

Walking Convenience in Urban Community in Promoting “Green Neighbourhood”



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“IN THE NAME OF ALLAH S.W.T THE MOST PRECIOUS AND MERCIFUL”

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May ALLAH S.W.T bless us all

4. Enhanced Research Title and Objectives

(If any)

Original Title as Proposed:

Walking Convenience in Urban Community in Promoting ‘Green Neighbourhood’

Improved/Enhanced Title:

Walking Convenience in Urban Community in Promoting ‘Green Neighbourhood’

Original Objectives as Proposed:

The objectives outlined for this study are:

- 1. To redefine the neighbourhood concept towards creating green neighbourhood**
- 2. To evaluate the planning of community facilities by considering walking convenience in neighbourhood area.**

Improved/Enhanced Objectives:

- 1. To determine the walking behaviour in urban community towards creating green neighbourhood**
- 2. To evaluate the planning of community facilities by considering walking convenience in neighbourhood area.**

5. Report

5.1 Proposed Executive Summary

Walking convenience has these implications; i) the high tendency for people to walk more than driving private cars which then reduce the emission of toxic gases into the air and ii) people will meet more fellow neighbours if they walk more in their neighbourhood than driving thus resulting in a sustainable community. Malaysia has a climate that is hot and humid that encourages the use of cars and air-conditioners. According to Malaysia New Economic Model (NEM) one of its eight Strategic Reform Initiatives (SRIs) is Ensuring Sustainability of Growth. It is in line with the aim of study to produce a green neighbourhood guideline in reducing the use of automobiles and encourage walkability in neighbourhood area reducing the production of greenhouse gases (GHG). It also gives great contribution in achieving the New Economic Model (NEM) strategic. In the context of this study, the implications of community facilities provision in urban neighbourhood area is analyzed by walking convenience which can be assessed by walking behaviour and measured by walking patterns of residents. The study will compare the accessibility of community facilities by walking convenience in study area and as theorized in the neighbourhood concept towards recommending guidelines increasing the 'walkability' of the neighbourhood to the community facilities. The study is conducted in an urban neighbourhood area such as Putrajaya since the city promotes 'green living'. The survey techniques that are expected to use are i) the expert interviews, ii) walking distance tests and iii) questionnaire survey. The expected outcome is promoting a new walkable neighbourhood concept that will decrease the use of cars and motorcycles towards the preservation of the green environment in the city for a better quality of life and better living environment for the present and future generation.

Keywords: Community facilities; walking convenience; walkability; Green Neighbourhood

5.2 Enhanced Executive Summary

Research background: The rapid growths of the cities in terms of economic and social development are the reasons that lead to major development problems in most of the country around the world. Many approaches have been made to Malaysia in encounter the development problem such as green neighbourhood concept. However, the concept still lacking in certain areas especially for encourage people to walk conveniently to reach the community facilities in the neighbourhood area. In addition, there is the need to evaluate the community facilities planning guidelines by considering walking convenience in neighbourhood area. This research intends to fill these two gaps in Malaysian community facilities planning study to encourage more sustainable environment for all. Other than that, this research also supports to achieve the objective of Putrajaya Green City Plan 2025.

Objectives: This research outlines two main objectives which are; (1) to determine the walking behaviour in urban community towards creating green neighbourhood and (2) to evaluate the planning of community facilities by considering walking convenience in neighbourhood area.

Methods: This research is the mixed method research of two types of survey which are semi structured interview and questionnaire survey. Semi structure interview measures the professional opinion while, questionnaire survey measures perception of residents on walking behaviour and walking conveniences in the neighbourhood area.

Case studies: The research was conducted in Putrajaya because Putrajaya used the garden city approach and also to encounter Putrajaya walkability problems. Two Precincts of different housing characteristic but similar community facilities planning characteristic were chosen as the case studies, Precinct 8 and Precinct 9 neighbourhood area.

Findings and conclusion: Findings show that walking convenience does significantly influence the level of walkability in Putrajaya neighbourhood area. Moreover, the findings also indicate that residents in high density residential area (Precinct 9) tend to walk more compare to residents with low density residential area (Precinct 8).

Keywords: Community facilities; walking convenience; walkability; Green Neighbourhood

5.3 Introduction

Climate change is a widely accepted fact. Industrialization and urbanization are the main causes of the climate change phenomena all around the world. According to United Nation survey, by 2050 nearly 70 percent of global population will be living in the cities. The rapid growths of the cities in terms of economic and social development are the reasons that lead to major development problems in most of the country around the world. According to Hashim (2005), as urbanization rate increase, there is a pressing need to improve community living in today's neighbourhoods as "neighbourhood is seen as the most important urban element that establishes the social and economic sustainability of the area, providing the community ties which hold it together...". Effort to improve neighbourhood living in today's urban community must be taken seriously because the social values in the urban area are characteristically different than the rural community (Yahya Ibrahim, 1995)

Moreover, one of the main problems of urbanization is the increase in growing dependence on automobiles. The main mode of transportation even in the neighbourhood area is the private cars because it is the norm of urbanites to use the motorized vehicles rather than to walk. This also leads to the sprawling development and unsustainable lifestyle which disconnect pedestrians to the neighbourhood cores by creating housing that sprawled outside of the residents walking zone (MacNally, 2010). Thus, people realized that there must be sustainable approaches to encounter the climate change phenomena. One of the initiatives is to design a neighbourhood area towards a walkability living because the design of the neighbourhood can influence the walkability of the housing area. The walkability of the neighbourhood can be measured by identifying the walking behaviour of the residents to community facilities provided. Different categories of residents have different types of walking behaviour. Increasing the walkability of the neighbourhood means that the planning and design needs to be improved towards more sustainable living.

The concept of neighbourhood unit evolved from the unplanned housing construction design during industrial revolution. The degradation of city environment causes by high congestion, heavy traffic movement through the city, insecurity of children going to school, distance location of basic community facilities also influence the design of the neighbourhood concept. Creating safe healthy physical environment will help in improving the unsustainable living. According to Gallion and Eisner (1963) neighbourhood are defined as a physical environment in which children will have no

traffic streets to cross on their way to school, all the basic community facilities such as school, playground and local shop is provided within walking distance; an environment in which community may walk easily to a shopping center where they may get the daily household goods, employed people may find convenient transportation to and from work. It is an environment in which a well-equipped playground is located near the house where children may play in safety with their friends in a safe and healthy development for their mind and spirit. The Neighbourhood Unit coined by Clarence Perry in 1929 illustrated the relationships between the residential components of a neighbourhood and non-residential component area by walking distance. Perry's intentions were calibrated to the human foot, not the automobile. The green concept is known as the "Green Neighbourhood". According to Landman (2010), the Green Neighbourhood is aimed to promote walkable and livable communities that reduce urban sprawl, decrease automobile dependence, provide housing close to jobs and services, and benefit environmental and public health. According to Department of Town and Country Planning (2011), green neighbourhood is the great neighbourhood concept that can combat the climate change. The green neighbourhood consist of 10 main components which are (i) Neighbourhood Size, (ii)Density, (iii)Composition of Mixed Land Use, (iv) Variety of Housing Types, (v)Street Network, (vi)Transit Services, (vii)Streetscape, (viii)Public Open Space, (ix)Neighbourhood Centre and (x)Local Food Production.

5.4 Brief Literature Review

Climate change brings the need to seriously reconsider the way cities are designed. In fact, cities now find themselves at the very centre of the “Green Revolution” as one of the main components for achieving sustainability. As a result, several urban initiatives are being put forward to make cities greener, healthier and more eco-friendly. One of these is the concept of “Green neighbourhoods”, which is probably the very first attempt to connect urban sustainability principles with micro-level community planning. Green Neighbourhood is a great place to live, as well as a terrific opportunity to combat climate change. According to Jonathan Denis-Jacob (2012), green neighbourhood is defined as being moderately dense, mixed-use, designed at a human scale, active and public transportation oriented and literally “green”. It is a place that emphasised on sustainable transportation and proximity to a diversity of services and amenities, in short, it consist of those elements which make neighbourhoods liveable places to live, work and play.

In Malaysia, green neighbourhood is designed based on the guidelines outlines by Federal Department of Town and Regional Planning Malaysia. One of the principle outlines is the walking convenience within the neighbourhood area. The principle is Pedestrian Walkways. This principle point out that the minimum size of pedestrian walkways in the residential area is 1.5 meter (5 feet) to provide comfortable walking place to walkers walk side to side. In neighbourhood centre area or high density area, the size of pedestrian walkways should be bigger than recommended size of pedestrian walkways in the residential area. The pedestrian walkways also should be equipped with natural landscapes and big tree to give shaded to walker when walking. The pedestrian connectivity must be the continuous network. Other, the location of kerb also should be decrease so that there are many ‘free barrier’ pedestrian walkways been provided. Walking convenience can be consider as one of the important factor in encourage residents in urban neighbourhood perform walking activity especially to the community facilities provided within walking distance.

5.4.1 Convenience to walk

Walking also may depend on comfort, which reflects the convenience of walking. Comfort can be operationalized by sidewalk, street conditions and traffic volume(Boarnet et al., 2005; Jago et al., 2005). Walking may be more likely to occur in environments that are pleasurable, such as neighbourhood with tree lining the

street and residents who spend time outdoors (Mota, Almeida, Santos, & Ribeiro, 2005).

Convenience also can make people willing to walk which depends on directness, continuity and availability (Untermann, 1984). Most people walk because there are natural attraction such as trees, grass, water and few other people. Removing obstacles such as barriers and installing sidewalk none exist is the first step. Shortcuts routes are the best aids which will make people walk as it reduce walking distance, focusing on desirable location such as school, shopping, play and work. Other than that extend traffic signal "WALK" time to ½ second per foot of roadway width assures adequate time and freer movement. Walker can change direction and go around obstacles but not without a sense of disruption as walk with few barriers contributes to psychological well-being and walking pleasure, but barrier elimination also can speeds up traffic flow and increase the walking capacity.

Auto travel has reduced the quality of many pedestrian areas and lengthened the walking distance necessary to accomplish daily activities. The shift also has reduced bus transportation making it difficult to live without a car. Shoppers who carry packages or tending children are not willing to walk more than 1,000 feet. Older people tired easily and not be able to walk a long distance. Other than that, construct an outstanding road network has been a factor in lowering the quality of the pedestrian system. When driver do not need to walk long distance, the need to developed good walkways disappears.

Convenience to walk also can be related to walking pleasure. Pleasure to walk is enhance and improved by providing protection, coherence, security and interest. Separate walk from major roads by curb or six feet planting increase safety. Protection from bad weather also can extend the walk potential. Walking also involved waiting. People wait to watch other people; waiting can make more comfortable with weather protection such as seating and space to talk. Waiting also can be more comfortable if it is slightly out of the line of traffic.

Visual appeal and stimulation is important to reinforce the progress being made by pedestrians. Well lighted and active streets are more appealing for night walking and provide feeling of security especially in urban area. Moreover, pedestrian furniture such as benches, planter and detailed paving can enhance visual experience and reduce the apparent walk length. The change in travel speed change in the way we design the landscape.

Adequate space for pedestrian flow is not important as the festiveness of the experience because people like to talk, mix, and watch and these activities enhance the total experiences even they may actually impede walking flow. Shopping districts may benefit by encouraging through pedestrian traffics. Moreover, foot traffic is busy enough, food and beverage services should be encouraged even though some merchants believe allowing private vendors in the streets and park should be discouraged.

5.4.2 Community Facilities Planning

Community facilities are the local services in neighbourhood area. Localised provision of community facilities to permit access by walking should be encouraged in every neighbourhood. The facilities should be grouped together in the direction of the major traffic flow from the development area to the outside, accessible by direct pedestrian and automobile routes. According to Barton et al. (2003), community facilities should be clustered together at location well served by bus or pedestrian routes preferably parallel to the main street which can offer variable catchments that can adapt to market condition. Cluster of community facilities provides an opportunity for multi-purpose trips that can save people's time and money. Cervero (as cited in (Saelens, Sallis, & Frank, 2003) stressed out that clustering can also increase the proportion of people using public transportation rather than the private cars. Within the group, the various facilities should be physically separated for each other to prevent conflict of circulation(De Chiara & Koppelman, 1929). The physical centred of the neighbourhood can stimulate the growth of community relationship. According to (Azmi & Karim, 2012) the strategic location of community facilities is different depending on the type of community facilities provided. Previous research also suggested that perception may vary based on the type of destination being judged (Lee, 1970). Moreover, the physical centre of the neighbourhood can stimulate the growth of community relationship. It is important that the pedestrian access to the school should be separated from all vehicular access to other facilities. Provision of neighbourhood facilities should be examined with the available existing facilities as there may be city or district facilities that can be also used by the neighbourhood as long as the existing facilities provide good service and readily accessible.

The type of common community facilities that should be located within walking distance in the neighbourhood area are listed as below (Table 5-1):

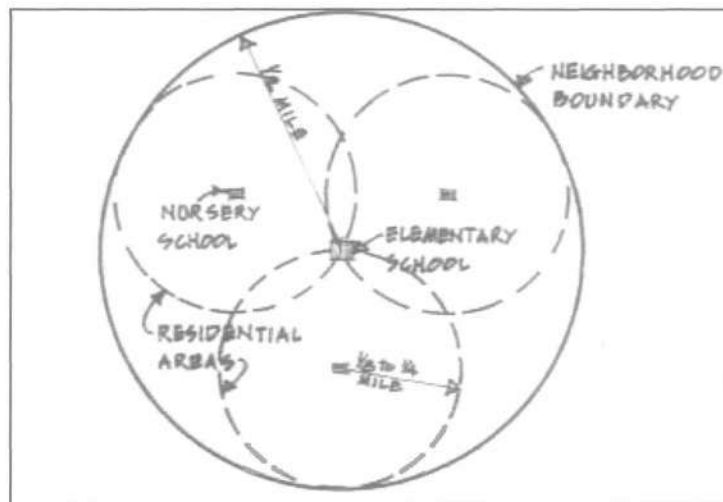
TABLE 5-1

Type of common community facilities/services within walking distance

Community Facilities/Services	Authors Barton, Grant & Guise (2003)	Neighbourhood Environment Walkability Scales (NEWS) by Saelens et al. (2003)	Krissek, Horning & El-Geneidy (2012)	De Chiara & Koppleman, (1925)
	There are 12 types of services : Local shop Nursery/junior school Primary school Secondary school Health centre Food shop (pub) Post office Local centre Community centre Bus stop Open space Leisure facility	There are 23 types of services: Convenience/small grocery store Supermarket Hardware store Fruit/vegetable market Laundry/dry cleaners Clothing store Post office Library Elementary School Other school Book store Fast food restaurant Coffee place Bank Non-fast food restaurant Video store Pharmacy Salon Your job/school Bus stop Park Recreation centre Fitness facilities/gym	Divided the services into 3 main group: Retail businesses (convenience store, grocery store, hardware store, Laundromat, bookstore, coffee shop, bank, pharmacy, barber) Public services (Post office, library, school) Amenities (Transit stop, off-street trail, park)	Did not explain in detail about services that should be provided only outlines type of main community facilities should be provided such as: Local shop Elementary school Junior school High school Playground Churches

FIGURE 5-1

Maximum walking distance for school children in neighbourhood area



Source : (De Chiara and Lee Koppleman (1925), Urban Planning and Design Criteria)

5.4.3 Community Facilities Guidelines in Malaysia

Community facilities can be considered as one of the important elements in residential development. Community facilities planning in Malaysia are based on the guidelines designed by Federal Department of Town and Regional Planning. Federal Department of Town and Regional Planning published various guidelines for community facilities planning. The community facilities planning in Malaysia usually are provided based on the location and population catchment of the area. The community facilities guidelines are divided into two types which are the general community facilities guidelines and the specific guidelines for every community facilities. This section will explain in details about the requirement needed in the guidelines especially that are related with the walkability.

The general community facilities guidelines cover the requirements of seven types of main community facilities such as (1) education facility, (2) police station, (3) fire and rescue station, (4) community centre, (5) library facility, (6) welfare facility and (7) health facility. The general principles of this guideline are listed as below(Federal Department of Town and Regional, 2012b):

Accessibility – The community facilities provided must be located at area where it is easy accessible by walking.

Convenience and Safety – The design and location of the community facilities should consider people safety and comfort to used and reach the community facilities.

Interaction – The provision of community facilities must encourage sense of community, sense of identity and social interaction within the community.

Form of arrangement – The arrangement of community facilities must consider element of Crime Prevention through Environment Design (CPTED) and Universal Design with supported facility such as parking space and toilets.

The requirements explanation for specific guidelines will consist only on selected community facilities that will be used in this research. The requirements are gathers from various community facilities guidelines such as *Garis Panduan Perancangan Perumahan*, *Garis Panduan Perancangan Tanah Lapang dan Rekreasi*, *Garis Panduan Perancangan Kawasan Perdagangan*, *Garis Panduan Perancangan Surau dan Masjid* dan *Garis Panduan Perancangan Kemudahan Masyarakat* (Federal Department of Town and Regional, 2012b). There are seven community facilities will be used which are (1) neighbourhood shop, (2) park and recreational facilities, (3) elementary school, (4) secondary school, (5) community centre, (6) surau and (7) bus

stop. The detail explanation on requirement on location and population catchment for each community facilities are explained in the table as below (Table 5-2):

TABLE 5-2

Population density and location requirement of community facilities planning

Types of community facilities	Population Catchment	Location requirement
Neighbourhood shop	Nil	<ul style="list-style-type: none"> • Must be located within 5 minutes of walking time or 400 meter walking distance from residential area. • Located near main thoroughfares and neighbourhood centre.
Park and recreational facilities	3,000-12,000 population	<ul style="list-style-type: none"> • 10% from the total development area. • Must be located within 5 minutes of walking time or 400 meter walking distance from residential area.
Elementary school	Minimum population of 3,000 Maximum population of 10,800	<ul style="list-style-type: none"> • Near residential area. • Must be located within 5-10 minute walking time or maximum distance of 800 meter from residential area. • Drop off and Pick up point must be provided for safety purposes.
Secondary school	9,000 population	<ul style="list-style-type: none"> • Near residential area. • Must be located within 10-20 minutes of walking time or maximum distance of 1600 meter from residential area.
Community centre	Minimum population of 3,000 Maximum population of 10,000	<ul style="list-style-type: none"> • Must be located within minimum of 10 minutes of walking time (800 meter walking distance) to maximum of 30 minutes of walking time (1 kilometre of walking distance) from residential area. • Component within the centre are office, badminton court, store, toilets, prayer rooms.
Surau	1 unit for every 200 unit of houses.	<ul style="list-style-type: none"> • Must be located in 'kiblat' direction. Location must be easy accessible to reach by cars or walking. • Must be located minimum of 5 minutes of walking time (400 meter walking distance) to maximum of 10 minutes of walking time (800 metre of walking distance) from residential area.
Bus stop	Nil	<ul style="list-style-type: none"> • Must be located within 5 minutes of walking time or 400 meter walking distance from residential area.

The requirement indicated that the population catchment and location requirement are the main factors in defined the location of the community facilities in the residential area. Moreover, summaries on maximum and minimum of walking distance by types of community facilities gathers from various guidelines are illustrated in the Table 2-22. Based on the summary table, it can be concluded that the minimum walking distance

recommended by JPBD to reach the community facilities are within 400 meter or 5 minutes of walking time from residential area to destination.

TABLE 5-3

Summaries of maximum and minimum walking distance to community facilities by JPBD

Community Facilities	<i>Garis Panduan Perancangan Kawasan Hijau (2012)</i>		<i>Garis Panduan Perancangan Kemudahan Masyarakat (2012)</i>		<i>Garis Panduan Perancangan Kawasan Perumahan (2013)</i>		<i>Garis Panduan Perancangan Kawasan Perniagaan (2012)</i>		<i>Garis Panduan Perancangan Surau dan Masjid (2011)</i>	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
	(meter)		(meter)		(meter)		(meter)		(meter)	
Neighbourhood shop	400	400	400	400	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Park and recreational facilities	<i>Nil</i>	<i>Nil</i>	400	400	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Elementary school	<i>Nil</i>	<i>Nil</i>	400	800	400	800	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Secondary school	<i>Nil</i>	<i>Nil</i>	800	1600	800	1600	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Community centre	<i>Nil</i>	<i>Nil</i>	1000	1000	800	800	<i>Nil</i>	<i>Nil</i>	400	800
Surau	<i>Nil</i>	<i>Nil</i>	800	800	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	400	800
Bus stop	400	400	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>

5.5 Methodology

Methodology is a guideline and that can describe the process to obtain the data of the study. It also can determine the suitable method in how the research will be conducted. This research used to types of research instrument which are expert interview and questionnaire survey.

5.5.1 Expert interview

Interview is a data collection method particularly during the exploratory stages of research. According to Sekaran & Roger (2010), data collected through interview are exploratory in nature. Exploratory studies basically is the pilot studies on small scale, interviewing individual or gathering information from a limited number are common in exploratory research. According to Zhang & Wildemuth (2005), interview can be divided into three categories: structured interview, semi-structured interview and unstructured interview. A structured interview is interviews that have a set of predefined questions and the questions would be asked by exact order to the respondents. Unstructured interview is defined as interviews in which neither the question nor the answer categories are predetermined. Semi-structure interview is defined as a guided interview that is prepared, but in the course of the interview, the interviewer has a certain amount of room to adjust the sequence of the questions to be asked and to add questions based on the context of the participants' responses.

For this research, expert interview was conducted to explore the earlier idea in drawn out the suitable variables that can be used in this study. Expert interview is an interview session with someone knowledgeable about the area of research. The types of interview used are the semi-structured face to face interview. In semi structured interview, is hard to determine the exact number of interviews that have to be done for a safety diagnosis, it is important to cover all topics with a range of sources (Laforest, 2009). The interview was conducted with six (6) expertises in the area of sustainable and green neighbourhood planning. The respondents are divided into two categories, which are academician and practitioner from the industry. Four of the respondents who expert in town planning field are from Federal Department of Town and Country Planning (JPBD), Malaysia Institute of Planner (MIP) and Director of Urban Planning firm in Malaysia and lecturer in Universiti Teknologi MARA(UiTM). Another two respondents who expert in Architecture and Landscape Architecture field are lecturer in Universiti Teknologi MARA(UiTM).

The duration of each interview lasted about 60 minute and by making an early appointment with the respondents. Laforest (2009), outline that the semi-structured interviews should last from 60 to 90 minutes. Sixty-minute interviews are perfectly acceptable and ensure that neither the interviewer nor the respondent lose their concentration. The interviews session also was tapped using a voice recorder. The respondents audio are then transcribed and analysed using the software called Computer Aided Qualitative Data Analysis (CAQDAS), Nvivo. The data from the interview was extracted using thematic analysis.

5.5.2 Questionnaires survey

Questionnaire is one of the efficient data collection instruments in research if the researcher already categorizes the variable to be measure. Questionnaire is defined as a set of questions for gathering information from respondents or individuals (Department of Health and Human Services [DHHS], 2008). The good way to collect data using questionnaire is by personal administered questionnaires. The survey is conducted when researcher or hired enumerators personally go to the site area to distribute the questionnaires. This is a good way to collect the data because distribution of the questionnaire to large number of respondent is less expensive and less time consumes compare to interviews. Moreover, if the respondents have any doubts on any questions in the questionnaire, it can be clarified on the spot.

In this research, the questionnaires survey was conducted in both study area; Precinct 8 and Precinct 9. The questionnaire undergoes the pilot study process before it was used in the final survey. The questionnaire was administered personally to the respondents in the study area. Identify the response rate in conducting the questionnaires survey is an important measured in determined the successful percentage of samples distribution. Response rate is the number of respondents who completed a questionnaire divided by the total number of respondents who were asked to participate (Department of Health and Human Services [DHHS], 2010). The respond rate in conducting the personal administered questionnaire for both study area is 100%. The respond rate is 100% because extra numbers of questionnaires are distributes to respondents than the number of sample needed for this study. Dommeyer, Baum, Hanna, & Chapman (2004), suggested that suitable and acceptable response rate for personal administrated questionnaires is more than 75%. Watt et al. (2002), outline that the overall response rate for face to face questionnaire survey was more than 33.3%. This can be concluding that the

questionnaire survey for this study achieved a successful percentage of respondent rate result. Moreover, majority of the questions in the questionnaire survey are analysed using Statistical Package for the Social Sciences (SPSS) software.

5.5.2.1 Sampling process

Sample is a subset or subgroup of the population. Sampling unit is the element or set of elements that is available for selection in some stage of the sampling process (Sekaran & Roger, 2010). Samples size is determined by the total population and interval error that has been calculated using sample calculation formula. Sample size can be calculated using the formula $n = N / (1 + Ne^2)$, where 'n' is total number of sample, 'N' represent total population and 'e' represent internal error.

Disproportionate stratified random sampling was chosen as the technique in identify and distribute the total number of samples that can best represent the total population for both study area. Stratified random sampling involves a process of stratification of the total population into group, followed by random selection of subjects from each group. In this study, the precinct represents the different groups from the total population. The total population for both Precincts are 37 515 peoples. The total population for Precinct 8 is 6 979 people and the total population for Precinct 9 is 30536 peoples. From the manual calculation on sample size, the total of sample need for 37 515 peoples is 379. Moreover, according to Sekaran & Roger (2010), total samples size for population between 30000 to 40000 peoples is similar with manual calculation which is 379 samples with 95% confidence level and 5% of confidence interval. The samples size also is calculated using the internet sample size calculator by Creative Research System (2014) to check the similarity of sample size between each calculation technique(refer Figure 3-1).

From different calculation techniques it can be concluded that there are just small differences in total number of samples between manual and internet calculation. This is because small margin differences of confidence interval which is 0.01. There are three types of confidence level which are 90%, 95% and 99 %. Ninety five percent (95%) confidence level is typical for population with normal distribution (Boytssov, 2010).

The total sample used for this study is 379 with 95% of confidence level where 72 samples for Precinct 8 and 307 samples for Precinct 9.

FIGURE 5-2

Internet sample size calculator result

Determine Sample Size

Confidence Level: 95% 99%

Confidence Interval:

Population:

Sample size needed:

Find Confidence Interval

Confidence Level: 95% 99%

Sample Size:

Population:

Percentage:

Confidence Interval:

5.6 Results and Discussion

5.6.1 Expert Interview

Expert interview was conducted to identify the suitable variables that can be used in the study. The type of interview used is the semi structured interview. This interview was conducted to gather the feedback and opinion from professionals on how the neighbourhood concept used in urban area affect the walkability within the neighbourhood area using exploratory research approach. The data from the interview was analysed using Computer Aided Qualitative Data Analysis (CAQDAS) Nvivo. The process of the analysis was explained in the previous chapter.

Based on the interview that is conducted among certain experts from different fields and backgrounds. The findings consist of negative and positive perceptions among the expertise. The following sections will highlight the findings in two different forms. The first findings are coding frequency of respondent perceptions shown in the form of table. The second findings are the summary of qualitative findings on respondent perceptions in the form of flow chart. Both findings are constructed based on the research domains which are walkability domains, community facilities planning and neighbourhood environment domains.

5.6.1.1 Coding Frequency

The coding frequency is gathered by analysing the transcribing of all the respondents using Nvivo analysis techniques. The number shows how often respondents express their negative and positive perception on all the three main domains. From the findings (Table 5-4), shows the majority of respondents give higher negative perceptions rather than the positive perceptions, with the frequency of 38 for negative perceptions and only 11 for positive perceptions. This can be argued that urban neighbourhood in Putrajaya are still lacking in promoting a walkability environment.

Table 4.1 show that the highest total frequency on negative perceptions by the respondents fall under the walkability domains (14 negative perceptions) consists of questions on the suitable distance for residents to walk in neighbourhood area, perception on willingness to walk before chooses to drive and do people feel safe and convenient to walk within their neighbourhood area?. The highest negative perceptions frequency is question related to safe and convenient to walk in the neighbourhood area. These show

that experts think most of the residents in Putrajaya do not feel convenience to walk within their neighbourhood area.

The highest total frequency on positives perceptions by respondents fall under the community facilities domains which are easy accessible location of community facilities by walking in the neighbourhood. Playground is chosen as the most accessible community facilities in Putrajaya area by the respondents. From the table, we can conclude that the neighbourhood design applied in still do not encourage people to walk, as more feedbacks on negative perceptions rather than positives perceptions on all the three main domains.

TABLE 5-4

Coding frequency of respondents perception on walkability in Putrajaya

No	Domains	Respondents perception	
		Positive	Negative
Neighbourhood Environment			
1	Neighborhoods Design apply encourage people to walk.	2	4
2	Clarence Perry Neighbourhood Design Principle applies in urban neighborhood area.	1	3
3	Awareness of practitioner such as local authority, developers, architect and planner to developed neighbourhood to promote walking.	1	3
4	Landscape planning (walking facilities)	-	2
5	Hot climate condition affect walking	-	1
Walkability			
1	Walking distance to community facilities.		
	Local Shop	-	-
	Playground	2	-
	School	-	1
2	Perception on willingness to walk before chooses to drive.	-	3
3	Safe to walk	-	4
4	Convenience to walk	-	6
Community facilities planning			
1	Strategic Location of community facilities		
	Local Shop	1	2
	Playground	-	1
	School	-	1
2	Easy accessibility location of community facilities by walking in neighbourhood area.		
	Local Shop	-	2
	Playground	4	2
	School	-	2
3	Clustering of Community Facilities	-	1
Total		11	38

*Note: the figure is based on coding frequency mentioned by the experts in transcription using Nvivo. The number shows how often respondents express their perceptions on all the three main domainss.

5.6.1.2 Summary of Qualitative Findings

Summary of qualitative findings was gathers from all perceptions expressed by the respondents. It shows in detail every perception and are divided using the same three main domains groupings used in the previous findings of coding frequency table. The summary of finding is simplified are shown in the form of flow charts.

Figure 5-3 shows summary of all perceptions gathered from the respondents. It shows in detail every perception and are divided using the same three main domains groupings used in the previous findings of coding frequency table.

Based on the findings, urban neighbourhood designs in Putrajaya are found to not encourage people to walk. This is because most of the neighbourhood designs still use single land use approach which tends to make people use the automobile to go from their origin to desire destination. Moreover, neighbourhood designs in Putrajaya have poor pedestrian design because they have too many barriers along the way which affect people desire to walk. One of the respondents said that; "Malaysians are not willing to walk because there is too much barrier, we should design toward what I call it barrier free". The adaptation of Clarence Perry Neighbourhood concept applies in urban neighbourhood area in Malaysia also is not suitable for tropical country such as Malaysia. The main purpose of the neighbourhood concept illustrate the relationships by walking distance, but the 400 meter distance from home to the community facilities is not working in our country today. Based on the respondent's perception, most of them think that the 400 meter walking distance should be reduced and the distance should not be calculated by straight radius line. There are also lack of awareness from the local authority, developers, architects and planners to develop a sustainable neighbourhood to promote walking. The developers are more interested in gaining profits rather than developing a sustainable residential area. These make them not willing to provide open space more than 30 per cent. Only big developers have the intention to develop a sustainable neighbourhood.

In terms of walkability in the neighbourhood, people in urban area especially in Putrajaya are not willing to walk in reaching community facilities provided in their neighbourhood. They are more likely to drive rather than to walk. Perceptions on walking in the neighbourhood to three basic community facilities such as school, playground and local shop were gathered. According to respondent's perception on accessibility, only the playgrounds are easily accessible to them compared to the school and the local shops. Majority of the respondents said that the school are located far from their house. One of the respondents said that the school is located near his house but, it is not safe enough to reach it by walking; "In my neighbourhood even if it located near my house I am still going to send the children by car because of high crime rate". In terms of walking distance, most of the respondents agreed that they are willing to walk 5 to 10 minute in reaching the community facilities provided in their neighbourhood area. Other than that, majority of respondents suggest that the reasons why Malaysian people are not willing to walk are because neighbourhood design is not well planned in term of community facilities

planning. They also think that Malaysians people do not like to walk and carry out healthy activities.

In terms of community facilities planning in Putrajaya, the community facilities do not have proper connectivity from one place to another place even though there are beautiful green networks. In term of strategic location, neighbourhoods in Putrajaya lack of community facilities such as the local shop. Moreover, most of the school Putrajaya are located near the main road, and this resulted in an unsafe environment to the school children. Safety is also one of the reasons why people are not willing to reach their community facilities by walking. Based on the perceptions of respondents in terms of safety, the reason why the urban neighbourhoods in Putrajaya discourage walking is because the road curb provided is too high for walking. There are also lacks of people control the traffic especially near the school area. The respondents also view that a high number of crime and feeling insecure are the reasons why they prefer to drive rather that walk.

For perceptions on convenience, the respondents think that the pedestrian walkways and cycling path provided in urban neighbourhood area in Putrajaya are too narrow. The pedestrian walkways are also not well connected and lack of covered paths. In a tropical climate such as Malaysia, this is why Malaysian is not willing to walk because the condition of pedestrian walkways is not comfortable or pleasant. Urban neighbourhoods in Putrajaya also lack of handicap facilities which tend to make this group of people unable to use the community facilities provided. In terms of landscape planning, the respondents view that neighbourhood area in Putrajaya lack of signage for walking people and big shady trees. From the respondents' perception, hot climate also is the main reason that discourages people to walk, thus reducing walkability in urban neighbourhood.