	.930	-.026	.400	.002	.940	.057	.063
Bicycle_Ownership	.049	.000***	.086	.006**	.085	.007**	.060	.050*	.093	.003**

[1] - *Standardized coefficients*

Statistically significant at 10% level
Statistically significant at 5% level
*** Statistically significant at 1% level*

Your Urban living Experience

Questionnaire

Dear Sir/Madam,

I am a lecturer in University Technology of Malaysia and a PhD researcher in the Heriot Watt University, United Kingdom and I am conducting a study among the local residents of your neighbourhood. The objective of the study is to obtain information related to the provisions of public facilities in your neighbourhood. The study is part of the academic research and results of the study will help guide the local authority to better plan and further improve the urban living in your neighbourhood.

Your house is located within a carefully selected sample area. We would to ask you or your spouse/ partner to complete this questionnaire (The householder is an owner/ joint owner of a property or, if renting the tenant or the joint tenant).

I would very much appreciate your time and effort in filling out this questionnaire. It may take about 10 - 15 minutes to answer this questionnaire survey and your responses will be treated confidentially, private and anonymous. I would also like to ensure that any information given will not be passed on to other parties. If you are unhappy answering any questions, please leave them blank.

Thank you very much in advance for willing to participate in this survey. For any further correspondence or clarification, please contact the researcher at the contact address stated below.

Best Regards,

WAN MOHD RANI, WAN NURUL MARDIAH

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SECTION 1: BACKGROUND ON YOUR CURRENT RESIDENCE

1. **Do you (or other household member) own or rent your home?**

    ☐ Own with mortgage   *1*
    ☐ Own outright   *2*
    ☐ Rent from public sector   *3*
    ☐ Rent from private individual   *4*
    ☐ Other, please specify: _____   *5*

2. **What type of accommodation do you live in?**

    ☐ Detached house   *1*
    ☐ Semi-detached house   *2*
    ☐ Terraced house   *3*
    ☐ Flat (walk-up)   *4*
    ☐ Apartment (more than 5 storeys, with elevator)   *5*
    ☐ Condominium (facilities and services provided)   *6*
    ☐ Shophouse   *7*
    ☐ Other, please specify: _____   *8*

3. **How many bedrooms are there in your home?**

    _____ rooms

4. **How many people are there in your household, including yourself?**

    _____ persons

5. **Is there more than one families in residing in your house?**

    Yes [   ]   No [   ]

    If yes, please state the number of families, and their relationship to you (respondent).

    _____

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6. Can you please detail out the members of your household in the table below?

o.	Age	Gender	Relationship to you (respondent)

SECTION II: PERCEPTIONS TOWARDS CURRENT NEIGHBOURHOOD

7. **Overall, how satisfied are you with your neighbourhood?**

☐	Very satisfied
☐	Fairly satisfied
☐	Neither satisfied or dissatisfied
☐	A little dissatisfied
☐	Very dissatisfied
☐	Don't know

8. **How would you rate the following aspects of your neighbourhood?**

	Very Good	Fairly Good	Neither good or bad	Fairly Bad	Very Bad	Don't know
General appearance of your neighbourhood						
Safety of your neighbourhood						
Cleanliness of your neighbourhood						
Provision of public transport						
Provision of shops						
Provision of recreational facilities						
Means of moving about						
Parking facilities						

9. Overall, how satisfied are you with the community in your neighbourhood?

	Very satisfied
	Fairly satisfied
	Neither satisfied or dissatisfied
	A little dissatisfied
	Very dissatisfied
	Don't know

10. How many of your neighbours would you say that :

	None	A few	Some	Most	All
You see socially on average once a week					
You have a chat with / greet					
You would ask to borrow food/ tools from					
You know by name					
You have contact with					
You avoid contact with					

11. How would you rate the following problems in your neighbourhood?

	Not a problem	Minor Problem	Serious Problem	Don't Know
Noise from neighbours				
Noise from traffic				
Disturbance from children or youngsters				
Lack of parking				
Amount of traffic				
Litter				
Vandalism & graffiti				
Safety				

12. How would you like your neighbourhood to improve?

_____

_____

SECTION III: PERCEPTIONS TOWARDS FACILITIES AND SERVICES IN CURRENT NEIGHBOURHOOD

13. Can you please tick (/) the facilities available in your neighbourhood which is within 5 - 15 minutes walking distance?

Places to Shop	
Supermarket	
Sundry shop/ convenience store	
Services	
Clinic (Private and Public)	
Post Office	
Bank	
Petrol Station	
Religious Centre	
Mosque	
Quill	
Church	
Recreational area	
Playground	
Football field	
Park/ Garden	

14. How often do you use the following facilities available in your neighbourhood?

	Most days	At least once a week	At least once a month	Occasionall	Don't Use/ Not Applicable	Use outside the
Places to Shop						
Supermarket						
Sundry shop/ convenience store						
Services						
Clinic (Private and Public)						
Post Office						
Bank						
Petrol Station						
Religious Centre						
Mosque						
Quill						
Church						
Recreational area						
Playground						
Football field						
Park/ Garden						

15. How would you rate the available facilities in your neighbourhood in terms of location?

	Very Good	Fairly Good	Neither good or bad	Fairly Bad	Very Bad	Don't Use/ Not Applicable
Places to Shop						
Supermarket						
Sundry shop/ convenience store						
Services						
Clinic (Private and Public)						
Post Office						
Bank						
Petrol Station						
Religious Centre						
Mosque						
Quill						
Church						
Recreational area						
Playground						
Football field						
Park/ Garden						

16. How would you rate the available facilities in your neighbourhood in terms of its quality?

	Very Good	Fairly Good	Neither good or bad	Fairly Bad	Very Bad	Don't Use/ Not Applicable
Places to Shop						
Supermarket						
Sundry shop/ convenience store						
Services						
Clinic (Private and Public)						
Post Office						
Bank						
Petrol Station						
Religious Centre						
Mosque						
Quill						
Church						
Recreational area						
Playground						
Football field						
Park/ Garden						

17. What is the mode of transportation you normally used to reach the following facilities available in your neighbourhood?

	Walking	Cycling	Car	Bus	Rail-Based (LRT, Commuter, Monorail)	Taxi	Combination of several mode	Not Applicable
Places to Shop								
Supermarket								
Sundry shop/ convenience store								
Services								
Clinic (Private and Public)								
Post Office								
Bank								
Petrol Station								
Religious Centre								
Mosque								
Quill								
Church								
Recreational area								
Playground								
Football field								
Park/ Garden								

18. Based on the answer to the above question (Q12), can you please specify the duration you spent to reach to the following facilities?

	0-5 mins	6-10 mins	11-15 mins	16- 20 mins	21- 25 mins	26-30 mins	More than 31 mins	Not Applicable
Places to Shop								
Supermarket								
Sundry shop/ convenience store								
Services								
Clinic (Private and Public)								
Post Office								
Bank								
Petrol Station								
Religious Centre								
Mosque								
Quill								
Church								
Recreational area								
Playground								
Football field								
Park/ Garden								

SECTION IV: BACKGROUND INFORMATION

19. Can you please specify your gender:

Female ……………………………………………..	*1*
Male …………………………….........................	*2*

20. Which of the following the age group that you fall into?

≤ 20 years ……………………………………	*1*
21 – 25 years…………………………………..	*2*
26 – 30 years…………………………………..	*3*
31 – 35 years…………………………………..	*4*
36 – 40 years ………………………………….	*5*
41 – 45 years ………………………………….	*6*
46 – 50 years ………………………………….	*7*
51 – 55 years ………………………………….	*8*
≥ 56 years ……………………………………..	*9*

21. Which of the following ethnic group do you belong to?

Malay …………………………………………….	*1*
Chinese …………………………………………	*2*
Indian ……………………………………………	*3*
Others ……………………………...... ………....	*4*

Please Specify: _____

22. Can you please specify your highest education qualification

	Respondent	Partner/Spouse
SRP/MCE or equivalent		
SPM/ O'Level		
STPM/ A'Level		
Diploma or equivalent		
Degree or equivalent		
Postgraduate Degree		
Others (*Please Specify_____)*		

23. Can you please specify your marital status

Single …………………………………………… *1*

Married …………………………………………... *2*

Widowed/ Divorced ……………………………….. *3*

24. Are you currently working?

	Respondent	Partner/Spouse
Working - Full-Time		
Working – Part Time		
Unemployed – seeking work		
Retired		
Full-time student		
Looking after family		
Others		

25. Which of the following best describes your occupation sector?

Managerial / Administration …………….................. *1*

Clerical/Secretarial ………...…………………………….. *2*

Professional/ Technical ....……………………… *3*

Sales/ Marketing …….…………….……………………… *4*

Research/ Consultancy…………................................. *5*

Public relations/ Customer service............................ *6*

Others ……………………………………………..……. *7*

Please Specify: _____

26. Which of the following best describes your gross monthly household income (including all source of income) ?

≤ RM 1000………………………………………............... *1*

RM 1001 – RM 2000………………………………… *2*

RM 2001 – RM 3000………………………………… *3*

RM 3001 – RM 4000 …………....... …………….......... *4*

RM 4001 – RM 5000………………………………… *5*

≥ RM 5001 …………………………………………….. *6*

27. How many cars and other 4-wheel vehicles are available to members of the household for personal use?

Please state number: _____

28. How many motorcycles are available in your household?

Please state number: _____

29. How many adults bicycle are available in your household?

Please state number: _____

30. What is the main mode of transport you (and your spouse) use for travelling to work?

	Respondent	Partner/Spouse
Car		
Motorcycle		
Bicycle		
Public Transport – Bus		
Public Transport – Rail Based (LRT, Monorail, Train)		
Taxi		
Walking		
Others (*Please Specify:* _____)		

31. Where do you normally park your vehicle?

Designated parking area in house compound……….. *1*

On-street parking ……………………………………. *2*

Locked up Garage ………………………………… *3*

Parking facilities provided in neighbourhood area…… *4*

Others

(Please Specify_____) ……… *5*

END

Thank You very much for you time

Kehidupan Anda di Bandar
Kajiselidik

Tuan/ Puan,

Saya, pensyarah dari Universiti Teknologi Malaysia dan juga seorang penyelidik PhD dari Heriot Watt University sedang menjalankan satu kajian yang melibatkan penduduk tempatan di kawasan kejiranan anda. Objektif kajian ini adalah untuk mendapatkan maklumat berkenaan dengan penyediaan kemudahan awam di dalam kawasan kejiranan anda. Kajian ini merupakan sebahagian daripada kajian ilmiah / akademik dan hasil kajian ini akan dapat membantu pihak berkuasa tempatan merancang dengan lebih baik dan juga meningkatkan kualiti kehidupan di kawasan kejiranan anda.

Rumah anda terletak di linkungan kawasan kajian yang telah dipilih dengan teliti. Oleh itu, kami ingin meminta kerjasama anda, selaku ketua isirumah atau pasangan anda untuk menjawab borang kajiselidik ini. (Ketua isirumah adalah pemilik / pemilik bersama kediaman ini atau jika menyewa, penyewa /penyewa bersama.

Masa dan usaha yang anda berikan untuk menjawab borang kajiselidik ini amat saya hargai. Anda hanya perlu meluangkan masa lebih kurang 10-15 minit untuk menjawab soalan-soalan di dalam borang kajiselidik ini dan semua maklumbalas anda akan disimpan sulit. Saya juga ingin meyakinkan anda bahawa semua maklumat yang diberikan tidak akan digunakan untuk sebarang tujuan lain. Anda juga tidak perlu jawab mana-mana soalan jika anda berasa kurang senang dengan soalan tersebut.

Saya ingin mengucapkan ribuan terima kasih kerana sudi mengambil bahagian di dalam kajian ini. Untuk sebarang keterangan lanjut, anda boleh menghubungi penyelidik di alamat yang diberikan dibawah.

Sekian,

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BAHAGIAN 1 : LATARBELAKANG KEDIAMAN SEMASA ANDA

1. **Adakah anda (atau ahli isirumah anda yang lain) memiliki atau menyewa rumah ini?**

    ☐ Memiliki dengan pinjaman *1*
    ☐ Memiliki sepenuhnya (tanpa pinjaman) *2*
    ☐ Sewa dari kerajaan *3*
    ☐ Sewa dari individu persendirian *4*
    ☐ Lain-lain, sila nyatakan: _____ *5*

2. **Apakah jenis kediaman yang anda diami sekarang?**

    ☐ Rumah sesebuah *1*
    ☐ Rumah berkembar *2*
    ☐ Rumah teres *3*
    ☐ Rumah flat (tanpa lif) *4*
    ☐ Pangsapuri *5*
    ☐ Kondominium (kemudahan dan perkhidmatan disediakan) *6*
    ☐ Rumah kedai *7*
    ☐ Lain-lain, sila nyatakan: _____ *8*

3. **Berapakah bilangan bilik di dalam rumah anda?**

    _____ bilik

4. **Berapakah bilangan penghuni isirumah anda, termasuk diri anda sendiri?**

    _____ orang

5. **Adakah terdapat lebih dari satu keluarga yang mendiami rumah anda?**

    Ya ☐   Tidak ☐

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Jika ya, sila nyatakan bilangan keluarga yang mendiami rumah anda dan hubungan mereka dengan anda (responden).

_____

6. **Bolehkah anda perincikan ahli-ahli isirumah anda di dalam jadual di bawah?**

o.	Umur	Jantina	Hubungan dengan anda (responden)

7. **Secara keseluruhan, sejauh manakah anda berpuas hati dengan kawasan kejiranan anda?**

☐	Sangat berpuas hati
☐	Agak berpuas hati
☐	Berpuas hati tidak, tidak puas hati pun tidak
☐	Agak tidak berpuas hati
☐	Sangat tidak berpuas hati
☐	Tidak tahu

8. **Bagaimana anda menilai kawasan kejiranan anda berdasarkan aspek-aspek berikut?**

	Sangat baik	Agak baik	Kedua-duanya tidak	Agak teruk	Sangat teruk	Tidak tahu
Penampilan kawasan kejiranan anda secara keseluruhan						
Keselamatan kawasan kejiranan anda						
Kebersihan kawasan kejiranan anda						
Penyediaan kemudahan pengangkutan awam						
Penyediaan Kemudahan kedai-kedai						
Penyediaan kemudahan beriadah						
Kemudahan mobiliti						
Kemudahan tempat letak kereta						

9. **Secara keseluruhan, sejauh manakah anda berpuas hati dengan komuniti di kawasan kejiranan anda?**

	Sangat berpuas hati
	Agak berpuas hati
	Berpuas hati tidak, tidak puas hati pun tidak
	Agak tidak berpuas hati
	Sangat tidak berpuas hati
	Tidak tahu

10. Berapakah orang jiran yang anda boleh katakan...

	Tiada	Hanya sedikit	Beberapa	Hampir semua	Semua
Anda berjumpa secara purata sekali seminggu untuk bersosial					
Anda kerap berborak / bersembang					
Anda akan meminta untuk pinjam barangan keperluan / alat-alat					
Anda kenal hanya dengan nama					
Anda selalu berhubung					
Anda elak untuk berhubung					

11. Bagaimana anda menilai masalah-masalah berikut di kawasan kejiranan anda?

	Tiada masalah	Masalah kecil	Masalah serius	Tidak Tahu
Bunyi bising dari jiran				
Bising dari trafik				
Gangguan muda-mudi dan kanak-kanak bermain				
Kekurangan tempat letak kereta				
Jumlah trafik				
Sampah sarap dibuang merata				
Vandalisma				
Keselamatan				

12. Secara kesimpulan, bagaimanakah anda ingin kawasan kejiranan anda ditingkatkan?

_____

_____

BAHAGIAN III: PERSEPSI TERHADAP KEMUDAHAN DAN PERKHIDMATAN DI DALAM KAWASAN KEJIRANAN ANDA

13. **Bolehkah anda tandakan (/) bagi kemudahan-kemudahan yang boleh didapati di dalam linkungan 5-15 minit perjalanan dengan berjalan kaki di dalam kawasan kejiranan anda?**

Perniagaan	
Pasaraya	
Kedai runcit	
Perkhidmatan	
Klinik (Kerajaan dan swasta)	
Pejabat Post	
Bank	
Stesen Petrol	
Pusat Beribadat	
Masjid/ Surau	
Kuil/ Tokong	
Gereja	
Kawasan Beriadah	
Taman permainan	
Padang bola	
Taman bunga	

14. Apakah kekerapan anda menggunakan kemudahan-kemudahan berikut yang terdapat di dalam kawasan kejiranan anda?

	Hampir setiap hari	Sekurang-kurangnya sekali seminggu	Sekurang-kurangnya sekali sebulan	Jarang-jarang	Tidak guna/ tidak berkenaan	Guna di luar kawasan kejiranan
Perniagaan						
Pasaraya						
Kedai runcit						
Perkhidmatan						
Klinik (Kerajaan dan swasta)						
Pejabat Post						
Bank						
Stesen Petrol						
Pusat Beribadat						
Masjid/ Surau						
Kuil/ Tokong						
Gereja						
Kawasan Beriadah						
Taman permainan						
Padang bola						
Taman bunga						

15. Bagaimana anda menilai kemudahan-kemudahan yang terdapat di dalam kawasan kejiranan anda dari segi lokasinya?

	Sangat baik	Agak baik	Kedua-duanya tidak/ tidak pasti	Agak teruk	Sangat Teruk	Tidak guna/ tidak berkenaan
Perniagaan						
Pasaraya						
Kedai runcit						
Perkhidmatan						
Klinik (Kerajaan dan swasta)						
Pejabat Post						
Bank						
Stesen Petrol						
Pusat Beribadat						
Masjid/ Surau						
Kuil/ Tokong						
Gereja						
Kawasan Beriadah						
Taman permainan						
Padang bola						
Taman bunga						

16. Bagaimana anda menilai kemudahan-kemudahan yang terdapat di dalam kawasan kejiranan anda dari segi kualitinya?

	Sangat baik	Agak baik	Kedua-duanya tidak/ tidak pasti	Agak teruk	Sangat Teruk	Tidak guna/ tidak berkenaan
Perniagaan						
Pasaraya						
Kedai runcit						
Perkhidmatan						
Klinik (Kerajaan dan swasta)						
Pejabat Post						
Bank						
Stesen Petrol						
Pusat Beribadat						
Masjid/ Surau						
Kuil/ Tokong						
Gereja						
Kawasan Beriadah						
Taman permainan						
Padang bola						
Taman bunga						

17. Apakah jenis pengangkutan yang biasa anda gunakan untuk pergi mendapatkan kemudahan-kemudahan yang terdapat di dalam kawasan kejiranan anda?

	Berjalan kaki	Berbasikal	Kereta	Bas	Berlandaskan rel (*LRT, komuter, Monorel*)	Teksi	Kombinasi beberapa mod	Tidak berkenaan
Perniagaan								
Pasaraya								
Kedai runcit								
Perkhidmatan								
Klinik (Kerajaan dan swasta)								
Pejabat Post								
Bank								
Stesen Petrol								
Pusat Beribadat								
Masjid/ Surau								
Kuil/ Tokong								
Gereja								
Kawasan Beriadah								
Taman permainan								
Padang bola								
Taman bunga								

18. Berdasarkan jawapan anda diatas (soalan Q12), sila nyatakan tempoh masa yang anda perlukan untuk pergi mendapatkan kemudahan-kemudahan berikut.

	0-5 min	6-10 min	11-15 min	16- 20 min	21- 25 min	26-30 min	Lebih dari 31 min	Tidak berkenaan
Perniagaan								
Pasaraya								
Kedai runcit								
Perkhidmatan								
Klinik (Kerajaan dan swasta)								
Pejabat Post								
Bank								
Stesen Petrol								
Pusat Beribadat								
Masjid/ Surau								
Kuil/ Tokong								
Gereja								
Kawasan Beriadah								
Taman permainan								
Padang bola								
Taman bunga								

BAHAGIAN IV: MAKLUMAT LATARBELAKANG RESPONDEN

19. Sila nyatakan jantina anda

Perempuan ……………………………………..	*1*
Lelaki ……………………………..........................	*2*

20. Apakah kumpulan umur yang anda tergolong?

≤ 20 tahun …………………………………………	*1*
21 – 25 tahun……………………………………..	*2*
26 – 30 tahun……………………………………..	*3*
31 – 35 tahun …………………………………..	*4*
36 – 40 tahun ……………………………………	*5*
41 – 45 tahun ……………………………………	*6*
46 – 50 tahun ……………………………………	*7*
51 – 55 tahun …………………………………..	*8*
≥ 56 tahun ……………………………………..	*9*

21. Apakah kumpulan bangsa yang anda tergolong?

Melayu……………………………………………	*1*
Cina ……………………………….……………	*2*
India. …………………………………………	*3*
Lain-lain………………………..... ……………...	*4*

Sila nyatakan : _____

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22. Bolehkah anda nyatakan tahap pendidikan tertinggi anda

	Respon den	Pasangan
SRP/MCE		
SPM/ O'Level		
STPM/ A'Level		
Diploma atau mana-mana setaraf		
Ijazah atau mana-mana setaraf		
Ijazah Pascasiswazah		
Lain-lain (*Sila Nyatakan_____*)		

23. Sila nyatakan taraf perkahwinan anda

Bujang …………………………………………	*1*
Berkahwin ………………………………………...	*2*
Bercerai/ Duda/ Janda ………………………………..	*3*

24. Adakah anda bekerja?

	Responden	Pasangan
Bekerja – Sepenuh masa		
Bekerja – Separuh masa		
Tidak bekerja – sedang mencari		
Bersara		
Pelajar sepenuh masa		
Suri rumah		
Lain-lain		

25. Manakah antara berikut terbaik menggambarkan sektor pekerjaan anda?

Pengurusan / Pentadbiran ………………....................	*1*
Pengkeranian/ Kesetiausahaan …………………………..	*2*
Profesional/ Teknikal .. ..…………………….	*3*
Jualan / Pemasaran …………………………………….	*4*
Penyelidikan / Perundingan …………..........................	*5*
Perhubungan Awam / Perkhidmatan Pelanggan	*6*
Lain-lain ……………………………………….……..	*7*

Sila nyatakan : _____

26. Manakah antara berikut terbaik menggambarkan pendapatan bulanan kasar isirumah anda (termasuk semua sumber pendapatan)?

≤ RM 1000……………………………………..............	*1*
RM 1001 – RM 2000…………………………………….	*2*
RM 2001 – RM 3000…………………………………….	*3*
RM 3001 – RM 4000 …………....... ………………........	*4*
RM 4001 – RM 5000……………………………………	*5*
≥ RM 5001 …………………………………………....	*6*

27. Berapakah jumlah kenderaan (bagi semua kenderaan 4 roda) yang anda miliki dan boleh digunakan oleh kesemua isirumah untuk kegunaan peribadi?

Sila nyatakan bilangan : _____

28. Berapakah jumlah motosikal yang dimiliki oleh isirumah anda?

Sila nyatakan bilangan: _____

29. Berapakah jumlah basikal yang dimiliki oleh isirumah anda?

Sila nyatakan bilangan: _____

30. Apakah mod pengangkutan utama yang anda (dan pasangan anda) gunakan bagi perjalanan ke tempat kerja?

	Responden	Pasangan
Kereta		
Motosikal		
Basikal		
Pengangkutan awam – Bas		
Pengangkutan Awam – Berlandaskan Rel (LRT, Monorel, Keretapi)		
Teksi		
Berjalan kaki		
Lain-lain (*Sila nyatakan: _____*)		

31. Dimanakah biasanya anda meletakkan kenderaan anda?

Ruang letak kereta khusus di dalam kawasan rumah . .   *1*

Di tepi jalan …………………………………………..   *2*

Garaj berkunci ………………………………………….   3

Kemudahan tempat letak kereta yang disediakan di

dalam kawasan kejiranan …………………..……   *4*

Lain-lain

(Sila nyatakan_____) *5*

Tamat

Terima Kasih di atas masa yang anda luangkan!

APPENDIX D: OBSERVATION SURVEY CHECKLIST

URBAN FORM ELEMENTS SURVEY

Date of Commencement: January, 2010

STUDY AREA:

1. Putrajaya (Neighbourhood Area) Precinct 6, 7, 8, 9, & 10.
2. Kuala LumpurCity Centre (Neigbourhood Area)

URBAN FORM ELEMENTS:

- Transportation Infrastructure
- Density
- Orientation
- Land Use
- Housing types
- Building types
- Urban layout and morphology

Key photographic checklist (to be taken for each case study areas/sub areas):

- Views of area from various views (wide-perspective view to capture layout and land use mix of)

- Views of different types of houses: terraces, semi-detached houses, detached houses, flats/apartments, shophouses, townhouses etc.

- Views of all streets/ paths

- Views of open/ recreation spaces to show condition i.e. maintenance, quality, and usage

- View of local services and facilities in the area

    - Commercial/ Retail services: Supermarket, sundry shops, markets, kiosk, stalls, etc.
    - Healthcare facilities: private clinics and public health centre.
    - Recreational facilities: playground, football field, park, garden, open spaces, etc.

- o Support services: bank, post office, petrol stations, religious centre i.e. mosque, musolla etc

- Evidence of problem in area: littering, lack of parking, vandalism, maintenance etc.

- Views of routes in the area, showing type of roads/ footpaths

- View of Landmarks in the area

- Views of representative Building types (i.e. commercial, industrial, Housing, Educational, Recreational, Buildings).

- Other (write in):--

- Other (write in):--

- Other (write in):--