AN EXPLORATION OF THE EMPLOYEE'S PERCEPTION OF WALKING: ENHANCING THE WALKING EXPERIENCE IN KUALA LUMPUR

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LIST OF ABBREVIATIONS

CAQDAS	Computer Aided Software for Qualitative Analysis
CBD	Central Business District
CDP	Comprehensive Development Plan
CO	Carbon monoxide
CO^2	Carbon Dioxide
CHKL	City Hall of Kuala Lumpur
DBKL	Dewan Bandaraya Kuala Lumpur
ERL	Express Rail Link
ETP	Economic Transformation Program
FTKL	Federal Territory of Kuala Lumpur
GTA	Golden Triangle Area
JICA	Japan International Co-operation Agency
K-economy	Knowledge-based Economy
KLCC	Kuala Lumpur City Centre
KLCPP	KLCC Property Holdings Berhad
KLCH	Kuala Lumpur City Hall
KLIA	Kuala Lumpur International Airport
KLMA	Kuala Lumpur Metropolitan Area
KLSP	Kuala Lumpur Structure Plan
KLSS	Kuala Lumpur Sentral Station
KTM	Keretapi Tanah Melayu
LRT	Light Railway Transit System
MRR 1	Middle Ring Roads 1
MRR 2	Middle Ring Roads 2
MSC	Multimedia Super Corridor
NEP	New Economic Policy
NMT	Non-motorized Transportation
NMTI	Non-motorized Transportation Improvement
PBIC	Pedestrian and Bicycle Information Centre
PQN	Pedestrian Quality Needs
QDA	Qualitative Data Analysis
SOV	Single Occupancy Vehicles
SPNB	Syarikat Prasarana Nasional Berhad
VMT	Vehicle Miles Travelled

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DECLARATION

This thesis is submitted under the University of Salford regulation for the award of a PhD degree by research. Some findings during the research together with details associated with the research process itself have been published in refereed conference proceeding prior to this submission and are detailed in Appendix G.

The work presented was carried out under the supervisions of Professor Marcus Ormerod and Ms Rita Newton, within the School of the Built Environment, University of Salford. Unless otherwise stated in the text, I here declare that the work presented in this thesis was the result of my own work. There is no portion of the work covered in this thesis that has been submitted in support of any application for other degree or qualification at this or other institutions of higher learning.

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Mastura Adam
July 2013

ABSTRACT

AN EXPLORATION OF THE EMPLOYEE'S PERCEPTION OF WALKING: ENHANCING THE WALKING EXPERIENCE IN KUALA LUMPUR

Urban planners in the Transportation Department of Kuala Lumpur, over a period of time, noticed a progressive increase in the influx of privately-owned vehicles into the city and decrease in the modal share of public transport. Over-dependence on cars has encouraged a sedentary lifestyle, an obesity epidemic, social exclusion and increased carbon foot print. This research investigates the factors that have led to the increasing dependency on private vehicles by employees who work in employment centres in Kuala Lumpur city. Deficiencies in urban planning have created a spatial separation between people and workplaces, meaning that the existing built environment and land uses are inadequately coordinated with various modes of transportation which could facilitate the movement of people in the city. This results in long hours of commuting between employment centres and residential areas, and causes severe traffic congestion into the city centre daily. Understanding this real life phenomenon in a holistic manner is vital in order to find or create alternatives to car dependency and traffic congestion, as it will show how people construct the meaning of commuting in their built environment, and how commuting can be beneficial to them.

In order to establish these arguments, the research takes a qualitative research approach, collecting data from multiple sources of evidence such as interviews and participant observation. A multiple embedded case study approach was adopted, using two contrasting areas in the city of Kuala Lumpur as samples; both the user and the pedestrian environment were used as units of analysis to measure the research questions. This allowed for the use of cross-case analysis to expose a replication logic between the two selected samples, after which the findings were adjusted to form four analytical categories: the user's understanding and knowledge of walking to the workplace; the use of mixed modes of transportation; physical features that support walking to work; and stakeholders' involvement. The framework for this research was formed by these analytical categories to meet the research aims of finding ways to improve the employees' walking experience in the pedestrian environment in the context of Kuala Lumpur city.

The results showed that the public have a negative attitude towards walking to work. The data collected revealed that the decision employees make to drive is somewhat uninformed, as they lack a holistic understanding of the benefits of incorporating walking to work as part of their daily routine. A framework is developed which proposes that the current mind-set towards walking can be reversed if the data from the analytical categories mentioned earlier are effectively deployed to enchance the walking experience. The study emphasises on the increased knowledge and better understanding of the situation among the employees in order to choose a sustainable way to travel to and around the city centre. The framework also aims to achieve a holistic understanding of incorporating walking as part of mixed mode transportation to the workplace for a more impactful solution to long-distance trips, and to affect, in a positive manner, the mind-set of people who still depend on cars to commute to work in Kuala Lumpur city.

CHAPTER 1. INTRODUCTION

This study explores people's perceptions of incorporating walking as part of a mixed mode of transport to the workplace for employees, and how they construct meaning about commuting to work. The approach will assist in bridging the existing gap between two units of analysis: first, the user, and second, the pedestrian environment (seen from the employee's perspective). The employees have been selected as the respondents for this research because they are the majority group most likely to seek accommodation outside Kuala Lumpur city, although their place of work is situated in the city centre; they therefore need to make long distance trips every day.

This chapter starts off with a background to the study, and an overview of the current situation. This will be followed by the problem statement, justification of the research together with the research question, the research objectives and aims. Also included in this chapter is a discussion of the research approach and research achievement. This chapter ends with a summary of the contents of the chapters.

1.1 Background

Recent reviews have recognised how researchers in population health (Panter, 2013), transportation (Ewing and Cevero, 2010), urban planning and design (Joh, 2011; Boarnet, 2011, Chatman, 2009) are exploring possible ways of improving the built environment by including walking as a sustainable means of transportation. In the research carried out for the Commission for Architecture and the Built Environment (CABE), United Kingdom, on the value of public spaces in the built environment, 85% of the surveyed pedestrians thought that the better quality of public spaces such as squares, streets, boulevards, sidewalks, etc. in the built environment has a heavy impact on the way they perceive their surroundings and the way they commute within these spaces (CABE, 2004). This has signified, from the urban design perspective, that people value an improved quality of life through good urban design in their surroundings, as stated by CABE:

> *"…good design is not just about the aesthetic improvement of our environment, it is as much about improved quality of life, equality of opportunity and economic growth. Good design does not cost more when measured across the lifetime of the building or place…"* (CABE: The Value of Good Design, 2002a, p.1).

Sustainability, which is about development that meets *"the needs of the present without compromising the ability of future generations to meet their own needs*" (WCED, 1987, p. 24) is becoming the main focus of cities worldwide, to preserve the city from the impact of urban development and a large ecological footprint. For this reason walking is re-emerging as an alternative mode of transportation to the more commonly used cars, as a necessary part of city planning (Gehl, 2004; Tolley, 2003). Many cities throughout the world acknowledge the importance of walking as a non-motorised means of transport, as a central point towards better sustainable development (Banister, 2000; Curwell, 2002).

As the city centre becomes more decentralized, the locations between urban nodes increases in distance (Giuliano 1999). Thus, travelling between any two nodes using motorized vehicles becomes more essential because people's movement needs are not easily served by public transport and ease or convenience of walking. The group most affected by the distance created by the separation of land use are those who commute from far away residential areas to the employment centre which is the city centre (Mydin and Muhamad, 2011). It is apparent that the employees are highly dependent on cars as a means of transportation to commute to the workplace in the city centre. This dependence is common among employees who have less confidence in other modes of transportation as alternative ways of commuting to the workplace daily (Steg, 2005). This behaviour has made driving a habit; however, employees do not take into account issues such as their vulnerability to a sedentary life as well as to mental stress due to traffic congestion – these issues put them at risk of diseases such as obesity and hypertension. Apart from this, there is considerable unnecessary expenditure, as well as excessive reliance on cars for short distance journeys of less than 1 mile, and a less considerate attitude towards other users who share the same movement spaces.

There are groups of employees who opt for walking as an alternative mode of transport to the workplace. However, these groups appear to face difficulties in ambulating within the pedestrian environment particularly from transit station to final destination (office), and their residences to the transit station. Interruptions and obstacles along movement spaces such as sidewalks, pathways, walkways, etc. are major barriers to the walking experience. Emanuel (2005) and Rose (2006) further strengthen this argument by stating that these barriers affect people while walking and influence their ability to ambulate efficiently. In addition, some qualities of the physical features in the built environment are seen to directly affect peoples' behaviour and to have a significant effect on the willingness of the employees to walk as part of their transportation pattern. The current body of knowledge has identified the fact that travelling by foot is complex and needs more planning as compared to travelling by car (Shay, 2003). Furthermore, the evidence shows that the workplace has been identified as an important setting in which policies and environmental changes can promote physical activity within and outside the working environment (Schmid et al., 2006).

Other research proposes that incorporating walking with public transportation could help to: i) reduce the growing number of private vehicles entering the city at any one time, especially during peak hours (); (ii) reduce car dependency among commuters especially for journeys of less than 1 mile (Brockman and Fox, 2011; Shay et al, 2003); and iii) reduce traffic congestion in the city, as congestion leads to the degradation of the environment due to the emission of carbon dioxide and noise pollution. Their research suggests that car-prioritized cities neglect pedestrian walkways, pushing pedestrians away from their allocated zones (Barter, 2000). In some cases they disappear entirely, with pedestrians hardly integrating into transport route networks (Grava 2003; Southworth 2005).

In addition to the car congestion problem, car traffic and parking have gradually usurped spaces along streets in the city centre leaving not much open physical space for the pedestrian to enjoy; hence, pedestrians suffer from street danger, harassment, air pollution and degradation in the urban environment, as well as from other irritations such as dirt, noise and visual pollution (Gehl and Gemzoe, 2001). Thus walking in the city has

become increasingly dangerous, with pedestrians at risk as they ambulate among moving traffic and parked cars (Frank, 2008; Burden and Litman, 2011).

1.2 Justification for the research

Many authors such as Litman (2011), Gehl (2002 and 2004) and Handy () also recognise the need for improvement in the implementation of walking environments and public transportation in many cities. Gehl's research (2004) describes the various reason for walking, and explains how urban design can improve the quality of city life and urban spaces; however, his research outcome does not cover specific walking criteria for specific reasons for walking. For example, the criteria he develops in his research do not address the particular conditions for walking for necessary purposes such as walking to the workplace. Given that all this research was carried out in the city context, many other cities are beginning to use it in places like USA, Europe, Canada and Australia as generic criteria to solve transportation and urban design problems.

Cities in developing nations, for example Kuala Lumpur, are also experiencing a similar pace of change in their urban form. Zegras and Gakenheimer (2006) suggest that it can be assumed that accessibility and mobility problems are categorically similar in all cities, whether developed or developing. Like the ideas of Gehl and Litman, this approach is generic, but problems change depending on the different contexts of the urban phenomenon. In line with Zegras and Gakenheimer's suggestion, Mateo-Babiano and Ieda (2007) also recommend that these criteria need to expand internationally for the improvements to reach many other cities.

This current research moves away from the practice of adopting generic urban design and transportation solutions. Instead, it is very specific to the Kuala Lumpur context; it seeks to understand the perception of people in their commuting environment, and to develop a framework that approaches walking not only from an urban design or transportation perspective but by looking into other fields in which walking is a relevant topic of discussion and examining it from the holistic perspective of several disparate fields.

For this research, the context is carefully chosen. The problematic scenario of car dependency as discussed above is slowly becoming a plague to the city of Kuala Lumpur.

Due to the separation of land uses and rapid urban development, residential areas tend to be situated at long distances from the Kuala Lumpur city centre which is the major employment area.

Most research in this area tends to look for a solution from a single perspective, such as urban design, transportation, health, etc. This current research, however, takes a multidisciplinary approach; the author looks into what researchers in other fields have written about walking and presents it in the literature review in Chapter 2. From the information gathered, the author was able to filter out several criteria in the form of a checklist that is used to develop the research questions and theoretical proposition.

The author further proposes that understanding the people's mind-set regarding walking to work will create a holistic understanding, allowing for the building of a stronger and more compelling argument. It appears that there has been no substantial study done on the people's perception of walking to work in the context of Kuala Lumpur city. For this reason, the direction of this PhD thesis leans towards trying to understand how Malaysian people construct an understanding of commuting between residences and employment centres in a specific context, in daily situations. This is in line with the qualitative research approach conducted through intense prolonged contact with the people in life situations (Miles and Hubberman, 1984).

In addition, the research is done not only to look into how people understand the concept of incorporating walking to work but also to understand why and how they perceive their pedestrian built environment in a certain manner and how it supports them while walking to work. It also explores their understanding of the benefits of selecting one particular mode of transportation over another. Furthermore, it investigates the aspects of the built environment that affect their walking experience and their hopes for a better built environment that supports pedestrian activity.

1.3 Aim and Objectives

The overarching aim of this research is to develop a framework for the enhancement of the walking experience in the pedestrian environment for employees, using their own holistic understanding and knowledge of commuting to the workplace in the context of Kuala Lumpur city. To achieve the stated aim, the following objectives are listed:

1. To develop an understanding of the current state of affairs using the available literature on the definition and meaning of walking to work, the health and transportation issues, and the benefits of and barriers to walking in the existing pedestrian environment.
2. To explore the extent to which employees perceive walking as part of their transportation mode, during their daily commute to the workplace in the city centre of Kuala Lumpur.
3. To investigate the factors that influence employees to incorporate walking to the workplace in the existing pedestrian environment in the city centre of Kuala Lumpur.
4. To investigate the quality of the physical features of the existing pedestrian environment, as they relate to the employees' walking activity in the city centre of Kuala Lumpur.
5. To develop a framework that will serve as a recommendation to all stakeholders for the enhancement of the walking experience for employees in the pedestrian environment in the city of Kuala Lumpur.

1.4 Research Questions

The following research questions have been articulated to achieve the research objectives, which are connected with the research aim:

RQ1 To what extent does the employee perceive walking as part of transportation to the workplace?

RQ2 What factors influence the employees to incorporate walking as part of transportation to the workplace in the existing pedestrian environment in the city centre of Kuala Lumpur?

RQ3 What are the main physical features in the pedestrian environment that encourage the employees to walk to work?

RQ4 How can employees be encouraged to choose walking as a part of transportation to their workplaces?

The next section will discuss the research methodology used for this study in order to fulfil the aim and objectives.

1.5 Research Methodology

The methodological framework for this research is divided into five central stages which consist of nine steps as illustrated in Chapter 4 section 4.2. These stages are: the research identification stage, development stage, operation stage, analysing stage and refinement stage.

The *first stage* describes the process of identification of the broad area of research by taking the author's past experience of working with urban design and architecture firms, as well holding teaching and consultancy positions in both urban design and architecture at a university in Kuala Lumpur. From there the author developed the research interest through observation and personal experiences in the existing pedestrian environment in the specific context and later through a thorough review of the available literature on walking in the city.

The *second stage* highlights the early development of the conceptual framework in the form of a theoretical proposition along with the research questions, aim and objectives. This is accomplished by underlining the units of analysis, namely the user and the pedestrian environment, based on a review of the research done in various fields about walking in the pedestrian environment.

The methodological framework explores the nested model of Kagioglou et al. (1998 & 2000) in identifying the appropriate research philosophy, approach and techniques of the

study, as well as the case study design and data collection process used for this research (refer to Section 4.4 in Chapter 4). Interpretivism has been recognised as the most applicable research philosophy for this study by taking 'case study' as the research approach (refer to Section 4.4.1.2 in Chapter 4). This study involves an in-depth examination within the real life context by looking at user perceptions of walking and how they apply to the particular context of Kuala Lumpur. Furthermore it views the entire scenario of walking in a holistic manner which includes an understanding of the factors that influence walking, the definition of walking, the nature of the pedestrian environment and the desires and needs of the user. By combining these studies the researcher is moving towards theory-building research, which makes the case study approach the most relevant approach for the study in question, as it adopts exploratory and explanatory approaches in a multiple embedded case study.

The *third stage* is fieldwork carried out with the aim of understanding the pedestrian walking experience, using their knowledge of commuting to the workplace in the context of Kuala Lumpur city. Then, during the exploratory stage of the case study, semi-structured interviews and participant observation were used. The emerging findings from the semi-structured interviews were then applied in real life situations in two case study areas using the participant observation technique. During the observation period, there was a special focus on tracing the routes selected by the respondents from both case studies. Adding to that, observations were made on the physical features in the pedestrian environment as a supplement to the aforementioned data collection techniques. Furthermore, it afforded a means of triangulating the data collection techniques.

In *stage four*, all data was gathered to analyse, interpret, synthesise and refine the findings of the case study, leading to the development of a framework for the enhancement of the walking experience in the pedestrian environment for employees in Kuala Lumpur. The semi-structured interview, participant observation and observation were analysed with the help of Nvivo 9, using the content analysis, cognitive mapping and thematic applications.

Finally, in *stage five*, pattern matching was used in the cross case analysis to expose a replication logic across the two case study areas. The research closes with a critical discussion of the established replication logic in an iterative process of looking back to the literature, methodology and data collected to further analyse, interpret, synthesise and refine the discussion and conclusion.

1.6 Contribution to knowledge

The research sets out to explore the employees' understanding and knowledge of commuting to the workplace using a combination of walking and public transportation in a natural setting, as opposed to car dependency. Therefore, the anticipated contributions to knowledge from this research are as follows:

1. Although walking is a widely discussed topic, it has never been explored from a multi-disciplinary perspective; this will help to advocate more compellingly for sustainability in the city.
2. The depth as well as breadth of this study of walking in the pedestrian environment has identified different stages, characteristics and purposes of walking to the workplace, and to understand how each purpose requires a different walking environment.
3. This research is the first to look at the issues from a Malaysian perspective; it takes into account the users of Kuala Lumpur city spaces, analysing their thoughts and needs from a holistic perspective. The author, as a user of these spaces, has taken this perspective based on the awareness that those who use the spaces have a much clearer insight into how they should work, and how they actually do work.
4. The author proposes that those users who have a negative mind-set towards walking will change their minds if they correctly understand the benefits that walking will add to their lifestyle.
5. Although there has been research done on the involvement of stakeholders in creating an environment conducive to walking, it has never been done from the perspective of the user's understanding of who the stakeholders are. This research

has brought the user into knowing how they can contribute to enhancing the walking experience in the pedestrian environment.

6. The development of a framework for the enhancement of the walking experience in the pedestrian environment for employees, using their holistic understanding and knowledge of commuting to the workplace in the context of Kuala Lumpur city, can be applied by stakeholders for the improvement of the pedestrian environment.

1.7 Structure of Thesis

This thesis is organised into eight chapters as follows:

Chapter 1 Introduction

This chapter introduces the background of the study, the research aim and objectives, the research questions, research design and plan, and the structure of the thesis.

Chapter 2 Understanding people walking to work in the pedestrian environment in the city.

The theoretical base of the research is developed here; the different meanings and connotations of the terms 'walking to work' and 'pedestrian environment' are explored and the implicit meaning of walking to work in the pedestrian environment is defined. The chapter covers the following points: the science of walking from the rudimentary aspect of physical activity; the bioclimatic needs of the human body; the relationship between people walking in urban spaces and the transformation of the city from a formerly walkable space to the car-oriented city of the present; the association of walking to work with the quality of life and issues related to the employees travelling to work; the benefits of walking, barriers to walking, and how a lack of physical facilities affects people walking in the built environment; issues of travel to the workplace and accessibility from the origin and destinations. The theoretical propositions deduced from the literature are discussed in the summary of the chapter.

Chapter 3 Pedestrian environment in Kuala Lumpur city development

This chapter covers the overview of the development of Kuala Lumpur (KL) city in relation to the pedestrian environment, from the early growth of the city up to the immense

transformation of the city structure with rapid motorization in the present day. Issues of travelling behaviour to the workplace, the pedestrian environment, and policies and guidelines related to pedestrian walking in the city are discussed in this chapter. The key findings deduced from literature in Chapter 2 and Chapter 3 are also discussed in the summary of the chapter.

Chapter 4 Research Methodology

This chapter discusses the many approaches or philosophies applicable to this research. The most suitable methodology is chosen and justified here. Qualitative methodology is used; the researcher also uses the triangulation method, which is the simultaneous use of more than one research method; the methods of data collection preferred for this research are discussed here.

Chapter 5: Presentation of Findings: Case Study 1

This chapter and the following chapter (six) will be presenting the 'within-case scenario' of the two case studies selected for this research. Chapter five presents Case Study 1 of the old Central Business District (CBD) area located within the city centre of Kuala Lumpur. The chapter focuses on the presentation of findings from the interviews, participant observations and observations in order to resolve the research questions in real life situations. Computer assisted qualitative data analysis (CAQDAS), in particular Nvivo 9.0 software, is used to organize the data, generate categories, identify patterns and themes, and code the data. This was in an effort to draw closer to the research findings.

Chapter 6: Presentation of Findings: Case Study 2

This chapter presents Case Study 2, the Kuala Lumpur City Centre (KLCC) area located within the city centre of Kuala Lumpur. The findings of case study 2 from the interviews, participant observations and observations are presented in a similar format as employed in Chapter 5. Similar to Chapter 5, content analysis, cognitive mapping and coding of the interviews, participation observation and observation data were done using Nvivo 9 software in order to establish a pattern of responses to produce the research findings.

Chapter 7: Analysis, Interpretation and Synthesis

This chapter presents the cross-case analysis of the two case studies, Case Study 1 and Case Study 2, which interprets and syntheses the emerging themes from the findings in Chapters 5 and 6.

Chapter 8: Discussion

This chapter will discuss the main findings of the research in four analytical categories. The contextual implications of the results are reviewed here. A developed framework is presented and explained at the end of this chapter.

Chapter 9: Recommendations and Conclusion

This chapter concludes the research and appropriate recommendations are made here. Major contributions of the research to knowledge are highlighted. The chapter also brings to light the limitations of the research with a view to assisting future researchers in the field.

1.8 Summary and Link

This chapter has provided a summary of the entire thesis. The first section has introduced the research focus on walking as an alternative transport mode, as opposed to dependency on cars. This research looks into why the situation in Kuala Lumpur persists. It is clear that some of the members of the population are oblivious to the severity of the current problems of car dependency and its effect on the pedestrian environment. This situation can be alleviated if there is an understanding of how the problem began and why car traffic congestion continues to hinder public transportation and improvement of the pedestrian environment in Kuala Lumpur. It has been explained that a qualitative research approach is being taken for the research plan and systems of data collection, and the content of the thesis has been outlined.

The next section is the literature review on this subject which will cover the meaning of walking to work, the definition, the health and transportation process, as well as the benefits of and barriers to walking in the existing pedestrian environment.

CHAPTER 2. UNDERSTANDING PEOPLE WALKING TO WORK IN THE PEDESTRIAN ENVIRONMENT IN THE CITY

2.1 Introduction

This chapter will review the available literature in the diverse fields of health, health behaviour, transportation and urban design and planning that is specifically concerned with walking for utilitarian and transport purposes. This chapter will also discuss three main components of this research project, namely walking context, the process of travelling to the workplace, and a theoretical deduction drawn from the existing literatures in these fields.

In order to gain an in-depth knowledge in this area, an extensive and comprehensive literature review in relation to walking to the workplace has been carried out. Fields reviewed include terminologies used for walking as a means of transportation; the development of the city from the past to present; the potential of walking as a mode of transportation for the future; the role of walking and its benefits; and barriers that discourage people from walking in their pedestrian environment.

This chapter further discusses an important aspect of walking to workplaces, namely the accessibility of the place. It introduces the concept of active travel to the workplace that looks at walking as a necessary part of the multi modal transportation pattern.

2.2 Walking to the workplace

2.2.1 What is walking to work?

People walk from one place to another with a specific purpose and rarely undertake the activity for its 'own sake'. It is usually undertaken to get to places where activities occur such as work or school, or for specific activities such as meeting friends etc., (Barton, 1998). Walking can be categorised according to Gehl and Gemzoe (2001) and Gehl (2004) as walking for necessary, optional or social purposes. Shay et al., (2003) have described walking for necessary purposes as a part of walking for utilitarian purposes. Shay continues by stating that walking for utilitarian purposes means walking to reach a predetermined destination, for example the workplace, or a specific place manifested by

a user. Another walking category is walking for transportation, which differs from its counterpart, walking for recreation and leisure. These two subdivisions of walking have a common characteristic towards the physical built environment based on their needs (PQN, 2010). That is, each subdivision innately requires a specific quality of physical built environment (Transport for London, 2011; Litman, 2011).

In view of these aspects and categories, Gehl (2004) concludes that walking is an integral element of a majority of the trips made in the outdoor environment. Methorst (2010) opined that pedestrians walk in the pedestrian environment in relation to specific walking categories for specific purposes.

Grava (2003) states in his book titled; "Urban Transportation Systems" that walking is a fundamental mode of transport that has supported cities and settlements in their operations for many years. Although walking is an easy form of transportation, urban planners and architects reflect on the need to make walking a more positive and safer experience for the general public (Blomberg et al., 2000). Walking as a transportation 'mode' has been posited by scholars in the fields of public health, transportation, urban design and planning, to be potentially helpful in accommodating future population and employment growth across the city, with no negative impact on climate change, congestion or other current urban problems (Gehl, 2004; Litman, 2011; Transport for London, 2011). Walking is often associated with transport-related activities, and shifting people's approach to walking for transportation is now a common objective of transport policies (Ogilvie et al., 2004).

It has been scientifically proven by bio-mechanists, physiologists and experts in human kinematic that walking is a physical activity useful for individuals to improve their physical health (Inman, 2006, Kaufman and Sutherland, 2006; Rose, 2006). Darker (2007) described walking as a functional mode of transport and the most common form of adult physical activity (Saelens et al., 2003). She also defined regular walking as a physical activity of moderate intensity. It has been regarded in terms of functionality because walking, which is known as non-motorised transport and human-powered mode of travel, also serves as a main form of transportation for people without vehicles, (Owen et.al, 2004). Evidence from public health research on walking has demonstrated that regular walking provides health benefits for people of all genders, races, and ages; this will be discussed in the topic titled "The roles and benefits of walking for health" in Section 2.5.

2.2.2 The Employee as the Pedestrian

A pedestrian is a person travelling from place to place by foot or using other mobility aids (TRL, 2006). It is also defined as a person walking in specific spaces such as roads, sidewalks pathways, etc. The term 'pedestrian' encompasses a wide range of people who may have very little in common with one another as individuals; however, the term 'pedestrian' is applied to anyone in the public realm who is not using vehicular transportation (Transport for London, 2006). People who have chosen to walk for a particular journey may be considered to have the same basic concerns as any transport user, whether motorised or otherwise (TfL, 2006). According to Gehl (2004), walking is an integral element of a majority of trips made in the outdoor environment including walking between workplaces and homes. It is important to point out that almost everybody walks, if only a little. There are a few aspects that distinguish the category of people who use walking as their preferred transport mode according to the extent to which they walk, whether as part of a multi-stage journey or all the way during the trip to their workplace.

In every developed economy, cities are the centre of economic activity and provide numerous job opportunities. The city brings together businesses, workers, and customers into close physical proximity, which leads to enhanced productivity, more efficient markets and greater economic success (Eberts, 1994). Most of the metropolitan core jobs are within three main sectors namely professional, scientific and technical; finance and insurance; and public administrations, all located in the city centre (Douglas, 1952, Eberts, 1994, Girarded, 2001). It is the pedestrians, however, who give life to the city through their movement and activities.

The spatial pattern of each city positions its central business district (CBD) as the focal point of a cohesive or centripetal force which dominates control on the spatial arrangement of the city population (Douglas, 1952). Douglas, Newman et al, (1996) state that the greatest concentration of jobs in most cities still remains in the central city; the increasing number of jobs and the high amount of floor spaces implies that the central city is also a centre for human activities, which emphasizes the importance of access and circulation by a variety of modes of transportation. Driving to work comprises a large portion of all motorised journeys. About 70% of all journeys to work within Sydney are made by car (Australian Bureau of Statistics 2009). These employees encompass the

majority of people who occupy the movement spaces with either motorised or non-motorised transportation, especially during the morning and evening hours. However, what should be pointed out is that employees still use their feet as a mode of transport to the workplace for very short-distance journeys such as from a car park to the office entrance. According to Wen et al., (2010) there is great potential for workplace interventions to promote active travel to work among employees. He then continues that the role of workplaces in developing policies and facilities to encourage their employees to use active travel modes to work is relatively unexplored.

2.2.3 Walkability in the pedestrian environment

The term walkability according to Southworth (2007) is '*…the extent to which the built environment supports and encourages walking by providing for pedestrian comfort and safety, connecting people with varied destinations within a reasonable amount of time and effort, and offering visual interest in journeys throughout the network'* (p248).

Another definition of walkability, developed by the Transport Research Laboratory (TRL, 2006), is given as:

> '…the ability for one to move around on foot in a given space'. Furthermore, the Oxford University Press Dictionary (2010) states that 'ability' could be defined as "…the quality in a person or thing which makes an action possible" and "the fact that somebody or something is able to do something".

It is necessary to define walkability and make it operational through some performance criteria based on the needs of pedestrian while walking in their built environment. Gehl (2004) proposes 3 categories of pedestrian needs while walking; the needs for protection, comfort and safety. In line with Gehl, Southworth (2007) further elaborated those needs into five criteria of walkability that could make the pedestrian walk more effective; they are comfort, safety, connectivity with a variety of routes and pathways and sufficient pedestrian facilities. Southworth states that within these criteria, a person's activities and a pleasant walking experience are highly important. However, most research fails to address these points.

The existing literature also emphasises that the walkability could be measured in terms of relevant factors, aspects, criteria or variables of the built environment in relation to walking that will be presented in a subjective and qualitative way. For example, Litman (2003) has used the word 'factors' to define walkability as "…the quality of walking conditions, including factors such as the existence of walking facilities and the degree of walking safety, comfort, and convenience." Litman's definitions however, did not specify to both tangible and intangible of walkability factors.

2.2.4 Pedestrian environment

The environment is considered friendly if the user's age variance, ability, experience and comprehension are taken into account (TRL, 2006). According to Hodgson (2012), walking in the pedestrian environment involves 'whole body' perception that constitutes habitual movement, emotions, memory as well as cognition. For the purposes of this research, 'habitual movement' refers to the physical spaces experienced by the users on foot, which give them accessibility between places, and the quality of the pedestrian environment (Talen, 2002; Clifton and Handy, 2001). Barton (1998) suggests that street, sidewalks or pavements, footpaths, routes, alleys, boulevards, etc. are the main components in the public realm that allow the pedestrian to walk. Barton highlights that elements of design such as road widths, sight lines, gradients and curbs are vital for the accessibility and safety of the pedestrian. He continues that these elements have a significant impact on the aesthetic of the environment.

According to Southworth (2007) and Pikora, (2003) accessibility to transit stops, as well as presence and connectivity of the walk paths are also part of the pedestrian environment. Bhat and Guo (2007), adding to Southworth and Pikora's work, state that street network density with regard to average length of links, number of intersections per unit area, blocks sizes and proportion of street frontage with buildings are significant components for direct access while walking. Urban design scholars such as Bentley et al. (1985), Robert (2001) and Gehl (2004) have agreed that a lively and convivial pedestrian environment should offer attractive places in which to stay longer and an overall good quality experience for the pedestrian.

2.2.5 Working Definition of Walking To the Workplace

Walking to work is categorised under walking for necessary activities, with trips that are usually made at least twice a day (Gehl, 1987; Blomberg, 2000). The World Health Organization (WHO) (1999) has defined 'activity' as "what an individual does" in the form of a task or action that can be performed by the individual within all aspects of human life.

Pedestrians walk with a regular pace of approximately 15 to 20 minutes a mile, which calculates to around 4 mph (6.8 kph) (Grava, 2003). Within this walking speed, pedestrians have opportunities to be in visual proximity with buildings and the surrounding environment (Gehl, 1987). Handy et al., (1996) and Tuan (1997) agree with Gehl's statement that the five human senses, namely sight, hearing, smell, touch and taste, are closely connected to the pedestrian's emotion while walking. According to the phenomenologist Tuan (1997), walking over a short distance provides a powerful, intense and emotional experience to pedestrians. Covering a greater distance on foot however, would change the emotional experience significantly, to one which is more impersonal and less passionate.

Walking to work for this study is considered as a subset of walking for utilitarian purposes. Walking is used as a connector to access other types of transport systems and as part of alternative transportation to reach destinations over short-distance journeys of less than a mile within 15-20 minutes, which is equivalent to 800 metres radius from the employment centres (Grava, 2003; Pikora et al., 2003; PQN, 2010). The kinds of trips undertaken and the walking stages which occur in walking to the workplace are discussed in detail in 2.7.2.

2.2.6 A multi-disciplinary perspective of walking to work

The following literature is reviewed based on multi-disciplinary perspectives which seek to understand the meaning of walking to the workplace in the pedestrian environment. The choice of a multi-disciplinary approach was influenced by two reasons as follows:

1) The need to ensure that walking is comprehensively considered from all disciplinary point of views in order to highlight the significant meaning of walking to work across the disciplines;

2) The fact that walking as an activity does not take place in isolation in the built environment; and that it is mistakenly characterised as unskilled and straight forward (Hodgson, 2012). This literature review aims to provide theoretical evidence about walking, as well as to explore some of the complex issues linked to the issue of walking.

2.2.7 The Science of Walking: The rudimentary process of walking as an activity

The human body is described as a 'machine' that has complex levels of organisation progressing from a single unit cell, which then forms a group of cells called a tissue to a group of tissues called an organ to a set of organs that make a system and finally to the many systems that function to manage the human body. This living 'machine' also generates the psychological and physiological functions of the different systems that operate within the human body while walking (U.S.DoT, 2004). Biomechanically, normal walking can be described as a method of locomotion relating to the use of both legs, alternately, to provide both support and constant forward movement with at least one foot being in contact with the ground at all times (Whittle, 2007). Capaday (2002) explains that the uniqueness of walking is found in the performance of the three stages of walking;
(1) a person walks upright on both legs,
(2) the person's legs are almost entirely extended when in contact with the ground, and
(3) the heel touches the ground first when the foot reaches the ground.

This entire process is known as the walking cycle which occurs in a uniform progressive straight line manner between one cycle and the other in a systematic fashion (Whittle, 2007; Inman, 2006) as shown in Fig 2.1.

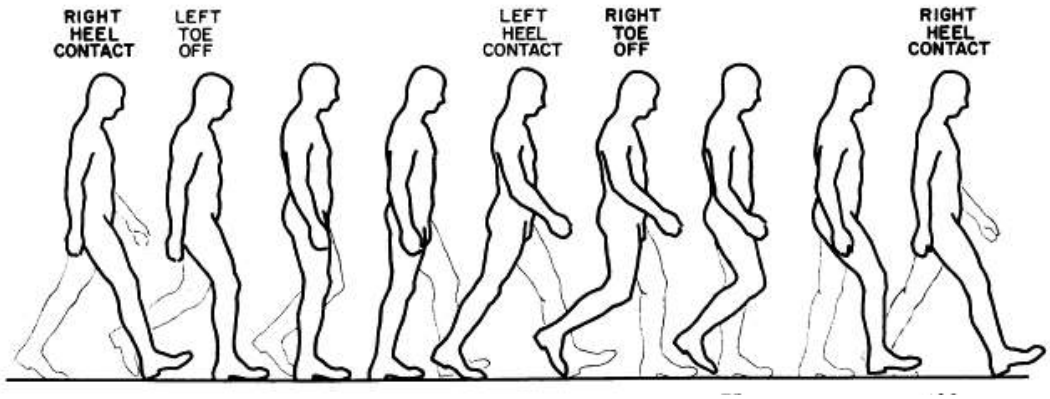

Figure 2. 1 A Diagram showing complete human walking cycle (Inman, 1996).

Whittle and Inman state that walking is a complex process that uses the peripheral nerves, joints, muscles, bones, spinal cord and brain. While walking, millions of neurons in the brain and spinal cord are connected in a vast and complex network that sends signals to the muscles, which in turn move the joints, the limbs and the remainder of the body (Whittle, 2007). Whittle states that walking has undoubtedly been observed ever since the time of the first man but the systematic study of the walking process appears to date from the Renaissance when scholars such as Newton, Galileo and Leonardo da Vinci all describe the process of walking. He adds that the truly scientific approach in walking studies was established in 1682 by Borelli, Galileo's ex-student. Borelli discovered a way to measure the centre of gravity of the body and ascertain how balance is maintained while walking by constant forward movement of the supporting area provided by feet (Whittle, 2007).

The study on walking by Inman and Ralston (2006) has identified two basic requirements that would cause specific body motions in the act of walking. They are as follows;

i) A continuous series of reaction forces between the ground and the foot to support the body, and
ii) Recurring change of each foot at regular intervals from one position of support to another in any direction of progression.

These are the necessary elements for bipedal walking (using two legs) no matter how influenced they are by the individual's physical disability. Based on Davis and Kaufman's (2005) observations, while walking, the body speeds up and slows down slightly, it rises

and falls a few centimetres, and weaves slightly from side to side as shown in Fig 2.2 below.

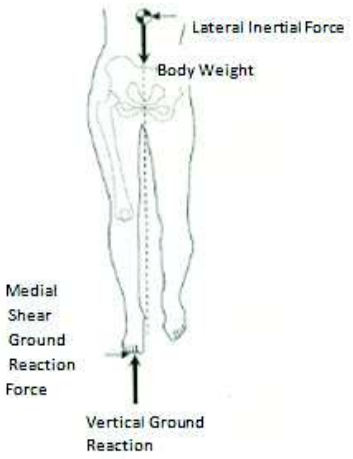

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Figure 2. 2 A schematic presentation of a person walking showing the body weight and vertical ground reaction force (GRF) that tend to rotate the body towards the swinging limb in forward progression (Davis and Kaufman, 2005)

In a study in kinematics of normal human walking, adapted from Lettre and Cortini's (1967) work, Kaufman and Sutherland (2006) have distinguished phases of development in walking from point A to B which involves three distinct stages, as explained below. These are shown in a diagrammatic representation in Fig. 2.3 below:

i) Development stage (from rest to some velocity),

ii) Rhythmic stage (some constant average velocity), and

iii) Decay stage (coming back to rest).

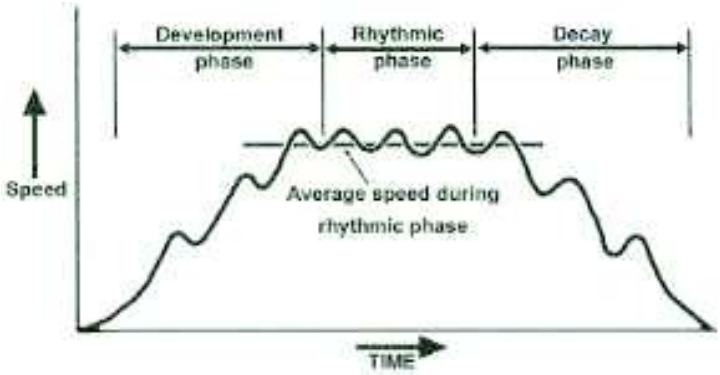


Figure 2. 3 Three phases of walking adapted from Kaufman and Sutherland (2006).

Rose et al. (2006) have used Kaufman and Sutherland's analysis and have experimented further to understand how the human body obtains the energy to perform the task of walking. In her analysis on Energetics of Walking, Rose has stated that people naturally walk in a manner that conserves energy and select their walking speed accordingly in order to minimize the energy expended per distance walked. She suggests that:

i) Between these three stages, the rhythmic phase of walking is observed to be very consistent and is related directly to the optimal efficiency for energy expenditure of an individual as shown in Fig. 2.3 above. This is the phase in which health benefits are received from the walking activity.

ii) Any deviation from the normal walking pattern, such as when the pedestrian encounters road blocks and barriers, increases the energy expenditure and limits ambulation.

The human body utilizes metabolic energy in the form of Adenosine triphosphate (ATP) to support physiological processes such as muscle contraction and relaxation while walking and resting as shown in a conceptual diagram in Fig. 2.4. The diagram shows the flow of the fuel for the body's energy requirements; fuel is derived from ingested nutrients or from stored glycogen and fat in the body. Meanwhile, muscle cells convert that energy so that it can be used for the molecular reactions of cellular metabolism. Several forms of energy transduction are involved in these physiological processes. The chemical energy of molecular bonds is conerted to thermal energy (heat) or to mechanical work (organ movements such as those which occur in the heart and lungs).

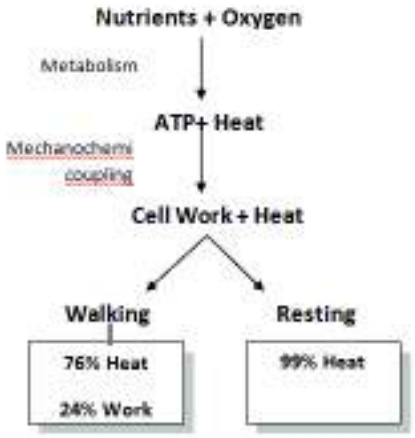


Figure 2. 4 The process of energy transduction in the body that produces physical work adapted from Rose et. al.,(2006).

Rose (2006) further explains that when performing physical work such as walking, human energy efficiency approaches 30% while the other 70% of the energy is utilized and released as heat. People are approximately 24% efficient while walking at a comfortable speed. At a slow walking speed, efficiency decreases to 14%. An interesting comparison is made to the internal combustion engine of an automobile; Rose explains that there is only 10% to 20% efficiency at converting the chemical energy of gasoline to heat and transduction heat into the mechanical energy of torque at the drive shaft. Because we need to burn energy stored in our body and replace it again, walking is therefore scientifically proven as an efficient means to burn up excess energy within a reasonable distance without putting in extra effort over a period of time regularly (Grava, 2003; Rose, 2006).

2.2.8 Bioclimatic needs of the human body while walking in the outdoor environment

The human body is exposed directly to climatic conditions, such as prevailing winds, direct sunlight, humidity and air temperature (Emmanuel, 2005) as they move in the outdoor environment. According to Emmanuel (2005), the body primarily responds immediately towards changes in temperature so as to adapt itself to the situation. He continues to explain that the ideal internal human body temperature must remain at a constant of about 37^0C; any decrease or increase will cause discomfort to the body. When in the outdoor environment, generally people have several options for adjusting to the air temperature, such as the selection of appropriate clothing according to the outdoor climate, deciding to be under the sun or in the shade, to be in an area with windy or still air, and to select the activity being conducted (Raja and Virk, 2001). It is important for the designer to understand the bio-climatic needs of the human body in designing the internal and external built environment (Emmanuel, 2005). Emmanuel opined that the point of bioclimatic design is to fashion the architecture of the external and internal built environments to be in coherence with nature while maintaining the demands of comfort for public well-being (Emmanuel, 2005).

Referring to ASHRAE 55 (1992), a thermally acceptable environment is when 80% or more of people do not express dissatisfaction. Thermal comfort means the ‘absence of thermal discomfort’. Since metabolized food releases energy, a healthy human body normally

attempts to lose heat to the surrounding environment at all times (Rose, 2006). Under moderate environmental conditions, the human body immersed in the environment for at least an hour strives to achieve thermal balance. Thermal comfort needs are influenced by three factors, namely:

i) Environmental Factor: the atmosphere surrounding the body such as air temperature and mean radiant temperature; and relative air velocity and relative humidity,

ii) Physiological Factor: what is being done by or to the personal/individual physical system to maintain and control the individual physiology such as activity level or metabolic resistance, clothing thermal resistance (Fanger 1972, McIntyre 1980, Gagge 1986); and

iii) Psychological Factor: the individual's psychological adaptation to the level of comfort in his or her surrounding environment, such as individual expectations that greatly influence people's perceptions, experience and perceived control (Nikolopoulou et al., 1998 and Nikolopoulou and Steemers, 2003).

Nikolopoulou and Steemers (2003) discovered that thermal comfort has a significant impact on the individual's psychological adaptation. Their findings show that environmental naturalness, people's expectations which influence their perceptions, short-term and long-term experiences that affect people's expectations, duration of exposure, perceived control of the discomfort levels, and environmental stimulation such as fresh air, sun and wind which provide a preferable environment to people (shown in Figure 2.5).

Meanwhile, Oja et al. (1998) have taken into account the aspects of seasonal prevalence, frequency and perceived reasons and constraints of weather in their study to measure the current status of walking as a method of commuting to work in mid-size Finnish towns. The findings suggest that people walking around 12 and 18 minutes for a distance of 1 km is the median one-way walking distance (less than one mile) in summer and fall. Whilst during winter and spring, people may walk up to 2 km for similar duration of time (12 and 18 minutes). The Joint Centre of Urban Design (2000) has suggested that the ideal time and distance for people to walk in an outdoor environment is around 10-15 minutes

across an area of 800m diameter. The comfort zone however varies according to region due to human adaptation to their environment. Therefore summer time in cold regions is not directly comparable to seasons in tropical regions.

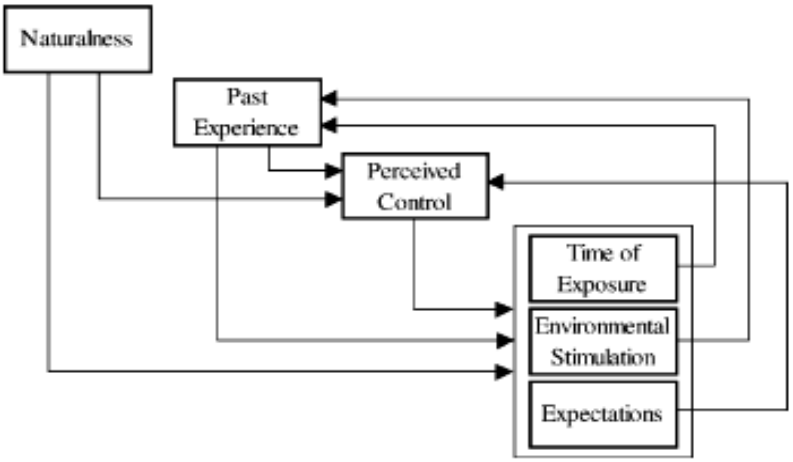


Figure 2. 5 Schematic presentation of the interrelationships between different parameters in psychological adaptation from Nikolopoulou and Steemers (2003).

2.2.9 Walking as an Alternative Transport Mode for Commuting

2.2.9.1 Walking in the city

According to Gehl and Gemzoe (2001) *"…walking is the key to city quality".* The quality of the urban atmosphere itself would, it is believed, shape the way people walk in the urban spaces in the city (Pedestrians' Quality Need (PQN), 2010). This is important as people need to walk, and walking is the primary means that should be considered as the lubricant for the transportation system within the city (Methorst, 2010). The quality of the walking experience however varies greatly in different walking environments, which directly affects peoples' decision to incorporate walking as part of transportation instead of driving cars into the city (Steg, 2005; PQN, 2010). The most essential need for most people when travelling from point A to point B is that the transportation mode should give them the ability to access the desired goods, services and daily activities safely (Burden and Litman, 2011).

Scholars have identified that there is a significant relationship between walking and the built environment to a certain extent, in that the built environment has influenced the quality of the walking experience in the city (Handy, 2002; Southworth, 2005; Frank,

2008; Litman, 2011). For example, in most cities plagued by cars, urban spaces for outdoor social activities have almost completely disappeared, leaving only the remnant spaces (left over after catering for the needs of drivers) for pedestrian activities; this leads people to avoid walking in the city centre. People walk in the city because they have to, not because they want to (Gehl and Gemzoe, 2001; Darker et al., 2007; Burden and Litman, 2011).

The city is categorised based on the current uses and movement conditions in the city spaces. In describing the links between walking, public life and city quality Gehl and Gemzoe (2001) have identified four different contemporary city concepts namely the traditional, invaded, abandoned and re-conquered cities. Besides labelling the cities into typologies and describing their physical characteristics, Gehl and Gemzoe (2001) also provide some examples of cities that fall under each category. The idea is to give a clear picture of how the urban pattern and its characteristics determine the level of walkability or automobile dependency in each city as explained in Table 2.1.

Table 2. 1 City types and its characteristics (Gehl and Gemzoe (2001))

CITY TYPES	CHARACTERISTIC
The Traditional Cities	• The cities as a site for meeting places, market places, military parades, religious processions, etc.; • Streets are functional for foot traffic and public squares are designed for community gatherings; • Cities characterized by narrow, often winding streets and provided with a naturally democratic transport systems such as canals in Venice, small hill towns; • The dimensions of the streets, distribution of uses along the streets and squares, scale of these cities, and the detail and scale of buildings are in harmony with human proportions and opportunities for movement, and they support the daily movements of pedestrians.
The Invaded Cities.	• In urban areas where car traffic has gained the upper hand, public spaces have certainly changed radically. Car traffic and parking have commandeered space along streets. In some instances, when parking spaces are full or there is heavy road traffic, they manoeuvre onto the pedestrian walkways and dominate the area by parking of driving through. • With the addition of other restrictions and irritations such as dirt, noise and visual pollution, it doesn't take long to ruin city life. It becomes unpleasant and strenuous to get around on foot and spending time in public spaces becomes intolerable because of lack of space and environmental problems. • Cities which are dominated by automobiles to such a level that the

	pedestrians are almost forced out, such as Napoli, Madrid and some cities in the Americas.
The Abandoned Cities.	• Where urban tradition is weak and car culture has had ample time to develop without planned constraints, a new type of city develops. This city has no historic model, because it is tied directly to the rise of hte automobile. Pedestrian traffic has been made unnecessary, and many of the other activities tied to the foot traffic of people in public spaces have disappeared completely, thus rendering life in public spaces dead. • Many city centres around the world are a sea of asphalt with parking places marking off the space between buildings. Walking is impossible and would also be unreasonable. Distances are too great and the only things a pedestrian might encounter on their way would be ugly, dirty and possibly dangerous. It is difficult to describe the total consequences of this type of city policy.
The Re-conquered Cities.	• Cities with public life where walking has been reintroduced in the past twenty to thirty years such as Copenhagen, Portland (Oregon), Barcelona, Strasbourg, Freiburg, Lyon, Curitiba, (Brazil) and, along the same lines, Australian cities like Melbourne and Perth. • In many of these cities, an increase in the volume of walking and other people-centred activities in public spaces can be found. In Copenhagen for example a four-fold increase in public space activities over the past twenty-five years has been documented - closely corresponding to the improvements carried out in the pedestrian environments in the same period.

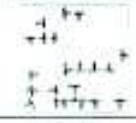
Gehl (2004) in his report for the City of London, "*Toward a fine city for people - public spaces and public life for London*", suggested that the formerly 'invaded' cities of Copenhagen, Lyon and Barcelona could be taken as good examples of re-conquered cities which have successfully brought back walkability into the urban spaces. Copenhagen for example, was once invaded by cars, but during the summer of 2000, the city changed completely in its character and atmosphere, such that it now invites the public to walk and spend time in the public spaces of the city. Over a period of four decades, many of the squares and streets in the inner city were gradually transformed into partially or wholly car-free spaces and almost 80% of the movement through the city centre is now by foot. A new inspiration was injected into the existing squares and streets with a new urban pattern emphasising the creation of good walking conditions and a quality walking experience for the user.

Southworth (2005) highlighted that the traditional cities are a compact urban form which serve as evidence of the benefits of prioritizing pedestrian needs in the urban pattern.

Public buildings and plazas served as sites for religious gatherings, markets, festivals, recreation, and other public events. Everything was typically packed into an area no more than half a mile from the central square. Southworth gives two examples of classic cities such as Urbino in Italy and Boston in America, which still maintain their walkability in the central area despite enormous growth and modernization. The built up area of Urbino (the World Heritage Site, distinguished for its outstanding historical legacy of Renaissance culture) occupied an area of only 300 acres yet housed 30,000 people. For Boston, the city development started with a built area of 800 acres where every point was accessible on foot within a distance of less than 1 mile or within a time frame of half an hour.

Southworth (2005) compares a walkable city concept in the traditional urban street pattern with the Modernist era and the late post-industrial city (between 1900 – 1980), and suggests that in between these eras, the pedestrian environment began to be overlooked in favour of automobiles. The new development, consisting of high speed traffic, shattered the existing fine grained pedestrian network and introduced physical barriers into the pedestrian movement spaces. He continues that, by being oblivious to the pedestrian experience, the street loses its intimate scale and its transparency, and becomes a mere service road as shown in Table 2.2 below.

Table 2. 2 The sample of residential street grids in the United States over the 20th Century that have lost their connectivity and walkability (Southworth, 2005).

	Gridiron (c.1900)	Fragmented Parallel (c. 1950)	Wraped Parallel (c. 1960)	Loops and Lollipops (c.1970)	Lollipops on a Stick (c. 1980)
Street Patterns					
Intersections					
Lineal Feet of Streets	20,800	19,000	16,500	15,300	15,600
# of Blocks	28	19	14	12	8
# of Intersections	26	22	14	12	8
# of Access Points	19	10	7	6	4
# of Loops & Cul-de-Sacs	0	1	2	8	24

From the Table 2.2 above, it can be seen that there are several conditions that reduce the walkability in these streets:

i) significant changes in the street pattern design, transforming from the grid iron to the 'Lollipops on a stick' pattern which has more cul-de-sacs;
ii) reduction in number of street intersections
iii) larger building blocks and plot size
iv) no easy access as the number of entry points is reduced, as well as being placed further apart due to longer and larger block sizes

Southworth continues that streets often are out of scale and uninviting to pedestrians because of the absence of sidewalks (in order to lower the cost of maintenance and infrastructure construction). The whole system has been planned for the accommodation of motorists rather than pedestrians. Jusoh (2009) suggested that good governance needs to provide a balanced investment between pedestrian facilities and public transportation in order to increase equity among citizens (Curwell, 2002).

Kenworthy (2000) also debated similar issues about the transformation of cities, and developed the descriptive terms 'walking cities', 'transit cities', 'automobile cities' and 'developing cities' in "*The death of the walking city: Killing the rights of the Pedestrians*". Other authors have also concluded that the needs of pedestrians have been increasingly ignored in urban and transportation planning across all metropolitan cities worldwide (Kenworthy and Laube, and Barter, 2000).

Because the city centre acts as a connection between commercial and transportation networks, it continues to face intense pedestrian traffic which is the only efficient mode of transport for short trips in areas of heavy land use (Shay et.al. 2003). The current city centre however has replaced the traditional street with skyscrapers built on individual plots of land, thus eliminating many important pedestrian needs such as comfortable and convenient walking conditions, protection from weather, safety and security, etc. (Gehl, 2004; Frank, 2008). These facilities have been forgone for the sake of motorised traffic. The pedestrian environment is frequently cluttered with obstructions including newsstands, traffic signals, parking meters, signposts, telephones, street furniture, grates, and unloading/loading zones. These are the barriers that are believed may hinder people from walking efficiently; this will be discussed in more detail in section 2.6.

2.3 Issues associated with walking to work

In the last 10 years, the level of mobility has increased substantially in developed countries such as in Europe (MOTIF, 1998; Methorst, 2010); the United States (Southworth, 2005; Shore, 2006; Litman, 2010) and Australia (Tolley, 2003; Frank, 2008). Meanwhile, car usage has become increasingly widespread in developing countries (Kenworthy and Leube, 1999; Barter, 2004). For example, the rate of car ownership in countries such as Luxembourg, Iceland, New Zealand, Italy, Canada, Germany and Australia are all higher than 50% and the figure in America is 46% (International Road Federation, 2008). The large number of cars used now and the rising trend will extend suburbanization and a great urban sprawl to a larger extent. The implication of the growth in the numbers of cars to the built environment and travel behaviour has raised many issues such as the increase of traffic congestion in many urban areas, major concerns relating to road safety, poor air quality due to high carbon emission, degradation in the urban environment, imbalanced use of movement spaces between motorised and non-motorised transport, and the decrease in the quality of life for the urban dwellers (Banister, 2000; Frank, 2006; Litman, 2011).

The more car-prioritized cities become, the more neglected the pedestrian are in urban spaces – walkways disappear, pedestrians hardly integrate into the public transportation systems and cities lack pedestrian amenities (Southworth 2005; Grava 2003). Car traffic and parking have slowly seized space along streets and in squares originally belonging to pedestrians. In addition, conventional planning often does not consider the consequences of roadway connectivity for accessibility to non-motorised travel between roads and paths. There are not many pedestrian spaces left and the public face danger, air pollution and degradation in the urban environment with the presence of other restrictions and irritations such as dirt, noise and visual pollution (Gehl and Gemzoe, 2001). Thus walking in the city becomes dangerous as the pedestrians risk their lives between moving traffic and parked cars, thus increasing unsafe activities especially to the daily user (Frank, 2008; Burden and Litman, 2011). Litman (2011) suggests that people are experiencing a great challenge when they ambulate between urban spaces. They face many problems and issues in relation to walking that need an in depth investigation before any solution can be proferred. These issues will be discussed next.

2.3.1 Lack of integration in promoting walking to workplace

The complex phenomenon of urbanisation has had a great, and often negative, impact on the built environment and people's quality of life within that environment. Increasingly, governments in many developed cities are trying to address this issue by recognising the role of non-motorized travel options in the effort to limit automobile dependency and thus enhance the quality of life in the city (Foltete, 2007 and Sisiopiku et al., 2003).

Many non-government agencies such as 'Living Streets' in the UK, 'Project for Public Spaces' (PPS) in New York, 'Pedestrian and Bicycle Information Centre' (PBIC) in North Carolina, etc. generally establish their mission to improve the quality of life in the communities by encouraging walking as a practical transportation means, encouraging increased physical activity, and spearheading campaigns for improvements to existing policies about pedestrian rights.

According to Burbridge and Goulias (2008), although there is growing research in the diverse fields of walking for transportation and travel behaviour, each piece of research appears to work within its individual sphere. For example, the database of many public health agencies shows an increase in obesity levels due to a lack of physical activity. They have begun to launch programs related to those problems. However, transportation policies do not address the epidemic, although it makes sense to draw a link between lack of physical activity, over-dependency on motorized forms of transport, and poor walking environments (Burbridge and Goulias, 2008).

Wen (2010) found that the workplace environment has its role in promoting active travel (cycling, walking or the use of public transport); again, this is not explored in a holistic way, and there is a lack of integration between agencies. This is one of the drawbacks to the various initiatives in promoting walking to the workplace, as it decelerates improvement to the pedestrian infrastructure in urban spaces (Lee and Moudon, 2006; Wen 2010).

As walking is dependent on human power, travel distances for this mode are generally limited to maximum journeys of less than 3.5 km (Rietveld, 2000). Therefore, walking is usually only feasible and viable to be incorporated as part of a multimodal transportation network in which the pedestrian walks to a public transport hub from the home, takes

public transport to a certain point, and then continues to walk to the workplace (Steg and Gifford, 2005). However, there is often a lack of efficiency in the existing public transportation systems although there is strong demand for good public transport from the non-motorised transport user (Litman, 2011).

More insight is needed in understanding the real issues surrounding walking to workplace in relation to pedestrian perception and experience while walking in the pedestrian environment (Darker, 2007). Researchers such as Rietveld, (2000); Tolley, (2003); Darker (2007); Pronk and Kottke (2009); Litman, (2010) and Wen et al (2010) urge that it is necessary to have a multi-dimensional approach within the diverse fields with regards to walking to workplace, as there are a lot of social, economic, and environmental opportunities and benefits that can be offered by encouraging walking as an activity.

2.3.2 Lack of connection between walking to work and employee welfare

Public health literature has recognised that regular walking is associated with health benefits and is the most common form of physical activity among adults (Cerin et al, 2007; Rafferty et al., 2002). It has been suggested that walking to work as a daily routine may fulfil the minimal public health goal of walking for 30 minutes a day (for at least 5 days/week) (Darker, 2007; Brockman and Fox, 2011; Gilson, 2009). This measure supports initiatives to combat a variety of health crises among adult employees, such as the obesity epidemic, depression, and high-mortality diseases such as heart diseases, type-2 diabetes and high blood pressure (Pronk and Kottke, 2009). Researchers in this field have also examined the causes of the health crises. A number of significant reasons have been found:

1. The nature of work of almost all core jobs in the city is associated with physical inactivity or sedentary behaviour; employees spend long hours sitting in front of the computer (Dunstant, 2010; Owen, 2009). Sedentary behaviour (from the Latin sedere—''to sit'') is used to characterise actions for which energy expenditure is low due to muscles remaining in a passive state (Owen et al, 2009). For many people, being at work involves sitting for long hours at a time (Jans et al., 2007) and this has been recognised as an independent risk factor for conditions such as type II diabetes and obesity (Hamilton et al., 2007).

Dunstant et al., (2010) have conducted a study that correlates sedentary behaviour such as sitting with the mortality risk in Australian adults. He stated that, *"the human body was designed to move, not sit for extended periods of time."* According to Dunstant:

> "…technological, social, and economic changes mean that people don't move their muscles as much as they used to - consequently the levels of energy expenditure as people go about their lives continue to shrink. For many people, on a daily basis they simply shift from one chair to another – from the chair in the car to the chair in the office to the chair in front of the television."

A recent study of Canadian adults discovered sitting for long periods of time causes a greater risk for all-cause mortality and cardiovascular disease, but not cancer, independent risk factors for conditions such as obesity and type II diabetes; the majority of these long hours of sitting occur at work (Katzmarzyk et al ,2009). In Asia, a study among Japanese women and men showed all-cause mortality to be higher in men who reported sitting for 8 hours per day as compared to those who reported sitting for 3 hours per day. However, mortality risks were not predicted by less prolonged sitting durations (Inoue et al, 2008). This phenomenon of the sedentary lifestyle has affected urban adults, contributing to their physical passivity and, therefore, their increased risk of a variety of health problems (Low, 2003).

In the United States nearly 46% of America's population is inactive, as is the case in many other industrialised nations (US Department of Health and Human Services, 1996; National Advisory Committee on Health and Disability, 1998; National Audit Office, 2001). In Switzerland, according to an investigation on physical activity levels, about a third of the Swiss populace have a sedentary lifestyle with no physical activity even during leisure time (Titze et al., 2001).

People rely more on use of personal vehicles even for journeys of less than 1.6 km which is equivalent to 1 mile (Reitveld, 2000; Owen, 2004; Anable, 2005; Steg, 2005). Evidence shows that car commuter journeys for travel to work are a significant contributor to the increase in road usage (Kingham et al, 2001). In the UK for example, journeys by car account for the greatest distance travelled of all journeys by individuals, which is 6,370 miles per year (NST, 2011). The National Travel Survey (2011) has reported that 79% of all journeys were made by cars in comparison with 13% for public transport (bus and rail),

3% for walking and 2% for bicycles for the year 2011, as shown in Fig. 2.6. An increase has been seen over the past 10 years in numbers of car commuters, while decreases were clear in numbers of walkers, cyclists and bus passengers (NST, 2008). Carbon Pathway Analysis by Defra (2008) reported that car trips for short journeys of less than 5 miles contribute under 20% of accumulated CO_2 emissions; car trips of between 5 and 25 miles produce 43% of CO_2 emissions; and finally car trips of over 25 miles account for 38% of CO_2 emissions from cars.

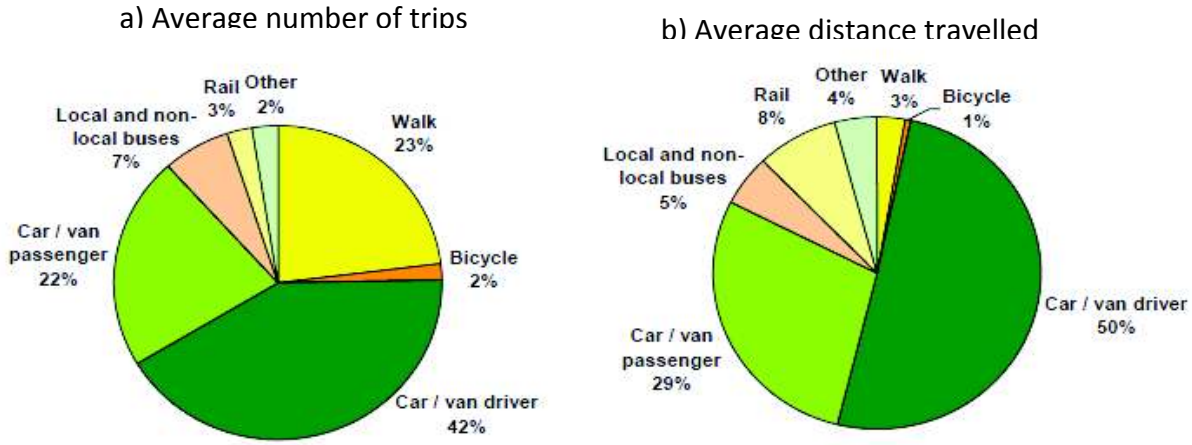


Figure 2. 6 Travel by Mode in 2011 (Department for Transport (DfT), 2011).

The chart indicates that travel via private car is the most popular, as it is used about 42% of the time. In terms of distance travelled, private cars also lead at 50%. Distance travelled by walking is the second-lowest, at 3%, although it must be borne in mind that walking constitutes about 23% of all trips made by individuals. This bears out Rietveld's assertion (2000) that walking can become a practical travel mode for short distance journeys. It requires smaller space per person than any other mode. A pedestrian requires about $0.8m^2$ to move 5km/h compared to a car which requires $20m^2$. If the car accelerates to 40km/h, it requires $60m^2$, which is 75 times the space required for a pedestrian (Tolley, 2003). Furthermore non-motorised transports are cheap and arguably more environmentally friendly with regard to emissions and noise, and space needed for parking (Rietveld, 2000). Although walking for transportation purpose is a matter of interest, not all cities in the world advocate pedestrian rights in urban spaces, nor do they include them in transportation policies (Kenworthy, 2000; Tolley, 2003; Litman 2003).

2. Combustible products from vehicles, such as NOx, HC, additives, and pm10s from diesels, are the leading cause of air pollution; many of these pollutants are carcinogenic (Tolley, 2003). An employee who walks daily along the sidewalks in close proximity to the congested traffic roadways is susceptible to a series of health risks due to prolonged exposure to air pollution from traffic congestion (Nazelle and Rodriguez, 2009). Various conditions from respiratory dysfunction to mortality from cardiopulmonary disease and stroke are likely to originate from the above sources (McConnel et al. 2006; Tonne et al., 2007). Apart from air pollution, Tolley (2003) adds that noise from traffic also contributes to health damage and is a serious impairment to everyday life, especially in urban areas. Compared to motorised vehicles, walking does not burn fossil fuels, it replaces short distance vehicle trips which generate the most pollution per mile travelled and are the least fuel-efficient, and it does not contribute to noise pollution (Tolley, 2003).

3. The common environmental stress factors experienced while walking in the external environment during travel to the workplace (e.g., traffic congestion, noise and air pollution, climatic extremes) have increased uncertainty, unpredictability and stimulus overload in the employee's daily life. Research has identified numerous behavioural and cognitive outcomes that employees commonly face including physical illness, a sense of helplessness, diminished altruism and attention fatigue leading to increased absenteeism, high staff turnover, unproductivity at work, poor performance and bad attitudes, all of which prevent the employees from being more efficient, innovative and creative (De Young, R. 1999, Pronk and Kottke, 2009).

It has been reported that a considerable number of adults in the Western world do not meet the minimal requirements for physical activity which will provide health benefits (Darker et al., 2007). For example in the United Kingdom, over 75% of adult females and 60% of adult males do not undertake health benefiting physical exercises (Department of Health, 2004). Public health statistics in the United States (U.S.) from 1980 to 2003 have shown that the U.S. has experienced an increase of 40% in the number of overweight residents. The rates have increased yearly; now 65-73% of the U.S. population are obese or overweight (Center for Disease Control-CDC 2004). According to Litman and Burden (2011), the cost of physical passivity and obesity to society is enormous. In 2004, the total cost of being overweight or obese was estimated at USD 117 billion and healthcare costs

arising from physical inactivity stand at USD 76billion. Approximately 17% (or 12.5 million) of children and adolescents aged 2—19 years are obese.

Reports on the health crisis are always updated in the national newspapers as a means to inform people and promote changes in active lifestyle. However, people are observed as having a difficulty in translating this physical activity recommendation into a behaviour pattern that fits into everyday life (Department of Health, 2005). There is an inconsistency between behavioural intention and actual behaviour that makes encouraging walking to the workplace a more challenging task (Shay et al., 2003; Ajzen, 2006).

2.3.3 Negative perceptions of and experiences in walking to work

There is substantial literature in the public health, transportation and urban planning sectors signifying that walking as a mode of transportation is related to factors of the built environment that affect walking ability for utilitarian purposes (FHWA, 2000). Walking as an activity does not take place in isolation from the built environment. It is believed that the pedestrian environment is the platform that could explain the interrelationship between these two units (Trew and Everett, 2007). Public health research has acknowledged that the physical built environment is potentially influential to the levels of activity of large segments of the population (Duncan, 2005). Trost (2002) and Humpel et al. (2002) have shown that the environment influences physical activity behaviour and suggest that accessibility and aesthetics are important influences on walking. Handy et al. (2002), Frank et al. (2003) and Saelens et al. (2003) have also supported the notion that easy access to destinations is shown to correlate positively with walking for transport.

For the employee, being able to access destinations, particularly when going to the workplace, arriving from transit, and getting home safely, comfortably and conveniently, are the most essential elements that would make their workplace travel more efficient and meaningful (Shay et. al., 2003). Research on walking behaviour suggests that the functional aspect of walking for transport, as well as the contextual factors of psychological benefits and social support, would make walking to the workplace easier (Darker et. al, 2007). Undoubtedly, travel behaviour is very complex because for each journey, particularly to/from home to the workplace, people have choices of different transportation modes, each of which has specific characteristics, advantages,

disadvantages and cost differences. Because of these complexities, Beirao and Cabra (2007) suggest that it is essential to understand travel behaviour and the motives behind selecting one mode of transport over another.

In some transportation research, walking is promoted as part of a transportation mode to the workplace which aims at decreasing levels of car usage (Steg and Gifford, 2005). It has been reported that, although drivers concede that the use of cars should to be reduced for reasons related to environmental issues, they are not in favour of measures that restrict their use of cars (Hagman, 2003; Steg and Gifford, 2005). Boudains et al., (2001) in their research on adult employees in the Perth Central Business District (CBD), Australia, for "TravelSmart Workplace" reported that up to 99% of people agreed that walking improved fitness and health and 78% said, if encouraged to, they would walk more. Even with these optimistic figures only a small portion of the trips made in the Perth area involve walking. This further affirms the recognition that there is inconsistency between behavioural intention and actual behaviour (Boudains, 2001; Hagman, 2003; Steg and Gifford, 2005).

This occurs because individuals are more encouraged to act on behaviours they believe will generate a highly valued outcome and are less willing to act when they do not believe that results will follow, which may occur for instance when the expected outcomes are not valued (Ajzen and Fishbein, 1980).

Understanding how the people perceive their environment is another underlying psychosocial factor. McDonald (2007) proffers his view that many of the efforts to increase walking among city dwellers concentrate on improvement to infrastructure and changes to the built form, but fail to take into account the social processes that inspire the choice to walk in the built environment. The social aspect of walking needs attention because as they walk, people are collectively storing many positive and negative ideas in their cognitive mind about the physical qualities existing in their pedestrian environment in the urban spaces. According to Handy (1996) a pedestrian sees, feels, smells and hears much of the immediate environment in the urban form; they are naturally much more aware of their outdoor environment than a driver (Talent, 2003). Thus, Handy (1996)

believes that urban form is likely to play a central role in the choice to walk for the pedestrian in the city.

A recent study on walking behaviour among UK adults has reported that they have many salient opinions with regards to negative and positive views in relation to walking for transport (Darker et. al, 2007). According to Darker, positive views such as the benefits of walking for exercise, fresh air and the relief of stress may motivate people to walk more, whereas views about perceived shortage of time, extreme weather and unfavourable urban surroundings are the most frequently repeated negative views in relation to walking 30 minutes a day on average. Environmental evaluation and perception could possibly mediate several behavioural effects, but not all. For example, people are most likely to walk in an area they assess as pleasant or safe. The perception concerning pleasantness also depends on the context (Kirtland et.al., 2003). De Young (1999) in his article Environment Psychology explains that people are inclined to look for places where they feel confident and competent, where they can understand the environment while being engaged with it.

Ciolfi's (2003) studies on the relationship between behaviour and environment argue that these relationships are based on the interweaving of structural properties of the space with people's experience of it. He alleged that the current design practices do not explicitly consider the importance of gaining a full understanding of human experience. According to De Young (1999) people store information about natural and built environment images in the brain as spatial network, namely cognitive maps. People tend to recall their experiences with the perception of the present ideas, events and emotions. Humans know and think about their environment, plan and carry out plans with neural networks. It also appears that individuals tend to give many reasons as to why they are not able to incorporate walking into their journey to work. There are also several reasons why individuals do not perceive the value of the health, economic, social and environmental benefits of walking to work (Darker et al, 2007). The fact is, walking behaviour is very subjective and indeed needs to be approached qualitatively as this will enable a detailed and contextualised understanding of the phenomenon under investigation (Darker, 2007).

2.3.4 Insufficient public transportation and excessive use of private vehicles for work commuting

Transportation professionals have identified that, in relation to degree of access and mobility, travel demands among businesses and individuals differ depending on several conditions such as cost, time, and service levels including speed and distance of travel, mobility of persons measured as person-miles and mobility of vehicles measured as vehicle-miles (Handy et al., 2002). Thus, a major share of funding is dedicated to building roads so as to ease motorised mobility; this includes the provision of excessive parking facilities in the urban spaces (Burden and Litman, 2011). According to Litman (2011), motorized travel demand is a well-studied area; however, non-motorised travel demands are under-researched. Many issues emerge in relation to current transportation systems that are worth discussing:

1. There are growing numbers of private vehicles entering the city especially during peak hours. Evidence from Kenworthy's study (2000) has shown that employees who work in the employment catchment area in the city are the highest contributors to traffic congestion. People move farther away from the city centre and from each other because the farther from the city centre, the lower the cost of housing (Shore, 2006). Reliance on personal car use has made the city centres become increasingly clogged with cars which distresses the far larger number of pedestrians who use the same movement space (Shore, 2006; Pharoah, 2008).

2. Increased spending on travel costs such as fuel and car parking charges.

3. Increased car dependency among urban adults for journeys of less than 1 mile (Brockman and Fox, 2011; Shay et al, 2003).

4. Increasing number of fatal accidents for pedestrians due to the high speed and volume of vehicles. According to Shore (2006) people are too accustomed to the convenience and comfort of the car, which gives them advantages such as freeing them from having to use public transport or their feet. The car drivers also tend to be less aware and less sensitive of the difficulties faced by the pedestrians who are directly exposed to danger from traffic and accidents (Clifton, 2007). This happens

when the motorized vehicles overpower the movement spaces which are meant to be shared with non-motorised travel in the city centre (Pharoah, 2008).

5. Intensifying traffic congestions in the city has led to a degradation of the environment due to the high influx of cars causing noise pollution and air pollution through CO_2 emissions.

6. Low levels of service in public transport facilities makes workplace travel ineffective, resulting in people opting to drive instead, as the best solution to meet their transportation and commuting needs (Mackett, 2001). However those who cannot afford car ownership are further marginalised from being efficient in their workplace travel.

2.3.5 Absence of pedestrian facilities in urban design and planning

The characteristics of the built environment play a major role in either supporting or impeding the inclination to walk for transport purposes (Coogan et al, 2007). Handy et al (2002), in their research into the environmental attributes of a walkable neighbourhood, found that various urban design features that are based on human scale streets with high connectivity, the functionality of destinations, aesthetic qualities of place, mix of land uses and density and intensity of development, are regularly included in categorizing a pedestrian friendly environment. Allan B. Jacobs in his book *Great Streets* explains the importance of walking on the city street (1993);

> *"It's on foot that you see people's faces and that you meet and experience them. That is how public socializing and community enjoyment in daily life can most easily occur. And it's on foot that one can be most intimately involved with the urban environment: with stores, houses, the natural environment, and with people".*

This explains that walking should be an enjoyable and interactive daily activity where people are directly involved physically and visually with their surrounding environment. People normally walk at a slow speed, compared to the speed of vehicles, allowing them to become more familiar with and sensitive to the outdoor environment. Therefore, an environment that is walkable, with a high quality of walking conditions and facilities, would invite more people to get around on foot to their destinations in the city

(Southworth, 2007; TfL, 2006). Handy et al., (2002) and Southworth (2005) have agreed that 'urban design' plays an important role in creating the built environment in the city and the physical elements within it. This includes planning arrangements and appearance which are highly concerned with the function and appeal of public spaces. People who want to walk to their desired destination, however, are discouraged from doing so and encounter many challenges in their external physical built environment (Shay E. et al., 2003 and Handy, 2006). There are many issues related to the quality of walking conditions as mentioned below:

1. People tend to respond behaviourally and perceptually to streets, corridors, shops and doorway-level designs. However, the quality of the existing pedestrian facilities and features appears to be unappealing and dissatisfying. The quality of the pedestrian environment is one of the main issues in meeting the pedestrians' needs. Poor urban design elements, a lack of pedestrian infrastructures and facilities in urban spaces, such as discontinuous sidewalks, numerous obstacles and poor drainage systems, influence the quality of the walking experience (Gehl, 2004). Methorst (2010) commented that the quality of the existing pedestrian environment is highly influential in attracting or deterring people from walking in the built environment.

2. Because walking is a low profile, low tech transportation mode, this implies low need for investments, which means that the producers of this necessary facility are perceived to be of minor importance for the national economy (Rietveld, 2000). Consequently, current conventional planning generally tends to ignore the need for a pedestrian environment and undervalue non-motorised transport. This is despite the fact that an increase in pedestrian activity over motorised transport could benefit the urban environment by reducing traffic congestion, accidents and chemical emissions, and increasing economic capital to the city (Litman, 2003).

3. It is also known in urban design and planning research that the lack of regulation in implementing pedestrian policies has resulted in an uneven distribution of people and activities in public urban spaces, as well as putting the pedestrian in arguably more danger from traffic and other accidents (Pharoah, 2008).

Pedestrians are seen to have been pushed onto the sidewalks and indoors spaces, walking in narrowed spaces between streets and the car-parking spaces alongside them, adding risk to their lives, while motorised vehicles dominate the urban spaces with ease (Zacharias, 2001). In reality, pedestrians are blamed for slowing down the vehicular traffic in the city.

4. It has been identified that pedestrian movement and its spaces in the built environment is much more complex than vehicle movement (Shay, 2003). It is complex because the current situation contains multi-layered systems such as people travelling on foot; people using motorised vehicles; differences among pedestrians in terms of gender, abilities and social status, etc. All of these factors operate at the same time in the same movement spaces, and arise from living things that have emotional feelings and perceptions (Talen, 2002; Clifton and Handy, 2001), and therefore need an intervention.

Crime is a serious concern for people who walk in their neighbourhoods particularly when night falls (Tolley, 2003). A survey in UK has shown that personal security matters bother people more than general safety issues such as busy roads and fast traffic ().A common fear in urban areas is that of 'people hanging around' in poorly lit places; such spaces where strangers might hide are associated with a lack of security. People are wary of walking in places which have evident features suggesting criminal activity such as graffiti, drugs and prostitution. In cases like this, the time of day in which the individual waits for and walks to access public transport is also a point of concern. People feel safest in places that are busy with others going about their ordinary business.

2.4 Understanding the Benefits of Walking

Walking and walkability are believed to have a major impact on community life, which mostly happens on the streets (Litman, 2009; 2011). Streets are one of the facilities for pedestrian movement that constitute a large part of the public realm, that is, a place where people are engaged with their society (Barton, 2004). Liveable streets are filled with people on foot which encourages social interaction and builds healthier

communities, which are attractive and have a diminished rate of crime (Tolley, 2003; Forkenbrock and Weisbrod, 2001).

Comparing residents on streets with less vehicle traffic and residents on streets with high traffic volumes, Appleyard (1981) discovered that the residents on the streets with high traffic volumes have a lower probability of knowing their neighbours and appear less interested in the local environment. This confirms that walking can offer a specific social setting, such as people who share common interests. A walk can serve as a means for looking at scenery, sharing experiences and enjoying companionship within the environmental context of the walk. According to Weyerer & Kupfer (1994), expanding the idea of walking within a social context, social relationships and social support are key aspects of a person's life conditions and has major influences on well-being and health (Darker et. al., 2007).

Walking is of great importance in sustainable development and maintenance of active living. Sustainable developments comprehensively search for livability within a community; this refers to the social capital and the built environment as perceived by inhabitants, workers and visitors (Weissman and Corbett 1992; “Livability,” VTPI 2008). Community cohesion (social capital) involves the relationship quality between people in a society, as signified by the positive interaction frequency, the number of friends and acquaintances in the neighbourhood, and their sense of connection to the community, especially among people of different social backgrounds and economic classes (Forkenbrock and Weisbrod, 2001).

2.4.1 Health benefits of walking

A study on the relationships between health and active living (Frankish, Milligan, & Reid, 1998) showed that in spite of the connection between participation and social support in vigorous exercise, few people are motivated by others to be active (Darker et al, 2007). Darker goes on to say that most people mentioned someone in their lives who advised them to walk for about 30 minutes per day either for any of the following reasons: as a necessity, as an option, or for social purposes. Social companionship is also found to be a consideration and facilitative factor for walking.

Recommendations from public health sectors emphasise the need to build up the habit of physical activity of at least a moderate intensity, such as walking or cycling, on as many days of the week as possible (Pate et. al, 1995). In the US, the Healthy People 2010 initiative sought to produce a more than 50% rise in walking for trips of less than 1 mile, embarked on by adults (U.S. Department of Health and Human Services, 2000). £5.2 million was invested by the Department of Health in the United Kingdom for in the 'Walking for Health' (WfH) organisation. WfH works in partnership with 'Let's Get Moving', 'Walk4Life', and other NHS exercise projects to target an increase of up to 400% in the number of walkers involved in WfH. This implies that, if the initiative is successful, there will be 130,000 people walking every week by March 2012.

Research done on exercise suggests that it reduces anxiety, improves physical self-perception and global self-esteem and mental health, and enhances mood states (Fox, 1999). It is thought that walking is therapeutic because it works as a respite from stress in the working environment. The therapeutic effects are understood in the perspective people have of their lives, and as embodied interactions between them and the world. Walking is therapeutic because it has the ability to make people feel refreshed, calm, and soothed (Darker, 2007). Not surprisingly, walking is widely acknowledged as an enjoyable exercise that builds up cardiovascular health, lowers obesity and improves mental health at a low cost not only to the individual but to the health care system as well (Morris and Hardman, 1997; Tannahill, 2000; Ogilvie et al, 2007; Hamer and Chida, 2008). WHO (2000) reported that walking for exercise meets the metabolic criteria for achieving health benefits. The health benefits of regular physical activity such as walking include:

- a risk reduction by 50% of developing coronary heart disease;
- a risk reduction by 50% of developing adult diabetes;
- a risk reduction by 50% of becoming obese;
- a risk reduction by 30% of developing hypertension;
- a decline in blood pressure by 10/8-mmHg in people with hypertension;
- lower risk for developing osteoporosis;
- Relief for anxiety and depression; and
- Prevention of falls among the elderly.

Reduced global warming through promoting sustainable transport, and increased social cohesion and community safety, are global categories of public health benefits that have been linked to a scenario where the proportion of active transport rises above that of

private car transport (Department for Transport (DfT), 2004). Several government departments are involved in passing policies centred around providing a friendly pedestrian environment, as well as increasing social interventions to encourage those not exercising to start walking (DfT, 2004).

2.4.2 Economic benefits of walking

Economic development is affected by walking in a number of ways (LGC, 2001). Advances made towards a community's economic goals, including increases in economic productivity, employment, business activity and investment, are referred to as economic development ("Economic Development," VTPI 2008). According to Litman (2009), pedestrian environments affect retail and employment centres, especially in resort communities and urban areas. The increasing regard for retail malls, suburban office campuses, and pedestrian-oriented resort communities is proof of the high standards consumers place on the quality of the pedestrian environment. If walking conditions improve, office complexes or retail centres may become more competitive economically (Tyler, 1999).

Rietveld (2000) and Tolley (2003) have pointed to the idea that the workplace plays a vital role in promoting active travel for urban workers. It has been suggested that employers ought to be more proactive with regard to encouraging walking as an alternative transportation mode, because there are several reasons why it is beneficial to them for staff members to walk to work:

- Possibility to reduce capacity and demand for parking space at the workplace
- A more productive workforce with healthier employees
- Reduced levels of stress
- Reduced air pollution in the office space
- Exemplary standards for the community

Substantially, all stakeholders may benefit from an increase in community life in the public spaces between buildings (Carmona, 2004; Gehl, 2004).

Vehicle parking is often subsidized by investors and developers in retail areas on the assumption that consumers need to drive to make large purchases. However this is not always the case (Transportation Alternatives & Schaller Consulting, 2006). A paper on consumer expenditure in British towns revealed that customers who walk spend more

than those who drive (Litman, 2009). Emerging evidence suggests that walking produces strong economic gain for towns and cities. According to Tolley (2003), for shoppers, residents, workers and visitors alike, the design of attractive and safe pedestrian environments in cities and towns is recognised as an essential condition for the success of walking. This shows that, apart from arguments in favour of walking based on sustainability, the environment or social inclusion, there is a strong business case to be made for improving the walking environment. To further strengthen the argument made for walking as a means of improving the economy, it may act as a substitute for driving, thus reducing dependence on fuel, in turn reducing its consumption and the budget allocated for the importation of fuel from other regions (TDM and Economic Development," VTPI 2008; Litman, 2004b). A walkable environment will cause a reduction in consumer transport costs and save expenses on vehicles ("Affordability," VTPI 2008). For example, a study found that automobile-dependent communities had households that allocated 50% more to transportation, which in some cases rose to over $8,500 annually, than households in mixed-use communities with access to multi-modal transportation systems, where transportation expenses fell to less than $5,500 annually (McCann 2000).

Public costs for parking and road facilities, crash risk, environmental damages and traffic congestion are direct effects of motor vehicle use (Murphy and Delucchi 1998; Litman 2006). It has been projected that shifting from motorized travel to walking mode, could possibly reduce or mitigate these effects. Motorized travel can be substituted with walking for relatively short vehicle trips, which usually have high costs per vehicle-mile. When parking lots are higher up and car engines are cold, pollution emissions and energy consumption are higher than normal for short trips, when measured per vehicle-mile, since these cost are split over a few miles. A longer motor vehicle trip can be substituted with short walking trips. As a result, external transport costs can be reduced by several percentage points for each percentage shift from vehicle trips to walking, particularly under urban-peak conditions when parking costs and emission are high (Litman,2009).

2.4.3 Environmental benefits of walking

According to Tolley (2003), people are thermodynamically more efficient on foot than in motorised vehicles and a kilometre travelled by foot uses 8 times less energy than if the

same distance is travelled by car (Tolley, 2003). Walking can more easily accommodate peaks in use at a lower cost and it uses less space per person than any other mode.

According to Ribeiro et al, (2007) in the year 2004, vehicle transport accounted for 23% of world energy-related GHG emissions with about three quarters emitted from road vehicles. Chemicals from vehicles such as HC, NOx, additives, pm10s from diesels and other combustion products cause air pollution and several are carcinogenic while by contrast, according to Tolley (2003), walking burns no fossil fuels. Short distance motor-vehicle trips, which are the least fuel-efficient and generate the most pollution, can be replaced by walking.

2.4.4 Social benefits of walking

Sustainable developments seek community liveability, which refers to the social and environmental quality of a place as perceived by employees, visitors and residents (Weissman and Corbett 1992; “Livability,” VTPI 2008).

The quality of relationships among people in a community is referred to as community cohesion or social capital. It is determined by the regularity of positive interactions, number of friends and acquaintances in the neighbourhood, and their sense of community connections, especially between people of different social backgrounds and economic classes (Forkenbrock and Weisbrod, 2001).

Streets are an important part of the public realm, as they are places where interaction within the community takes place. Community livability is increased by safer, more attractive and walkable streets (Forkenbrock and Weisbrod 2001). It is more probable for residents on streets with less vehicle traffic to know their neighbours, compared to residents on streets with higher traffic volumes and speeds who are less likely to know their neighbours (Appleyard 1981).

Even though walking is relatively unpopular, it can play a great role in improving the quality of life for individuals and communities (Shafer et al., 2000) as shown in Fig. 2.7. Researchers have forecast that the key to prosperity for towns and cities lies in creating the best environment for people to walk in (Low, 2003). Therefore, it is important to understand how the nature of the urban environment affects the way people experience

their pedestrian environment and how they perceive the benefits of and barriers to walking to work.

Figure 2. 7 A conceptual model of factors that contribute to community quality of life from a human ecological perspective (Shafer et al., 2000).

2.5 Understanding Barriers to Walking

People use several methods to move around within their built environment depending on their abilities. An individual's ability to partake in community life depends on their ability to travel independently, which can give them freedom of movement in their pedestrian environment (Gehl, 2001; DoT, 2004). Pedestrian travel paths such as sidewalks and routes are a necessity for virtually every activity that requires people to venture outside of their homes (FHWA, 2004). People become pedestrians walking from their automobile to the building or destination even when they rely on automobiles for every other stage in their journey. Because walking is so widely used, it is important to understand the factors that motivate people to walk, as well as the obstacles they may face when they decide to walk.

2.5.1 Perceived Barriers to Walking for Transport

Barriers are factors perceived by certain segments of the population as any "hindrance to the desired behavioural change" (Litman, 2009). Barriers are created because planners do not take walking into account in their planning activities. One of the reasons walking is overlooked in urban planning is because it is a very inexpensive transportation mode. According to Litman (2009), there is no organized walking industry, unlike with vehicles,

transits and air transports. Because it is so basic, planning practices and many transportation policies today favour automobile travel over alternative modes and mobility over accessibility (Burden and Litman, 2011). Furthermore, a chunk of the share of transportation funding is allocated to parking and road facilities and cannot be transferred to support other modes even though they are the most cost-effective transportation system improvement options. It was further observed that the conventional travel statistics tend to undercount non-motorised travel activity, which leads to underinvestment and undervaluation in walking facilities. Short trips for recreational travel, travel by children, non-work travel and non-motorised links on trips that involve motorised travel are also undercounted in the travel surveys.

The report on 'Walking in London' (TfL, 2008) described barriers to walking in relation to hard "infrastructure" factors and soft "image" factors. Soft 'image' factors arise from individual barriers which are based on the individual experience while walking, whereas hard 'infrastructure' factors are linked with qualitative and quantitative outcomes from the physical infrastructure, as summarised in the table below.

2.5.2 Physical Barriers

Sidewalks and pathway networks, *movement* and *information barriers* are the key factors that hinder people from participating in their pedestrian environment (U.S Department for Transport, 2004; Southward, 2005). A *movement barrier* is something which restricts the ability of an individual to physically move along or within an environment. They may restrict the individual from moving from one place to the next due to 'broken' pathways or the ability of the individual to position his or her body within one location. Movement barriers can occur in both natural and constructed environments, and include:

- Difficult terrains (e.g., cross or steep slopes, uneven and unstable surfaces);
- Obstacles within the path (e.g., lamp posts, benches, railings etc.);
- Travel path without rest or shelter;
- Under and over passes with steep ramps and stairs;
- Sidewalks exposing the users to potential risks;
- Environmental designs that require unusual coordination or movement (e.g., placing pedestrian signal tools in locations that cannot be accessed by all pedestrians)

Information barriers limit the individual's use of data held in the pedestrian environment. The barriers hinder the pedestrian's ability to identify and understand information (e.g., impaired or lost vision prevents the pedestrian from utilizing visual signs), or process the information gathered and decide on a course of action. Information barriers found in the environment comprise:

- Limited sightlines
- Complex travel paths
- Ambiguous or unclear signs or signals
- Missing or unclear information about a suitable pedestrian travel path.

Table 2. 3 The 'soft' and 'hard' factors in barriers to walking. (Source: Walking for London Report, Transport for London, 2008)

	Image	**Infrastructure**
Knowledge	Distance perceived Perceived time it takes to walk /speed of walking Car convenience Unknown location Not able or willing to rely on maps	Lack of 'at a glance' directional consistent way-finding information Absence of landmarks No information relating to time/distance on
Safety	Fear of attack (at night/in the dark) Fear of child abduction Fear of traffic	Poor lighting Litter, graffiti Poor pavement maintenance No safe places to cross the road
Other	Habitual nature of most travel behaviour Importance of time and using time efficiently Walking is not seen as a mode in itself, but a means of accessing other modes Practical and emotional benefits of car	Bad weather Pollution Need to carry heavy objects Need to 'trip chain'

Like Litman, Gehl (TfL, 2004) in his report on '*Public Spaces and Public Life for London City*' has explained that the majority of all difficulties related to walking are caused by the high priority placed on vehicular traffic. He has stated that "…Cars have been the king for a very long time and there is no end to pedestrian hardships". He added that the obstacles and barriers in the existing pedestrian environment in the City of London are among the general problems faced by the pedestrians in everyday walking. This has caused danger and irritation to users, as shown in the pictures below (Fig.2.8):

Figure 2. 8 Barriers in the existing pedestrian environment in the movement spaces in the city: (Source: Towards a fine City for People- Public Spaces and Public Life – London Report (TfL, 2004).

The following are the common barriers to walking in the built environment, summarised from the extensive literature review:

Table 2. 4 The general barriers to walking in the pedestrian environment. (Source: Compiled by author, 2011).

	Barriers	**Authors**
1	**Security and Safety Concerns** The actual and perceived danger encountered when walking. Severance by car parks and roads Heavy traffic with excessive vehicles speed	Tolley, 2003 U.S. DfT, 2004; TfL, 2006 ASTUTE, 2008 PQN, 2010

2.	**Inadequate Information** Ambiguous or missing information for communication such as signs, signals and way-findings This includes ineffectiveness of promotional campaigns on walking to work.	Tolley, 2003; TfL, 2006 ASTUTE, 2008; Litman, 2009; LIVING STREET, 2011
3.	**Inadequate Physical Features** Complex travel pathways Challenging topography and climate Aesthetics and appearance of the pedestrian environment Poor quality of walkways, uneven surfaces The walkways networks do not engage the interest of the user.	Handy, 2002; Barton, 2004 Southworth, 2005; Pharoah, 2008; Litman, 2009; PQN, 2010
4.	**Lack of recorded walking data** Only main modes of transportation are recorded Short-distance trips like those of less than a mile are not considered in transportation planning	PQN, 2010
5	**Lack of Infrastructure and Support** The nature of walking is low-profile and basic, so the transport, urban design and planning systems undercount walking opportunities for short distance journey Inagequate provision and maintenance of pedestrian movements such as sidewalks and walkways Indirect links with other transport modes.	Tolley, 2003; Southworth, 2005; TfL, 2006; Litman, 2009, Burden and Litman, 2011
6	**Lack of crossing opportunities** Pedestrian are given insufficient time to cross the road Lack of pedestrian-friendly traffic lights Non-existence of crossing facilities at points/areas with high usage	Tolley, 2003; TfL, 2006
7	**Poor Public Perception of walking as alternative transport mode** Walking is not considered as part of transportation mode and treated just as a habit Lack of public interest Cultural barriers in some places	Rietveld, 2000; Boudains, 2001; Darker, 2007; PQN, 2010; Wen, 2010
8	**Lack of public awareness on the benefits of walking** Little understanding or knowledge of the roles and benefits of walking for health, economy, environmental and social purposes	PQN, 2010; Darker, 2007; ASTUTE, 2008;
9	**Poor accessibility** Absence of walking facilities, which makes walking modes inaccessible	Southworth, 2005; Litman, 2009; Burden and Litman, 2011
10	**Congestion and Air Pollution** High influx of cars going towards the same directions to and fro the city centre during peak hours Contribute to the increase of CO^2, air and noise pollution causing unhealthy living.	WHO, 2000; Tolley, 2003; Lee and Moudon, 2007; Frank, 2008, Steg PQN,2010; Litman, 2010; Burden and Litman, 2011
11	**Lack of Public Sector Support** City wide coordination and walking initiatives are not successfully implemented because of their low priority to politicians and decision makers	Tolley, 2003; ASTUTE, 2008; PQN, 2010; Burden and Litman, 2011
12	**Lack of Private Sector Support** Lack of awareness of organisations on benefits of Travel Plans for their employees	ASTUTE, 2008; De Young, R. 1999, Tolley, 2003; Pronk and Kottke, 2009;

	Inadequate facilities for staff - resources are not made available to all	Wen et al., 2010
13	**Lack of Training and Education** Low level of road safety skills in relation to walking for both user and decision maker	ASTUTE, 2008;

2.6 Accessibility to pedestrians while walking to work

In the transportation planning field, according to Handy et al. (2002), travel is defined according to 'trips' as the movement from one street address to the next. It is also divided into a number of components such as destination of trips, frequency of trips, length of the trip, and travel mode, such as walking, automobile, biking and transit. Furthermore, trips are distinguished by "purpose," that is the nature of the activity found at the destination; this can be classified as work, recreation, shopping, and so on. Travel can be analysed at either the "disaggregate" level of the individual or the household, or the "aggregate" level of the traffic analysis zone or even metropolitan area. Handy's explanation has emphasised the importance of defining and determining the type and purpose of travel before going on to the next step in research, because of the broadness and complexity of the topic of walking for transport.

2.6.1 Pedestrian Accessibility

According to Litman (2003) accessibility is *"the ability to reach desired goods, services and activities"*. Handy and Clifton (2001a) state that;

> "Accessibility reflects the ease of reaching necessary or simply desired activities and therefore reflects characteristics of both the land-use and transportation systems".

Walking is seen as an easy form of access, by itself and in combination with other travel modes such as driving, transit, air travel, etc. Walking offers a basic level of mobility, as several people rely on walking to access activities with high social value, such as essential education, errands, employment and medical services, (Basic Mobility, VTPI 2008). It is important for transportation-disadvantaged people such as people with disabilities, children, the elderly, and people with low incomes. Walking conditions described as poor can contribute to social exclusion, which is the physical, social and economic isolation of vulnerable populations.

Degree of access to public transit for pedestrians is an important facet of accessibility and plays a role in choice of mode of transport and active travel, and is mainly affected by the layout of a community (Litman, 2009). According to Litman (2009) there are several methods used to measure accessibility, such as calculating the number of opportunities reached within a given distance and time. In other words, accessibility is also affected by the scale at which a specific mode operates. Litman notices that accessibility may be seriously restricted for a community which is designed with land-uses completely separated from each other, and that travel time affects the choice of transportation mode. Tolley (2003) has defined accessibility based on walking purposes which can be explained in four different ways as follows:

- 'access mode' or functional walking – walking to get to workplace, shops or school:
- 'access sub-mode' - the primary way of getting to public transport services;
- 'recreation/leisure mode' – walking for the sake of walking, for example; walking the dog; and
- 'circulation/ exchange mode' – where a range of non-transport activities on foot are carried out by people in public spaces such as chatting to neighbours, window shopping, or having a drink on a pavement café.

According to Barton (1998), accessibility is the antonym of mobility. In his observation, the current built environment has been designed for mobility not accessibility. Mobility is about allowing people and goods to be mobile, increasing traffic speeds, reducing congestion, road improvements, free-flow traffic movement, and settlement dominated by motor traffic. For built environments designed around the car, for example housing estates, this means decline in accessibility and actively deterring walking, cycling and public transport. By contrast, design for accessibility means:

- ensuring there is a real choice of modes types to suit different needs;
- movement facilities that are pleasant, convenient, and as local as possible; and
- pedestrian environments that invite more people to walk because they are attractive and feel safe.

Barton further elaborates that the main concern of designing for movement is to ensure a good level of accessibility and to understand access for whom, to what, and by what means or mode. To understand *access for whom* the designer must consider specific needs, which means a focus on details of safety, a sense of security, and local provision so that trips especially on foot can be kept short.

Access to what describes the degree to which accessibility can be affected by the segregation or clustering of activities. Barton suggests that the viability of local facilities can be enhanced by associating the optional trip end (such as shop and library) with an obligatory trip end (such as workplace and school). However, the key purposes in relation to the capacity of any transport system are commuting and work or school trips, which create the morning and evening peaks of demand.

Access by what also means it is important to recognise the needs of the 'transport poor', those without access to a car, as well as the 'transport rich'. Traveller choice is of central importance. According to Barton (1998) the design should attempt to open up the options that are available to people, with special attention given to those who are inherently less mobile. This is to ensure that a wide range of work, business, education, social and leisure needs can be satisfied with short trip lengths, that there is the opportunity and encouragement to walk and cycle, and that public transport is viable. The environment however should be permeable, with alternative routes and alternative modes available between any two destinations.

Talen (2002) defined access *"as the quality of having interaction with, or passage to, a particular good, service or facility"*. The important factors for pedestrian access are sidewalk quality and width, perceived safety, traffic and parking volume. Talen believes that locations that have facilities close by have better access than locations with facilities far away. Access is always tied up with the urban pattern in the urban spaces. Although measuring access can be quite complex, if the objective is to predict travel behaviour and behavioural changes resulting from different urban patterns, then complex measurements of individual access are essential.

2.6.2 Walking Trips and Stages

According to London Travel Demand Survey (LTDS) for 2008 and 2009, a trip is defined as; *"… one way movement from one location to another to achieve a specific purpose such as to go from home to work"*. In the Transport for London (TfL)'s, (2011) report on "Walking Segmentation", several forms of travel modes which may be used in one trip are identified as: walking from home to the station, train to central London, onward underground journey and a further short walk to the place of work. These individual

mode components of a trip are referred to as stages, each of which is distinguished by being accomplished on a single mode of transport. Transport for London also identifies at least four journey stages involved in a trip to workplace in London City as shown in the Figure 2.9 below.

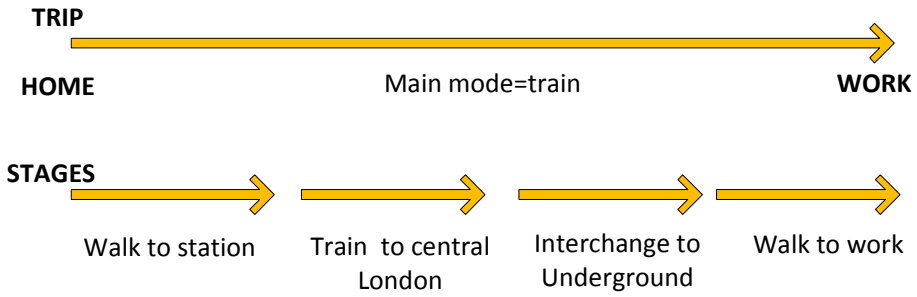


Figure 2. 9 The diagram shows that there are at least two walk stages within one trip consisting of four stages in total (Transport for London, 2011).

The example above shows the average walk stages per day performed by employees who travel from home to the workplace in the city in a trip chain. As walking is divided by purpose and/or type of trip,

- walking to work is most likely used in the trip stages to access another mode of transport (TfL, 2011)
- walking can be either an access mode (getting to workplace) or sub-mode (getting to public transport services) (Tolley, 2003).

It is also important to take into account the destination of trips and the trip lengths from point A to B, as walking all the way is unlikely to be feasible for distances of more than 3.5 km (Rietveld, 2000).

According to Rietveld (2000), conventional planning has underestimated the point that walking is most favourable for short distance trips of less than 1.6 km, whether for access mode or sub-mode. Based on Rietveld's research on non-motorised modes in transport systems in Netherland, the short-distance trips share is high. Approximately all trips are shorter than 1.6 km (1 mile) which is within the range of walking capacity. Rietveld continues that although these trips may have a rather small share in terms of the total number of kilometres travelled, they are still important transport modes. He concludes that non-motorised transport modes are an appealing travel mode both in terms of their environmental performance, their quality (speed) and cost for short-distance trips. For

the longer trips, walking is becoming important when a multimodal perspective is incorporated for the whole journey. A recognition of the multimodal nature of these trips means that the number of moves made by pedestrians increases in distance by about 40%. Walking is therefore considered as a complementary transportation mode to other modes.

2.6.3 Mixed-mode transportation for commuting to work

According to Hoehner (2005), research aimed at understanding the positive relationship between walking and access to public transport is being developed. It has become evident that an integrated and efficient public transport network could encourage a more active lifestyle within the community by providing better opportunities for active travel (Cerin et al, 2007).

Multimodal transportation is defined as the use of more than a single transport mode within one journey (Litman, 2011). It also involves a series of trips that are linked together between anchor destinations. A trip that involves leaving home, walking to a transit stop (such as bus, train or monorail), walking to and from interchanges, and ends with walking to the workplace from the last transit point within the employment catchment area meets the above definition. According to M.C. González et al. (2008) most of the time only short distances are travelled in the various stages between home and work; however occasionally longer trips are undertaken and this has implications for average travel speeds, daily travel-time budgets, parking policies and public transport stimulating policies.

According to Litman (2011), transportation planning in the recent years has become more comprehensive and multi-modal considering a wider scope of impacts and options. Transport planners have begun applying Level-of-Service (LOS) ratings to walking, cycling and public transit, considering demand-management strategies as another alternative to roadway capacity expansion. He remarks that in certain urban areas a green transportation hierarchy has been developed which states that priority will be given to more resource-efficient modes over single-occupant automobile travel, particularly in congested urban corridors (see Figure 2.10)

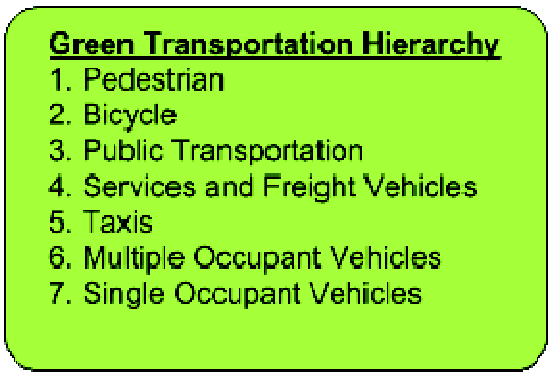


Figure 2. 10 The green transportation hierarchy approach (Litman (2011).

This has provided a basis for shifting the emphasis in funding and pricing to favour more affordable road space allocation, transport planning, and efficient modes of travel. The current trend for people who have jobs in major multimodal activity centres is to commute, by transit; they do this more than those who work in more distant locations and they tend to drive less for errands. A high concentration of multi-mode transport services is usually centred within the employment, commercial, entertainment, and other major activities areas in the city centres, downtowns and large industrial parks.

Litman (2011) has suggested that various transportation modes have their own level of performance in terms of availability, travel speed, density, load capacity, travel user cost, potential users and limitation of each mode as shown in Appendix A. Greater understanding of this aspect would give more insight into the efficiency of each mode, and how users are influenced in choosing a particular mode of transport. According to Methorst (2010), decisions are made based on people's expectations: whether it is feasible to arrive at the destination, what one knows or feels, what one can expect along the way, the energy it will take to arrive at the destination, the risks and the rewards that one gets for getting there or penalty for not getting there etc. (PQN, 2010).

2.6.4 Perceptions of public transport

According to Jensen (1999), cars are a status symbol as they offer opportunities for personal control and autonomy. In contrast, public transportation is often viewed as lacking in comfort, convenience and status ((Hamilton, Jenkins and Gregory (1991); Stokes and Hallet (1992); Root, Boardman and Fielding (1996)). Thogersen (2006) in his study investigated several determinants that possibly influence travel mode choices. He

concluded that travel mode choices were the results of the relationship between volition (e.g. influenced by the traveller's evaluations and motives), the individual (e.g. transport habits, car ownership) and context (e.g. accessibility to public transport). From the individual's point of view (habit and car ownership), car owners are less likely to travel using other options. When the perceived benefits derived from travelling by car (more flexible schedules, route, weather conditions, and health condition) are high, the choice to drive tends to be repeated and then transformed into a habit. If the habit becomes stronger, car owners will drive more and use other modes less than non-owners of cars. This therefore leads car owners to pay little attention to alternative modes of transport (Aarts et al., 1997; Verplanken et al., 1997).

2.7 Existing theories concerning walking to work

According to Low (2003), despite advances in transport and communication technology, no growth in urban transport has replaced the undeniable simplicity of public roads with private vehicles. Low (2003) argues that there is no significant progression through the 'walking city', the 'railway city', the 'car city' to a new technological dream. In that context, Low has observed that advanced cities in most countries around the world are now trying to live better and more effectively by integrating different modes of transport (walking, cycling, collective transport, and private vehicles) into 'the active city'. He also highlights that the key for prosperity in the city centre lies in designing the best possible environment for walking.

Steg and Gifford (2005) emphasise that active travel should contribute in a broader agenda that is called 'sustainable transportation'. They believe that the authorities should be looking into the sustainability of the transport system itself by focussing on the negative and positive values and the externalities of transport and traffic as they are apparent now or in the near future. According to them, the existing transportation scenarios have affected the quality of life of the community in positive or negative ways. In order to encourage communities to opt for active travel especially from home to workplace there is a need for a systematic strategy to ensure that the existing transportation system is more sustainable which will no doubt involve many parties in the built environment.

There are many theories and concepts used by researchers to characterise the city in order to provide a foundation for the emerging body of research on finding ways to overcome urban issues related to walking (Handy, 2002). Aytur et al.(2007) for example, propose a framework for the role of land use and transportation plans as policy instruments in supporting non-motorized transportation improvement (NMTI) to promote active community environments. The theoretical framework for their study is derived from a socio-ecological model adapted from the work of Schulz and Northridge (2004), Northridge et al (2003), and Stokols (1998) (Fig. 2.11). The model describes the potential of pathways through which macro social, political, and economic processes interface with the built environment to affect health by mediating differential access to power and community resources. It is suggested that improving the quality of local land-use plans may provide a means for communities to integrate transportation projects with appropriate land uses and improve access to health-promoting infrastructure.

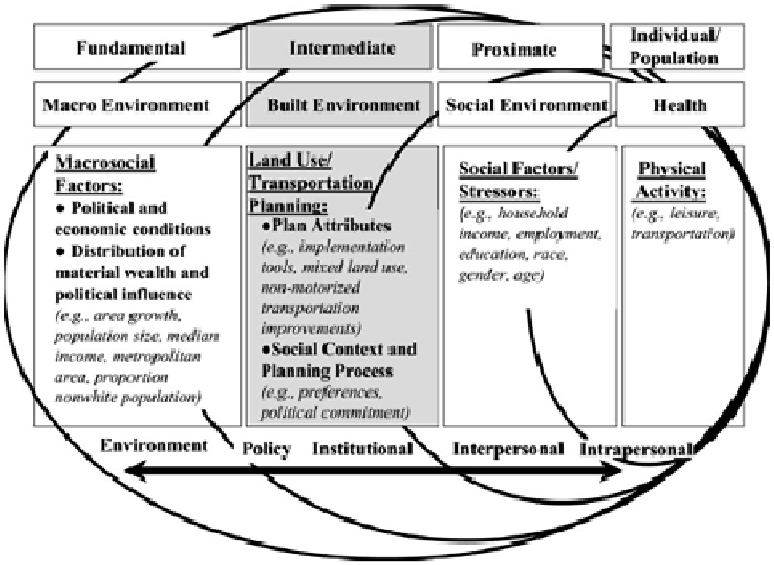


Figure 2. 11 The socio ecological framework (Aytur et al, 2007).

According to Lapintie, physiological and psychological needs are not independent of each other. Dissatisfaction with how physical needs are met will have psychological effects and dissatisfaction with how some psychological needs are met will have physiological effects. As we move from psychology to sociology and political and cultural theory, various different meanings of the term 'need' emerge. In social and political systems, people are given and they acquire human and civil rights and duties, which are enforced by political

and social systems. The public have a right to the fulfilment of certain legitimate needs or demands, and the political system is obligated to satisfy those needs or demands.

Lapintie (2010) highlights that each discipline concentrates on different scales, and proposes a definition to distinguish each discipline in relation to the quality of the pedestrian needs in their built environment, as shown in Table 2. 6 below:

Table 2. 5 Pedestrian needs and pedestrian environment quality described across different disciplines (Lapintie, 2010).

Types of need	Definition	Description	Pedestrian Environment Quality
Physiological needs	Homeostatic needs dealing with the individual body in its physical environment.	Necessity of the human physical system to maintain a set level of temperature, nutrition, activity, etc.	Provision of shade, shelter, resting places, public wells, restaurants and cafeterias, safe crossings, etc.
ii) Psychological needs	Dealing with the individual psyche and its relationships and behaviour in the social and physical environment	Necessity to reach e.g. relatedness, competence and autonomy in order to live a satisfying and meaningful life	Provision of accessible public and community spaces for meeting and communication, clear orientation and legibility, necessary control to ensure personal security.
iii)Social needs	Dealing with social groups and social dynamics	Necessity of social groups to communicate and cooperate, as well as form social distinctions.	Provision of accessible public spaces for meeting and communication, clear orientation and legibility.
iv)Aesthetic needs	An example of the larger group of normative/cultural needs dealing with human cultural activities and their products	Preference for well-designed and/or meaningful cultural products and natural environments, can be refined through education and acquaintance with the arts	Provision of well-designed urban space, good materials and street furniture, scenic environments.
v)Political needs	Dealing with the legitimization of certain human wants and drives within the political system	Facilities and services that are considered citizens' rights that the political system is committed to. Disciplinary control / subjugation.	Provision of high quality and accessible public spaces and public services, public transport, affordable and accessible housing, personal security, freedom to use public space within limits.

This research uses numerous behavioural theories and models which include physical activity (walking) and its correlation with the environment. A social-ecological approach acknowledges multiple levels of behavioural determinants, including individual, interpersonal, organizational, and community, as well as both social and physical environments at various levels (McLeroy et al., 1998). According to Sallis and Owen (2002), the social-ecological approach models have been referred to as those dealing with 'any space outside the person'. Health decisions are made, and behaviors occur, in environmental contexts (Stokols, 1992).

This model has emphasised that the influences from the physical environment, particularly the 'pedestrian environment', are key to the complex network of causality and a key feature of ecological models applied to walking behaviour (Owen et al., 2000; Sallis and Owen, 2002). According to Sallis & Owen (2002), influences may derive from two factors:

i) physical (e.g., weather or climate, community resources, the built environment, the information environment); or

ii) social (e.g., social support, norms, beliefs, and attitudes) as well as objective (actual) or subjective (perceived).

Saelens et al. (2003) formulated a framework that is based on the social ecological approach as mentioned above. The researchers made an extensive study of transportation, urban planning and the promotion of active physical activity (walking and cycling) for health, within a neighbourhood environment. The researchers probe the individual variations in physical activity by simultaneously examining the psychological correlation with physical activity and environmental variables. The framework emphasises that the interaction between environmental and socio-demographic variables are also known to influence people's travel behaviour and perception of walking for transport and recreation purposes. There are collective psychosocial factors such as social support, self-efficacy and positive beliefs about the physical activity that are more closely related to behaviour in the presence of a more walkable physical environment. Individuals who perceive high benefits to being physically active are more likely to be influenced by street connectivity than an individual who has less positive beliefs about physical activity.

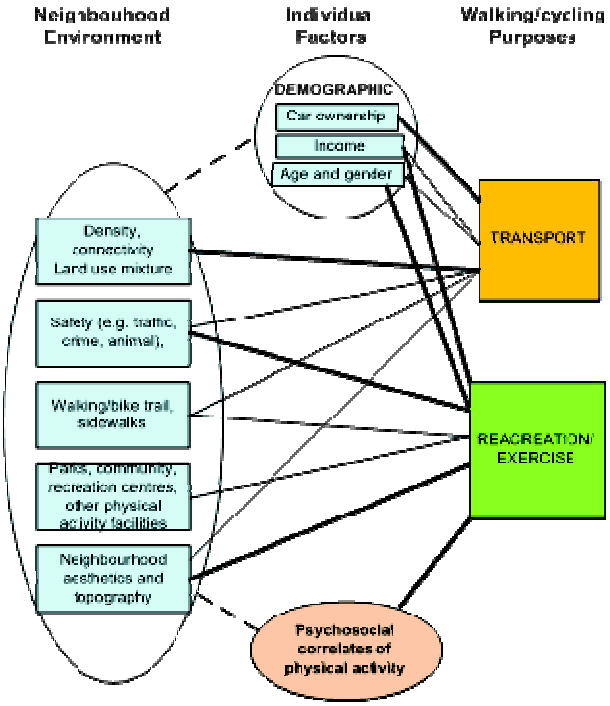


Figure 2. 12 A proposed ecological framework of neighbourhood environment influences on walking and cycling. Bold lines denote stronger relations; single lines denote weaker relations; dashes denote mediated relations. Psychosocial correlates of physical activity include but are not limited to, such variables as self-efficacy, perceived benefits, perceived barriers, social support, and enjoyment of physical activity (Saelens et al., 2003).

Ewing et. al. (2006) proposed an ecological framework to understand the physical environmental qualities that may affect people's perceptions of streetscapes and their willingness to walk and otherwise be active in them. The graphic below shows the factors that contribute to the overall walkability in the pedestrian environment and are most likely to influence people walking. Ewing and colleagues have identified and grouped the factors into the following categories: physical features of the pedestrian facilities and eight urban design qualities (e.g. imageability, legibility, enclosure, human scale, transparency, linkage, complexity and coherence). These researchers recommend that urban design and physical features have a direct relationship to the individual's sense of safety, comfort and enjoyment while walking in their pedestrian environment. They suggest that the walkability phenomenon can be understood using either objective or subjective measures as shown in the proposed continuum line in the below framework (Figure 2.13).

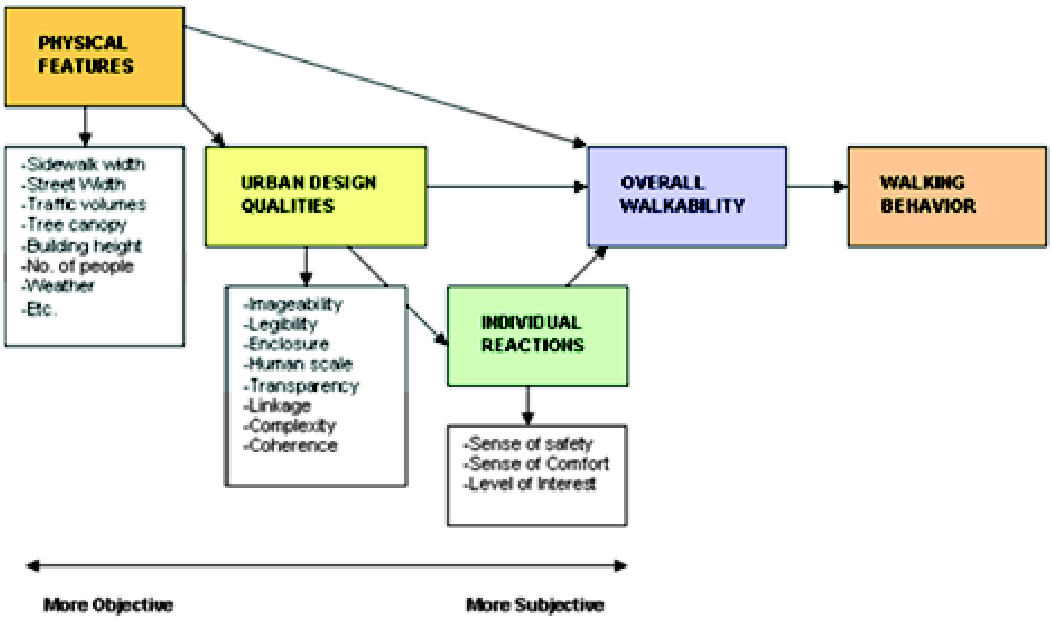


Figure 2. 13 Conceptual framework of urban qualities related to walkability (Ewing et al., 2006).

Pikora et al. (2003) have constructed a framework that emphasises the physical environmental factors that may influence walking for transport in local neighbourhoods. Their framework consists of four key physical features which influence walking, namely functionality, safety, aesthetics and destination. Each feature can be further subdivided into several elements. They also discuss items that influence these elements (factors that have the potential to improve an element) as illustrated in Fig 2.14 below. The framework also has taken multi-disciplinary approaches to develop frameworks that focus on encouraging walking and cycling in local neighbourhoods. It is worth mentioning that their initial framework that was developed earlier identified several individual factors influencing walking in the local neighbourhood, namely: motivations, interest, and social/family support and health status.

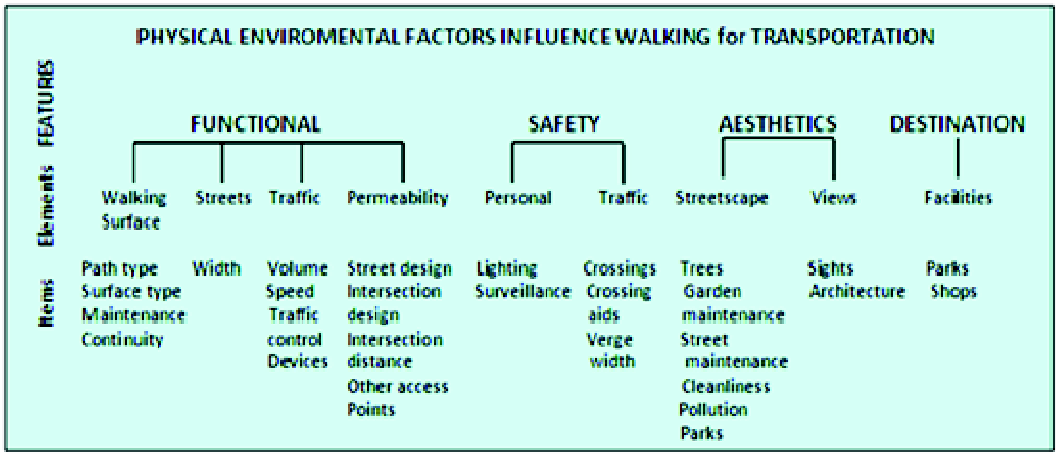


Figure 2. 14 Conceptual framework of the physical environmental factors which influence walking for transport (Pikora et al., 2003).

Gehl (2004) has formulated a framework that accentuates the relationship between the walking environment and how it works at the human scale. He states that in designing a quality pedestrian-friendly environment, the focus should be on the human scale, the microclimate, and details of the physical environment. He suggests three groups of quality criteria namely protection, comfort and enjoyment; these criteria take into account the five human senses, which will help in the creation of a better quality of pedestrian environment. Gehl has further divided these three criteria into what he calls the twelve urban design qualities that fulfil the peoples' needs in their pedestrian environment. Although the framework was originated for Copenhagen, he has tested his theory extensively in other western cities such as London, Perth, Melbourne, etc. Gehl's framework is shown in the diagram below.

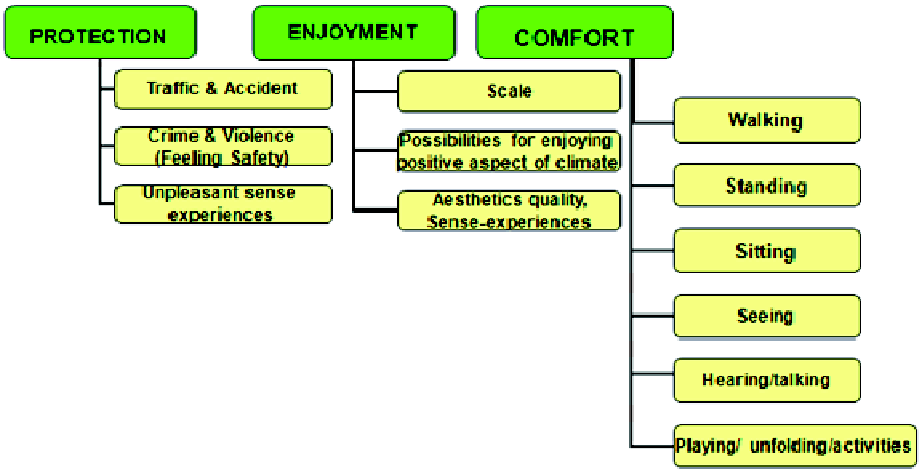


Figure 2. 15 Conceptual framework emphasising the three components of urban design qualities in creating a pedestrian-friendly environment Gehl (2001, 2004).

There are various views from different authors with regards to walking for utilitarian and transport purposes found in the literature reviewed here. These authors identify the factors that support people walking in their pedestrian environment in their framework. All the theorists mentioned above discuss similar issues of investigating across the various disciplines and looking at walking in a holistic manner in a social-ecological perspective. However, the information provided is too generic, in some cases, to be applied in different cities with regard to specifying the appropriate pedestrian environment for a specific walking purpose. Lee and Moudon (2006) point out that there are numerous physical environmental factors characteristics, which are subject to complex interactions that are relevant to different types of walking. Lee and Moudon (2006) continue that there appears to be insufficient knowledge about the specific environmental conditions that are associated with walking to work among employees who work in the employment area in the city centre of developing cities.

2.8 Theoretical proposition

The theoretical basis for this research gives strong consideration to human life experience which Tuan (1977) emphasised as having a dynamic relationship between personal, behavioural, and environment factors. From the literature reviewed, six propositions have been identified that could assist in the development of a conceptual framework to demonstrate relationships between the employees as users, the pedestrian environment, and multi-layered factors that may influence the employee in incorporating walking as part of transportation modes while commuting to their workplace in the city centre. The propositions will help to strengthen the research focus leading to further development of the research aim, research questions and research objectives of the study. They are as listed below:

Proposition 1;

> "People will be encouraged to walk to their workplace in the city if they are facilitated with accessibility to a good quality pedestrian environment that meets their needs" (Gehl, 2001; Low,2003; Sealens, 2003; Southward,2005 and Ewing, 2006, Talen, 2002; Clifton and Handy, 2001; Barton, 1998; Handy, 1996).

Proposition 2;

> "Physical barriers, obstacles and interruptions along the pedestrian path are perceived as unpleasant and time-consuming due to the effort people must

exert in order to avoid them" (Inman, 2006; Gehl, 2004; Southworth, 2003).

Proposition 3;

"A pedestrian environment needs to be safe, comfortable and pleasant as this will provide the pedestrian with a positive experience while walking to the workplace" (Gehl, 2004; Patton, 2007).

Proposition 4;

"Different people have different perceptions of walking to the workplace, based on individuals' past and present walking experiences. These perceptions and experiences influence them in making their decision to opt for walking as part of a transportation mode including public transport, instead of driving their private vehicles" (Gehl, 2004, Tuan, 1997; Shaftoe, 2008; Wunderlich, 2008)

Proposition 5;

"The pedestrian environment provides a strong relationship with the sensory expression and social interaction derived from everyday walking practices which nurtures a sense of belonging, familiarity, emotional attachment and thoughts to the area which is being walked" (Giles and Corti, 2002; Saelens, 2003; Gehl, 2004; Ewing, 2006; Aytur, 2007; Lapintie, 2010; PQN, 2010).

Proposition 6;

"An integrated approach that involves various disciplines is needed to envision and advocate for a quality pedestrian environment that encourages walking in the city" (Pikora, 2003, Ewing, 2006, Aytur, 2007; Lee & Moudon, 2006, PQN, 2010; Litman, 2011; Lapintie, 2007; Kitamura et al., 1997; Handy et al., 2002).

2.9 Conceptual framework

A conceptual framework refers to the theory about what is going on, what is happening and why, particularly when expressed in diagrammatic form (Robson, 2002). Reichel and Ramey (1987) describe the conceptual framework as a set of broad ideas and principles taken from relevant fields of inquiry and used to structure a subsequent presentation. Miles and Huberman (1994) concur that when the research focus is clearly articulated, a conceptual framework has potential usefulness as a tool to explain in narrative form and often graphical format, the main things to be studied – the key factors, constructs and variables – and the presumed relationships between them. This exercise also forces the researcher to be selective and specific about what is going to be studied and what is going to be omitted and which relationship is likely to be the most meaningful (Miles and Huberman, 1994, p 18).

This conceptual framework is a working tool that focuses and shapes the research process, informs the methodological design and influences the selected data collection instruments (Bloomberg and Volpe, 2008). Through this conceptual framework, the studies are able to explain aspects and causal arguments identified by the descriptive research data gathered and to describe the phenomenon under investigation (Yin, 1994).

In this research, the conceptual framework is the heart of the study. It increasingly embraced, reinforced and kept this research on track by providing clear links from the literature to the research problems and questions outlined in Section 1.3 and 1.4 in Chapter 1. It will also be used as repository for the data collected, and provides an organising structure for reporting the study's findings, analysis and interpretation, and the synthesis of these findings (Bloomberg and Volpe, 2008; Yin, 1994).

The review and critique of the literatures, combined with the author's own experience and insights, has contributed to developing a conceptual framework for the design and conduct of this study. In this study, the first research question seeks to determine the extent to which the employees as commuters perceive walking as part of transportation to the workplace. Therefore, the logical conceptual category to capture responses to this question would be "**The individual's psychosocial reaction to the pedestrian environment**" which involves the user's perception toward walking as part of transportation to work, as well as their perception of the benefit of walking based on their present and past walking experience while walking to work in the pedestrian environment. Below are some propositions that researchers agree may influence the individual's travel mode choice and how the users understand the meaning of walking to work.

> Proposition 2; "physical barriers, obstacles and interruptions along the pedestrian movement are perceived as unpleasant and time-consuming due to the effort people must exert in order to avoid them" (Inman, 2006; Gehl, 2004; Southworth, 2003).
>
> Proposition 5; "The pedestrian environment provides a strong relationship with the sensory expression and social interaction derived from everyday walking practices which nurtures a sense of belonging, familiarity, emotional attachment and thoughts to the area which is being walked" (Giles and Corti, 2002; Saelens, 2003; Gehl, 2004; Ewing, 2006; Aytur, 2007; Lapintie, 2010; PQN, 2010).

> Proposition 6; "An integrated approach that involve various disciplines is needed to envision and advocate for a quality pedestrian environment that encourages walking in the city" (Pikora, 2003, Ewing, 2006, Aytur, 2007; Lee & Moudon, 2006, PQN, 2010; Litman, 2011; Lapintie, 2007; Kitamura et al., 1997; Handy et al., 2002).

The second research question seeks to examine what factors influence the employees to incorporate walking as part of transportation to workplace in the existing pedestrian environment in the city centre of Kuala Lumpur. The category focuses on two key actors which are the **employee as pedestrian** and **the pedestrian environment** within the working area in the city centre. The relationship between the two actors according to the existing research is defined as a subject and context relationship. The research therefore looks into what tangible and intangible factors in context influence the perception of the subject. Below are the theoretical propositions that the researchers agree are factors likely to influence walking to workplace.

> Proposition 1;
>
> "people will be encouraged to walk to their workplace in the city if they are facilitated with accessibility to a good quality pedestrian environment that meets their needs" (Gehl, 2001; Low,2003; Sealens, 2003; Southward,2005 and Ewing, 2006, Talen, 2002; Clifton and Handy, 2001; Barton, 1998; Handy, 1996).
> Proposition 2;
>
> "physical barriers, obstacles and interruptions along the pedestrian movement are perceived as unpleasant and time-consuming due to the effort people must exert in order to avoid them" (Inman, 2006; Gehl, 2004; Southworth, 2003).
>
> Proposition 3;
>
> "a pedestrian environment needs to be safe, comfortable and pleasant as this will provide the pedestrian with a positive experience while walking to the workplace" (Gehl, 2004; Patton, 2007).
>
> Proposition 4;
>
> "Different people have different perceptions of walking to the workplace, based on individuals' past and present walking experiences. These perceptions and experiences influence them in making their decision to walk as part of a transportation mode including public transport, instead of driving their private vehicles" (Gehl, 2004; Tuan, 1997; Shaftoe, 2008; Wunderlich, 2008)

The conceptual framework below illustrates responses to the research questions; one, two, three and four (refer Figure 2.17).

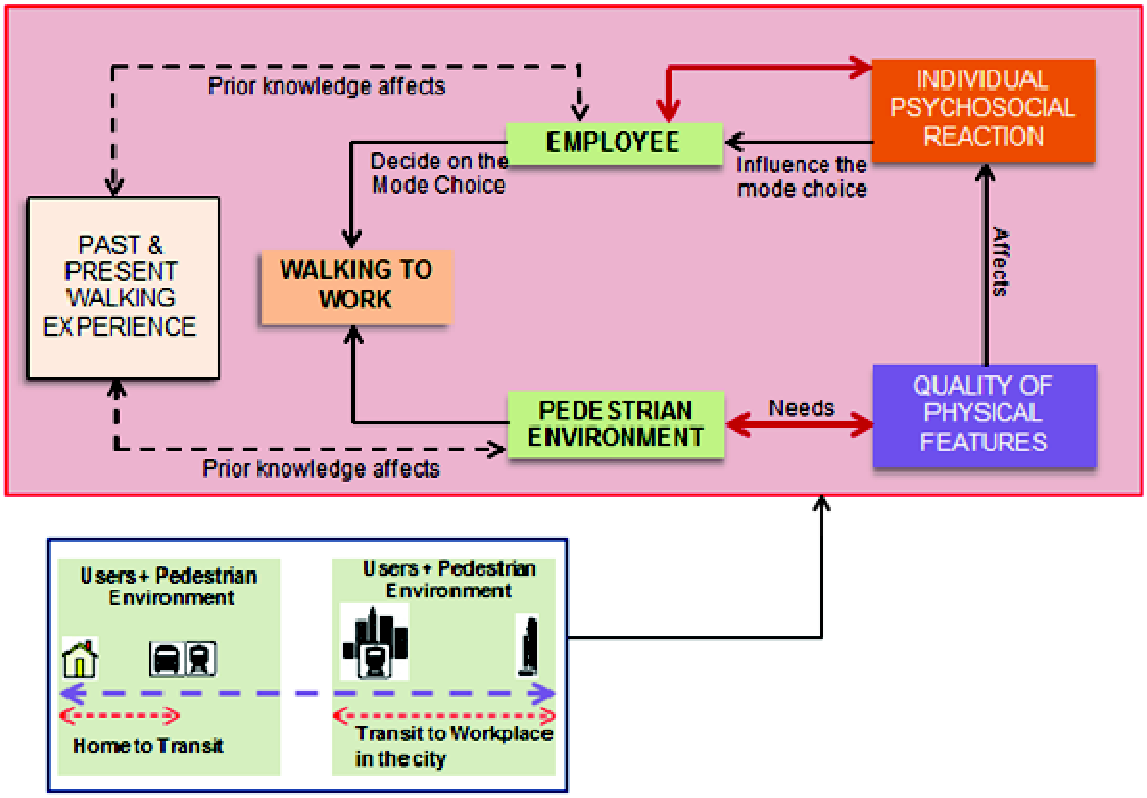


Figure 2. 16 A Conceptual framework derived directly from the study's research questions as outlined in Chapter 1.

The third research question is intended to uncover the main physical features in the pedestrian environment that encourage the employees to walk to work. When discussing **physical features**, it is very important to discuss the condition these features are in. A good quality pedestrian environment will have up-to-par physical features that support walking to work. Proposition 2 addresses the issue that physical features have an effect on the choice users make to incorporate walking as part of their transport mode to work.

> Proposition 2; "physical barriers, obstacles and interruptions along the pedestrian movement are perceived as unpleasant and time-consuming due to the effort people must exert in order to avoid them" (Inman, 2006; Gehl, 2004; Southworth, 2003).

The fourth research question focuses on how employees can be encouraged to choose walking as a part of their transport mode to their workplaces. Among the various ways of improving the users' perceptions based on **past and present experiences**, the following

are some aspects that can help change the negative perception employees may have of the physical environment.

> Proposition 1; “people will be encouraged to walk to their workplace in the city if they are facilitated with accessibility to a good quality pedestrian environment that meets their needs” (Gehl, 2001; Low,2003; Sealens, 2003; Southward,2005 and Ewing, 2006, Talen, 2002; Clifton and Handy, 2001; Barton, 1998; Handy, 1996).
>
> Proposition 3; “a pedestrian environment needs to be safe, comfortable and pleasant as this will provide the pedestrian with a positive experience while walking to the workplace” (Gehl, 2004; Patton, 2007).
>
> Proposition 5; “the pedestrian environment provides a strong relationship with the sensory expression and social interaction derived from everyday walking practices which nurtures a sense of belonging, familiarity, emotional attachment and thoughts to the area which is being walked” (Giles and Corti, 2002; Saelens, 2003; Gehl, 2004; Ewing, 2006; Aytur, 2007; Lapintie, 2010; PQN, 2010).

2.10 Summary and Link

In attempting to gain a holistic understanding of the issue of walking to the workplace, a multi-dimensional approach from diverse disciplines is taken. The author has synthesised knowledge based on the literature on various topics related to walking to work, into a set of research propositions. 2.11 Summary and key findings

The key findings emerging from the review shows that first, walking is seen as an alternative mode of transportation for the employees to commute from home to the workplace in the city centre. Previous research suggested that it would feasible and viable to combine with the mixed mode of transportation. Thus, such an environment will increase the reliance on public transportation and decrease car dependencies. Second, walking can function as an integral part of transportation for an able body, even if only to move from the car park or to the public transport transit (refer to Figure 2.17). Researchers have suggested that the complex issues of users (the employees) and the pedestrian environments are seen as the main subject matter. Third, not many are aware of the benefits of walking, except for individuals already in the habit of walking. Fourth, the review emphasises the importance of the physical features in the pedestrian environment in encouraging people to incorporate walking to work. Figure 2.17 graphically illustrates the key findings of chapter 2.

The chapter ends with the explanation of a conceptual framework that will be used for this research, developed in response to the research questions derived from chapter 1.

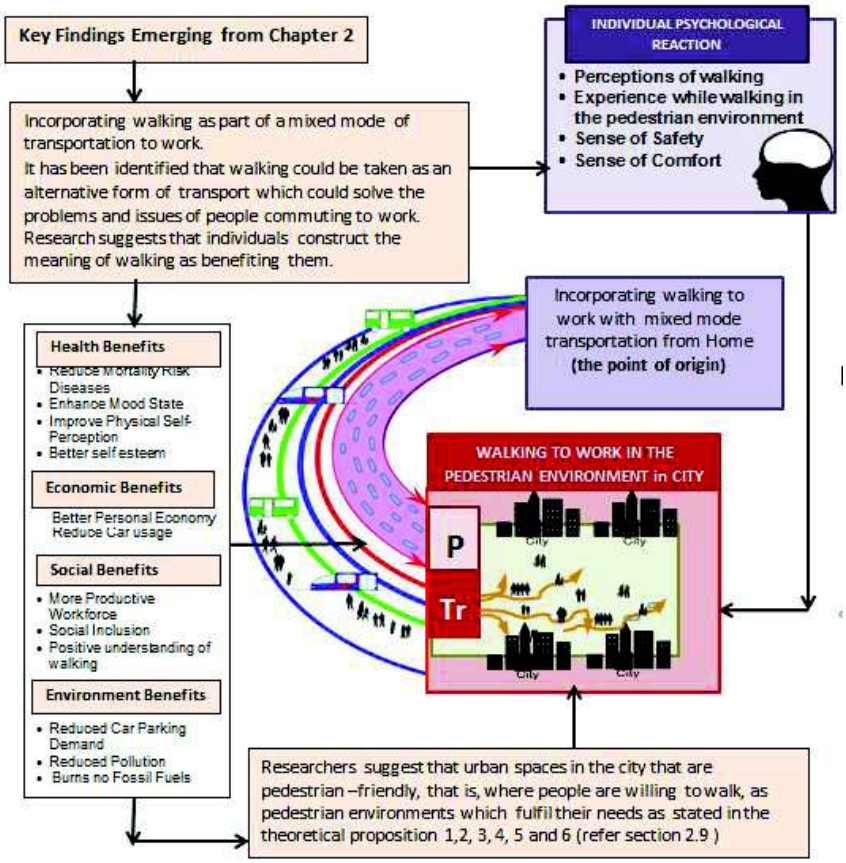


Figure 2. 17 Key findings emerging from Chapter 2, displaying ideas for improvements for people commuting to their workplaces in the employment centres in the city centre.

CHAPTER 3. PEDESTRIAN ENVIRONMENT IN KUALA LUMPUR CITY DEVELOPMENT

3.1 Introduction

The previous chapter identified a set of theoretical propositions deduced from theories about people's walking processes and the physical feature in the pedestrian environment that may encourage walking as a possible mode of transportation to workplaces. The theoretical propositions from Chapter 2 have given some indication to the author regarding what to review in the research context of Kuala Lumpur City. Research context in this study refers to the physical setting of the research topic and the natural condition of this setting. This chapter focuses on a general description of the explicit and implicit reasoning behind an individual's attitude about travelling to the workplace. It examines the state of the pedestrian environment in the context of Kuala Lumpur city, taking into account changes in the urban morphology from the 1890s till the present. The review on walking in Kuala Lumpur is conducted based on the following development stages:

i) The early development of Kuala Lumpur city as a traditional city before World War II;
ii) The transformation era where the city's land use and mobility trends underwent vast changes after independence. An example of this change was the increased dependency on motor vehicles for transportation to workplaces; and
iii) The mobility trend, notably for daily activities particularly travelling to workplace from the 1990s to the present.

The chapter will then review the underlying issues related to walking to work that have developed through three decades of Kuala Lumpur City's development, and establish a link between these issues and the previously mentioned theoretical proposition in Chapter 2. The discussion of the impact of globalization, large scale development and urban sprawl in the Kuala Lumpur Metropolitan Area on the way people travel and move in the city further justifies the importance of this research. Information gathered from this chapter will be further investigated to find its relation to employee's perceptions of walking to the workplace in the real life context of Kuala Lumpur City.

3.2 Overview of Kuala Lumpur

Kuala Lumpur is the capital city of Malaysia, which lies in the heart of Southeast Asia near Thailand, Brunei, Indonesia, Singapore, Hong Kong and the Philippines as shown in Figure 3.1. The city has an area of 242.10 sq. km (24,221.01 hectares) with a population of 1.6 million as of 2005 with a projected increase to 2.2 million by the year 2020 (KLCH, 2010). Kuala Lumpur Metropolitan Area (KLMA) covers a land area of 4,000 sq. km which consists of 9 Local Authorities with a population of 4.3 million people and 1.7 million employment in the year 2000 (see Figure 3.1). The city is the fastest growing metropolitan region in the country in terms of population and economy (Marshall, 1998; Morsidi, 2000; Barter, 2004). Kuala Lumpur is a multi-cultural city, with a population consisting of the 3 main ethnic groups in Malaysia, namely the Malays (41%) and Chinese (39%) who form the bulk of the population in the City, while the Indians comprise 10%, followed closely by the foreign population at 7%. Such trends will continue until 2020 when Kuala Lumpur population is projected to grow to 2.2 million (Kuala Lumpur City Hall, 2008)

Malaysia's is considered a tropical climate throughout the year with annual southwest (April to October) and northeast (October to February) monsoon. In January, the daily temperature of Kuala Lumpur averages at a maximum of 32^{O}C and averages at a minimum of 23 ^{O}C while in June, the figures are 33 ^{O}C and 24 ^{O}C respectively. November is the city's wettest month and December is the coolest month with 31 ^{O}C while June is its driest (Elsayed, 2012). The humidity level in the city is general high throughout the year. The heat condition could reach alarming levels where over exposure and physical activity could lead to heatstroke, sunstrokes, muscles cramps, heat exhaustion, severe heat rash and pulmonary disorder (Elyased, 2012). According to Elyased, to couple with the heat and high humidity, the air movement in the city is very minimal leading a greater demand by home owners and offices to excessively using air-conditioners indoor. Elsayed continues that traffic activities in the city centre of Kuala Lumpur also contribute to high temperatures on the overall outdoor environment particularly on the street level.

As for its physical character, Kuala Lumpur has been divided into several Planning Units that can be grouped into three planning zones as follows.

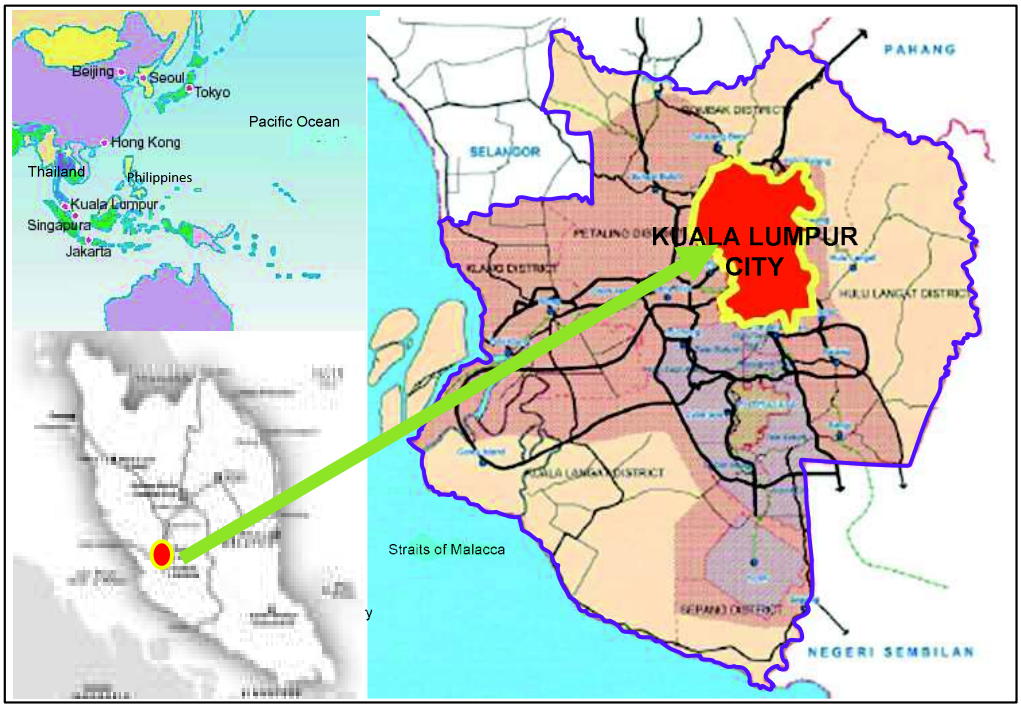


Figure 3. 1: Location map of Kuala Lumpur City and Kuala Lumpur Metropolitan Area in the Southeast Asia Region (CHKL, 2004)

CPA – Central Planning Area

The CPA is bordered by Jalan Tun Razak from the east to the north, the Southern Middle Ring Road to the south and Persiaran Mahameru on the west. Many of the major institutions such as commercial establishments, major administrative departments, headquarters of private, public and semi-governmental corporations, and recreational, entertainment and residential establishments are included in this area. Situated inside the CPA is the Central Business District (CBD), which is the commercial hub and core of the city. The CPA includes:

i. Old Central Business District Area (CBD)

This is a sub-district of the city centre mainly characterized by shopping streets and shops, with a collection of historic and new buildings. It is located close to another sub-district in the city called 'the Golden Triangle'.

ii. The Golden Triangle (GTA)

It defines an area surrounded by three major roads that form a triangle area, namely Jalan Imbi, Jalan Sultan Ismail and Jalan Raja Chulan (refer to Figure 3.11). Its reputation arises from the fact that it is mass of commercial buildings, business companies, shopping malls, and prestigious hotels. Bukit Bintang is a popular place for shoppers and for those

who seek leisure or entertainment, regardless of nationality. The Golden Triangle's image as a vibrant business centre was established when many monumental projects were completed. The architectural trend within this area has been influenced primarily by commercial rather than environmental objectives.

The overview of Kuala Lumpur will be covered in the following pages under the sub-headings of:

i. Historical development of Kuala Lumpur
ii. Rapid Increase of Urbanisation
iii. Walking in Kuala Lumpur City during the transformation era
iv. Kuala Lumpur as a 'World Class City'

3.2.1 Historical Development of Old CBD

Kuala Lumpur received its name from two Malay words: *'Kuala'* means river confluence and *'Lumpur'* means muddy, and the name references the confluence of the rivers Sungai Gombak and Sungai Kelang, which is where the city was first established. The city evolved from a small tin mining village in the mid-19th century to a metropolitan area by the 20th century. The success of the mining industry resulted in a trading boom and by 1867, the village of Kuala Lumpur had become one of the principal mining centres in Malaya. In 1880, the British Colonial administration had officially made Kuala Lumpur the headquarters for the state of Selangor, replacing Klang, their former headquarters. Since then, the demographic growth and physical form of Kuala Lumpur have changed greatly and rapidly.

Figure 3. 2 Picture showing the meeting point of Gombak and Klang River. This area was the City's original business and commercial centre, and contains some of its oldest and grandest buildings (CHKL, 2004)

The majority of the populace of the CBD in the beginning were tin miners who lived in a shanty settlement mainly made of timber until the great fire in 1881 reduced the shanty settlement to ashes and a new town was developed with brick buildings. In 1884, Sir Frank Swettenham, the British Resident of Selangor during the time, introduced the building by-laws to be used in town building. Buildings called shop-houses were to be made of bricks and concrete and they were 2 to 3 storeys in height. In 1887, the population was about 4,000, the majority of whom worked as tin miners. The year 1887 also saw the beginning of the urban growth and morphological structuring of Kuala Lumpur. The population gradually increased to 25,000 residents by the year 1890. In the year 1890, the first administration board for the early Kuala Lumpur town, known as the Sanitary Board, was set up and covered an area of 0.65 sq. km. The Sanitary Board was the forerunner of the present Kuala Lumpur City Hall (KLCH, 1995). This small settlement eventually developed into a fine mixed-use district combining living and working areas together with other uses such as civic, commercial, industrial and cultural centers as shown in Figure 3.1 (CHKL, 1995).

Figure 3. 3: A perspective view of central Old Town Kuala Lumpur in 1890 (Tate et al, 1987)

There was an extensive development of shop-houses taking place in the Central Business District (CBD) called the Market Square. The shop-house typology consequently set a new urban pattern for the town of Kuala Lumpur; the shop-house was designed to accommodate trading on the ground floor and residences on the floors above. Each unit had a narrow street frontage (approximately 12 feet width), but with much greater depth, of up to 80 feet or 100 feet long. Another significant characteristic of the shop-house is the 'five-foot way', covered walkway or 'veranda' incorporated in front of the shops on the ground floor (See Figure 3.4). After that, all commercial centres in every town in

Malaysia before World War II were characterized by one or more main streets lined by shop-houses. (Chen, 1998).

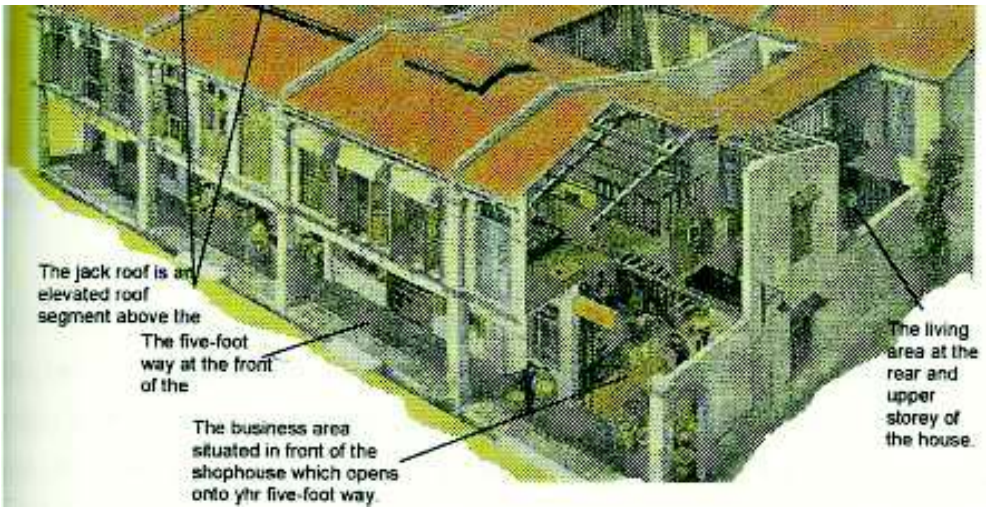


Figure 3. 4 Shop-house typology in a Malaysian town in 1900 (Chen, 1998)

3.2.2 Walking in the Old Town of KL

The shop-houses 'five-foot way' was a requirement and a distinguishing feature for shop-house architecture in Malaysian towns during the colonial administration and is still used today (Chen, 1998). The verandah has played an important role in serving the pedestrians as:

i. a linkage on the ground floor level connecting people from one shop-house to the next;
ii. a means to keep the pedestrians protected from the extreme sun and rain of the country's climate

Street provisions in the Old Town of Kuala Lumpur during this period, by necessity, everyone depended upon ready access to their jobs in the tin mines and marketplace by foot and slow moving carts, wagons or carriages. The Old Town of Kuala Lumpur was characterized by high walkability which, according to Southworth (2005), was essential in the urban spaces before the automobile era. (See Figure 3.7).

Figure 3. 5 Street view of Market Street (Leboh Pasar Besar) taken in 1900 (CHKL, 1995).

In the year 1895, Kuala Lumpur was declared the capital of the Federated Malay States which consisted of four protected states in the Malay Peninsula: Selangor, Perak, Negeri Sembilan and Pahang. This gave importance to Kuala Lumpur as the centre of British administration and a hub of commerce and trading (CHKL, 2008). By the year 1900, the construction of several government buildings and public facilities such as the Town Hall, Supreme Court, banks, railway station, post offices, religious buildings (mosques, Hindu and Chinese temples and churches), sports clubs, cinemas and theatres all surrounded the focal point of the Central Business District (CBD) (JICA, 1999). The activity patterns in the city were formed by the wide variety of uses and the relatively high density of dwellings within the city (See Figure 3.8). Kuala Lumpur began as a walkable city through natural growth, with daily trips tending to be less than 5 km (see Figure 3.9)

Figure 3. 6 The business district in Melaka Street, Old Town Kuala Lumpur is characterized by a wide variety of uses with a walkable pedestrian environment in 1900 (Elyas, 1991).

Figure 3. 7 High walkability in the Old Town Kuala Lumpur (Elyas, 1991).

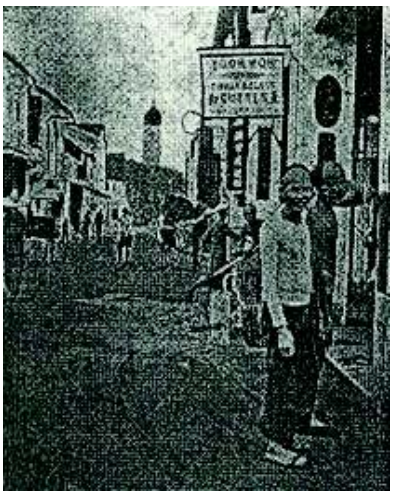


Figure 3. 8 A street scene in the Old Town Kuala Lumpur in 1900 (Tate et al., 1987)

Omar (2000) asserts that although this colonial city had a good balance between the governmental and civic functions and commerce, it grew without any conscious forward planning until 1921 when the first town plan was introduced (Dasimah, 2000). Eighteen years later, in 1939, the Town Plan for urban development control was gazetted. This plan was then reviewed in 1965 and in 1967 when there was an initial attempt for a Master Plan for Kuala Lumpur. The absence of a Kuala Lumpur Master Plan, coupled with the inadequacies of planning legislation and shortage of personnel, caused problems with the developmental control of the urban area (Mohamed, 2002). From this juncture, the

traditional urban form of Kuala Lumpur, that is, the conventional layout of shop-houses on assorted lots, no longer met the needs of a modern city (Dasimah, 2000).

3.2.3 Rapid Increased of Urbanisation

At the end of World War II, Kuala Lumpur became the largest and most active city in Malaya (former name for Malaysia). The population was 176,000 in 1947, which increased by 175% in 1967 to 450,000. According to Hamzah (1965), the end of the 1950s saw the beginning of urban and industrial development in the western area of Kuala Lumpur city, which offered more job opportunities and invited migration from rural areas. According to Mohamed (2002), however, the rapid growth of urbanization did not align with the housing demand. Kuala Lumpur was confronted with the critical problem of the accommodation of its expanding workforce and the build-up of squatter settlements. In 1952 the Municipal Council, under the British administration, created the first “New Town” namely Petaling Jaya, as the solution to overcrowding which was the result of massive rural-urban migration into the Old Town of Kuala Lumpur (Lee, 1987). Petaling Jaya is located beyond the existing western urban fringe of the Federal Territory of Kuala Lumpur (FTKL). The first development activity in Petaling Jaya started with the construction of 800 houses which centered on the area currently known as “Old Town”.

According to Katiman (1997), by the early 1970s, “Klang Valley” was recognized as a coherent urban planning region. In addition to the Federal Territory of Kuala Lumpur, the Klang Valley included the four Selangor state districts of Gombak, Klang, Petaling and Hulu Langat (see Figure 3.8). The population figure in the Municipal Area of Kuala Lumpur continued to increase to 485,000 with an area expansion of about 36 sq. miles. During this time, Kuala Lumpur engaged in large scale urban development, renewal and restructuring of the society which changed the urban form of the city. In addition to that, the completion of the Federal Highway, linking Kuala Lumpur to Port Klang, further integrated and facilitated developments in the Klang Valley (Bunnell et al, 2002). Because of the rapid urban changes that occurred, Kuala Lumpur was granted city status on 1st February 1972.

According to King (2007), by the late 1970s there were an estimated 243,200 people squatting in Kuala Lumpur, in some 40,934 dwellings - a quarter of the total population of Kuala Lumpur. Under the New Economic Policy (NEP), from 1971 to 1990, it was recommended to encourage more employment opportunities in the city, but not to

increase housing; this was in order to mitigate the increasing number of squatters in the city.

By the 1980s, the development of the Klang Valley urban region had affirmed Kuala Lumpur's national centrality (see Table 3.1). FTKL became the centre for commerce, banking and finance, administration, religion, communication, sport, education, health, arts and culture, tourism etc. which has made the city a major employment centre (CHKL, 2010).

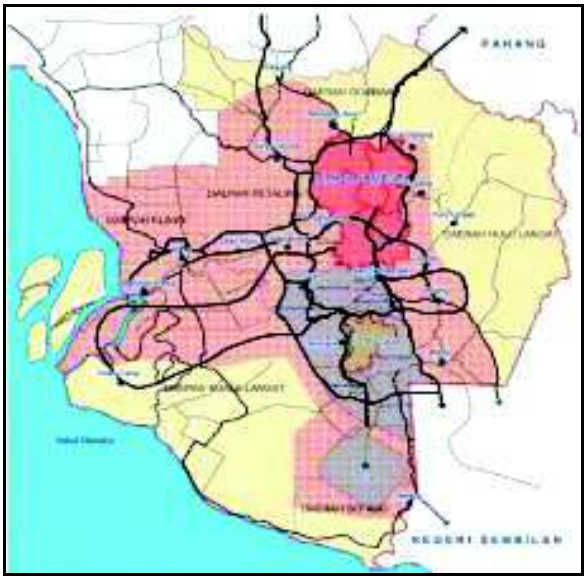


Figure 3. 9 The location of districts and KL Federal Territory within the Klang Valley areas (CHKL, 1991)

Table 3. 1 Major urban centres and functions in Kuala Lumpur Metropolitan Area (KLMA) (formerly known as Klang Valley), Source: Malaysia Highway Authority (1999)

DISTRICTS	Urban center	Administrative status	Hierarchy of centers	Urban Function
Federal Territory	Kuala Lumpur	National Capital	National Center	Federal government, Commerce, trade, banking, offices, wholesale, health, education
Petaling	Shah Alam	State Capital	Regional Center	State government, industry, commerce
	Petaling Jaya	Municipality	Regional Center	Commerce, industry
	Subang Jaya	Municipality	Sub-Regional	Commerce

			Center	
Klang	Klang	Municipality	Regional Center	Port, industry, commerce, trade
Gombak	Selayang	Municipality	Regional Center	Industry, wholesale, commerce
Hulu Langat	Bangi	Municipality	Regional Center	Education, Commerce, training, industry
	Kajang	Municipality	Sub-Regional Center	Commerce
	Ampang Jaya	Municipality	Sub-Regional Center	Commerce
Sepang	Putrajaya	Federal Territory	Sub-Regional Center	Federal Goverment
	Cyberjaya	Municipality	Sub-Regional Center	Research, training, education

The overall physical development of FTKL was guided by the policies contained in the Kuala Lumpur Structure Plan (KLSP) gazetted in 1984 (CHKL, 2004). According to Brookfield et al (1991), the higher the population rate, the greater the need for the development of new areas for housing, social amenities, commerce and other urban land uses. The 1984 KLSP emphasized providing the 'basic' needs such as: housing, schools and hospitals (King, 2007) as well as to improve the quality of life of urban dwellers. The KLSP also identified five new growth areas within the FTKL in order to decentralize future employment and residential development from the dense urban core. The five new growth areas are strategic zones known as: Wangsa Maju Maluri, Sentul Manjalara, Damansara Penchala, Bukit Jalil Seputeh and Bandar Tun Razak (see Figure 3.9). Besides that, the City Centre was contained within the Central Planning Area (CPA) which was designated as the principal urban core for Klang Valley (CHKL, 2004).

Figure 3. 10 Six strategic zones including the City Centre in the Federal Territory of Kuala Lumpur [FTKL] (CHKL, 1991).

After the review of the 1984 KLSP showing the Central Planning Area (CPA), the City Centre experienced a decline in its population, a reverse of its strategic role and a serious oversupply in commercial floor-space, whereas the other five growth centres have experienced different rates of development according to specific targets. For example, Wangsa Maju has almost achieved its population target and the current growth is directed towards supporting commercial, industrial and open space requirements (Mohamad, 2007). The other four growth centres such as Bandar Tun Razak, Bukit Jalil and Damansara are underway in achieving their targets. This has been attributed to the migration of the KL populace outside the city core to other areas, in search of more affordable housing (CHKL, 2004).

The housing supply and demand data shows that 52% of the housing supply is categorized as high cost housing, although more than 68% of Kuala Lumpur's population require low to medium cost housing, creating an incongruity of 16% in the supply and demand for affordable housing (CHKL, 2004). Maidin and Muhamad (2011) point out that affordable housing is not located where it is needed; therefore people are forced to seek affordable housing outside the city centre in the surrounding Kuala Lumpur Metropolitan Area (KLMA).

Despite the decline of population in the city centre, FTKL still has the highest population density in Malaysia with 1269.5 persons per sq. km compared to other regions within the KLMA. It is followed by Selangor with 524.8 persons per sq. km (Eighth Malaysia Plan, 2001). The total population of FTKL alone increased from 1.21 million in 1990 to about 1.42 million in 2000, rising to 1.6 million in the year 2005. The total population has been estimated to increase to 2.2 million by the year 2020 (CHKL, 2004). Jusoh et al.(2009) add that during the last two decades, major developments have been occurring rapidly throughout Malaysia with the rate increasing from 54.3% to 65.4% between 1991 and 2000. This has synergized the urbanization process throughout FTKL and KLMA, where urbanization is expected to increase to 75% by 2020 (Jusoh et al, 2009).

This increase was due to rural-urban migration, spurred by expectations of job opportunities and a better quality of life, growth of new urban areas and extension of existing administrative boundaries (Economic Planning Unit, 2001). With increasing urbanization, the government has undertaken 'urban dispersal' as an important strategy to reduce pressures on Kuala Lumpur City Centre. The relocation of Federal Government Administrative Centre from Kuala Lumpur to Putrajaya and the development of Cyberjaya are some of the examples of the outcome of the urban development dispersal strategy (Economic Planning Unit, 2001). This has continued to produce an unplanned expansion of the existing urban centres throughout the region especially along the road corridors. In addition, this has been followed by a gradual filling in of the interstices between corridors, with formerly rural villages in certain areas being turned into urban centres.

According to Jusoh et al. (2009), the lack of clear urban limits has led to the creation of urban sprawl which is encroaching upon environmentally sensitive areas, major agricultural areas and other areas unsuitable for development. 'Sprawl', as Knapp et al, (1999) have described, is a process in which the spread of development across the landscape far outstretches population growth and creates a population that is widely dispersed in low-density developments, rigidly separated homes, shops and workplaces, and creates a network of roads marked by huge blocks, poor access and lack of well-defined, thriving activity centres such as downtowns and town centres. Kuala Lumpur City has also experienced urban sprawl, greatly affecting the mobility of the population from suburban areas into Kuala Lumpur City Centre, thus increasing the dependency on private motor-vehicles.

3.2.4 Walking in KL City during the transformation era

At the time of independence in 1957, Kuala Lumpur was chosen as the capital of the new nation. Since then, Kuala Lumpur has developed rapidly and has become the nerve centre of the Malaysian economy (Mohamad, 2003). The city has expanded with the expansion of the tertiary sector. The investment boom between the late 60s and 70s saw the emergence of new building types such as high-rise office blocks, shopping centres, international hotels and condominiums, as larger companies demanded their own office blocks next to high-end retail complexes and prestigious hotels (Beinart, 1986; Yeang, 1986). The city centre of Kuala Lumpur began to take shape in an area located on the eastern side, known as the "Golden Triangle Area" (GTA). The development in this area contains no government civic functions, either central or local, and no religious buildings of any consequence. This new urban landscape has also altered the skyline of Kuala Lumpur city from low rise traditional shop-houses to high-rise blocks for offices and apartments built on a single plot of land called "island developments" (Yeang, 1986). According to Lewcock (1986), in many cases these high rise buildings blocks were set back from the road and resulted in:

- visually and functionally weak links between the high rise building and the street;
- the cutting up of the sidewalk by access and egress roads as driveways into each site;
- the loss of the real street functions as the social expression manifested by the pedestrian.

The combination of these results destroyed the pedestrian sidewalks along the street. The situation was exacerbated by the planting of shrubs in the centre of the sidewalks in an attempt to beautify the roadways. Pedestrians experience difficulties in walking on sidewalks because of these roadblocks. The trees which had once lined the roads were cut down for street widening, and that has further weakened the visual and functional strength of the street. Furthermore, each building withdrew into itself, being independent in the context of its neighbours and community – making it excessively isolated. Moreover, the expansion of development left Kuala Lumpur subject to severe traffic congestion and flooding, worsening the overall situation (King, 2007).

Beinart (1986) explains that this type of development is a phenomenon of modern capital planning with little or no overlapping between governmental and commercial functions. According to Beinart (1986), this high end environment grows very rapidly as a prompt reaction to market pressure from international investors. This phenomenon is propelled by the notion that building must be done quickly before the investment opportunities disappear. Beinart (1986) asserts that the speed of development completely outstrips the ability of the public sector to act, especially considering the unpredictability of the market, which in turn creates haphazard development without any control imposed by the authorities.

In 1978, the Mayor of the city was made responsible for the newly created Federal Territory Ministry, to take charge of development. According to Phang et al (1996) nine years later, because of the former Prime Minister Dr. Mahathir Mohamed's personal interest in the development of Kuala Lumpur, the authority of the Ministry of the Federal Territory was shifted directly under the supervision of the Prime Minister's Department.
During the 1980s, there were many notable and monumental buildings erected in Kuala Lumpur City Centre such as Lembaga Tabung Haji Tower and Maybank Tower (see Figure 3.10). At this point, Malaysia was on a quest for a 'Malaysian Architecture', or more generally the search for a Malaysian identity which would provide some terms of reference for architecture (Yeang, 1985). Bunnel et al. (2002) have also claimed that the monumental regional architectural forms expressed in those two buildings are part of the idea to represent and articulate a conception of national identity. Sadly, although the quest for Malaysian Architecture created iconic buildings, there was no physical or conceptual link between buildings on the streets and sidewalks. There are obvious gaps between buildings and it is noticeable that the sidewalks and street life have completely disappeared from Kuala Lumpur City (Beinart et al, 1985).

At a conference entitled *the Golden Triangle Area Study: Design for High Intensity Development held in Kuala Lumpur in 1985*, many architects and urban designers expressed their worries about this kind of occurrence, and tried to find better ideas for the future development of the GTA. During the conference, world renowned Malaysian architect, Dr. Ken Yeang articulated the opinion that;

> "…we should be expanding the debate to the question of what the Malaysian city should be…Planning involves knowing where you are now, as well as knowing where you want to go and how to get there" (Beinart at el, 1985, p. 90).

Dr. Ken Yeang suggests that although the rapid development of high rise buildings expressing the quest for Malaysian Architecture with Malaysian themes was taking place in Kuala Lumpur City and was changing the urban morphology and skyline of Kuala Lumpur, the usability of the city for people on the street level was being completely ignored. The city should, however, be the city that Malaysians want it to be, therefore some thought needs to go into defining where Kuala Lumpur city is going, and deciding on ways to take it there.

Figure 3. 11 The Maybank Tower (pictured left) and Lembaga Tabung Haji Tower (pictured right), designed by Architect Hijjas Kasturi, were built in the 80's and represent a Malay-centred conception of national identity (Bunnell et al., 2002).

3.2.5 Kuala Lumpur as 'A World Class City'

In the 1990s global finance capital began spreading across the Asia-Pacific region. Major cities including Kuala Lumpur began to experience fundamental restructuring of their built environments to reconstitute the urban core for global management and service functions in the form of mega projects aimed at intentionally creating world class cities (Douglas et al, 2008). According to Douglas et al. (2008), as cities are the principle bases for foreign direct investment, both national and local authorities have been fully engaged in the business of attracting transnational capital to the city. It is hoped that these investments will build up the urban economy and bring about an increase in demand for the city's workforce, and in turn create an enlarged market for local businesses. Kuala

Lumpur has welcomed these developments in the global economy, on the assumption that they will open local economies and intensify global investment (Bunnel et al (2002). Bunnel et al (2002) state that the 'world class' urban investment in Kuala Lumpur city was increasingly understood as part of a national agenda to 'plug in' to global political, economic and social networks. Douglas et al. (2008) suggest that the increased involvement of different capital circuits implies the pull of cities towards world city formation and this is reflected in the built environment via new commercial spaces of production (such as business districts, techno parks and science parks) and consumption (such as shopping malls).

As the globalizing process went on, in 1991, Dr. Mahathir Mohamad, the Malaysian Prime Minister at the time, launched a "Vision 2020" or "Wawasan 2020", a national vision aimed at transforming Malaysia into a fully developed nation by the year 2020 (CHKL, 2004). The vision, articulated in the document "Kuala Lumpur - A World-Class City", encapsulated the ambition to make a city that would assume a major global role, for the benefit of all its inhabitants, workers, visitors and investors. According to Vision 2020, Kuala Lumpur will strive to establish the highest quality living, working and business environments, benchmarked against the best in the world (CHKL, 2004).

This was seen as necessary as it was believed that the developed city will be able to attract and retain national and international investors as well as skilled and professional workers, both local and foreign (KLCH, 2004). In addition to the ambition to create a world-class city, the government believed that it is important to ensure that the infrastructure, environment, city management and cultural, social and community facilities meet the highest expectations of the majority of its residents, workers, visitors and investors (KLCH, 2004, Douglas et al 2008). Five goals were identified in order to achieve the Kuala Lumpur Structure Plan 2020, as listed in Table 3.2 below.

Table 3. 2 The five goals identified to achieve the vision of A World Class City in the KLSP

The Goals	Description
Goal 1: **To enhance the role of Kuala Lumpur as an international commercial and financial centre;**	Kuala Lumpur city to be effectively competitive with other cities in Asia Pacific Region such as Bangkok, Singapore, Jakarta and Manila by maintaining a favoured position within the global economy for the benefit of all its inhabitants,

	workers, visitors and investors (Moshidi, 2000; CHKL, 2004).
Goal 2: To create an efficient and equitable city structure;	Kuala Lumpur city to have balanced development without compromising societal needs or adversely affecting the existing natural and built environment (CHKL, 2004). It is therefore essential for Kuala Lumpur city to have good transportation and communication linkages within the city, country and the world. This is to ensure that all citizens are able to access infrastructure, utilities and facilities that are equitably distributed (CHKL, 2004).
Goal 3: To enhance the city living environment;	Kuala Lumpur to establish the highest quality living, working and business environment with easy access to all facilities, as well as a healthy, safe and lively environment, so those who work and live in the city can enjoy the best possible quality of life (CHKL, 2004).
Goal 4: To create a distinctive city identity and image;	Kuala Lumpur to have its own distinctive identity which reflects the tropical climate and multi-ethnic population. It is expected to be manifested in the built and natural environment and the everyday way of life of the city's inhabitants as well as the various forms of cultural expression.
Goal 5: To have efficient and effective governance.	Kuala Lumpur to encompass good governance in meeting the goals, strategies and policies set out in the Habitat Agenda - transparent, responsible, accountable, and effective and efficient administrative practices.

In order to synchronise with the city's global aspirations of becoming "A World Class City", two mega projects were undertaken at the beginning of the 1990's: , the Kuala Lumpur City Centre (KLCC) and the Kuala Lumpur International Airport (KLIA). The two were subsequently followed by other equally important developments such as Putrajaya as a Federal Government Administrative Centre. They are discussed in the following section.

a) Kuala Lumpur City Centre (KLCC) - "City-Within-a City"

The largest project undertaken to create a world class city was the Kuala Lumpur City Centre (KLCC), built in 1992 on the site of the former colonial race course off Jalan Ampang. The project was located in the north-eastward expansion of the Golden Triangle Area (GTA) commercial district (Figure 3.11a). This mega project conceptualised a "City

within a City" (KLCC Holdings Sdn. Bhd., circa. 1996a), which was proclaimed by the former Prime Minister Mahathir Mohamad as "among the largest real estate in the world" (Mahathir, 1992). As cited in Bunnel (1999), the KLCC project may be understood in terms of regional economic change and was one among a myriad of "Urban Mega projects" (Olds,1995) and considered to be economically "miraculous" in the Asia Pacific region (World Bank, 1993).

The development of this "City within a City" included the Petronas Twin Towers which was the tallest building in the world in 2001 (Figure 3.11). Its construction was part of the greatest boom in sky-scraper construction in history, led largely by rapidly-urbanizing societies in Asia (Scientific American, 2011).

The Petronas Towers formed part of a larger development project and was named after the state oil company whose new headquarters occupied one half of the building. The building consisted of two identical towers 452m in height and joined by a sky-bridge at the 41st and 42nd floors (see Figure 3.11). In addition to the Petronas Towers, phase 1 of KLCC included a Concert Hall accommodating the newly-created Malaysian Philharmonic Orchestra; a luxury hotel, the Mandarin Oriental; two other office blocks, Ampang Tower and Esso Tower; and a 50-acre "public park" (Bunnel, 2004) (see Figure 3.11).

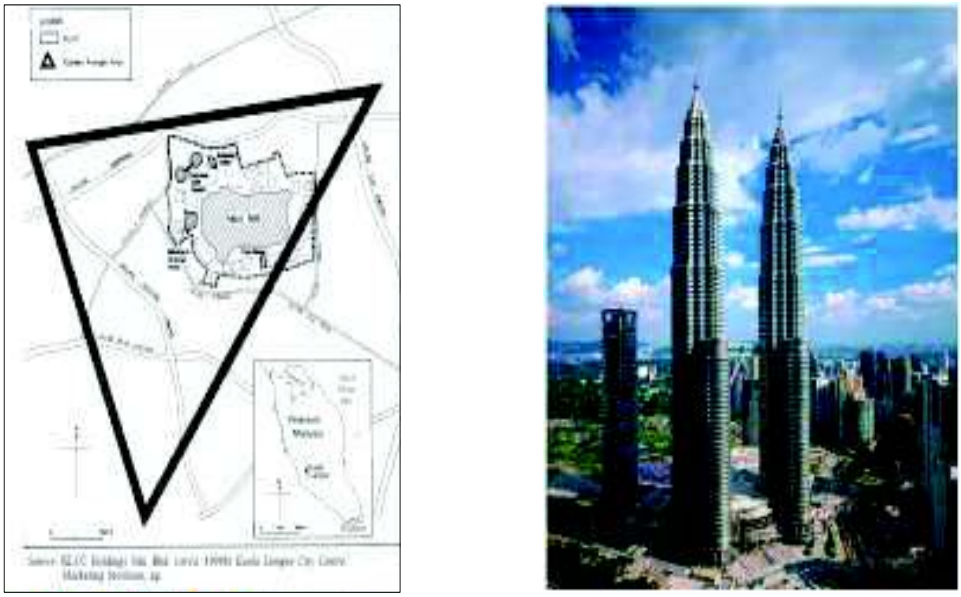


Figure 3. 12 (left)The mega project of Kuala Lumpur City Centre (KLCC) in the marked boundary of the Golden Triangle Area (KLCC Marketing brochure, 1996b) and (right) the Petronas Twin Towers, designed by Cesar Pelli and Associates and completed in 1996 (The Aga Khan Award for Architecture On site Review Report, 2004).

According to Bunnel (1999), although KLCC may serve a symbolic function in advertising Malaysia internationally and provide "world-class" infrastructure to promote further economic expansion, the project did little to ameliorate urban citizens' everyday lives and only offers high end services which benefit the middle and upper classes (Bunnell et al, 2002).

In fact, from the construction stage to the present time, the KLCC project contributed to increases in air pollution and traffic congestion in the capital, involving artery roads such as Jalan Ampang, Jalan Tun Razak and Jalan Hang Tuah, which have become renowned hot-spots for traffic congestion in an already congested city (New StraitsTimes (NST), 1996; NST, 2011) (Figure 3.12). It also worsened the traffic congestion along Jalan Sultan Ismail, one of the most choked-up roads during peak hours on normal days with jams stretching from Jalan Bukit Bintang to Jalan Kuching through to Jalan Tunku Abdul Rahman (News Straits Times, 1993; NST 2011). Indeed, Bunnel (1999) argued that the sheer size of the KLCC project raised fears upon completion; it would only mean more cars and more traffic problems as each Petronas Tower has the capacity to accommodate 5,000 workers with underground parking limited to 5,000 cars. Overall, the traffic scenario within the GTA is still unresolved (Barter, 2000). How this problem rose to its current proportions will be discussed under section 3.3.

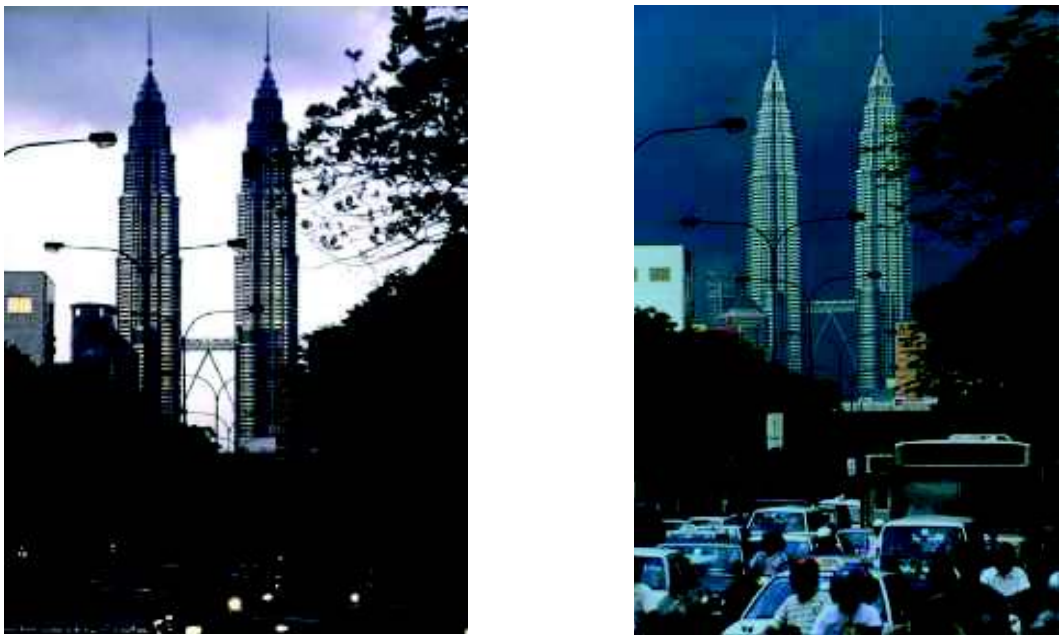


Figure 3. 13 The view looking towards the Petronas Twin Towers in the evening (left) and during the day (right) (The Aga Khan Award for Architecture On site Review Report, 2004)

b) Kuala Lumpur International Airport (KLIA)

The next global mega project was the Kuala Lumpur International Airport (KLIA) which was built in 1991. This new regional and international transportation hub serving the city and nation covers an area of 10,000 hectares in Sepang, which is approximately 70 km to the south east of Kuala Lumpur City Centre. The airport is in an isolated and poorly developed part of the region, not readily accessible from Kuala Lumpur; it was deliberately chosen on the understanding that the project would bring economic and employment benefits to the area. The airport was opened in late 1999. By this time, most of the area around Sepang was already being transformed economically. Kuala Lumpur was linked to KLIA by the south expressway and Express Rail Link (ERL) by the end of 2001 (Bruton and Jamilah Mohamad, 2002).

The Federal Government made the important decision to transfer Malaysia's main international airport from Subang (the former international airport) to the new 'world-class' airport, KLIA, in Sepang in 1996 because the travel distance from Putrajaya to Sepang is shorter as compared to Putrajaya to Subang. In short, the move to build a new airport away from Kuala Lumpur City Centre and closer to Putrajaya (the new Federal Government Administrative Centre), , was intended to ease the city centre's traffic congestion issue.

c) Putrajaya

Numerous decisions aimed at taking advantage of globalization and creating a world class city were taken administratively by the Federal Government and implemented swiftly (Bunnell, 2002; Bruton and Jamilah Mohamad, 2002). Another significant decision made was to relocate the new Federal Government Administrative Centre to Putrajaya. Putrajaya is situated in the Multimedia Super Corridor (MSC); it was turned into the Administrative Centre as a way of decongesting the city centre (Bunnel et al, 2002). This new administrative capital would aid the dispersal of growth from Kuala Lumpur and bring investment and income to a poor area (Bruton and Mohamad, 2002). Upon completion, Putrajaya was expected to accommodate 76,000 government employees (Mohamad and Kiggundu, 2007). However, several issues arose as a result of this move. The traffic congestion was already severe and only got worse in themorning and evening peak hours, as people dealing with almost all government administrative offices and services have to come to Putrajaya (Bruton and Jamilah Mohamad, 2002).

The offices are set far apart from each other and not all are connected via public transportation, nor are they within walking distance. Furthermore, most of the sidewalks in Putrajaya city have no deciduous vegetative cover at all. The type and selection of trees and shrubs in the existing planting scheme do not provide shade even when they are mature. The lack of shade also discourages 'green' forms of transportation such as walking and cycling as it is only bearable to move around the city in an air conditioned car.

d) Cyberjaya

Cyberjaya is located to the west of Putrajaya and essentially forms part of Putrajaya although plans for its development started after the thinking underpinning Putrajaya was well advanced. Cyberjaya aims to be a model "Intelligent City" concerned with developing Malaysia's Multimedia Industry. This project also has to complement Putrajaya as the new electronic administrative capital and to utilise cutting-edge technology in smart homes, interactive community living and control over utilities and transport within the city.

e) Multi Media Super- Corridor (MSC)

The 'world class' is part of the MSC's key projects are repeatedly alluded to in promotional marketing and political imaging as noted by Bunnel (2002). MSC is a symbolic as well as physical node for the nation's entry to global technological and cultural-economic circuits (Bunnell, 2002). According to Mohamad and Kiggundu (2007), the MSC was designed and launched to serve as a catalyst for the development of the information technology (IT) sector in Malaysia and to help shift the Malaysian economy from its current input-output development model based on manufacturing and primary commodities towards a knowledge-based economy (K-economy) (Eighth Malaysia Plan, 2001-2005). For the former Prime Minister Mahathir Mohamad, the MSC was intended as 'a pilot project for harmonising our entire country with the global forces shaping the Information Age' (Mahathir, 1998: 30).

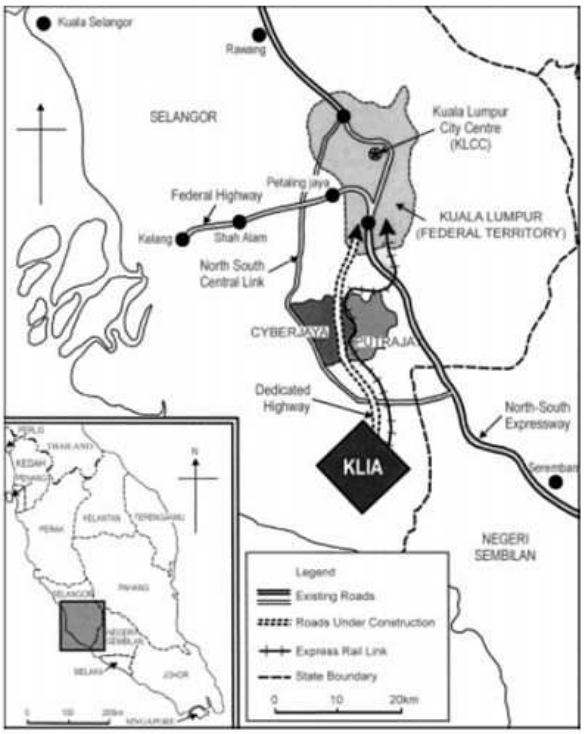


Figure 3. 14 Multimedia Super corridor, including Cyberjaya and Putrajaya, running north to KLCC and south to KLIA (Map source: Bunnell, 2002)

The plan was that ideally, the MSC would connect important places such as FTKL, Putrajaya, and Cyberjaya through fiber optics; it was expected to attract more people and employment into this mega-urban region of Kuala Lumpur (Mohamad and Kiggundu, 2007). Instead, however, it has further spread out the traffic over a wider region (Jusoh et al, 2007).

The next section discusses how the decentralisation of Kuala Lumpur City with the other mega-developments has had an impact on increasing car-dependency levels as opposed to walking and using public transport.

3.2.6 Kuala Lumpur as a Centre for Employment

The concentration of employment in the FTKL and regional growth centres in the KLMA has produced radial commuting patterns with traffic flows concentrated along the urban expressways, urban railways and bus routes in Kuala Lumpur city (Kitamura and Mohamad, 2009, Bunnel et al, 2002) (See Figure 3.14). FTKL has the highest concentration of employment throughout the metropolitan area with 612,000 employees as compared to other regions in the same area, for example Petaling with 546,0000 employees

followed by the Hulu Langat region with 379,000 employees and, trailing behind, the Klang and Gombak regions (see Figure 3.14 (left)).

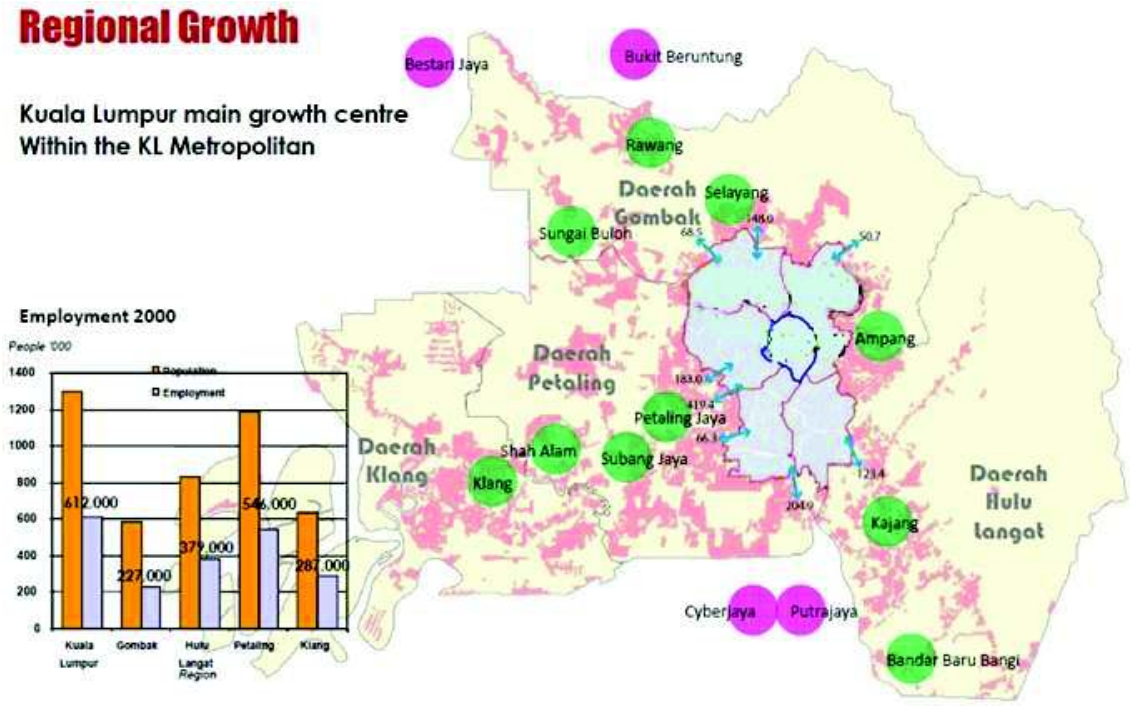


Figure 3. 15 (Histogram left) The employment per total population in FTKL and (map right) the KL metropolitan regions and (map right) growth centres within the metropolitan area (CHKL, 2004, 2010 and Eight Malaysian Plan).

Kuala Lumpur had a total employment figure of about 0.84 million in 2000, of which 83% was in the tertiary sector of the economy, such as administrative and service areas (comprising finance, insurance, real estate and business services, hotels etc.) (KLCH, 2004). The total employment is expected to increase to 1.4 million by the year 2020.

Looking at employment figures within the FTKL, the city centre shows the highest total job creation projected for 2010, 2015 and 2020 among the six strategic areas. The second highest is Bukit Jalil Seputeh followed by Sentul-Menjalara, Damansara, Wangsa Maju and Bandar Tun Razak as presented graphically in Figure 3.15 (KLCH, 2008).

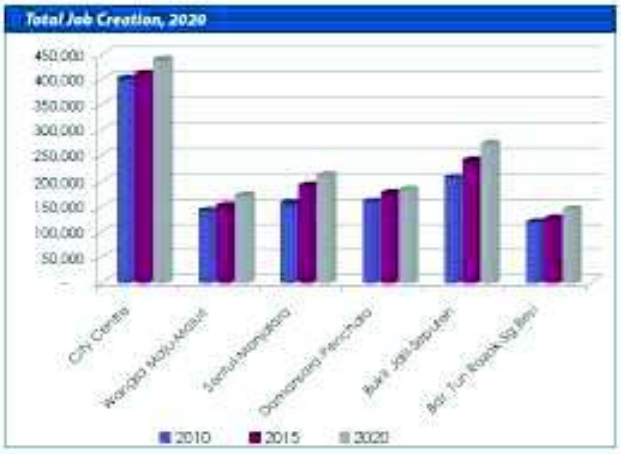


Figure 3. 16 The total creation of job opportunities for 2020 (KLCH, 2008).

From the employment database reported in the 'Draft of Kuala Lumpur City Plan 2008', the majority (59%) of the work force working in the city are adult residents of Kuala Lumpur aged between 20 and 55 years old (see Figure 3.16).

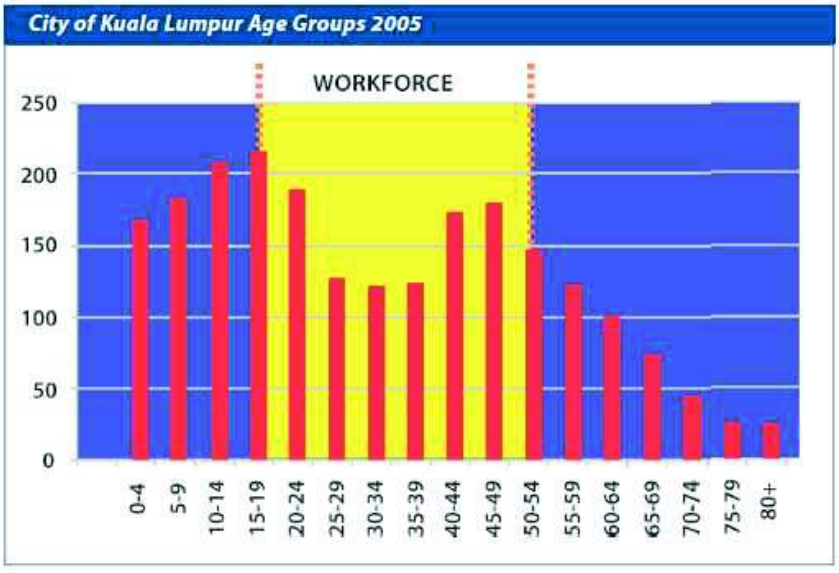


Figure 3. 17 The average age of workforce working in Kuala Lumpur city (Draft KLCP, 2008)

According to Garcia-López and Muñiz (2010), presently, most large cities in the world are polycentric and, at the same time, they are undergoing processes of employment decentralisation and deconcentration. Kuala Lumpur is no exception to this process. However, despite the policies implementing the decentralisation and deconcentration processes to reduce the concentration of population in the city centre, the employment

concentration in the city centre area still represents a significant percentage of the total employment figures (Mohamad, 2002). Conversely, there is a significant increase in population in the new growth centres (KLCH, 2008). By looking at the distance between land uses that constitute the origin and destination of a person's travel, the decentralization has created high travel demand especially for journeys to workplaces (Maidin and Mohamad, 2011). Giuliano (1999) states that as the distance between urban nodes increases as a result of the decentralization, travelling using motorized vehicles between any two nodes becomes essential. Several scholars corroborate this, noting that most urban nodes are not effectively connected by physical infrastructure to allow for the use of Non-Motorized Transportation (NMT) such as walking and cycling (Maidin and Mohamad, 2011, Jusoh, 2007, Barter, 2004). It also appears that these urban land uses and activities are also usually not efficiently served by public transportation to increase mobility for residents and workers (Maidin and Mohamad, 2011).

3.2.7 Urban Transportation Systems in Kuala Lumpur

The transport infrastructure in Kuala Lumpur City has played an essential role in the growth of urban societies in Malaysia after World War II. According to Kitamura and Mohamad (2007), the development of transport infrastructure during the 20th century was seen asserting a powerful influence on economic growth and industrial location. The urban sprawl has subsequently made the Kuala Lumpur Metropolitan Region (KLMA) expand to a larger area, covering approximately 4000 sq. km stretching towards the south all the way to the Kuala Lumpur International Airport. The entire Metropolitan Region is well linked with a system of highways and railways, with the FTKL as the dominant centre of the transportation hub as shown in Figure 3. 14 (Muhamad, 2002; Barter, 2004).

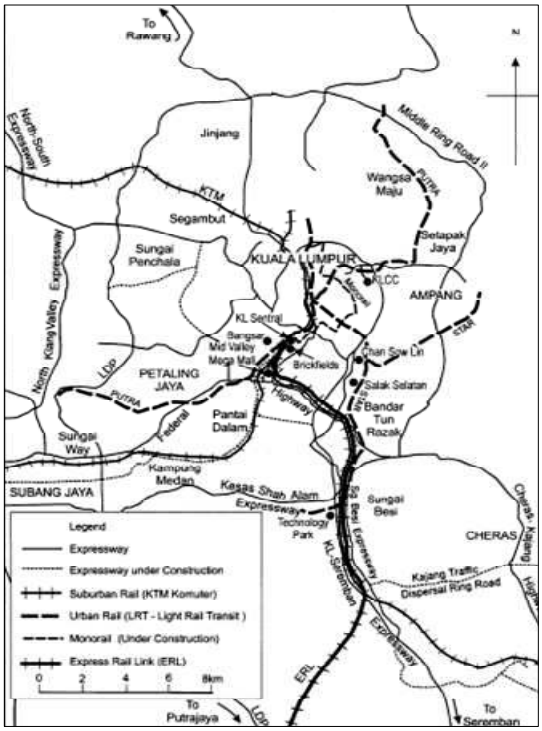


Figure 3. 18 The map of the central part of the Kuala Lumpur Metropolitan showing the details of transportation infrastructure (cited in Barter, 2004)

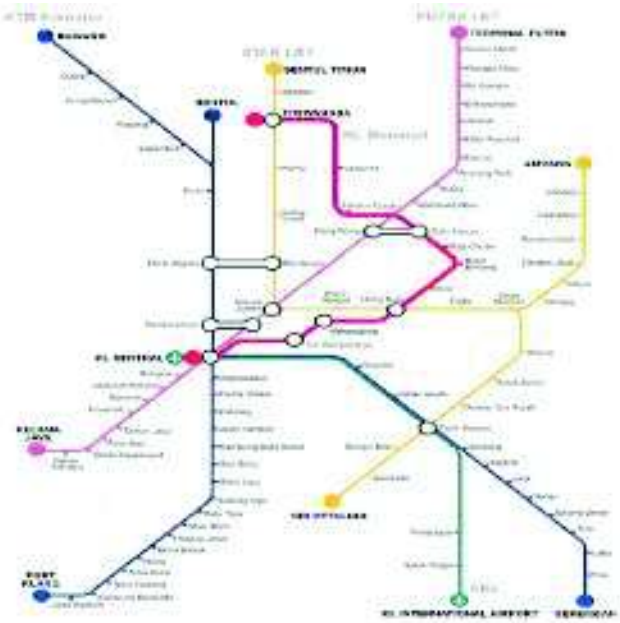


Figure 3. 19 The map on the entire rail network including KTM Komuter, STAR LRT, PUTRA LRT, KL Monorail and ERL in FTKL and KLMA (Source: CHKL, 2004)

At present, apart from the road infrastructure for vehicular movement, the rail network also play an important role in connecting people in the FTKL and metropolitan areas. Rail

services have become a very significant mode of transportation since the introduction of several rail networks to meet the travel demands of urban dwellers for journeys to the workplace (Muhamad, 2004). The types of rail network systems found in the Metropolitan Region are (see Figure 3.18):

1. Light Rail Transit System (LRT) namely STAR and PUTRA. The STAR LRT System was planned in two phases. Phase I runs generally at-grade from CPA to the north FTKL with the administration, workshops and stabling area located in Ampang. For Phase I, there are 17 two-vehicle trains running on double tracks, segregated from all other traffic and fully fenced. Phase II is an extension of the Phase I route, which comprises a further 3.2 km of track to the north and 11.8 km to the South. PUTRA LRT System 2 covers a total distance of 29 km, linking the eastern and western suburbs of Kuala Lumpur, servicing some of Kuala Lumpur's most affluent and heavily populated areas (Muhamad, 2003).
2. The commuter system known as Keretapi Tanah Melayu (KTM) Komuter is a product offered as a suburban railway service that runs for the most part within the Kuala Lumpur Metropolitan Region. The fully air-conditioned electric train service began operations on 14 August 1995. The service, using Electric Multiple Units (EMUs) running on a 25KV AC system, covers the Rawang to Seremban and Sentul to Port Klang sectors, running through the Kuala Lumpur sector (Muhamad, 2003). KTM Komuter serves an average of 37 million passengers per annum, of whom 47% are working adults and 45% are students (Ho et al., 2008).
3. The KL Monorail is a straddle monorail system with pneumatic tyres running along the top and hugging the sides of a narrow concrete guide-way beam. The monorail system provides intra-city public transport to the CBD, hotel and shopping districts of Kuala Lumpur. The monorail route runs a distance of 8.6 km with 12 fully-elevated stations. The KL Monorail is designed to handle up to 18000 passengers per hour per direction and operates with up to slightly above two minutes headway between trains (Ho et al., 2008).
4. Mass Rapid Transit(MRT), currently under construction, will be a 3-line, 150 kilometre mass rapid transit system in the Greater KL conurbation based on the "Wheel and Spoke" pattern comprising two northeast-southwest radial lines and one circle line looping around Kuala Lumpur city. The proposal was announced in

June 2010 and was approved by the government of Malaysia in December 2010. Construction of the first line commenced in July 2011. The project also represents one of the economic entry point projects identified for the Klang Valley "National Key Economic Area" under the Malaysian government's Economic Transformation Program (ETP).

In order to integrate these rail networks, in 1994 another mega project was built in the CPA known as Kuala Lumpur Sentral Station (KLSS). The KLSS is the new transportation hub of Kuala Lumpur, and is intended to function as the `nucleus of the nation' as a new Central Station which integrates KTMB rail facilities, the Light Rail Transit (LRT) System and the Express Rail Link (ERL) service to the Kuala Lumpur International Airport, the new Federal Government Administrative Centre of Putrajaya, Cyberjaya and key areas within the Multimedia Super Corridor (CHKL, 2004). KLSS has been expected to generate more efficient movement and travel for urban dwellers for their journeys to work.

Even though the KLSS was planned as a transportation hub that integrates the main public transport services under one roof, this still does not solve the fundamental urban problem of traffic congestion in the city (Bruton and Mohamad, 2002).

A survey of mobility for journeys to the workplace for those entering the CPA from the two Middle Ring Roads (MRR 1 and MRR 2) suggests that public transport ridership in the KLMA is generally very low compared to the use of private vehicles (Bunnell, 2002; Barter, 2004, Lee, 2005; Muhamad and Kigunddu, 2007; Kitamura and Muhamad, 2007; Ho et al., 2008).

Figure 3. 20 The ratio between public transport and private vehicles entering Central Planning Area via Middle Ring Road 1 (MRR1) (source: KVTS 1985, SMURT-KL, 1998, Draft KL city Plan, 2005)

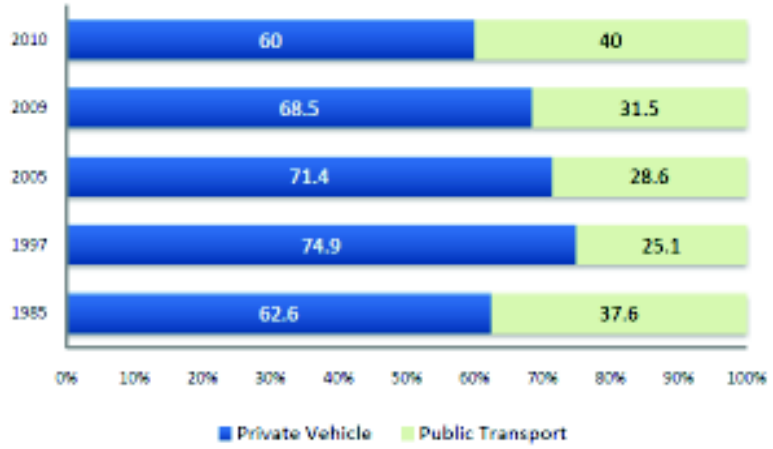


Figure 3. 21 The ratio between public transport and private vehicles entering Central Planning Area via Middle Ring Road 2 (MRR2) (source: KVTS 1985, SMURT-KL, 1998, Draft KL city Plan, 2005)

The alteration in the pedestrian environment over time has been a gradual process, linked to three different phases of development in the city. The development of highways linking KLMA to FTKL had the unintended effect of prioritising cars over pedestrians, thereby increasing car dependence in the area. Efforts have been made to decentralize the City Centre by moving the administrative centre to Putrajaya. However this solution has not proved to be especially helpful because Kuala Lumpur City is still the centre for commerce, banking, entertainment, etc., and therefore continues to attract large numbers of people. The figure 3.22 below summarises the argument presented in section 3.2:

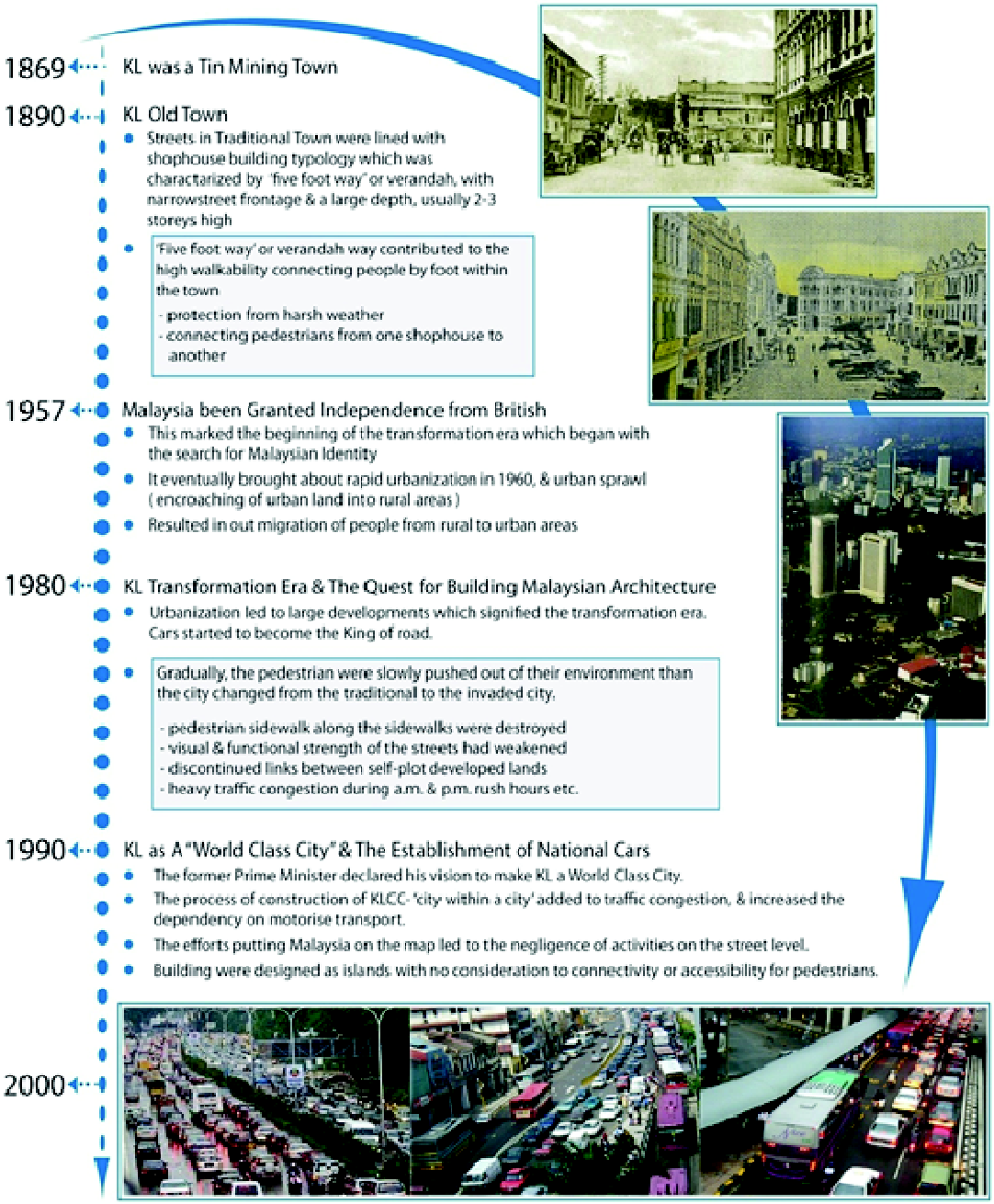


Figure 3. 22 Summary of Kuala Lumpur Overview

3.3 Travelling To Work In Kuala Lumpur City

Based on evidence from the trip generation study by KLCH, the number of trips made for work purposes is highest in FTKL (KLCH, 2008). The aim of the trip generation study is to predict the total number of trips generated and attracted to each zone of the study area (Mathew and Rao, 2006). The study on trip generation in six strategic months in FTKL shows a gradual increase in the work trip pattern forecast from 2005 to 2020 (see Figure

3.21). There were about 3,699 trips made for every 1000 persons for work travel purposes in 2005, increasing to 4,498 trips per 1000 persons in 2010; this figure is expected to rise by another 4% in 2020. Among all six strategic growth centres in the FTKL (Wangsa Maju, Damansara, Sentul, Bandar Tun Razak, Bukit Jalil and City Centre), the City Centre zones show the highest travel demand.

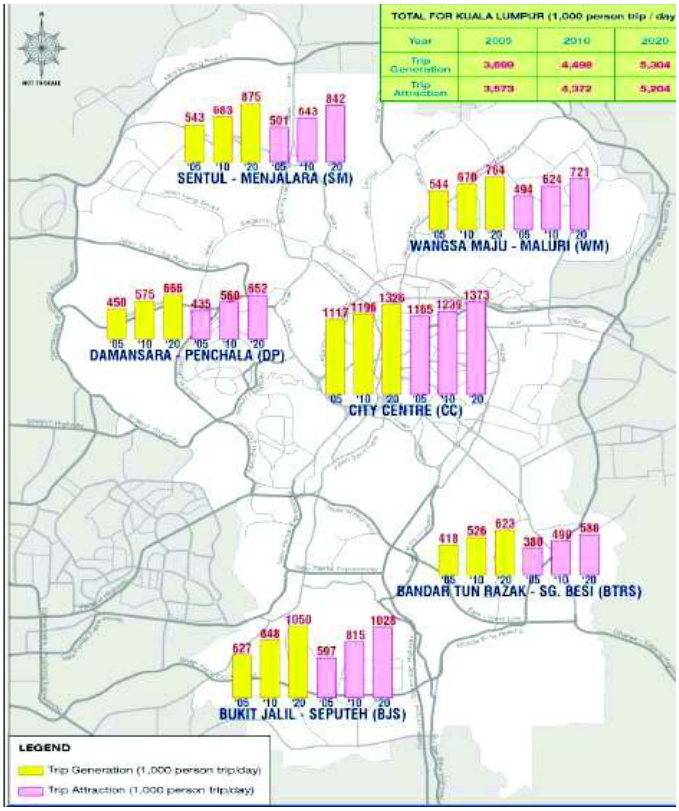


Figure 3. 23 Trip generation for work trip purposes in six strategic zone of FTKL (CHKL, 2010)

Lee (2005) has pointed out that, despite the development of the new strategic growth centres at the urban fringe of KL city, strategized by the government to relieve pressure on the inner city; the dependency of the fringe on the City Centre has not been broken. This means that the expansion of the new growth areas and the development of mega urban regions in the fringes, actually ties these peripheries to the central city. Lee (2005) continues that the flyovers, urban expressways, the monorail, the light rail transit (LRT) system, and the commuter train to the outlying towns that were built to address the traffic gridlock in the inner city, have actually made the city even more 'nodal centric'.

The new transport infrastructure in KLMA has generated new demand for travel; new roads generate faster and longer trips, more trips by car and higher car ownership, all of which adds up to more traffic congestion (Kitamura and Mohamad, 2009). At this point, because of the 'nodal centric' planning of the city, the situation has led to the inner city becoming even more clogged with private vehicles (Lee, 2005).

As a result, according to Maidin and Mohamad (2011), traveling to work in KLMA is believed to be nerve-racking both for those who drive and those who use public transportation. They assert that, as with most major urban areas around the world, road networks and highways in KLMA are heavily congested due to the predominant use of private vehicles. Meanwhile, people who travel to work using public transportation struggle daily through much inconvenience to reach their workplaces during the a.m. and p.m. peak hours. According to Kitamura and Mohamad (2007), the quality of the public transport infrastructure in Kuala Lumpur city is poor. This is accompanied by decreasing levels of personal safety and widespread pollution. It appears that the urban transport problem is now at an intractable level, and has become a major urban crisis for FTKL (Lee, 2005). Despite encouraging policies as well as investment in public transportation infrastructure and usage improvement to mitigate the traffic congestion, the modal share for public transportation continues to drop (Zakaria, 2008). In the same way, traffic congestion does not show any signs of improvement regardless of the large number of highways and flyover developments (Bunnell, 2002; Barter, 2004).

On the other hand, the Non-Motorised Transport sector (NMT) appears to be the least important and least recognized part of the urban transportation system in KL city (Barter, 2004). According to Barter (2000), many urban transport surveys in Asian countries including KL exclude very short trips, and therefore tend to underestimate the number of walking trips. Adding to this argument, Litman (2011) also criticises the conventional method of amassing travel statistics, as it tends to undercount non-motorised travel activity which leads to undervaluation and underestimation of walking facilities. Furthermore, the conventional evaluation of transportation system performance only considers delays to motor vehicle traffic. The delay that motor vehicle traffic imposes on pedestrians is not generally measured in economic or planning analysis (Litman, 2011). To emphasize this point, Barter (2004) affirms that the urban fabric of Kuala Lumpur city appears to aim at easing conditions for vehicle traffic, and is not friendly to the NMT

mode. The factors that influence people's choices about transport modes when travelling to work in Kuala Lumpur City are discussed below.

3.3.1 Deficit in Housing Provision in Kuala Lumpur City Centre (KLCC)

Based on housing supply and demand in KL city, 52% of the housing supply is categorized as high-cost housing while more than 68% of Kuala Lumpur's population requires low- to medium-cost housing. This creates a mismatch of 16% in supply and demand for affordable housing (CHKL, 2004). Maidin and Muhamad (2011) and Bunnell et al (2002) point out that affordable housing is not located appropriately according to where it is needed; therefore people are forced to seek affordable houses away from the city centre, in the emerging transport nodes at the urban fringe. Bunnel et al. (2002) further point out that the land for low- and medium-cost housing in the central area is declining thus, stimulating new socio-spatial patterns and problems. Figure 3.19 from Bunnell et al (2002) demonstrates the pattern of housing distribution as of 2000; from these figures it is clear that low and medium cost housing construction was concentrated towards areas to the south and south east of the city centre.

Table 3. 3 Housing distribution by type in Kuala Lumpur as of 2000 (KLCH 2008)

Housing type	Existing		Required	
	Units	%	Units	%
Low Cost	80,465	24.5	107,323	32.7
Medium Cost	78,589	24.9	114,215	34.8
High Cost	169,151	51.5	106,667	32.5
Total	**328,205**	**100**	**328,205**	**100**

What this means is that there will be a high demand for travel, especially from the workers who work in the KLCC but live outside the centre. With decreasing opportunities for mode split for public transportation, the demand for mobility infrastructure such as private vehicles increases, hence explaining the heavy investment in the expansion of the Malaysian Expressway System within the KVR (Maidin and Muhamad, 2011).

Being the centre for economic development for KLMA, Kuala Lumpur also recorded a high jobs-housing ratio of 2.56 in 2000 (CHKL, 2004). According to Ren Pheng (1997), the jobs-

housing ratio is considered balanced when residents can both live and work in the same area. Theoretically, he points out that in a balanced community, it is possible to reduce the number of vehicle trips, shorten trip length, increase the NMT such as bicycling and walking, and/or eliminate some trips altogether. Based on Cervero (1989) cited in Ren Pheng (1997), there is a significant relationship between the jobs-housing ratio and regional mobility. Decreasing urban densities has been one of the factors that is positively associated with rapid motorization in Asian cities, as confirmed by Hook and Replogle (1996).

Meanwhile, the jobs-housing imbalance tends to correlate with high levels of congestion on connecting highways, and high housing prices and low availability in the vicinity of job centres. These are significant factors that help explain residential location choice and commuting distance to job centres. According Cervero (1991) and Giuliano (1991) the jobs-housing balance refers to the spatial relationship between the number of jobs and housing units within a given geographical area. An area is considered balanced when the resident workers can obtain a job within a reasonable travel distance and when the available housing types can complement a variety of employees' housing demands. Ren Pheng (1997) in his empirical analysis of the relationship between the jobs-housing ratio and urban commuting patterns in terms of Vehicle Miles Travelled (VMT) and trip length in the Portland, Oregon, metropolitan area has suggested that if a given area does not have enough employment opportunities, local residents must seek jobs in other, more distant, areas. On the other hand, if a given area has more employment than resident workers, workers must be drawn from other areas. In either case, it will lead to longer journey-to-work commutes, and the longer work-trip length will cause more home-to-work VMT. Maidin and Muhamad (2011) refer to the jobs-housing ratio as another indicator of spatial mismatch, but note that it serves as an indicator to measure the availability of employment compared to the availability of housing in an area.

In the case of KL city, the jobs-housing ratio indicates an imbalance between the availability of jobs and housing units in Kuala Lumpur as a whole (Maidin and Muhamad, 2011). Since a high jobs-housing ratio indicates that there are more workers than housing units within an area, it is implied that most workers will definitely need to travel a longer distance to reach their workplaces from their homes which are located elsewhere. Therefore both types of locational mismatches will induce travelling between the two

points of origin and destination for workers. According to Maidin and Muhamad (2011) this has led to a high demand for travel especially from workers who work in Kuala Lumpur but live outside Kuala Lumpur. Furthermore with the decreasing mode split for public transportation, the demand for infrastructure that promotes mobility services via private vehicles has increased, thus further explaining the heavy investment in the expansion of the highways throughout the city causing severe traffic congestion, especially during morning and evening peak hours,that continue to degrade the city environment and atmosphere (see section 3.2.3).

Despite this, the KL City Plan 2020 has projected that there will be around 1,419,600 jobs in Kuala Lumpur, but only around 626,317 units of housing, thus increasing the jobs-housing ratio to 2.27 (CHKL, 2004). What this means is that Kuala Lumpur will continue experiencing a severe jobs-housing imbalance, and an extremely high working population during the daytime in 2020 (Maidin and Muhamad (2011).

3.3.2 Automobile dependencies and the rise of car ownership in KL City

In Barter's (2004) paper, private vehicle oriented transport policies in the Kuala Lumpur Metropolitan Area have created heavy investments in car oriented mobility in line with an 'automobile-dependence' scenario. Barter describes 'automobile dependence' as the extent to which higher order structures, especially the built environment, encourage and 'depend' on car usage.

On a daily basis, 1.305 million vehicles cross the MRR 1 and 2.125 million vehicles cross the MRR 2. During the morning peak hour, about 70% of these are Single Occupancy Vehicles (SOV) for both MRR 1 (42,600 vehicles) and MRR 2 (86,500 vehicles). This decreases slightly to 65% SOV for the MRR 1 (39,100 vehicles) and MRR 2 (84,500 vehicles) during p.m. peak hours (Mohamad and Kiggunddu, 2007, Omar, 2007). The number when rounded to total Highway Capacity in/out of the Central Planning Area (CPA) is 930,000 pcu. Meanwhile, the total volume entering the CPA in the year 2005 was 1,260,000 pcu/day. The present traffic volume entering the CPA boundary has already exceeded the SMURT-KL forecast of 1,187,000 pcu/day in 2010 (Mohamad and Kiggunddu, 2007) (see Figure 3.23).

Figure 3. 24 Daily traffic flow situation on KL road networks in 2005 (CHKL, 2010)

Barter (2004) and Mohamad and Kiggunddu (2007) note that the Federal Territory of Kuala Lumpur continues to be flooded with newly-registered motor vehicles each year. The volume of vehicle sales, based on number of new car registrations, suggests that this trend is continuing, despite the slight fall in sales during the Asian financial crisis of 1997. The total number of newly-registered motor vehicles however has skyrocketed since Malaysia's gradual economic recovery.

Percentage share of newly-registered motor vehicles in the Federal Territory compared to that in the whole of Malaysia was 20.88 in 1991, 19.11 (1993), 19.59 (1994), 24.24 (1995), 27.12 (1996), 28.01 (1997), 19.13 (1998), 24.71 (1999), 24.96 (2000), 25.08 (2001) and 26.94 (2002) (Mohamad and Kiggunddu 2007). According to Jusoh (2007), reports from the Road Transport Department of Malaysia state that the total number of registered vehicles for Malaysia was 14.8 million in 2003. Out of this, 47% were motorcycles and 44% were private cars, while the rest were commercial and other vehicles. The most recent report on road traffic volume in the Federal Territory of KL alone, shows a steady increase in car ownership from, 4,146 per 1000 people in 2000 to 7,420 per 1000 people in 2007. The ratio between cars and population was rounded to 3.01:1 in 2000 and increased to 3.93:1 in 2007 (KLCH, 2010) (see Figure 3.24). Barter

(2004) points out that the KLMA has yet to see the implementation of policies that aim to reduce the rate of growth of vehicle ownership or usage. The consequences of automobile dependency are discussed in the following section.

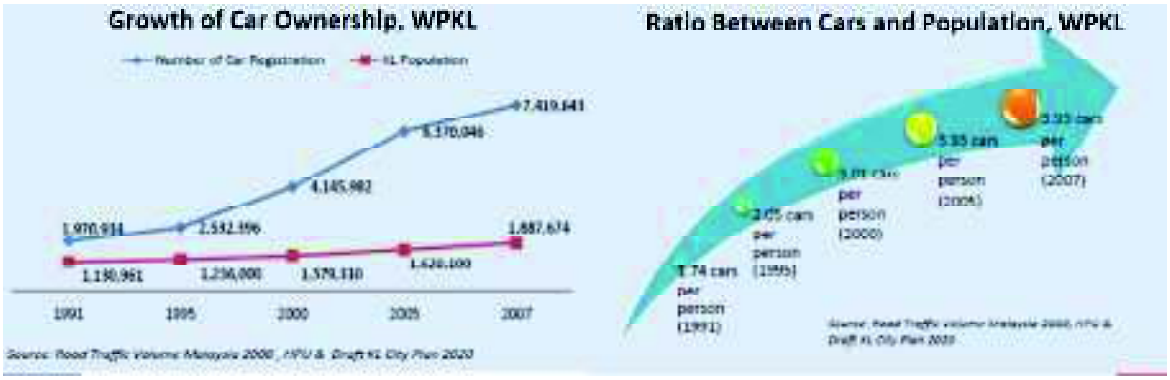


Figure 3. 25 A graphic representation on the growth of car ownership (left diagram) and the ratio between cars and the population in the Federal Territory of KL from the 1991 to 2007 (DBKL, 2010).

The increase in automobile dependencies in Kuala Lumpur has given rise to many significant consequences for the people who travel to their workplace in the city. The consequences are as follows:

(a) Increased traffic congestion throughout KL

Rapid motorization in Kuala Lumpur has led to increased traffic flow, which has resulted in greater traffic congestion (Mohamad and T. Kiggundu, 2007; Barter, 2004 and Barter et. al, 2003). The increasing traffic congestion has proven to be a challenge to the recent motorization of the city.

A comparative study by Poboon (2000), cited in Mohamad and Kiggundu (2007), shows that the average traffic flow during peak-hour periods in the CBDs of Kuala Lumpur and Bangkok metropolitan region is 28 km/h and 13 km/h respectively. The slow flow of vehicles in KL during the peak-hours is due to a high volume of traffic on almost all highways and streets; the drivers of these vehicles all want to minimize their own journey time on the road. According to Lewis (1993), the speed and flow of the traffic is entirely dependent on the behaviour of each vehicle's driver. Each vehicle's progress therefore is necessarily dependent (except on an empty road) on how its driver adapts his behaviour to that of other drivers. Thus, congestion is primarily a function of personal behaviour and

dynamics. In addition, traffic congestion can lead to accidents and air pollution (Muhamad and Kiggungu, 2007).

Figure 3. 26 Typical traffic conditions in the Klang Valley during morning and evening rush hour. Congestion is getting worse because of the rise in private car ownership (Source: SPAD, 2010).

(b) Rise in number of Accidents

In addition to the above problem, congestion is also responsible for an increase in the number of car accidents in Kuala Lumpur City (Mohamad and Kiggundu, 2007; Jusoh, 2009).

It was reported that between 1990 and 2000 the number of reported car accidents in Kuala Lumpur increased by 92.9 % from 19,365 to 33,735. Table 6 shows the number of accidents which involved deaths and injuries in Kuala Lumpur for the years 1987-1996. In Kuala Lumpur, 52% of the total numbers of fatal accidents caused by vehicles were caused by motorcycles, 30% by private cars, 10% by lorries/ vans, 3% by buses and 2% by taxis (Mohamad and Kiggundu, 2007).

Table 3. 4 Total road accidents in Kuala Lumpur, 1987-1996 Compiled from the Ministry of Transport Yearbooks

Year		1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Total No. of Accidents		20,104	18,728	16,068	19,365	22,800	24,697	27,000	27,439	27,939	33,375
Casualties	Death		203	210	249	265	298	287	350	323	396
	Injury		2,958	2,699	3,192	3,712	3,875	4,473	4,444	4,697	4,350

(c) The impact of carbon emissions on air quality and health

In relation to the issue of atmospheric pollution, motor vehicles have been blamed for the high levels of suspended particulate matter (SPM) in the air. According to Afroz et al (2002), the three major sources of air pollution in Malaysia are mobile sources, stationary sources, and open burning sources. The emissions from mobile sources such as personal cars, commercial vehicles, and motorcycles have been the major source of air pollution, contributing to at least 70–75% of total air pollution. According to the Department of the Environment Malaysia (DOE, 1997), in 1996 the percentages of air emission load by type were motor vehicles, 82%; power stations, 9%; industrial fuel burning, 5%; industrial production processes, 3%; domestic and commercial furnaces, 0.2%; and open burning at solid waste disposal sites, 0.8% (Figure 3.26).

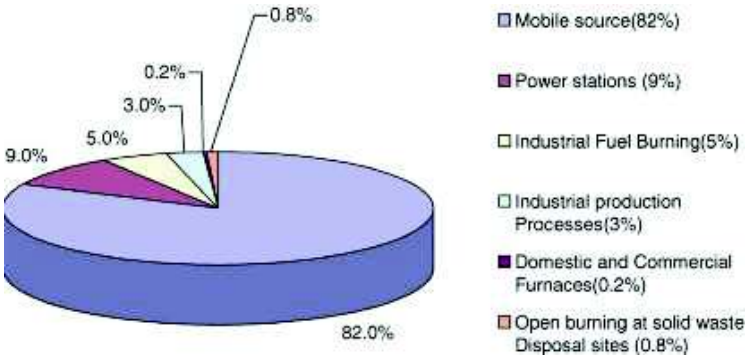


Figure 3. 27 Sources of air pollution in Malaysia, 1996 (Department of the Environment, 1997)

In 1989, an estimated 2.8 million vehicles in Kuala Lumpur released about 3700 tons of SPM into the air (Pendakur, 1995). The 1997 SMURT-KL Study reported a problem with the ambient air quality in Kuala Lumpur, with unfavourable conditions prevailing at busy traffic crossings. Daily NO_2 levels at Pudu and Cheng Lock crossings exceeded WHO guidelines (0.15 mg/m^3 or 73 ppb) and 8-hour measurement of CO levels at busy crossings showed values over the Malaysian guidelines. Extensive use of private vehicles in Kuala Lumpur has also affected visibility, and has caused health problems such as asthmatic conditions, conjunctivitis and other diseases among the public (Pendakur, 1995; Afroz, 2002).

In the early days of Malaysia, from about the 1900s to the 1950s, development and growth were initiated according to the needs and pressures of the time. Consequently,

unplanned developments between the 1960s and 1990s have had a negative impact on the environment and air quality (Sham, 1994).

Air quality studies conducted in the Klang Valley during the non-haze episodes between 1986 and1989, December 1991 to November 1992, and January 1995 to December 1997, demonstrated two distinct daily peaks in the diurnal variations in concentrations of sulphur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide, and particulate matter. The early morning peak was due mainly to vehicle emissions and the late evening peak was attributed mainly to meteorological conditions, including atmospheric stability and wind speed. Total suspended particle matter was the main pollutant. The concentrations at a few sites in the Klang Valley often exceeded the Recommended Malaysian Air Quality Guidelines. A comprehensive study conducted by the Department of the Environment, Japan International Cooperation Agency, the Malaysian Meteorological Service, and University Putra Malaysia between December and August 1993 gave clear indications that air pollution in the Klang Valley is becoming worse. The study also indicated that if no effective counter measures are introduced, the emissions of sulphur oxides (SO), nitrogen oxides (NO), particulate matter, hydrocarbons, and carbon monoxides (CO) in the year 2005 would increase 1.4, 2.12, 1.47, and 2.7 times, respectively, from the 1992 levels (Awang et al., 1997).

Pendakur (1995) and Mohamad and Kiggundu (2007) suggest that there is an urgent call for Malaysians to change their travel behaviour. It is believed the urban environment should be able to offer an alternative transport mode for users in planning their travel plan to the city and within the city.

However, inefficient public transportation has resulted in the tendency for the urban population to opt for private vehicles instead of public transport. The study on the Integration of Public Transport Development and Land Use in Klang Valley 2003 shows the ratio of private vehicle usage compared to public transport was 89:11 (Jusoh, 2009).

These two factors have contributed to the acute problem of congestion in cities. In the long term, this will have a negative impact on the attractiveness of city to local and foreign investors, and therefore on its competitiveness as well (Jusoh, 2007). According to Barter (2004) and Jusoh (2007) the current transportation system is insufficient to handle the problem of congestion, and to provide safe, user-friendly services to urban dwellers. Transportation facilities are provided without taking into account the need to integrate

the different modes of transportation, which subsequently makes it difficult for the user to change between modes of transportation.

3.3.3 Inadequacy of Public Transport

According to Ho et al., (2008), among the reasons for poor public transport ridership in FTKL are the long waiting hours, overcrowding, poor integration of access to different modes, and inconvenience. Travellers who repeatedly face these problems are likely to eventually resort to private vehicles. The lack of provision of physical infrastructure for public transportation systems such as covered pedestrian footpaths, and bus stops that enhance the comfort of the user, also contribute to the rejection of public transport by the people (Jusoh, 2007).

Barter (2004) and Jusoh (2007) have observed the poor design features of the rail systems themselves, which possibly resulted from inadequacies in the relevant governance arrangements. The obvious failure is seen in the lack of physical integration between lines and poor accessibility to stations. As Barter has observed, KL Sentral, allows relatively easy transfers between KTM's suburban rail (and KTM's intercity services) and PUTRA. However, the monorail station terminates about 400 m short of the KL Sentral complex, and users have to negotiate stairs as well as cross a busy road and a large open-air car park to transfer to other systems at KL Sentral. The existing urban fabric is not friendly to public transport and NMT.

3.4 Pedestrian Environment in Kl City Today

The first part of this chapter overviewed the transformation of KL city from a traditional city, built to carry foot traffic, which also functioned as meeting space and marketplace, to an invaded city, characterized by disproportionate balance brought about by car domination. Now, the city is in danger of becoming an abandoned city, described as a place where the number of people on foot decreases drastically, and public life ceases to exist (Gehl and Gemzoe, 2003, Barter, 2004).

In the context of transportation, Mareo-Babiano and Ieda (2007) suggest that Western models continue to have a strong influence on the East. It is believed that this has a socio-cultural basis since design influence in Asian colonial cities was imposed by the colonizer. For example, the physical planning principle introduced by the British in Malaya (now

Peninsular Malaysia) served as a morphological model, replicated to a great extent in urban centers throughout the archipelago and visible in the urban fabric of most Malaysian towns; Kuala Lumpur Old Town in FTKL, George Town in Penang and others, strongly reflect their British colonial past (Gullick, 1974). However, even non-colonized metropolises, such as cities in Japan and Thailand, were restructured through the assimilation of Western techniques during the Modernization period.

This section critically reviews the walking conditions of the current pedestrian environment in the CPA of KL city.

3.4.1 Walking conditions under piecemeal development

During the globalization period, the government brought about a major utility shift in the city, from a multi-activity space of mega developments where people were prioritized, to a space dominated by motor vehicles (Beinart, 1986, Barter, 2004). These mega developments have their own characteristics, given that each development was based on site-specific projects built on individual plots of land (Yeang, 1985). For instance, the KLCC and other high rise development projects in the Golden Triangle Area (GTA) are part of the collage which forms the new KL skyline, reflects a desire for global recognition (Bunnel, 2002). But the reality at ground level is that the road system has been developed in a piecemeal fashion resulting in poor linkages between major and minor roads. This piecemeal development has adversely affected the quality of the streetscape, causing pedestrians inconvenience in terms of unclear movement patterns, route connectivity and accessibility to the destination (CHKL, 2004). With more space given over to private vehicles, pedestrians often get squeezed out of the movement space (Boaddus et al., 2009). The ground level is completely ignored due to a lack of planned and guided developments pleasant to pedestrians (Dasimah, 2000; Bunnell, 2002; KLCH, 2004).

3.4.2 Rapid motorization has led to declining pedestrian mode share

Evidence from the previous discussion has shown that the trend towards motorization has become a critical issue in Kuala Lumpur, as elsewhere in the rapidly-developing economies of Asia (Kitamura and Mohamad, 2009). In order to improve automobile accessibility, local governments have allocated massive investments in expanding roads, building new highways and locating activities and new towns along the major highways

(Bunnell et al, 2002,; Barter, 2004; Jusoh, 2009). The recent allocation in the 2011 budget for construction of highways in KL, such as the Ampang-Cheras-Pandan Elevated Highway, Guthrie-Damansara Expressway and Damansara-Petaling Jaya Highway, shows that a concerted effort is being made to constructing more new highways to create ease of vehicular movement in the Kuala Lumpur Metropolitan Area (The Star online, 2010).

Furthermore, intense competition in the motor vehicle market within the Asian region has created the perfect setting for a rapid increase in private vehicle ownership and utilization across Malaysia (Kitamura and Mohamad, 2009; Muhamad and Kiggundu,2009). The situation in KL is deteriorating because highways are clogged with the massive number of automobiles, especially private cars, which appear to be the major form of transportation to the workplace in the city (Kitamura and Mohamad, 2009; Muhamad and Kiggundu, 2009). Barter (2004) claims that the Malaysian authorities are not serious enough about mitigating the issue of traffic congestion. He also found that constraints on entry of traffic into the Kuala Lumpur city centre (but not restraints on vehicle ownership) have often been considered but never implemented.

Adding to Barter's argument, Mareo-Babiano and Ieda (2007) found that in most developing Asian cities, this was partly due to national policies which encouraged motor vehicle ownership as well as the adoption of Western street design standards and practices, which have brought about a mismatch between facility provision and its users.

Researchers have identified several factors, listed below, that contributed to the explosive growth in the number of private vehicles in Kuala Lumpur and its conurbation.

i. Disposable incomes. (Mohamad and T. Kiggundu, 2007; Kasipillai and Chan, 2008; Yamato, 2009) have confirmed disposable incomes as a dominant factor determining car ownership in KL; this has changed the lifestyle and travel behavior of urban dwellers;
ii. Fuel subsidies (Barter, 2004, Kasipillai and Chan, 2008);
iii. Decentralization and urban sprawl (Jusoh, 2007; Bunnell, 2002; Barter, 2004). Kuala Lumpur will suffer from a serious imbalance in the jobs-housing ratio until the year 2020 (Mohamad, 2007).
iv. Malaysia's national car projects also played a role in the growth in motor vehicle use; the need to encourage the local car industry limited the options

available to the government for improvement of sustainable transportation (Barter, 2004; Kasipillai and Chan, 2008)

v. Decreasing public transport usage due to poor service quality (Bunnell, 2002; Barter, 2004; Jusoh, 2007; Mohamad and Kiggundu, 2007; Kasipillai and Chan, 2000)

vi. Extensive development of vehicle movement infrastructure such as MRR 1, MRR 2, expressways and others (Bunnell, 2002; Barter, 2004; Mohamad and Kiggundu, 2007)

3.4.3 Underestimation of Non-Motorised Transport (NMT) modes in KL travel survey

To date, it has been identified that the conventional travel surveys practiced in KL undercount non-motorized transportation (NMT) activity like walking because they ignore short trips and walking links on trips that involve motorized travel (Barter, 2004; Litman, 2011). According to Rietveld (2009) and Litman (2011) walking is the recommended transport mode for short trips to link to other motorized trips such as transit stations for buses or rail transport or to/from parking areas to destinations. In this case, it is believed that pedestrian accessibility should be the primary concern, for accessibility is more about the ability to travel between residence and work places with ease (NST, 2010, NST, 2011). In the KL scenario, the modes of transportation commonly surveyed for personal trips are categorized into two main groups:

i) Private vehicle modes which include car, van, and motorcycle; and

ii) Public transport modes that include bus and rail.

The table below shows examples of modal split for person trips recorded at the CPA of Kuala Lumpur based on the 1985, 1997, 2005, 2009 and 2010 travel surveys.

Table 3. 5 Modal Split for Person Trips at Central Planning Area Screen Line (MRR 1)
#1 Sources from KVTS, 1985; #2 Sources from SMURT-KL, 1997; #3 Estimated by KL Local Plan Study in 2005 for Draft KL City Plan 2020; #4 Estimated by KL Local Plan Study based on Operators' data for 2009; * Forecast Estimated by KL Local Plan Study Team, 2010)

Mode	1985[1]			1997[2]			2005[3]			2009[4]			2010 *		
	Person Trips/Day	Share		Person Trips/Day	Share		Person Trips/Day	Share		Person Trips/Day	Share		Person Trips/Day	Share	
Car/Van/Taxi	983,372	49.0%	62.6 %	1,137,110	55.2%	74.9 %	1,173,218	52.5%	71.4 %	1,245,200	49.3%	68.5 %	1,091,500	44.6%	60.0 %
Motorcycle	271,374	13.5%		406,860	19.7%		420,153	18.8%		482,100	19.1%		378,500	15.4%	
Bus	750,273	37.4%	37.4 %	408,480	19.8%	25.1 %	469,969	21.1%	28.6 %	475,000	18.8%	31.5 %	646,880	26.4%	40.0 %
Rail	-	-		109,000	5.3%		169,277	7.6%		321,000	12.7%		333,120	13.6%	
Total	2,005,019	100.0%		2,061,450	100.0%		2,232,617	100.0%		2,523,300	100.0%		2,450,000	100.0%	

NMT has not been recognised as one of transportation mode in the KLSP 2020, however it was only reported in the amendment of the 'Draft Kuala Lumpur City Plan 2020' on the absence of a policy to integrate motorised and NMT, and of the lack of plans related to the pedestrian network for KL city (KLCH, 2008) (Draft KLCH, 2008). According to Barter (2004) and Jusoh et al (2007), issues pertaining to pedestrian accessibility, connectivity and lack of provision for pedestrian facilities in KL are due to insufficient data on walking, which have been overlooked by the authorities.

3.4.4 Pedestrian problems and issues in the existing urban fabric

The movement of pedestrian within the CPA is extremely difficult ''Strategies for Managing Urban Transport in Kuala Lumpur'' (SMURT, 1999). Based on the "Study for a Pedestrian Friendly City in Kuala Lumpur" (JICA, 1999), KLSP 2020 (2004) and Draft Kuala Lumpur City Plan 2020 (KLCP, 2008), made with reference to the CPA, the difficulties are attributed to several problems and issues arising from the existing pedestrian environment:

Table 3. 6 Pedestrian environment issues (Compiled by author from JICA and DBKL, 1999, KLSP 2004 and Draft KLCP 2008)

Existing problems	Issues
1. Design failure of Pedestrian pavement and sidewalk • There is no continuity in the pedestrian walkways • Uneven, broken and slippery surfaces are major hazards to the pedestrian • Narrow width of pavement and sidewalk • Poor placement of public utilities such as water meter and fire hydrant • Poor placement of street furniture restricts the flow • Illegal parking on the pavement is a major cause of the break up	• Lack of maintenance; • Lack of health and safety of pedestrian facilities; • Lack of legible movement pattern; • Lack of weather protection

and rapid deterioration of pavement surfaces	
2. Five foot ways • Sudden and extreme changes of level along the five footways contribute to major hazards for the pedestrians and limit usability of the pavement width • Obstructions from the adjoining premises such as overspill onto the five-foot ways for displays, and tables and chairs for extra seating for coffee shops • Informal street traders also utilize this area • Disjointed pedestrian walkways: • Activities by unlicensed hawkers and vendors that encroach into pedestrian walkways (KLCH, 2008) and existing parking lots. • Some buildings do not permit public access across their property boundaries, thus leaving little or no space for pedestrian movement (KLCH, 2008).	• Lack of enforcement from the authorities; • Lack of urban design guidelines; • Existence of barriers and obstructions in the existing pedestrian environment
3. Kerbs • Excessive and inconsistent height in many locations represent a major hazard and obstruction to the pedestrians	• Lack of regulation on the standard design specification; • Lack of monitoring during the construction
4. Drains • Uncovered and poorly maintained drains causing bad odours	• Lack of maintenance~~,~~; • Lack of urban design guidelines~~,~~
5. Pedestrian crossing • Inconsistent traffic signal systems at road junctions causing confusion and danger to the pedestrian • Non-functioning and obstructed traffic signals	• Lack of maintenance; • Lack of periodical monitoring of the signal systems
6. Pedestrian bridges • Many pedestrian bridges are in non-strategic locations in terms of main flow • Footbridges are at inconvenient locations • Difficult to access	• Lack of regulation on standard design; • Lack of urban design guidelines
7. Signage • Unclear and confusing signs • Poorly located signs	• Lack of comprehensive route guidance system
8. Public transportation • Difficulties accessing the transit rail stations • Difficult access to bus and taxi stations • Limited audio visual announcement • Disconnected links between rail infrastructure and major road to the adjacent areas.	• Lack of amenities for pedestrians and general users
9. Public toilets • Inadequate number of public toilets • Unclear information on location	• Lack of urban design guidelines

Seranta Awam, a recent public survey conducted by CHKL during the public hearing for the Amendment to Draft of Kuala Lumpur City Plan (KLCP) 2008, revealed that issues on connectivity and accessibility in the city drew the highest public concern (Amendment Draft KLCP, 2010). Based on public feedback, Kuala Lumpur city and Klang Valley have

emerged as non-pedestrian friendly cities. This is due to several deficiencies existing in the current pedestrian environment such as:

i) Poor pedestrian environment quality

ii) No comprehensive planning for the pedestrian network

iii) Poor maintenance on the pedestrian walkways

iv) No integration between buildings that could be accessed on foot, either via elevated or underground linkages.

These deficiencies are also seen as a drawback affecting public transport use among daily commuters for workplace travel into the CPA (PEMANDU, 2010).

3.4.5 Pedestrian's fear of traffic and street crimes

It cannot be denied that crime is of utmost importance to this study; the fact that the nation and public are gripped with fear due to the sharp increase in criminal activities, which is highlighted on a daily basis by the media, both electronic and print. Figure 3.27 depicts the statistics of crime in Malaysia over a period of 30 years (1973-2003), for various categories of crime such as violent crime, property crime, theft and burglary. According to Baharom (2009), it can be seen that the trends are more or less the same across all categories, showing similar upward and downward trends throughout three decades, reaching the highest at 2000. Figure 3.27 shows the growth rate of crime by various categories of crime, such as violent crime, property crime, theft and burglary, for the period 1974 – 2003, and a similar trend is observed (Baharom, 2009).

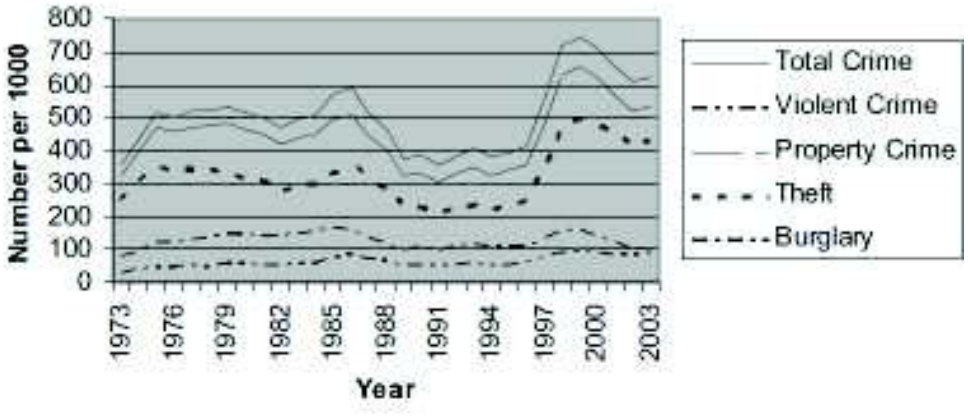


Figure 3. 28 Trend of Crime in Malaysia.
Source: Crime and Income Inequality: The Case of Malaysia, Journal of Politics and Law, Vol. 2, No. 1

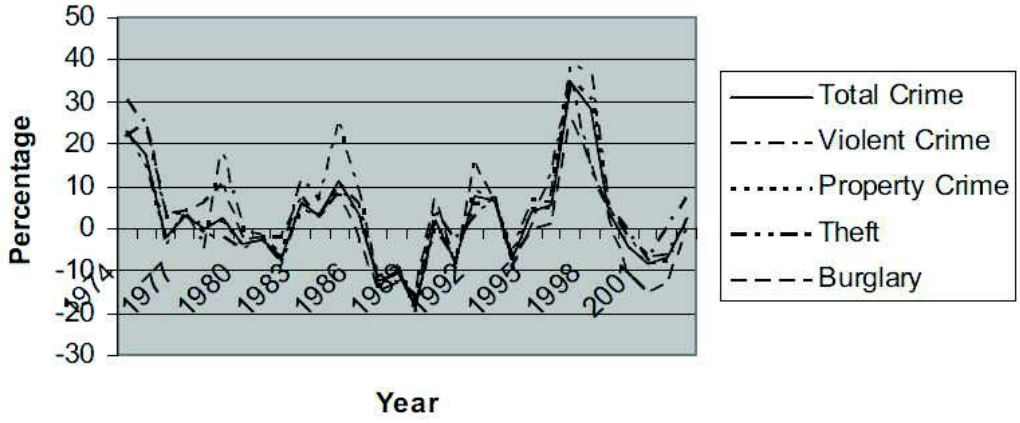


Figure 3. 29 Growth rate of Crime in Malaysia.
(Source: Crime and Income Inequality: The Case of Malaysia, Journal of Politics and Law, Vol. 2, No. 1)

Street crimes such as snatch thefts and unarmed robberies, which are the focus of this study, are mainly associated with pedestrian walking on sidewalks. Most snatch theft incidents involve purse-snatchings in urban spaces where pedestrians walk on narrow sidewalks and end up very close to the street. Women walking by themselves or with children, as well as men, who walk or jog alone, are common targets.

3.5 Existing Policies and Guidelines Governing the Pedestrian Environment in Kuala Lumpur

Policies and procedures are designed to influence and determine all major decisions and actions, and all activities that take place within set boundaries. Procedures are the specific methods employed to express policies in action in day-to-day operations of the organization. Together, policies and procedures ensure that a point of view held by the governing body of an organization is translated into steps that result in an outcome compatible with that view.

This section reviews the policies, programs, guidelines and standards adopted by the government that are likely to stimulate walking in KL city. The existing measures undertaken by the government will also be discussed in order to understand the relationship between pedestrian environment issues and relevant policies that relate to walking to work in the KL pedestrian environment. For example, one of the pedestrian issues is *safety*. Rietveld (2001) claimed that this is the most important issue influencing the creation of policies to stimulate the use of Non-Motorised Transport (NMT) modes over motorised vehicles in developed and developing cities. He suggested that

governments have various means to stimulate the use of NMT modes through policies and guidelines.

i) Comprehensive Development Plan

The Comprehensive Development Plan (CDP) for Iskandar Malaysia addresses socio-economic development in a sustainable and holistic fashion, with particular emphasis being placed on creating a healthy investment climate that is attractive to local and foreign investors.

ii) Kuala Lumpur Structure Plan 1984 (1980-2000)

This was the first structure plan commissioned and published by the City Hall of Kuala Lumpur (CHKL) in 1984. Kuala Lumpur City Hall (KLCH) (known in Malay as Dewan Bandaraya Kuala Lumpur (DBKL) is the government agency appointed under the Federal Territories Ministry of Malaysia, charged with responsibility for the administration of Kuala Lumpur (KLCH, 2004). The physical development of Kuala Lumpur was guided by the first structure plan commissioned and published by the City Hall of Kuala Lumpur (CHKL) in 1984 and revised in 1994. The Plan has a perspective period of 20 years, up to the year 2000, and will be reviewed periodically (KLCH, 2004).

The KLSP 1984 set out a policy on upgrading of the landscape of the pedestrian routes along the streets and rivers under the heading of 'beautification of the city'. KLCH acted as the body responsible for all tree planting and landscaping work which was guided by the 'Streetscape and Townscape' policy as follows:

LC 5: *The authority shall intensify the programs of roadside plantings and landscaping of open spaces and recreation areas.*

Another area related to the provision of pedestrian facilities was through rehabilitation and landscaping work, known as the CHKL River Beautification Program. The program involved three major rivers which pass through the CPA namely Sungai (River) Klang, Sungai Gombak and Sungai Batu. The rehabilitation and landscaping work was guided by the 'Environment Improvement' policy:

LC 7: *The authority shall ensure the landscaping of river reserves and the rehabilitation of ex mining lands.*

KLCH also drew up two proposals in the Structure Plan to improve the major streets in the Golden Triangle Area (GTA), which is located in the centre of Kuala Lumpur and is bordered by Jalan (Street) Bukit Bintang and Jalan Sultan Ismail. The proposals have laid

out the conceptual planting plans and the proposed street furniture; however they have not been implemented (JICA, 1999). The 1984 KLSP policies have done little to promote walking. On the contrary, over time the transportation and land-use policies have made walking less feasible, less convenient, and more dangerous to the pedestrian (Beinart et al, 1985) as discussed in section 3.2.3.

The review of Kuala Lumpur Structure Plan 1984 (KLSP 1984) development strategies indicates that the strategy for Central Planning Area, which is to relieve some of the pressures on the CPA by directing more growth towards the new growth areas, has not been entirely successful. Commercial development has continued to increase in the CPA while residential development and open space have both declined significantly. Land for commercial use has been mainly obtained by the rezoning of residential land. As a result of the intensification of commercial development in the CPA and the outmigration of the residential population to other growth areas in the Klang Valley Region in search of more affordable housing, the number of private vehicles coming into the CPA has increased causing severe traffic congestion, thus putting additional pressure on the road infrastructure (Burton and Muhamad, 2002).

iii) Improvement Program, KLCH 1996 -2000

In 1996, in response to severe traffic congestion in the city centre of KL, KLCH in association with Japan International Co-operation Agency (JICA) undertook a major two-year study on "Integrated Urban Strategies for Environmental Improvement in Kuala Lumpur" and formulated a master plan for Kuala Lumpur's transportation system. Based on the Master Plan, a "Pedestrian Friendly City Project in Kuala Lumpur" was launched and proposed a transition from automobile transport to public transport by achieving a pedestrian friendly city concept (JICA, 1999; Townsend, 2003).

According to Bachok et al. (2004), KLCH allocated over RM11.0 million (USD2.8 million) for the reconstruction, redevelopment and provision of new pedestrian facilities in the year 1998. Most of the budget was used to improve the pedestrian facilities along and around the shopping streets. Bachok (2004) continues that these efforts gave new hope to the public that they would be able to conveniently walk everywhere. There was also a strategy to segregating vehicle traffic and pedestrians, with the aim of improving traffic movement and increasing pedestrian safety. However, the pedestrianisation

improvement project has overlooked the pedestrians' behaviour (Bachok et al., 2003). Bachok comments further that the study by JICA and CHKL emphasizes 'hard issues' which have to do with finding ways to overcome the physical barriers and obstructions in the pedestrian environment. The study also neglected the 'soft issues' such as people's experiences and perceptions when walking in their pedestrian environment.

Other improvement works done within this program included the upgrading of the existing flexible paving surfaces made of interlocking bricks and replacing them with new rigid structure paving materials such as granite, concrete and clay tiles. The improvement works also aimed to provide five feet of unobstructed width for the pedestrian, with high kerbs to prevent vehicles driving over pavements. Although the plan had considered the installation of street furniture, it still lacks urban design details that would make walking conditions more users friendly (KKLCH, 2004).

iv) Kuala Lumpur Structure Plan 2020 (2000-2020)

Most of the developments and rapid changes in the urban form of Kuala Lumpur city that took place during the economic boom were not anticipated in the 1984 KLSP (KLSP, 2004). In fact, most of the policies of the 1984 KLSP were rendered obsolete by more recent mega developments (Omar and Ling, 2009). For this reason the previous KLSP needed a revision and in 2003, the preparation of the Draft KLSP 2020 began. By 2004, the Kuala Lumpur Structure Plan 2020 was formally launched. According to Omar and Ling (2009), the KLSP 2020 will act as a reference for the urban development that is to include the Malaysian "Vision 2020", emphasizing the vision to transform KL into "a world class city" (refer to section 3.2.4).

In the KLSP 2020, the NMT mode is finally recognized as being of central importance, and has been fixed under transportation policy, TT 17 as follows:

> "To develop specific guidelines and standards to provide for the needs of the aged and handicapped to be applied to pedestrian networks, new public transport terminuses and stations as well as multi-modal interchanges" (KLCH, 2004).

Pedestrian issues, especially the provision of pedestrian amenities such as streetscapes, urban spaces and pedestrian linkages, have been assigned to the urban design and landscape sector. In response to the pedestrian issues discussed in section 3.4.4., several

pedestrian policies have been formulated for the streetscape (UD 6), urban spaces (UD 13) and pedestrian linkages (UD 16, 17 and 18) as in the table 3. 7 below:

Table 3. 7 Policies regarding pedestrianisation in KLSP 2020 (City Hall Kuala Lumpur, 2004)

Policy	Kuala Lumpur Structure Plan [KLSP] 2020
Transportation TT 17	To develop specific guidelines and standards to provide for the needs of the aged and handicapped to be applied to pedestrian networks, new public transport terminuses and stations as well as multi-modal interchanges
Streetscape UD 6	To implement measures to improve the visual definition, continuity and streetscape character of the major road networks, to provide greater coherence and legibility within the urban areas.
Urban spaces, nodes, plazas and parks UD13	To provide and designate places for informal civic and cultural use in the City Centre.
Pedestrian linkages UD16	To designate and implement pedestrian friendly street networks and green pedestrian networks within the City Centre, urban centres, major activity nodes and areas surrounding transit nodes which also cater for the needs of the aged and the handicapped.
Pedestrian linkages UD17	To construct a system of continuous covered walkways linking major activity centres in the City and in areas of high pedestrian activity.
Pedestrian linkages UD18	To ensure the adequate provision of pedestrian connections where major road or rail infrastructure has disconnected linkages between adjacent areas.

Although the policy does not state climate as a factor, it is implied in recent projects conducted by the Kuala Lumpur City Hall with consideration to pedestrians such as the sky bridge in KLCC and several covered walkways in many parts of the city. There are at least four categories of pedestrian linkages in the existing pedestrian environment in KL city (Leong, 2010):

i) Sidewalks at the street level;

ii) Covered pedestrian walkways connecting to rail transit;

iii) Covered walkways in front of schools; and

iv) Pedestrian sky bridges connecting buildings to buildings.

Currently, KLCH has undertaken several initiatives to further improve the pedestrian network under KLSP 2020's policies; they are enumerated as follows:

- Continuous pedestrian covered walkways around the rail transit station, initiated by the STAR, PUTRA LRT and Monorail under privatization project by Syarikat Prasarana National Berhad (SPNB) (Leong, 2010).

Despite the government's measures to improve public transportation by incorporating an integrated transportation system involving several rail networks with the pedestrian network under the TT17 policy, Zakaria (2008) asserts that the use of public transport is still declining. Jusoh et al (2009) have claimed that there is a lack of pedestrian linkages connecting the existing transit stations to the surrounding area. Likewise, access routes to the railway and LRT stations are not well planned for pedestrians (Dissanayake et al., 2012). In addition, Jusoh et al. (2009) observe that there is a lack of pedestrian covered walkways to protect the walkers from the sun and rain. He states that this is a drawback for the use of public transportation, as it limits the use of NMT as part of multi modal means of workplace travel.

Kennedy and Hossain (2006) in their study on the "Fuel Price Elasticity of Travel Demand in Klang Valley" said that the reliability of the public transport service has received the highest number of "poor" marks, followed by quality of service and ease of access. Ease of access is influenced by the availability, adequacy, and design of the infrastructure at public transport stations, such as covered waiting areas, working escalators or lifts, connecting pedestrian walkways etc. Kennedy and Hossain (2006) have added that the quality of services encompasses the comfort level on the buses and trains, friendliness and efficiency of staff, ticketing services, etc. Reliability refers primarily to the confidence level among users that a bus or train will arrive, depart, and reach the final destination in a predictable amount of time especially during the morning and evening peak hours. Although at the time this study was conducted, the government had announced the increase of the fuel price by 18.5%, the majority (72%) of commuters in the Klang Valley were reluctant to make the switch from driving private cars to taking public transport as the main mode of their journey to the workplace (Burton and Mohamad, 2002)

- Pedestrian walkways and sky bridges complete with air conditioning systems and total separation between motorized vehicles and pedestrian movement.

The federal government has an allocation of RM100 million under the mini-budget tabled in Parliament under the 10th National Budget, for the construction of sky bridges and covered walkways between buildings (Bavani, 2009). The FTKL Mayor has announced joint collaboration projects between KLCH and private sector organisations such as Syarikat Prasarana Nasional Berhad (SPNB) and PETRONAS. SPNB will complete six linkages in the city centre by the end of 2010 as part of its broader public transport investment programme, while a PETRONAS-led effort to complete an elevated walkway around the KLCC area will be completed by 2011 (Government Transformation Programme Report, 2012). It is believed that once completed these efforts will offer connectivity to offices blocks, malls, hotels, and train, rail and bus terminals as shown in Figure 3.30.

Figure 3. 30 Elevated walkways connecting KL Convention Centre and Pavilion Mall

This initiative has, however, caused some public debate on the necessity of the projects, as they have been found by some to be purely cosmetic, rather than addressing real pedestrian needs. The public also believe that building concrete and glass walkways with air conditioning systems will only generate significant amounts of heat outside the walkways, thus making the city even more inhospitable. Apart from this, they also questioned issues such as energy utilisation and long-term maintenance costs (Ahmad, 2009).

3.6 Summary and key findings

Chapter 3 provides an in-depth look into Kuala Lumpur, which is the context of the research. During the colonial period, Kuala Lumpur city was highly walkable; walkability

was in fact central to the essence of the city (refer section 3.2.2). However, this essence disappeared through a series of changes and developments, especially during the transformation era after the country's independence in 1957, followed by the economic boom during 1960 to 1980 (refer section 3.2.3) and the globalization of the 1990s (refer section 3.3.4).

At present, the city is in extreme danger of becoming overly automobile-friendly rather than pedestrian-friendly city, due to problems and issues such as the deterioration of walking conditions because of piecemeal development; rapid motorization leading to declining pedestrian mode share; and underestimation of Non-Motorised Transport (NMT) modes in KL travel surveys. Problems and issues faced by pedestrians in the existing urban fabric, as well as pedestrian's fear of traffic and of street crimes have contributed to the deterioration of the urban environment in Kuala Lumpur city. It has been established that issues related to walking and the pedestrian environment are categorised generically as non-motorised transport in the existing policies; however, specific issues relating to pedestrian environments in the context of daily use are not well established. Furthermore, policies relating to the incorporation of walking to work as part of transport modes are also absent in the existing policies. The diagram below illustrates the emerging key findings obtained in Chapter two, combined with the current scenarios discussed in Chapter 3 (see figure 3.31).

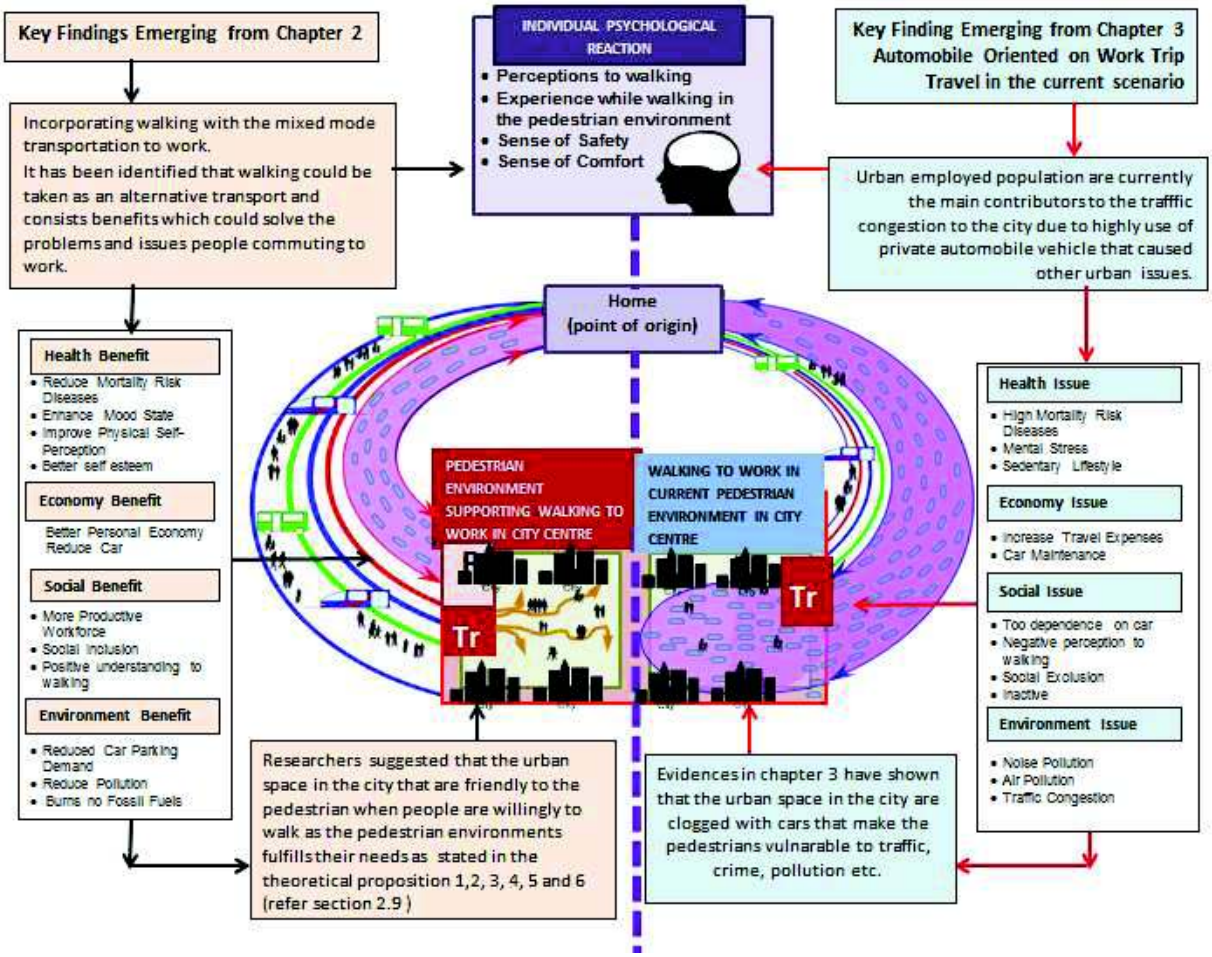


Figure 3. 31 A graphic representation of the key findings of chapter two and chapter 3 showing the current state of problems and issues of this research.

The diagram above depicts people using private vehicles to access their workplace in the city centre, in purple on the right hand side of the diagram. The evidence gathered from the existing literature has shown that walking to work in the current pedestrian environment in Kuala Lumpur city is challenging due to the unfriendliness of the environment to pedestrians.

CHAPTER 4. RESEARCH METHODOLOGY

4.1 Introduction

Chapters two and three provided a comprehensive literature review to address the main research issues. Chapter four provides an insight into the research methodology adopted for the purpose of this PhD study. The chapter is organized as follows:

i) Discussion of research methodology.
ii) Presentation and description of the overall methodological framework of this study.
iii) Statement of the research philosophy and the approach taken in this study. This includes a justification for and the reasoning behind the selection and implementation of the proposed methodology. A discussion of the case study design then follows.
iv) Discussion of data collection and analysis techniques. This includes the use of computer aided software for qualitative data analysis (CAQDAS).
v) Presentation of the applicability of the case study design to the study.

4.2 Understanding the Research Methodology

Research is about creating new knowledge in all disciplines (Gillham, 2000). The roots of any research lie in the methodology (Grix, 2001). The ancient Greeks termed it as *methodos*, which has two meanings: 'the path towards knowledge' and 'reflections on the quest for knowledge-gathering' (Grix, 2001). According to Kumar (1999), research is a process of collecting, analysing and interpreting information to answer questions. In this applied research context, it is a systematic and organized effort to investigate a specific problem that needs solutions (Sakaran, 2007). Yin (2011) suggests systematic and organised research should be able to be conducted empirically. He adds that empirical study involves:

i) Defining a particular area to be investigated;
ii) Collecting relevant data;
iii) Analyzing and interpreting the results; and

iv) Drawing conclusions based on the empirical findings.

Hart (1998) defines methodology as a system of methods and rules to facilitate the collection and analysis of data, which acts as a starting point for selecting an approach based on theories, ideas, concepts, and definitions of the topic. It is therefore the basis of a critical activity consisting of making choices about the nature and character of the social world (assumptions) (Hart, 1998). According to Collis and Hussey (2003) methodology embraces the overall approach of the research process, from the theoretical underpinning, to the collection and analysis of the data. Grix (2001, p36) asserts that methodology is driven by certain ontological and epistemological assumptions and consists of research question or hypotheses, a conceptual approach to a topic, the methods to be used in the study – and their justification – and, finally, the data sources. Grix (2001) continues that all of these components are inextricably linked to one another in a logical manner.

Several authors such as Kagioglou et al., (1998 & 2000), Saunders et al., (2007) and Keraminiyage, (2009) share their views on the methodology of the research process. They posit that there is a series of stages or layers that gives a sense of a 'sequence' to the overall research framework. Kagioglou et al. (2000) for example, introduce a 'nested' research methodology to help researchers to understand the relationships and integration of ideas within the research process and to be familiar with each component in the research methodology, to better recognize the importance of and connection between each component in order to organise the research process in a logical and flowing manner, as illustrated in figure 4.1 below.

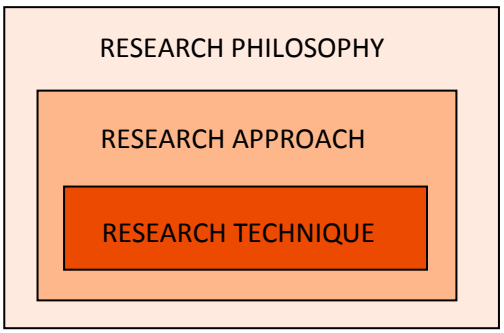


Figure 4. 1 Research Model (Sources: Nested Approach by Kagioglou et al. (2000))

4.2.1 A Methodological Framework

A methodological framework is used in research to outline possible courses of action and to present a preferred and reliable approach to an idea or thought within the research subject area. It is viewed as a reference guideline that can be used to solve or address the complex issues under study. The framework, developed from the broad literature review, also ensures that the objectives are set for study. Gray (2009) explains that the framework helps establish the boundaries for research.

This current piece of research is interested in exploring the way people respond to their daily commute to the workplace from home; the methodological framework can be specified at the beginning of the research without knowing the responses of the subjects under investigation (Sarantakos, 2005). Sarantakos (2005) suggests that this type of framework allows the researcher to set the path of the research using specific methods and techniques, and to remain committed to the research design in a creative way. The framework helps the researcher to understand what their study intention is, what setting to investigate, how and when, which actors to approach, which processes to consider, what types of events to record and what instruments to engage (Benini (2000) cited in Sarantakos (2005)).

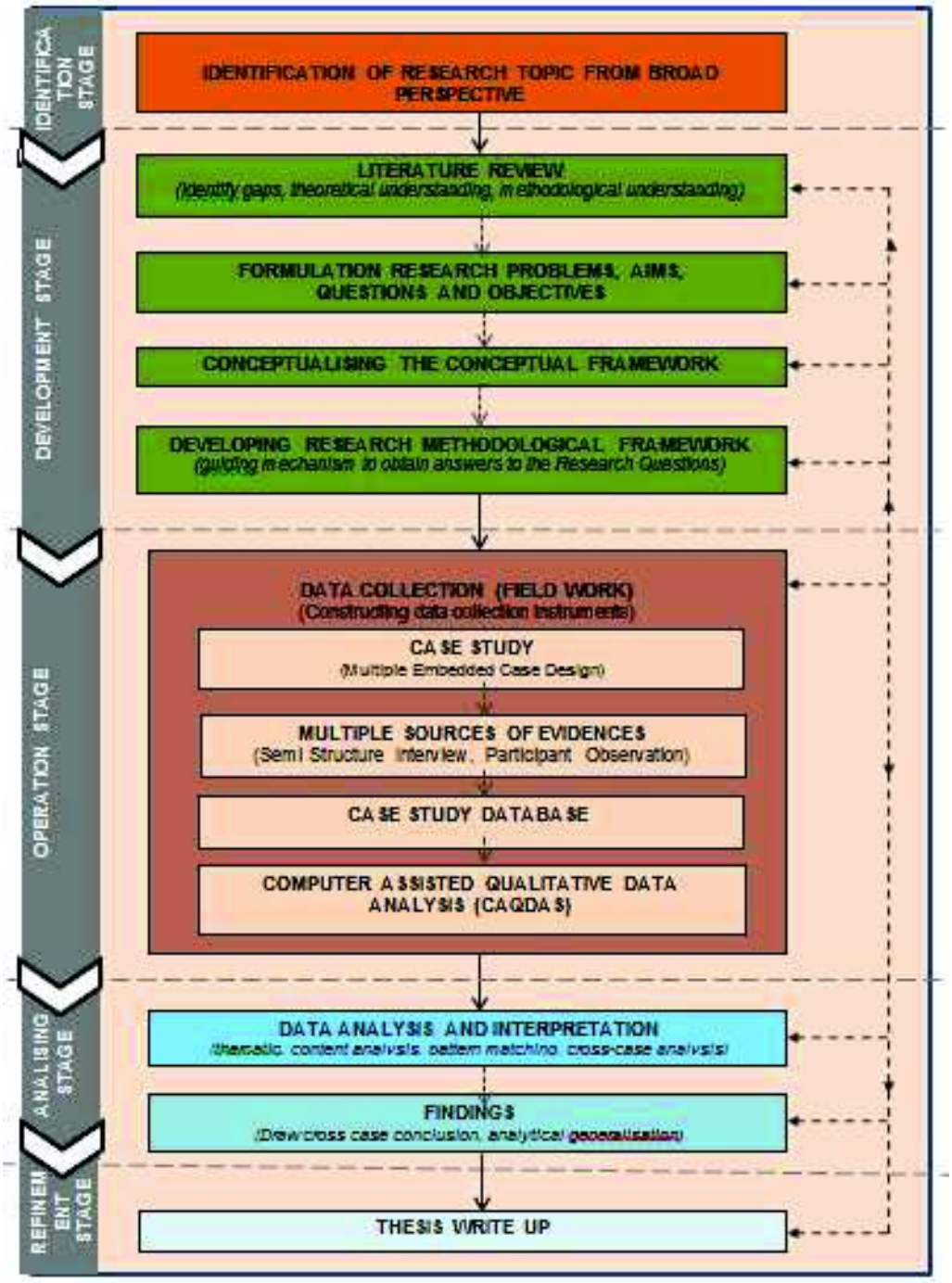


Figure 4. 2The methodological framework formulated for this research adapted from Sarantakos (2005).

The methodological framework followed within this study is illustrated in Figure 4.2. The framework has demonstrated the basic stages for a qualitative research process which includes nine steps, namely identification of the research topic from a broad perspective, literature review (an on-going process); the research problem; case study design; data

collection; data analysis; and finally the write up. Each of the steps undertaken in this research will be discussed next.

4.3 Identification Stage

Choosing the research topic is the first stage undertaken by the author; this also takes into account how the author arrived at the research problem. The author's experience and background as an architect, urban designer and academician in architecture education, helped her to identify the research gap. The author developed an initial idea and later thoroughly reviewed the literature relating to issues of walking in the pedestrian environment, before discussing the gaps in knowledge exposed by the literature review. According to Bloomberg and Volpe (2008) and Sarantakos (2005), the topic should be essentially within the researcher's research interest, and should correspond to their capabilities and abilities.

It is necessary to have a thorough knowledge of other studies of the subject area, to be able to identify the specific research area and the research problems which will be explored. This also allows the author to refine the topic and make it clear and specific. The following subsection shows how the researcher moved from the initial research idea to the literature review, in order to arrive at the research problem relevant to the study.

4.3.1 Literature review

Second in importance to the identification of the research topic is the review of the existing literature in the chosen field. A literature review is integral to the success of academic research, and is regarded as a fundamental process in research in all subjects irrespective of the discipline (Hart, 1998). Hart (1998) defined the literature review as;

> "…*the selection of available documents (both published and unpublished) on the topic, which contain information, ideas, data and evidence written from a particular standpoint to fulfil certain aims or express certain views on the nature of the topic and how it is to be investigated, and the effective evaluation of these documents in relation to the research being proposed*" (Hart, 1998).

After choosing the topic, the author conducted a literature review aimed at providing an in-depth understanding of the subject area being studied. Grix (2001) claimed that conducting a literature review allows the researcher to '*get a feel for the state of the art*' on and around the general topic under study, assess the feasibility of the research project, and narrow down the research focus. By going through this process, the author will be able to think critically about exactly what needs to be researched, and if there is a real need for the study to be carried out.

The literature review encompasses three functions as discussed below:

i) **Brings clarity and focus to the research problems.**

This can be done by evaluating research ideas with several critical questions as Hart (1998) suggests in the diagram shown in Figure 4.3. Answering the questions helps the researcher to achieve the necessary level of critical thinking

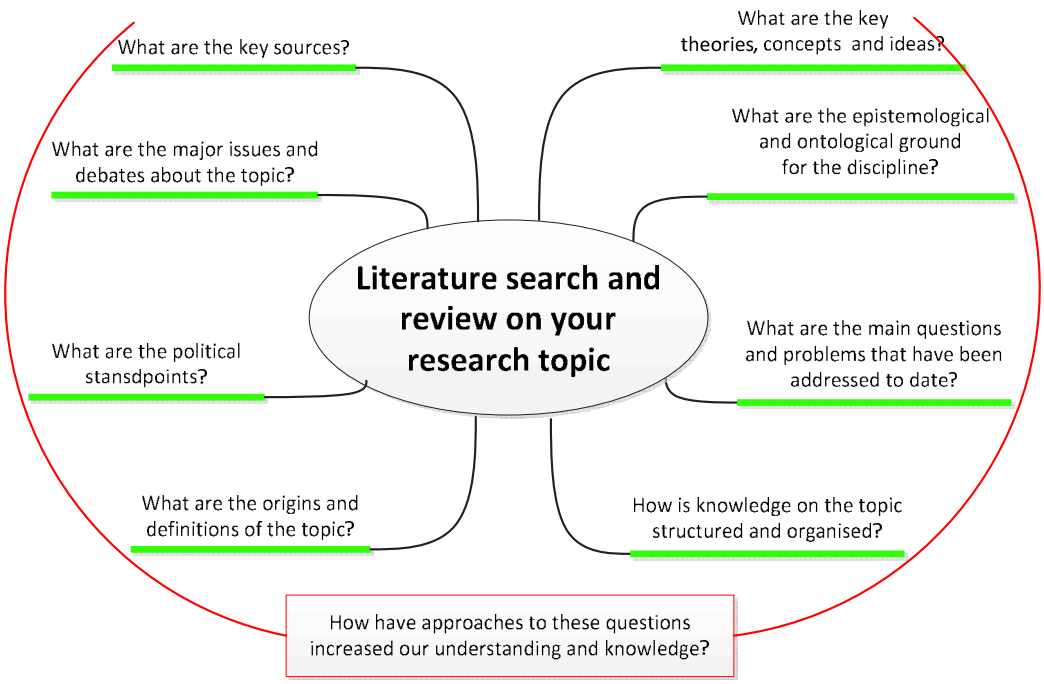


Figure 4. 3 A systematic exploration through a list of enquiries suggested by Hart (1998).

ii) Improves the research methodology.

Going through the existing literature on the subject will expose the researcher to the methodologies that have been used by others in order to find answers to research questions similar to the ones under investigation (Kumar, 1999). This will enable the researcher to demonstrate familiarity with the topic of inquiry (Hart, 1998). Collis and Hussey (2003) suggest that the literature search gives some guidance on the overall approach to the research process from the theoretical underpinning to the collection and analysis of data. Leedy and Ormrod (2005) stated that it can help the researcher to interpret the results and relate them to what is already known in the field.

iii) Broadens researcher's knowledge base in the research area.

Grix (2001) points out that the literature review represents the sum of current knowledge and understanding on the topic under study. It also assists the researcher in identifying a gap in the literature, thus justifying the research contribution (Grix, 2001). The literature also provides the researcher with the theoretical base which helps to build the rationale for his or her study (Leedy and Ormrod, 2005). Flyvbjerg (2004) distinguishes two types of knowledge - theoretical knowledge and practical knowledge. Theoretical knowledge is context-independent whereas practical knowledge is context dependent. Context-independent refers to the kind of knowledge that forms the basis of textbooks and computers. On the other hand, context-dependent refers to the knowledge that allows people to develop from rule-based beginners to experts. Similar to Flyvbjerg's knowledge theory, Wallace and Wray (2006) have developed the idea of 'comprehensive knowledge', explaining the social world being made up of theoretical knowledge, practice knowledge and research knowledge.

Theories, models, concepts, perspectives, ideologies, and assumptions are the tools for thinking employed in generating, questioning and creating the three kinds of knowledge shown in Figure 4.4.

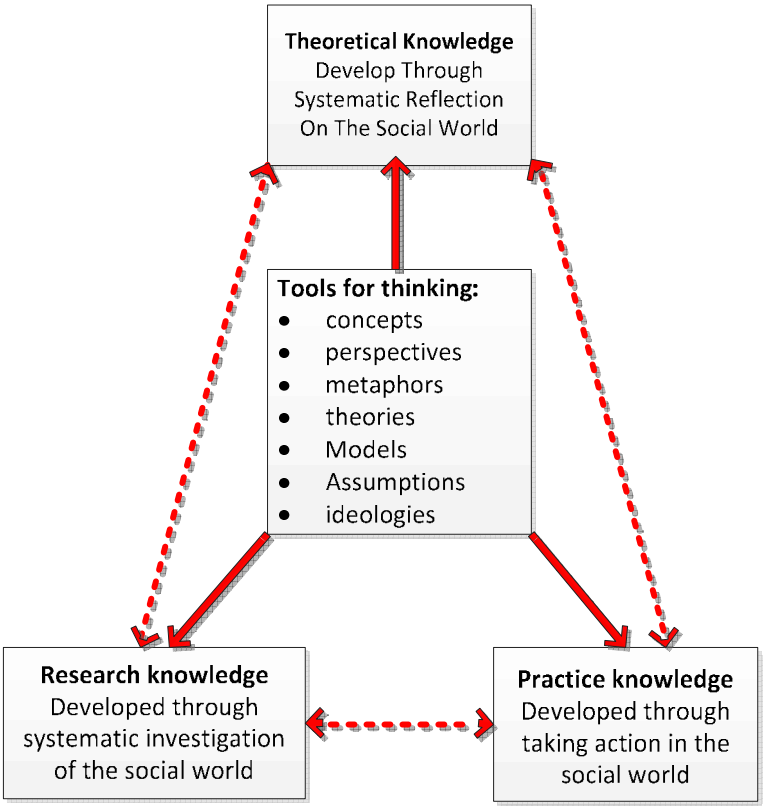


Figure 4. 4 The creation of three kinds of knowledge about the social world as a 'Tools for thinking' (Wallace and Wray, 2006).

The three functions of knowledge suggested by Wallace and Wray are applied to the second, third, fourth and fifth steps in the research process in this study as shown in Figure 4.2. The literature reviews in Chapter two and three have a variety of issues in relation to incorporating walking as part of transportation mode to the workplace, providing the author with the *theoretical knowledge, practice knowledge and research knowledge* needed to conduct the study.

4.4 Development Stage

The next step involves the formulation of research problems, research aim, research questions and research objectives, as well as conceptualising the conceptual framework of the study and developing the research methodology design framework. These steps are grouped under the title 'development stage'.

As mentioned in the methodological framework (Section 4.2.1), there are several types of methodologies which can help the researcher conduct the research, and the nature of the research usually identifies the most appropriate methodologies. This PhD research adopts the "nested" research model developed by Kagioglou et al. (2000). In the nested model, there are three elements that aid the understanding of the research methodology, namely Research Philosophy, Research Approach and Research Techniques, which are organised in hierarchical layers, that is, the outer, middle and inner layers. These three research elements explain the way theories are layered or nested, and are contingent on the context of research under investigation (Ely, 2001 p. 232).

The outer layer represents the research philosophy which defines the underlying assumptions of the study and functions as a guide to the appropriate selection of the research approach in the middle layer. The research techniques in the innermost layer are the tools used in line with the selected research approach (see Figure 4.4).

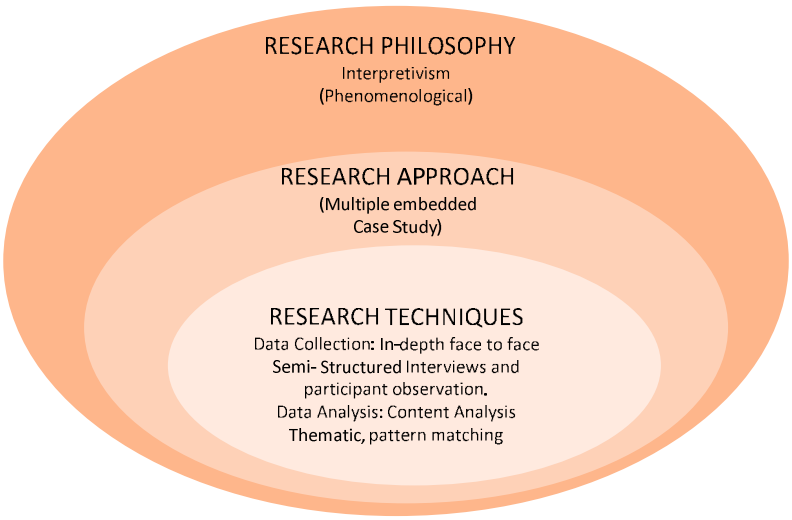


Figure 4. 5 The nested approach and the employment of each element of methodology in this study (Adapted from Kagioglou et al., 2000).

The next sections explain the components in the methodological approach undertaken for this research.

4.4.1 Research Problem

Leedy and Ormrod (2005) claimed that the research problem is as the heart of the research process. In this step, the research questions are developed to assist in understanding the issues and bringing focus to the problem at hand. The research questions then provide some direction in formulating the research objectives, leading to the adoption of either the descriptive, correlational, exploratory or explanatory type of research.

According to Kumar (1999) *the source of research problems* may revolve around four 'P's - *people, problems, programme and phenomenon*. Kumar (1999) continues that in social science research, there are two aspects of study - the 'study population' which is about people and the 'subject areas' which cover the other three 'P's as shown in Table 4.1.

Table 4. 1 Sources of a research problem (Kumar, 1999)

Aspect of study	About	Study of
Study population	People	Individuals, organizations, groups, communities
Subject area	Problem	Issues, situations, associations, needs, population, composition, profiles, etc.
	Program	Contents, structure, outcomes, attributes, satisfaction, consumers, service providers, etc.
	Phenomenon	Cause and effect relationships, the study of a phenomenon itself, etc.

The research problems in this study are derived from *people* and *phenomenon*; these are considered most appropriate for this study for the following reasons;

i) **People** - the employee as the pedestrian who performs purposive walking daily. The researcher believes that no single reality underlies their perception towards walking as a mode of transportation to their workplace. Instead, different individuals may have constructed the nature of walking differently. Therefore the information will be collected from the people who are employees.

ii) **Phenomenon** – the problems revolving around the pedestrian environment issues which appear to have a significant relationship to the walking behaviour. The research enquiry revolves around these unique relationships involving experiences

of an individual walking to the workplace in their built environment during peak hours of lunch break and closing time.

Because this research seeks to understand how people construct the meaning of walking to work, and how they understand their travel behaviour, the qualitative approach has emerged as the most appropriate research approach, based on *the source of research problems* discussed in Chapters Two and Three. The selection of the research approach is discussed next.

4.4.2 Research Philosophy

The research approach is largely influenced by the philosophical stances adopted in the study. The research philosophy embraces important assumptions about the way in which we view the world. This is dependent on the researcher's thinking and assumptions about the progress of knowledge (Saunders et al, 2003). According to Saunders et al. (2007) the philosophy that one adopts in research will be influenced by practical considerations with a particular view of the relationship between knowledge and the process by which it is developed. Kagioglou et al., (2000) stress that the research philosophy provides a guiding context for the research approach and research techniques as shown in Figure 4.2. Amaratunga et al. (2002) highlight that research could mean different things to different people and suggested that research is:

- a process of enquiry and investigation;
- systematic and methodical; and
- knowledge generating.

Research is a process of "finding out something you don't know" (Phillips and Pugh, 2004). A research project is a piece of research undertaken, consisting of a thesis to describe something that you wish to argue and a position that you wish to maintain. Arguing a position means the study must have a storyline, a coherent thrust that pushes along argument, an explanation, a systematic set of inferences derived from new data or new ways of viewing current data. A thesis must add something to the existing knowledge (Phillips and Pugh, 2004). However, a PhD student will add only a few grains of new knowledge to an already established mountain (Remenyi et al., 1998). According to Esterby-Smith et al., (1991), failure to think through philosophical issues can seriously affect the quality of management research.

There are a number of philosophical stances such as *ontology, epistemology* and *axiology.* Creswell (1994) points out that researcher make claims about what is knowledge (ontology), how we know it (epistemology), what values go into it (axiology), how we write about it (rhetoric); and the process for studying it (methodology). Sarantakos (2005) affirmed that the combination of ontology, epistemology and methodology is a prescription for social research 'packaged' in paradigms which guide the everyday research. The research philosophy is primarily concerned with the assumptions that a researcher brings to an investigation, which will be discussed next.

4.4.2.1 Ontological Perspectives

Ontology seeks to identify the nature of reality, while epistemology demonstrates how we acquire and accept knowledge about the world, and axiology is about the values the researcher places on the study (Collins and Hussey, 2003 and Easterby-Smith et al., 2002). Ontology is the study of being, that is the nature of existence (Gray, 2009). Interestingly, Johnson and Duberly (2000) view research as a subject and the researcher as an indicator of ontological and epistemological assumptions on which a given study is 'based'.

Sarantakos (2005) suggests ***realism*** and ***social constructivism*** are examples of ontological positions that can be taken in research. Sarantakos (2005) continues that the essence of realism is that the existence of reality is independent from our consciousness and experience, and that objects have an existence independent of a human mind (Saunders et al, 2007). According to Sarantakos (2007) human beings are shaped by their social world. This differs from the positions taken in realism, social constructivism and idealism, where the belief is that reality is constructed through meaning, which means taking into account the world around us and gaining impressions based on culturally defined and historically situated interpretations and personal experiences (Sarantakos, 2005). The ontological perspective undertaken for this research is as follows:

Social constructivism and Phenomenological consideration for this research

The nature of this research is to explore the factors that may influence people when walking to their place of work in the employment area within the city, by considering the employee's experiences and perceptions while walking to work and/or to lunch break.

Guided by the literature, the author believes that walking is an essential physical activity manifested in our everyday life. For the employee, walking for the purpose of transportation to the workplace is a complex phenomenon by itself (Shay et al, 2003 and Handy, 2006). According to Shay et al (2003), adding on to this complexity is the relationship between the way people travel and the external physical built environment; it is apparent that the employees have to deal with multidimensional aspects of transport and travel in their real life context.

This research is also centered on the subjective meaning of an individual's (employee's) belief as to whether walking can or cannot be part of a transportation mode for travel to their workplace. Further, this research seeks to understand how the quality of the pedestrian environment influences their perception of walking, expectations while walking, and the decision to walk. All these factors reflect the idea that individuals construct their reality, as suggested by Sarantakos (2007, p37), who states that:

- the nature of reality is a construction of meanings by people who live in it;
- the meanings are not fixed but emerge out of people's interaction with the world;
- the meanings do not exist before a mind engages them; and
- the world is constructed by the people who live in it.

The illustration in Figure 4.4 below shows an ontological position which inclines towards social constructivism, as adopted for this study.

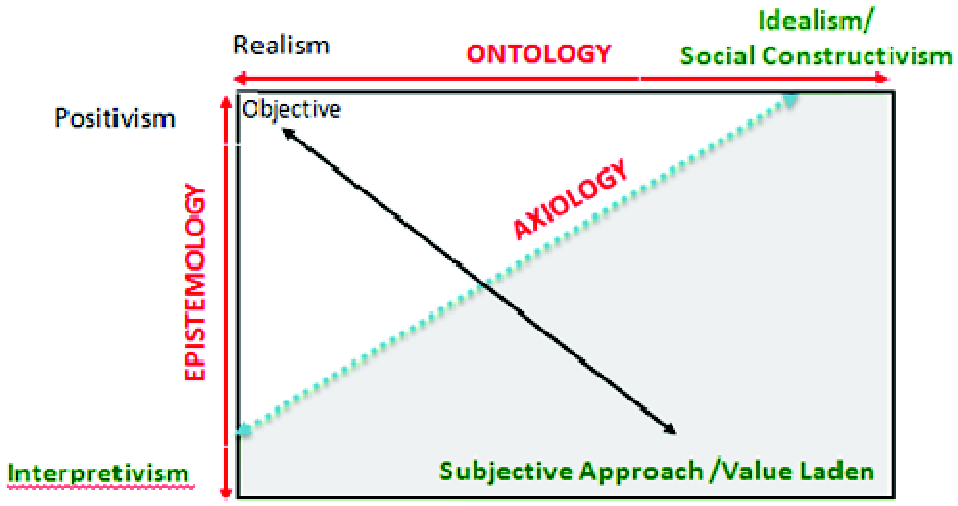


Figure 4. 6 Dimension of research philosophy adapted from Sexton and Barrett (2003).

4.4.2.2 Epistemological perspectives

Epistemology is a way of understanding and explaining how we know (Cresswell, 2003) and a branch of philosophy that considers the criteria for determining what constitutes and what does not constitute valid knowledge (Gray, 2004). A researcher's epistemology, according to Holloway (1997), Mason (1996) and Creswell (1994), is literally the theory of knowledge, which serves to decide how the social phenomena will be studied. In other words, epistemology asks: How can we claim to know that something is true or false? It is a theory of knowledge embedded in the theoretical perspective and thereby in the methodology (Crotty, 1998). According to Easterby-Smith et al. (2002) epistemology is important for two reasons:

i) It could help to clarify issues of research design - the overarching structure of the research including the kind of evidence that is being gathered, from where, and how it is going to be interpreted.

ii) Knowledge of research philosophy will help the researcher recognize which designs will work (for a given set of objectives) and which will not.

There are a number of research stances in social science. Saunders et al., (2007) have identified ten different types of research stances, namely: Positivism, Realism, Interpretivism, Objectivism, Subjectivism, Pragmatism, Functionalist, interpretive, Radical humanist and Radical structuralist. However, Easterby-Smith et al. (1991), Saunders et al. (2007) and Gray (2009) have emphasized the importance of two main epistemological positions, ***positivism*** and ***interpretivism (phenomenology)*** that could be used for guidance in research**.**

According to Easterby-Smith et al. (2002) *interpretivism* is mainly a reaction to the application of positivism to the sciences, which stems from the view that 'reality' is not objective and exterior, but is socially constructed, and given meaning by people. *Interpretivism* is concerned with feelings and attitudes as social phenomena which have no external reality (Saunders, 2007). The term *interpretivism* has also been referred to as a *phenomenological paradigm* (Collis and Hussy, 2003). This stance, emphasising the production of meanings and understanding the special views of actors, is called local meaning (Pfeifer, 2000). In contrast, positivism looks at the reality that is represented by

the objects that are considered to be 'real'. Gray (2009) lays out the essence of positivism in three arguments which contrast with *interpretivism* as follows:

- reality consists of what is available to the senses – that is, what can be seen, smelt, touched, etc.;
- inquiry should be based upon scientific observation; and
- the natural and human sciences share common logical and methodological principles, dealing with facts and not with value.

According to this stance, researchers and objects have separate existences and for that reason, the researchers argue that the data collected are far less open to bias and therefore more 'objective'. The contrasting characters of these two epistemological research approaches are summarized in Table 4.2.

Table 4. 2 Contrast between positivism and interpretivism [Adapted from Easterby-Smith et al. (2002) and Gray (2009)]

	POSITIVISM	**INTERPRETIVISM**
Ontology	Realism/ Objectivism	Idealism/Social Construction
Epistemology	Positivism	Phenomenology
Basic Beliefs	The world is external and objective; Observer is independent - the observer is independent of the phenomenon and neither affects nor is affected by the subject being observed; and Science is value free -the choice of what to study, and how to study it, can be determined by objective criteria rather than by human feelings and beliefs.	The world is socially constructed Observer is part of what is observed; and Science is driven by human interest and feelings.
The researcher should	Focus on facts; Look for causality and fundamental laws; Reduce phenomena to simplest elements; and F ormulate hypotheses and test them.	Focus on meanings; Try to understand what is happening; View the totality of each situation; and Develop ideas through induction from data.
Methodology	Quantitative	Qualitative
Unit of Analysis	Should be reduced to simplest term	May include complexity of whole situation
Instrument	Experimental methods to test hypothetical-deductive generalizations	Multiple methods to establish Small samples investigated in depth or over time

	Large samples	

The epistemological perspective undertaken for this research is explained below.

Interpretivism (phenomenology): Considerations for this research

This research focuses on the social construction of meanings developed by the employee who experiences walking to the workplace in the pedestrian environment in the city centre. This means that the nature of research requires an examinination of the human actors' personal views, opinions and perceptions experienced and expressed throughout their journey while walking to the workplace within the real life context. Thus, the complexities of such social phenomena cannot be studied and understood through the positivistic tradition. This therefore led to the adoption of the phenomenological research methodological framework as shown Figure 4.4. The implication is that truth and meaning do not exist in some external world but are created by the subjects; meaning is constructed, not discovered; subjects construct their own meaning in different ways, even in relation to the same phenomenon (Gray, 2004).

The researcher suggests that a qualitative approach is suitable for this research as this research is oriented towards;

- exploring the process of everyday walking to workplace based on the employee walking experience;
- interpreting the subjective meaning on the way people understand the value of walking to workplace; and
- gaining a holistic understanding of the factors and conditions within the pedestrian environment that generate certain situations, particularly the factors that may encourage people to incorporate walking as part of their transportation mode to the workplace.

Sarantakos (2007) notes that qualitative research has several purposes in social research, particularly in helping the investigators interpret and understand the following:

- the actors' reasons for social action;
- the way they construct their lives and the meanings they attach to things; and

- the social context of social action, which means the subjective meaning of such actions is more important than observable social action.

4.4.2.3 Axiological Perspectives

According to Saunders et al. (2007), axiology is a branch of philosophy that studies judgments regarding value. Adding to the definition, Rescher (2004) contends that value is perceived in different ways by individuals, and Robson (2002) confirms that value and value judgment are closely linked to morals and moral judgments. The axiological position can be located in between two values; value free and value laden (Healy and Perry, 2000). The positivist insists that researchers must remain in the value free position because the resultant knowledge is objective and generalized, and relevant to other contexts. Robson (2002) noted that positivists' views are value free, facts and values are fundamentally different, and scientific research which is based on facts arising from empirical data has no role in making value judgment.

On the other hand, the interpretivist observes that research is value laden, subjective (Sexton and Barrett, 2003) and judgments are made based on values (Robson, 2002). Robson (2002) asserts the value laden nature of what are taken to be facts, and seeks to establish and state explicitly when value judgments are being made.

Axiological Consideration for this research

Being both socio-constructionist and idealist, the value of this research will be subjective, based on observations of the way employees understand the value of purposive walking to the workplace and their perception of the walking environment that may encourage them to walk in the morning and evening rush hour and during lunch break. Consequently, it can be subjectively interpreted and evaluated in all stages of the research process. Therefore, the axiological assumptions in this study lean more towards being value laden as graphically illustrated in Figure 4.4 .

4.4.3 Research Approach

The research approach is a strategy that decodes ontological and epistemological principles into guidelines that demonstrate how research is to be conducted (Sarantakos, 2005). According to Gray (2009), there are two different approaches in research -

deductive and inductive. These two approaches can be used to underpin the nature and uses of theory in research, such as whether the research should begin with theory, or should theory result from the research (Gray, 2009). Gray (2009) continues that the choice of the research approach is influenced by several factors, for example whether:

- the researcher believes that there is some sort of external truth out there that needs discovering; or
- the task of research is to explore and untangle people's multiple perceptions in natural life conditions;
- the research inclines towards a positivist (realist), interpretivist (phenomenologist) approach or other perspectives;
- the research should begin with a theoretical model using deductive approach; or
- such models should emerge from the data itself inductively.

Leedy and Ormrod (2005) have designed a guide to help the researcher decide between the qualitative and quantitative approach, delineating the difference between deductive and inductive reasoning, as shown in Table 4.3.

Table 4. 3: A guide on which approach the researcher should use, adopted from Leedy and Ormrod (2005).

Use This Approach If	**Quantitative**	**Qualitative**
1. You believe that:	There is an objective reality that can be measured	There are multiple possible realities constructed by different individuals
2. Your audience is:	Familiar with/supportive of quantitative studies	Familiar with/supportive of qualitative studies
3. Your research question is:	Confirmatory, predictive	Exploratory, interpretive
4. The available literature is:	Relatively large	Limited
5. Your research focus:	Covers a lot of breadth	Involves in-depth study
6. Your available time:	Relatively short	Relatively Long
7. Your ability/desire to work with people is:	Medium to low	High
8. Your desire for structure is:	High	Low
9. You have skills in the area(s) of:	Deductive reasoning and statistics	Inductive reasoning and attention to detail
10. Your writing skills are strong in the area of:	Technical, scientific writing	Literary, narrative writing

In order to discuss the complexity of the pedestrian environment in the context of Kuala Lumpur city, this study has taken the social constructivist and phenomenological approaches to research. This study looks at employees' understanding of the meaning of walking to the workplace, which relates to their experiences and perceptions of walking as part of the transportation mode to the workplace.

Overall, according to Clifton and Handy (2001), this qualitative approach is a powerful tool to explore those complexities. They assert that this research approach allows a grasp of the individual's own explanations of their travel behavior and attitudes to walking for transportation purposes. To Patton (1990), this is one of the major trade-off in the quantitative method while qualitative method is a trade-off between breadth and depth. Therefore, this research has rejected the quantitative research approach to be taken for data collection and analysis.

There are a number of research strategies that can be positioned within these two extremes of deductive and inductive research approaches (Creswell, 2007 and Yin, 2003). Different authors classify strategies in different ways. Among the most common strategies found are experiment, survey, case study, action research, grounded theory and ethnography.

According to Gray (2009), experiment and survey strategies are associated with the deductive approaches while action research, grounded theory and ethnography are more favoured in the inductive approaches. The case study research approach has been positioned as being governed by the interpretivist epistemological undertaking and leans towards social constructivism/ontological assumption as shown in Figure 4.7.

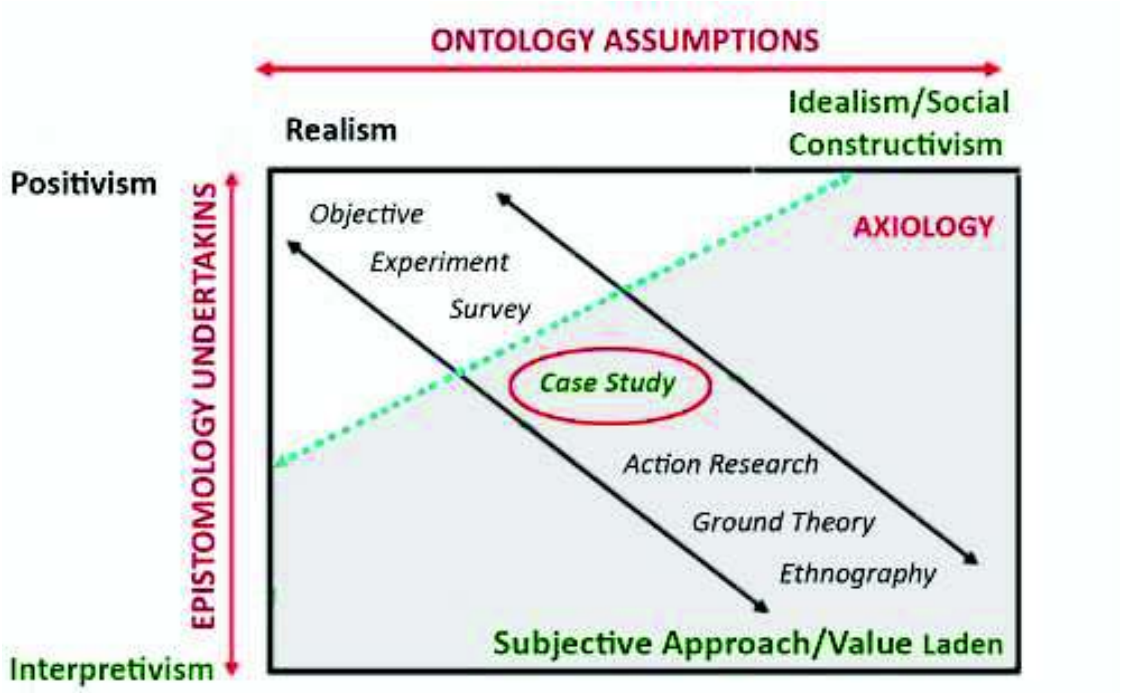


Figure 4. 7 Research approaches and strategies mapped into epistemological and ontological assumptions.

The case study strategy was considered the most appropriate primary research approach for this research. Yin (2009) describes the case study approach as an approach aimed at understanding the holistic view of the phenomenon. Yin (2003, p13) further underlines this idea, stating:

> "…you would use the case study method because you deliberately wanted to cover contextual conditions - believing that they might be highly pertinent to your phenomenon of study".

The reasoning behind the selection of this method is discussed in the next stage.

4.5 Operation Stage

In the operation stage, the focus will be on the case study research approach for the collection of the empirical data, and the techniques and triangulation used in the selected case study. In accordance with data analysis techniques used during the refinement stage, two steps relating to the research process are discussed:

i) Research Design - Case study as a Research Strategy

ii) Research techniques for data collection

4.5.1 Case Study as a Research Strategy

The case study strategy is scientific and provides multiple sources of evidences for the studies; it is widely associated with the qualitative paradigm (Yin, 2009). According to Yin (2009), the case study is used in many situations to contribute to our knowledge about individual, group, organization, social and related phenomena. The case study as a research strategy is most appropriate for research based on the desire to understand a complex phenomenon, as this strategy allows researchers to retain the holistic and meaningful characteristics of real-life events within these situations (Yin, 2009). The next section discusses the components of the case study as a research approach.

4.5.2 What is a case study?

According to Gillham (2001), the *case* can be defined as:

- a unit of human activity embedded in the real world;
- something that can only be studied or understood in context;
- something that exists in the here and now;
- something that merges with its context to that precise boundary difficult to draw.

Gillham continues that a *case* depends on what the researcher wants to find out, which leads their research onwards. The author provides several examples of common cases - single cases such as an individual, a group, an institution, a large scale community; and multiple cases such as several schools, two different professions and a number of districts (Gillham, 2001). Yin (2009) adds that cases could be developed from organizations, processes, programmes, neighbourhoods, institutions, events, as well as other phenomena. Seeing that the case study covers large situations in the real world, Yin (2009) suggests that the *case* and *unit of analysis* (refer section 4.6.5) can be defined in the same way.

4.5.3 Why case study?

Remenyi et. Al. (2002) state “the case study approach is an umbrella term for a family of research methods having in common decision to focus on an enquiry around a specific instance or event”. The term ‘case study’ has multiple meanings. In research, the case study can be used as valid and reliable evidence or as a vehicle for creating a story or narrative description of the situation being studied (Remenyi, 2002). The researcher’s interpretivist paradigm fits in with Yin’s (2003) technical definitions of case studies:

- Empirical inquiry that investigates a contemporary phenomenon within its life context, especially when the boundaries between phenomenon and context are not clearly evident and;
- Case study inquiry copes with the technically distinctive situation in which there will be many more variables of interest than data points and as one result relies on multiple sources of evidence, with data needing to converge in a triangulation fashion, and as another result benefits from prior development of theoretical propositions to guide data collection.

The case study approach is suitable:

- Where the research is to study the natural setting of the phenomenon in order to develop an in-depth understanding of the real life situation (Remenyi et al., 1998; Miles and Huberman, 1994; Benbasat et al. 1987).
- Where the research question is to investigate 'How' and 'Why' as represented in table 4. 4 (Yin, 2003);
- Depending on the extent of control an investigator has over actual behaviour events (Yin 2009);
- Depending on the degree of focus on contemporary events, as opposed to historical phenomena, of the research question (refer to table 4.4).

Case study research has gained increasing credibility as a suitable research approach for urban design studies. It is an appropriate technique in studying issues concerned with explaining social phenomena which correlate to travel behaviour in the physical built environment (Clifton and Handy, 2001).

Table 4. 4 The case study research strategy (Yin, 2009)

Strategy	**Form of Research Question**	**Requires Control of Behaviour Event**	**Focuses on Contemporary Event**
Experiment	How, Why?	Yes	Yes
Survey	Who, What, Where, How Many, How Much?	No	Yes
Archival Analysis	Who, What, Where, How Many, How Much?	No	Yes/No
History	How, Why?	No	No
Case study	How, Why?	No	Yes

4.5.4 Case Study Categorisation

According to Yin (2009, p9), case studies are categorised into three types: the exploratory case study, the explanatory case study and the descriptive case study. This is explained below:

i) The 'exploratory case study' has some degree of rationale and direction to it. It is used when there is insufficient information or few theories or knowledge about the phenomenon under study. It is also used to discover the phenomena in the data which act as the point of interest to the researcher; and it focuses on cause and effect relationship considering how and why something happens.

ii) The explanatory case study's intention is to explain the course of events using existing theories for understanding and describing a phenomenon.

iii) The descriptive case study traces the sequence of events over time and describes key phenomena. Descriptive case study is suitable when there is existing knowledge of the problem, and what is required is further investigation.

In this PhD research, the author is interested in exploring the phenomenon of individuals' perception of walking as part of their transportation mode, and how the pedestrian environment encourages walking to the workplace. The researcher believes that to achieve this, there should be contemplation and clarification on how the phenomenon is observed. This should be defined at a micro level as being the result of the individual's instincts, drives and experience, or may at macro level as an expression of development in the society (Routio, 2007). For these reasons, the exploratory case study is adopted for this research.

4.5.4.1 Single vs. multiple case study

Yin (1994) classifies case studies into four basic types: i) single case holistic, ii) single case embedded, iii) multiple cases holistic, and iv) multiple case embedded. Each case can be selected according to the nature of the research (refer Figure 4.6). The case study design can be adopted, before any data collection, whether it is a single or multiple case studies (Yin, 2009). The type of case study used in this research is multiple case studies. This selection has been based on a comprehensive review of the types of case study and the

research questions, as well as the research objectives (Refer Section 1.3). The suitability of the multiple case studies approach is also reflected in the Case Study Design. This study adopts the multiple embedded case study (Type 4) based on the two units of analysis and two case study contexts as illustrated in figure 4.8.

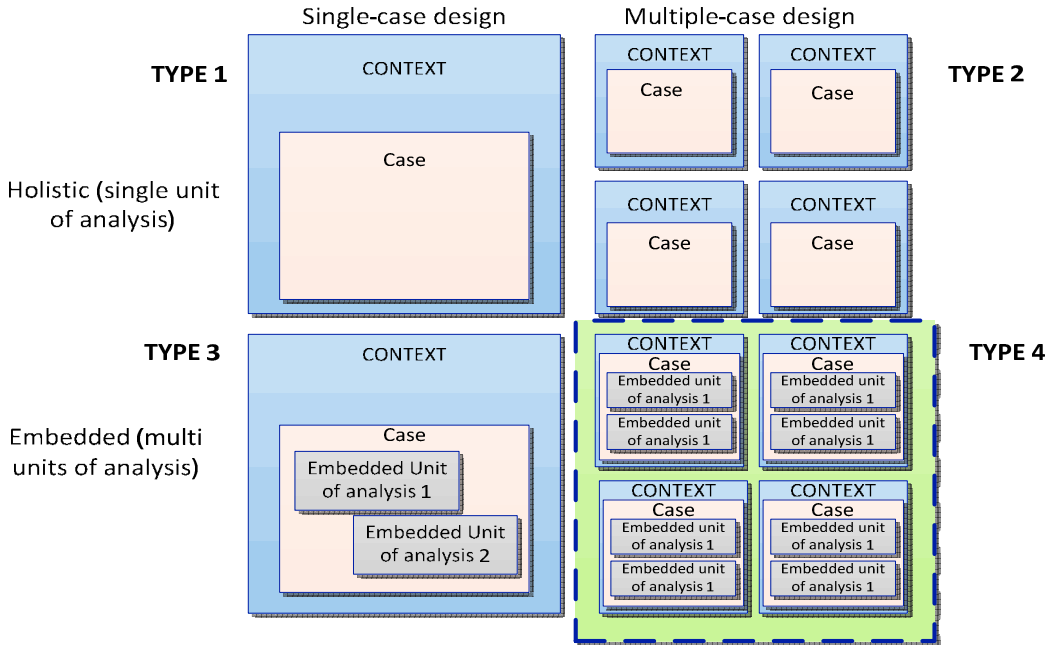


Figure 4. 8 Four types of design for case study, adopted from Yin (2009)

The author's justification for selecting a multiple case study design rather than a single case study design is discussed below.

According to Vaus (2001) a single case study is less compelling than multiple cases, although a single case study is certainly appropriate when it presents critical cases that are able to test a well-formulated theory. Researchers argue that it may be that the unique or extreme nature of a single case may mean it is only possible to study that one. Moreover, the single case can be a representative or typical case, and may be the only option when the research is being conducted longitudinally (Yin, 2009). However, the single case study does have a major drawback in terms of its reduced ability to generalise the results obtained by a wider population. Multiple case designs address this weakness because they have the advantage of replication logic.

The multiple case study approach is considered ideal as it allows both theoretical and literal replication to be used (Yin, 2003). Moreover, multiple cases are often considered more compelling and robust (Yin, 1994; Amaratunga and Baldry, 2001). In addition, multiple case designs may be preferred over single case designs to improve generalisation and accord more credibility to the research findings, thereby minimising criticisms and skepticism and producing a stronger conclusion (Yin 2009, p.62). Clearly, the use of multiple cases adds much more credibility to any attempts to generalise, since there is more opportunity for triangulation of findings. Furthermore, if the subject being studied is complex, the use of several case studies will enable the researcher to collect a large range of information regarding the topic, and will increase understanding of the phenomenon. Gray (2002) stated that there are no precise guides for the number of cases to be included. Gray further emphasise the fewer the cases the greater the opportunity for in-depth exploration of the phenomenon.

4.5.5 Case Study Research Design

A research design is "a logical plan for getting from *here* to *there*, where *here* may be defined as the initial set of questions to be answered, and *there* is some set of conclusions (answers) for these questions" (Yin, 2009, p26). Between *here* and *there* according to Yin (2009) there may be a number of major steps including the collection and analysis of relevant data. Yin (2009), citing Philliber et al., (1980) agrees that the research design functions as a "blue print" guiding the researcher to answer:

- what questions to study;
- what data is relevant;
- what data to collect; and
- how to analyse the results.

This blue print is used to guide the researcher in gathering evidence that addresses and answers the research questions validly, objectively, accurately and economically (Kumar, 1999). Another purpose of research design is to detail the procedures for undertaking a study. Yin (2009) has suggested five major components for the case study as below:

1) a study's questions;
2) a study's propositions;
3) unit(s) of analysis;

4) the logic linking the data to the propositions; and
5) the criteria for interpreting the findings.

The research design for this research has been guided using these five components, as explained in the next section.

4.5.5.1 Research Aim, Research Questions and Research Objectives

This PhD aims to develop a framework for advocating walking to the workplace, through a holistic understanding of how to improve the pedestrian environment in the city centre of Kuala Lumpur. Research questions and research objectives have been developed in guiding this research, as explained in Section 1.3 in Chapter 1.

Nevertheless, making sure that there is a connection between the research questions and the research objectives, and that they are in line with the research aim, is important for the validity and reliability of the research as shown in table 4.5

Table 4. 5 : Association between Research Questions and Research Objectives

Research Question (RQ)	Research Objectives (RO)
1	RO1, RO2
2	RO1, RO3,
3	RO1, RO4,
4	RO1, RO5

4.5.5.2 Theoretical Propositions (TP) and purpose

Propositions are designed to guide the researcher in determining the right data to collect, and to assist in formulating the strategies for analysing the data which reflect the propositions. The propositions were made earlier in the research process to point attention to specific details within the scope and suggest possible links between the phenomena under study (Yin, 2009). Clarke (2006) suggests that propositions are statements of expected outcomes which are similar to a hypothesis. During the data analysis stage, these statements are supported or rejected. Propositions allow the researcher to expose any preconceived beliefs about the topic, thus helping them to move into the study admitting any bias (Clarke, 2006). Yin (2009, p 36) asserts that this is an important step in doing case studies, as strong theoretical propositions could build the

researcher's ability in interpreting their ultimate data as in the discussion in Section 7.3 in Chapter 7. Following Yin's suggestion, the theoretical propositions that have been identified in the literature are used to lead this case study research. The six TP mentioned in Chapter 2 have been classified to link with the two unit of analysis, that is, the employee as a user and the quality of the pedestrian environment, as already discussed in several sections such as Section 2 and 4.3.1.

4.5.5.3 Unit of Analysis

The unit of analysis refers to what is studied; it could be an individual, a group, an institution, community or even an organization process (Yin, 2009). The unit of analysis relates to the fundamental problem of defining what the "case" is. It could be determined by an interest in exploring or explaining a specific phenomenon based on the research problem. It is suggested that main units used must be at the same level as the study questions, and typically comparable to those previously studied (Yin, 2009). This means that the unit should state who is included, context, phenomena and time-period being studied (Clarke, 2006).

The two units of analysis or cases to be carried out for this study are as follows:

1) **Individuals** –adult employees as the pedestrians who work in the city centre areas using pedestrian facilities to reach their workplaces during the peak hours and break periods; and

2) **Phenomenon of the pedestrian environment in a real life context** - Walking to the workplace in the pedestrian environment in the city centre areas. Therefore the specific case is the walkability of the pedestrian environment within the context of the city centre i.e. Kuala Lumpur City Centre in Malaysia.

These two (2) units of analysis are the key actors that have been highlighted in the research problem presented in Section 2.5 in Chapter 2 and Section 3.3 and 3.4 in Chapter 3. These units of analysis will be studied in detail in the field work and presented in Chapter 5 and Chapter 6, as well as in the discussion chapter in Chapter 7. Figure 4.9 below illustrates these two (2) units of analysis, pictorially projected out from its context that is the city centre of Kuala Lumpur.

Figure 4. 9 A graphic representation of two units of analysis – the pedestrian environment and the employee as pedestrian in the context of city centre of Kuala Lumpur.

4.5.5.4 Linking data to the theoretical propositions

The TP are formulated around several themes and aspects which reflect the theoretical issues arising from the literature review with regard to walking to the workplace in the city centre. According to Yin (2009) the purpose of TP is that they should shape the data collection plan and help prioritise the relevant analytic strategies used during the data analysis stage. The TP for this research project are formulated to guide the case study in finding the answers to research inquiries on the employees' perception and experience of WtW, and the pedestrian environmental factors that influence them to incorporate walking to the workplace as part of transportation. The preferred strategy during the analysis stage is to be able to link the key findings to the TP. The logic of linking the data to the propositions is to be able to match pieces of information to rival patterns that can be derived from the propositions (Yin, 2009). Therefore the statements in the TP may be supported or rejected during data analysis (Clarke, 2006).

Since the propositions are designed to relate back to the research questions and contribute to the research objectives, it is essential to attach them to the objectives of the research. The association of the propositions with the research questions and the research objectives is depicted in Figure 7.1 in Section 7.3 in Chapter 7. Although the

researcher developed the propositions prior to collecting data, the propositions are not intended to predict study results and may change during the course of the data collection.

4.5.5.5 Criteria for interpreting research findings

According to Yin (2009, p34), a major and important alternative strategy is to identify and address rival explanations for the research findings. Interpreting the findings is considered as an iterative process between propositions and data collected. Yin (2009, p 136-160) suggests five analytical techniques in interpreting the research findings, as follows:

i) Pattern matching – this analytical technique compares empirically based patterns in the data with the propositions, and seeks to find a match between the two. The matching can also be done using contrasting rival patterns for data from multiple-case study. The results from pattern matching help to strengthen the internal validity of the argument (Yin, 2009).

ii) Cross case synthesis – applies specifically to the analysis of multiple-case study, where in each case the patterns of events are matched using different theoretical predictions, and are also used in replication logic across the cases. All data is analysed using word tables to depict the cross-case conclusion.

iii) Explanation building – the case study data is analysed by building an explanation about the case and identifying a set of causal links. Explanation is a result of series of iteration processes involving activities, as depicted in Figure 4.10;

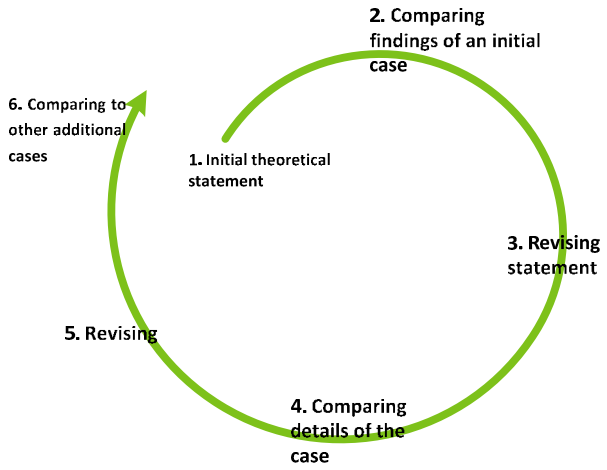


Figure 4. 10 Iterative process applied in explanation building technique

iv) Time-series analysis – a technique which is directly analogous to time series analysis conducted in experiments and quasi experiments to find answers to the "how" and "why" questions about relationship changes of events over time.

v) Logic models – The logic models purposely specify a complex chain of events over an extended period of time.

4.5.5.6 Case study selection

According to Stake (1995) the principal criterion in opting for a particularly way of organising a study is that the case will facilitate the researcher to maximise the opportunity to learn. The selection of cases is based on the aims and objectives of this research and the research context i.e. employee perception of walking to work in the pedestrian environment in the city centre of KL. The case study is carefully selected so the findings from the case study will yield literal replication as suggested by Yin (2009). Sarantakos (2005) states that each case is to be treated as an experiment on its own, and subsequent cases will be used either to verify or to contest the previous findings. Hence, Stake (1999) emphasises that representativeness is not the main criterion for case selection. Rather, the choice of cases is made, as explained by Yin (2009), because it either:

i) Predicts similar results for predictable reasons (literal replication); OR

ii) Produces contrary results for predictable reasons (theoretical replication)

Eisenhardt (1989) agrees with this, positing that cases may be chosen to replicate previous cases or to extend emergent theories. Thoroughness in selection is also essential in assisting the author in gathering sufficient information. This in turn will help the author to generate the final conclusions at the end of the study.

As it is important for the author to choose the most appropriate case study for data collection in this study, the selection of participants that are able to shed light on the phenomenon is vital. In case study based research, the researcher is not expected to produce a statistical generalisation i.e. generalise the findings to the whole population; instead it is anticipated for the researcher to achieve a thorough understanding about the phenomenon in order to develop theories and generalise further from there (Yin, 2009).

4.5.5.7 Case Study Protocol

A case study protocol is a set of guidelines that can be used to structure and govern a case research project (Yin, 2009). It depicts the procedures that need to be followed by the researcher in embarking on the case study approach, whether before, during or after the research. Eisenhardt (1989) emphasises that a protocol for the interviews should be developed before the researcher starts going to the field.

According to Yin (2009), the usage of the case study protocol is vital and also useful especially when it involves multiple researchers and multiple sites, as it can ensure consistency. Furthermore, the reliability of the research will be enhanced by applying this case study protocol. This case study protocol also involves the research instrument(s) that are going to be used in collecting the data (Pervan and Maimbo, 2005). A typical content outline to be included in a case study protocol is tabulated in Table 4.6 below:

Table 4. 6 Case study protocol (design and content) Source: Yin (2009), Maimbo and Pervan (2005).

SECTION	STRUCTURE OF CASE STUDY PROTOCOL	DESCRIPTION
Preamble	• Confidentiality and data storage; • Publication; • Documentation; • Layout of protocol	Contains information about the purpose of the protocol. Guidelines for data and document storage, publication
General	• Overview of research project; • The case research method;	Provides a brief overview of the research project and the case research method including the aim and objectives; the importance of the research and how the research is going to be conducted (see **Appendix B**)
Data collection procedure	• Initial approach to organisations; ✓ Selection of cases; ✓ Numbers of cases; ✓ Establishing contact. • Names of sites to be visited; • Scheduling of field visits; • Length of sessions; • Equipment and stationery.	Detailed description of the procedures for conduction each case. These procedures should be utilised to ensure uniformity in the data collection process and consequently facilitate both within case and cross-case analysis. (Informed Consent Letter – see **Appendix C**)
Research Instrument	• Research instruments are:- ✓ Qualitative – interviews guides; ✓ Case study questions depending on the research topic and purpose, research objective.	Research instruments developed utilising guidelines by Sekaran (2006) and Easterby-Smith (2008). It is recommended that this research instrument be highly structured to facilitate the data collection process and uniformity in the collection of said data. (Refer **Appendix D** for interview questions).

Data analysis guidelines	• Overview of data analysis process; • Details regarding: i. How convergence of data from multiple sources will be achieved; ii. How triangulation of perspective from multiple participants will be achieved. • Description of 'within-case' analysis process: i. Descriptive data; ii. Explanatory data; iii. Individual case report. • Description of 'cross-case' analysis process; • Data schema: i. Summary of primary data types, sources and purpose; ii. Summary of secondary data types, sources and purpose. • Description of data displays that will be used in analysis; • A priori list of codes that will be used during qualitative analysis; • Content analysis; • Cognitive mapping.	Guidelines for data analysis based on guidelines such as those provided by Miles and Huberman (1994) and Yin (2009)
Appendix	Participation request letter.	Template letter sent to potential participants inviting them to participate (Refer Appendix E)

Source: Yin (2009), Maimbo and Pervan (2005)

4.6 Research Techniques for data collection

'Research techniques' refers to the collection of primary and secondary data and the analysis method for both types of data (Saunders et al., 2007). Primary data refers to information obtained first hand by the researcher for the specific purpose of the study. Meanwhile, secondary data refers to information gathered from existing sources. The data could either be in the format of raw data or analysed data. The following sections describe the data collection techniques to be adopted in this research.

4.6.1 Data collection technique

Data collection refers to the techniques used to gather data in the study. Data is the information relevant to the study under investigation, and can be collected or recorded through observing records, numbers (such as test scores), interview transcripts, and photographs or documents (Thomas, 2011). Data is collected when the researchers are 'in the field' doing 'fieldwork'.

Creswell (2007) identifies four basic data collection methods for case study namely 'observations' (ranging from non-participant to participant), 'interviews' (ranging from close-ended to open-ended), 'documents' (ranging from private to public) and 'audio visual materials' (including materials such as photographs, compact disks and videotapes). Similarly, Eisenhardt (1989) identifies the data collection methods used in case studies as interviews, questionnaires, archives and observations.

Yin (2009) on the other hand suggests that there are six methods of evidence collection which are frequently employed in undertaking case study, as follows:

1) **Documents:** These can be in the form of letters, agendas, newspapers, memoranda or any documents that are relevant to the research. In triangulation, the documents serve to support evidence from other sources;
2) **Archival records:** These can be in the form of personal records, lists of names, organisational records, service records or survey data. It is very important for the researcher to be very cautious in evaluating the accuracy of the records before utilising them as even if the records are highly quantitative, they may not be accurate;
3) **Interviews:** These are one of the key sources of case study information. There are three types of interview, namely informant interview (unstructured interview), focused interview (semi-structured interview) and formal survey (structured interview) (Further discussion will be in Section 4.6.1.1);
4) **Direct observation:** This source happens when a researcher conducts a field visit during the case study. In the simplest form, it can be a casual data collection activity or a formal protocol to measure and record behaviours. This source is argued to be useful in providing additional information about the issue being observed. When involving more than one observer, the reliability of the evidence from the observation is enhanced;
5) **Participant observation:** This source occurs when a researcher actively participates in the case study (Further discussion will be in Section 4.6.1.1); and
6) **Physical artefacts:** This can be in the form of tools, instruments, or some other physical evidence that may be collected during the study as part of a field visit.

It should be noted that no single technique has a complete advantage over the others; they are highly complementary and a good case study will tend to use multiple sources of

evidence (Gray, 2009). Yin (2009), however, feels that it is important to take note that not all sources are relevant for all case studies.

4.6.2 Interviews as a technique of data collection

Interviews are a form of conversation that involves human interaction. Gray (2009) describes interviews as the exchange of opinions between interviewer and respondent. Gray contends that a well-conducted interview is a powerful tool for eliciting rich data on people's views, attitudes and the meanings they ascribe to things. In addition, Robson (2002) and Creswell (2003) concur that interviews are widely used in the field of social science research. Furthermore these techniques are extensively used in qualitative research (Bryman, 2004).

Yin (2009) adds that interviews are a vital source of case study evidence because most case studies are about human affairs. They are used to allow people to develop arguments and speak more widely on issues raised by the researcher. Yin categorises interviews into three, namely 'open ended key informant interviews' (unstructured interviews), 'focused interviews' (semi-structured interviews) and 'formal surveys' (structured interviews).

The purpose of 'semi-structured interviews', according to Cargan (2007), is "a purposeful conversation in which one person asks prepared questions (interviewer) and another answers them (respondent)". This is done to gain information on a particular topic or a particular area to be researched; the interviewer commences with a set of interview themes and the interview itself consists of pre-determined questions. However, this type of interview is flexible and can be adjusted based on the interviewer's perception of what is appropriate. The interviewer is prepared to vary the order in which questions are asked and to ask new questions in the context of the research situation. The process of gaining this information can be done in several ways; according to Robson (2002) face-to-face interviews are the most common. Besides face-to-face interviews, interviewing by telephone is also popular because of the saving in time and resources it permits. The following are the advantages of interviews (Grix, 2001: Sarantakos, 2005; Gray, 2009):

1) **Flexible**. Interviews can be started with a defined questioning plan, but can be adjusted to follow the natural flow of the conversation and allow the intended, interesting and unexpected data to emerges;
2) **Potential for exploring** issues in greater depth, and **best at** exploring stories and perspectives of informants.
3) **High response rate**: Interviewing attracts a relatively high response rate;
4) **Richness of responses**: Dialogue between the interviewer and the respondent allows for nuances to be captured and for questions to be clarified and adapted or improvised. Long interviews are common as compared to long questionnaires, which are rarely acceptable;
5) **Easy administration**: Interviews do not require respondents to have the ability to read or handle complex documents or long questionnaires;
6) **Opportunity to observe non-verbal behaviour**: This is not available through questionnaires or other indirect methods;
7) **Less tedium**: Interviews require less patience and motivation, as compared to questionnaires. Interviews need "participation", not just "response". Participation involves another person with whom the respondent completes the task, so interviewing is often perceived as a cooperative venture rather than a one-sided exercise;
8) **Control over the environment**: The interviewer has an opportunity to control the conditions under which the questions are answered;
9) **Control over the order of the questions**: Respondent has no opportunity to know which questions come next, or to alter the order of the questions they answer. When the order of the questions is significant, an interview is much more useful than a questionnaire;
10) **Control over the time, date, and place of the interview**: Interviews can be conducted exactly as planned, with reference to the time and date, and according to specified conditions. Such guarantees cannot be given when questionnaires are used;
11) **Completeness over the interview guaranteed**: The fact that the interviewer presents the questions guarantees that all questions are more likely be attempted and the interview will be complete.

Structure is provided by the use of a specific interview schedule, which could cover a set list of issues (Thomas, 2011). Similarly, Gray (2009) suggests that the order of the questions may also change depending on the direction given to the interview so that the content focuses on the crucial issues of the study. This, according to Gray, allows for greater flexibility than the closed-ended type, and permits a more valid response based on the respondent's perception of reality. This is vital, asserts Gray (2009), when the phenomenological approach is being taken where the objective is to explore subjective meanings that the respondents ascribe to concepts or events. On the other hand, Robson (2002) recommends using an interview guide which has predetermined questions without fixed wording or fixed ordering of the questions.

In this study, semi-structured interviews were used to collect data. The questions were designed based on the research objectives, research questions and case study propositions. The questions were used during the interviews to extract the right and relevant data to be used to address the research objectives, research questions and case study propositions. The author employs the semi-structured interview method of data collection as a means:

1) To obtain a deeper understanding of the issues involved. Also, these types of interviews offer the potential to obtain sensitive data that may not have been possible from a questionnaire.

2) To elicit evidence that will or will not support the case study propositions that guiding this research.

4.6.2.1 Semi-structured interviews

The interviews were conducted in a number of stages, with each stage having its' own task assignment as follows:

1. Pre-interview: A schedule containing confirmed interview dates with potential respondents was prepared. Confirmation of interview appointment was made via telephone prior to the interview. A set of relevant documents, research brief, authorisation letter, interview questions, ethical approval form and other materials important to facilitate the readiness of the respondent for the interview session were delivered prior to the interview session.

2. *Interview*: The interview was conducted during office hours in the individual office room of the respective respondents or in a meeting room. Each interview session lasted for a period of 45 to 90 minutes. The respondents were given a briefing on the study before the interviews started. They were also made to understand the purpose of the interviews and were assured of complete confidentiality about the source of the responses. Informed consent forms were distributed and all respondents signed them accordingly.

The interviews were face to face, semi-structured and in-depth. All of the interviews were recorded using a Dictaphone (model Sony I C Recorder ICD- UX200) after permission was granted by each individual. The purpose of recording the interviews is to increase the accuracy of the data collected and to allow for accurate transcription of the interviews. Furthermore, this allows the author to concentrate, be attentive to the respondents and be able to use direct quotations from the respective respondents when writing up the findings. According to Gray (2009), this in turn will increase the reliability and validity of the study. The author also took notes when necessary during the interview, although these notes were not verbatim. The manual notes act as a backup for the recording and also help the author to devise new and appropriate questions during the interview.

3. *Ending the interview:* It is advisable to end the interview smoothly and in a friendly atmosphere (Sarantakos, 2005). This is vital because a certain level of trust, cooperation and mutual respect has developed between the respondents and the interviewer during the interviewing session, making the respondents feels that their contribution to the research and to society in general has been appreciated (Sarantakos, 2005).

4.6.3 Selection of respondents

Purposive sampling method is adopted for the selection of respondents since this study uses a qualitative research approach. This method also known as judgemental sampling, and allows the author to select respondents according to predetermined criteria which will enable the research questions to be answered, thus meeting the objectives of the research (Saunders et al., 2007; Patton, 2002). According to Eisenhardt (1989), the sample selected for qualitative research should be purposeful and based on some theoretical underpinnings. In addition, Eisenhardt (1989) emphasises that in building theory from

case studies, the sampling of cases depends on theoretical sampling rather than from the chosen population or statistical samples. The objective of theoretical sampling is to select cases that are likely to replicate or extend the emergent theory. In addition, this type of sampling takes into account the fact that different people think and act differently, depending on many factors. Supporting this point, Benini (2000) points out that taking those factors into consideration will help the researcher to test, verify and contrast emerging concepts, categories and theories. Tongco (2007) also asserts that though purposive sampling is not free from bias, the data collected from purposive sampling can still generate reliable and robust data. In line with Eisenhardt, Benini and Tongco, Sarantakos (2005) suggests that the appropriateness of utilising purposive sampling emerges when the selection is done with the goal of representativeness in mind, and strategies are used to ensure samples match population characteristics.

In this study, a *snowball sampling* method is used: a few participants are selected who possess certain characteristics that meet the criteria of the research as mentioned in Chapter 2, Chapter three and Section 4.5.5.3 (Unit of Analysis). In this approach, the author choose a few respondents who are then asked to recommend others who are known to have the same or similar characteristics and who might be willing to participate in this research (Sarantakos, 2005 and Bloomberg and Volpe, 2008). This involves building a sample through referrals (O'Leary, 2010), as shown in Figure 4.11. In this method, subsequent respondents are found based on information given by the initial respondents (Saunders et al., 2007). This process continues with the new respondents until saturation has been reached, at which point no more substantial information can be acquired through additional respondents (Sarantakos, 2005). As shown in the figure below. Bloomberg and Volpe (2008) suggest the sample size often used in case study research is relatively small, but consists of information-rich cases.

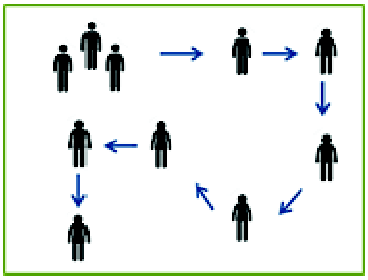


Figure 4. 11 Snowball sampling method (O'Leary, 2010, Sarantakos, 2005 and Bloomberg and Volpe, 2008).

A good range of employees holding various posts under the same departments were chosen as respondents, with the adoption of the snowball sampling method to find more respondents. The final total of 19 respondents is deemed sufficient for the study, in line with Marshall (1996) who postulates that an appropriate sample size for a qualitative study is one that adequately answers the research questions. In addition, the number of respondents is considered adequate when new categories, themes and explanations cease to emerge from the data. At this point, the process of study has become saturated (Sarantakos, 2005). Bertaux (1981) suggests that the smallest sample size in qualitative research is 15, while, Guest et al. (2006) in their study state that saturation occurred at the 12th interview and therefore concluded that 12 interviews should suffice for qualitative research.

The criteria for respondents of this study include:

- Adult employee
- Age ranged from 25 to 60 years old
- Able-body
- Walking from the final transit station to the office or from parking spaces (in surrounding areas) to the offices
- Walking to work during peak hours (AM and PM)
- Wide range of job position for holistic opinions (senior and junior executives, maintenance personnel and office secretaries)

Appointments with the respondents were arranged through the Heads of Department. A total of 19 semi-structured interviews were carried out. This can be summarised in Table 4.7 as follows:

Table 4. 7 Selected Respondents for Case Study 1 and Case Study 2

Case Study Area	**Male Respondents/ Designation**	**Female Respondents/ Designation**	**No of Respondents Educated till Tertiary Level**	**No of respondents**
Case Study 1 Old CBD area	3 -2 senior executives, -1 Junior executive	7 - 2 senior executives - 5 executives	10	10
Case Study 2 KLCC area	4 - 3 engineers - 1 maintenance personal	5 - 4 engineers - 1 secretary - 1 general clerk	8	9
Total number of interviews			**19**	**19**

The case study brief and letters of invitation to participate were sent to Commercial Offices in two case study areas within city centre of Kuala Lumpur. Follow-up telephone calls and e-mails were made subsequently. Employees from the same department in two different commercial offices, each office being situated within one case study area (Office A in Case Study 1 and Office B in Case Study 2) agreed to participate in this study. The majority of the employees walk daily to and from their final transit to their offices during the AM and PM rush hours, and also take part in other walking activity such as walking during the lunch break. According to Wood (2006) this kind of setting, in which human actions are contextualised within situations and time, can provide the author with 'information-rich cases'. The selection of the case study areas that provide the context of pedestrian environment for the respondents will be discussed in the next section.

4.6.4 Selection of Case Studies Area

The main criterion for the selection of the Case Study areas is the position of the worksite environment within the city centre boundary of KL. The selection of pedestrian environments in the city centre of Kuala Lumpur is based on the research question, research objectives and theoretical propositions established for this research. Two case study areas were chosen as samples, to be able to represent the phenomena in the real life context of people walking in the existing pedestrian environment. The areas are known as ***Old Central Business District (CBD) Case Study 1)*** and ***Kuala Lumpur City Centre (KLCC) (Case Study 2)***; both are located within the city centre of Kuala Lumpur. These two sites will be the areas from which data will be gathered, that could support or reject the theoretical propositions.

Case Study 1 used to be a prominent employment district; it was formerly a part of the CBD before World War II. Rapid development during the 20th century has meant that these districts have experienced unplanned development with a disorganised mixture of old and new development (Section 3.2.2 and 3.2.4 in Chapter 3). In contrary, Case Study 2 was developed during the era of globalisation, and was envisioned as an urban masterpiece for KL. The details of both sites will be discussed in greater detail in Chapter 5, Old Central Business District (CBD) (Case Study 1), and Chapter 6, Kuala Lumpur City Centre (KLCC) (Case Study 2).

4.6.4.1 Background of Case Study 1 (CS1)

The historical background to Site A has been collected through document reviews. Office A is situated in the key employment centres called the Central Business District (CBD) within the Central Planning Area (CPA) of Kuala Lumpur. Office A was set as a destination and an origin for the journey from home to work during AM peak hours and vice-versa for PM peak hours. The area of coverage for Site A is based on an 800 m radius (1/2 mile) from Office A, the reference point. Office A has very good proximity to various public transport networks: for example, it is approximately 250 m from the Putra Station of the STAR Light Rail Transit (LRT) network; 400 m from the PUTRA LRT Masjid Jamek Interchange station; and finally it is 800 m from the PUTRA LRT Pasar Seni Station and Bus Rapid Transit (BRT) station as shown in Figure 4.12.

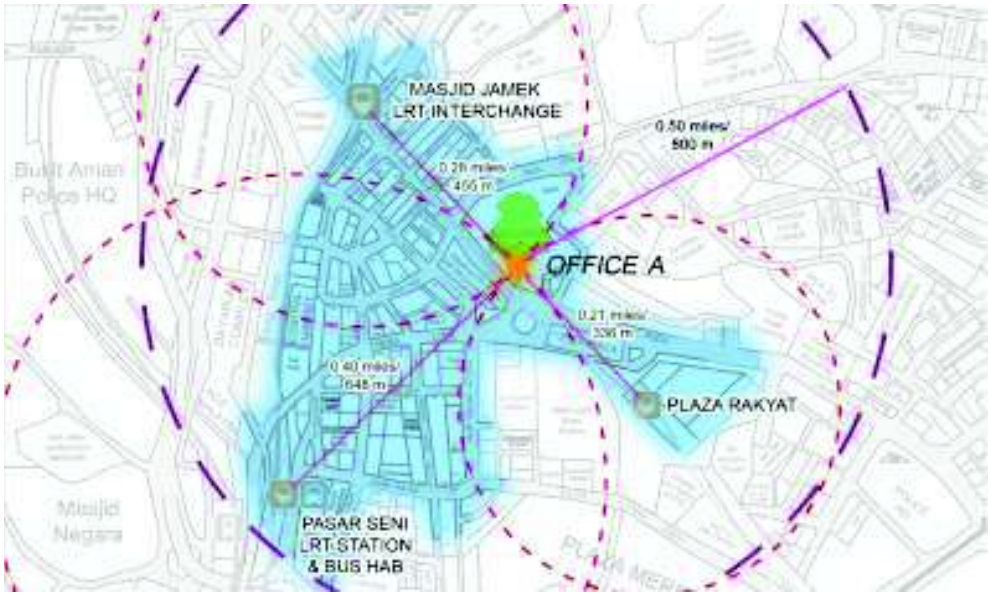


Figure 4. 12 Coloured areas represent the studied boundary for this research. The boundary is determined by the frequent usage of the respondents.

Land use developments within Site A are considered unique because it contains a fine variety of uses that combine living and working in shop-houses which have been in use since the 1890s in the Old Town of Kuala Lumpur as discussed in Chapter 3. This site has also witnessed dramatic changes during the city's transformation after the World War, with piecemeal developments including a variety of both old and new buildings such as the original historic shop-houses of the old city; and the high-rise offices and hotels buildings of different height ranges from 3 storeys to 50 storeys. Because of the unique mixture of developments within Site A, the area was gazetted as a Heritage Zone by the Kuala Lumpur City Hall (KLCH) (Draft of KL 2020 City Plan, 2008).

4.6.4.2 Background of Case Study 2

The historical background of Site B was obtained from the review of documents. Office B is situated in the Kuala Lumpur City Centre (KLCC) Development within the Golden Triangle Area (GTA) and it is owned by KLCC Property Holdings Berhad (KLCCP). The development of KLCC ranks among the largest real-estate developments in the world, covering 40 hectares (100 acres) of land. The KLCC Master Plan planned the area as an integrated mixed-use development where the public can work, live, visit, shop, and enjoy leisure time and cultural activities in a convenient and pleasant environment (KLCC Property Holdings Berhad (KLCCP), 2010) as shown in Figure 4.13.

Several developments have been planned, constructed, completed and occupied up to the present time; among them are:

- Office buildings (88 storey PETRONAS Twin Towers, Office B Tower, 49 storey Maxis Tower, 30 storey Esso Tower and Lot C, a mix of retail and office space);
- Shopping mall, retail space and entertainment space (Suria KLCC, Aquaria KLCC and Petronas Philharmonic Hall);
- Kuala Lumpur Convention Centre;
- Luxury hotels (Mandarin Oriental Kuala Lumpur Hotel and Traders Hotel);
- Residential buildings (The Binjai, Stonor Park and others);
- Public Area (50 acre Metropolitan Public Park and As Syakirin Mosque).

(Source: Annual Report Kuala Lumpur City Centre Properties (KLCCP), 2011)

Figure 4. 13 Office B Tower and all buildings within the KLCC Development are thoughtfully arranged on the perimeter of a 100 acre site, looking inward to the Metropolitan Public Park.

The site boundary in Case Study 2 is indicated by the name Site B as illustrated within the coloured area shown in figure 6-2. Site B represents the pedestrian environment, which is worth studying as it contains rich elements that support the needs of people on foot. The covered area for Site B is based on a radius of 800 m (1/2 mile) from Office B at the centre of the selected site and a reference point demonstrated in Figure 6-2. Office B was also marked as the main destination as well as the origin for the journey from home to workplace for AM peak hours and vice-versa for PM peak hours. Office B is surrounded by vibrant and active commercial, business, art, cultural and tourist activities with places like Bukit Bintang, Pavillion, Kuala Lumpur Craft Complex, Imperial Hotel, etc., within close proximity.

Office B has good connectivity to public transport networks namely PUTRA LRT which is approximately 572 m distant, Raja Chulan Monorail station which is 648 m away, and several Rapid KL bus routes.

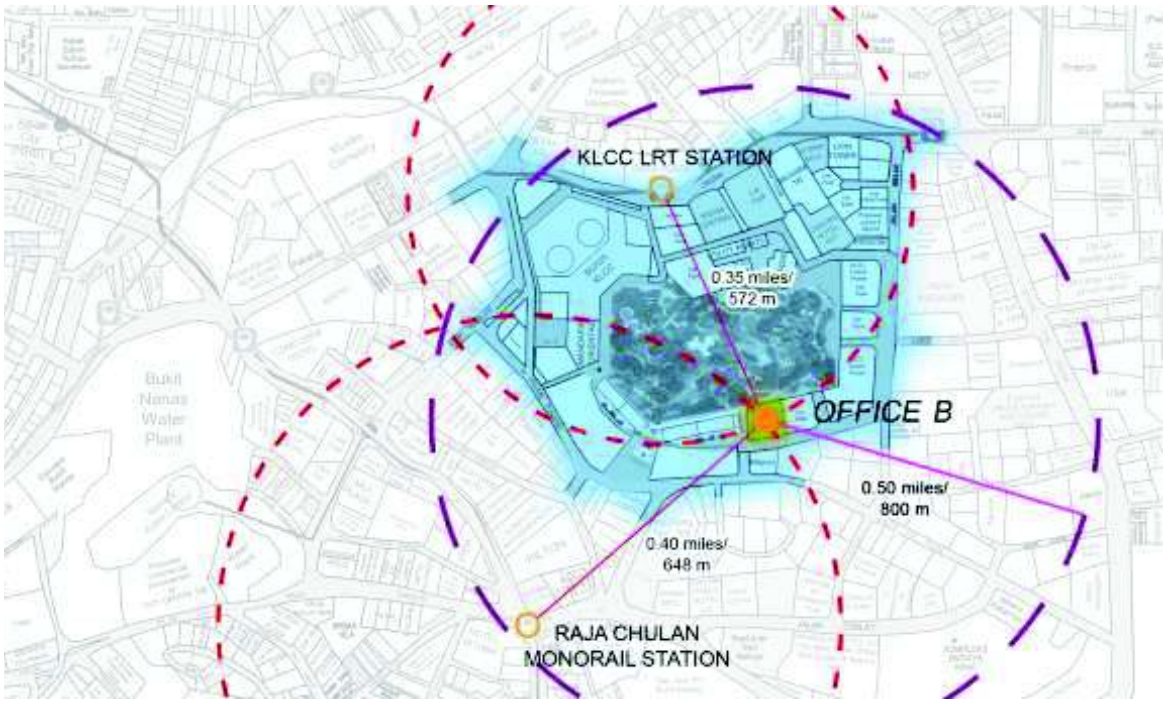


Figure 4. 14 The coverage area for Office B in Case Study 2.

4.7 Observation as a technique of data collection

Observation is a systematic method of data collection that relies on a researcher's ability to gather data through his or her senses (O'Leary, 2010). Sarantakos (2005) lists the basic types of observation, namely *participant* and *non-participant observation*; and structured, semi-structured and unstructured observation.

In *participant observation,* the researchers immerse themselves in the groups that they plan to study, and observe it from the inside (Legewie, 1991 as cited in Sarantakos, 2005). With this technique, the researchers are able to generate data through observing and listening to people in their natural setting, and to discover their social meaning and interpretation of their own activities (Gray, 2009). According to Guest et. al. (2013), it connects the researcher to the most basic of human experiences, discovering through immersion and participation the hows and whys of human behavior in a particular context. Guest continues that such discovery is natural; all of us have done this repeatedly throughout our lives, learning what it means to be members of our own families, our ethnic and national cultures, our work groups, and our personal circles and associations. Scholars such as Guest et. al (2013), White and Mc Burne (2013) and

Sarantakos (2005) suggest that participant observation is used for qualitative data collection.

In *non-participant observation*, however, according to Sarantakos (2005), the researchers study their subjects 'from the outside'; this is typically known as laboratory observation. This observation type allows the observer to observe the subjects through a one way mirror. It is most appropriately employed in quantitative data collection (O'Leary, 2010). Table 4.8 below illustrate the types of observation and guides the researcher in conducting observation techniques as part of data collection in their research.

Structured and *un-structured observation* differ in term of the degree to which they are structured (Sarantakos, 2005). Structured observation is more formal and employs a strict design in a highly systematic fashion (O'Leary, 2010). It is a form of non-participant observation and implies direct observation, and is applicable to quantitative data collection.

Un-structured observation is employed in qualitative research approach; it allows a flexible design in which the observers attempt to observe and record the data without using predetermined criteria (O'Leary, 2010). It is a form of participant observation, informal, and works in natural settings.

Semi-structured observation is a combination of structured and un-structured observation and is relatively common in social research (Sarantakos, 2005). It is perhaps structured in approach, but unstructured in terms of setting. O'Leary (2010) highlights that in semi-structured observation, the observer utilises predetermined criteria, but allows some degree of flexibility in the natural setting.

Table 4. 8 Types of observation (Sarantakos, 2005).

Factor	**Types of Observation**
Structure	Structured: entails strict design and control Unstructured: entail a flexible design and no control Semi- structured: lie in between structured and unstructured techniques.
Observer's role	Participant: the observer is not a part of the setting Non-Participant: the observer is not a part of the setting.
Observer	Self-observation: observer observing self, e.g. using videos Other observation: observer observing others
Focus	Human observation: focuses on people and their activities Physical observation: focuses on objects e.g. physical features

	and artefacts.
Setting	Natural observation: observation in natural settings Laboratory observation: observation in laboratories
Observer's commitment	Active observation: observer is committed to the cause of the study (involved in and supports the overall purpose of the study) Passive observation: observer is not committed to the cause of study.

4.7.1 Participant Observation Method

This research employed participant observation because this technique allows the author to explore what people actually do, and not just what they say they do during the interview session. Here, the author has access to the same places, people and events as the respondents. The author also goes through the experiences, feelings, fears and anxieties when engaged with people and the environment in the field. However, the author is supposed to remain unbiased because the research is about the experiences of the observed and not the opinions of the observer.

In light of the author's research objectives, this technique allows the author to explore the social events under all conditions, thus gathering data that is close to the reality that people live in, the way they construct meaning and their experiences (Sarantakos, 2005). According to Gray (2009), this technique is to generate data through observing and listening to people in their natural setting, and to discover their social meaning and interpretation of their own activities. The information gained from participant observation is used to support data gathered from the interview as a secondary source of data. The use of interviews together with participation observation when discussing the pedestrian environment strengthens the use of the qualitative research approach for understanding walking to the workplace. There is a physical quality that exists within the experience of participant observation which allows for a more in-depth discussion of the experience of the users. In this research, participant observation could be seen as a kind of interview; however, it is a 'walking' interview in which the researcher accompanies the respondents as they walk, and is thus able to obtain 'real' responses from the employees.

Although the researcher is present, her presence should not disrupt the respondents' regular actions and thoughts in a manner which affects the final results (White and McBurne, 2013). Another advantage of becoming a participant in the environment under

investigation is that when there is physical evidence, the researcher can readily see it. This will help the author obtain direct information and collect rich and in-depth non-verbal and verbal qualitative data in understanding the employees' actual reactions to certain things and places while walking in the pedestrian environment.

In this research, the author is immersed in two case study areas namely Case Study 1 and Case Study 2. The observation in Case Study 1 and Case Study 2 will be conducted based on two units of analysis:

1. *User (human observation):* To gather information about the perception of walking to work, and the relationship between the employees' walking to work and the factors that influence their walking experiences; and
2. *Pedestrian environment (observation of objects):* To gather information on the physical objects in the pedestrian environment within the site area that have a significant impact on the employees' walking activity to the workplace. Sarantakos (2005) points out that physical observation is able to provide sufficient data to draw conclusions about people without their active assistance.

According to Sarantakos (2005), participant observation may occur after or at the same time as other forms of data collection. In this research, the participant observation is to confirm or gain face validity for the findings produced from the interview method. The information that emerged from the interviews was manipulated to develop the semi-structured checklist that guided participant observation during field work. Information on commuting issues, selected routes choices to and from transit to workplace, route directness, experiences using the pedestrian facilities, positive and negative feelings on condition of pedestrian facilities, and physical features that may influence the employees' walking experience to the workplace.

Furthermore, for human observation, the author was guided by the respondents while walking through their desired routes from the transit point to their workplace. Yin (2009, p 110) opines that observational evidence provides supporting information for the main data.

The actual processes adopted for participant observation in this research are as follows:

1. Planning with the consideration of who, where, when, how and what

The author has identified the problems and phenomena as mentioned in Chapter 1; this has led the author to use participant observation using a semi-structured technique. The conceptual framework identified in Chapter 2 has been used to strategize what data will be gathered in answering the research questions and research objectives. The author then tries to discern what will yield the greatest understanding of the problem or phenomenon by using the information that emerged from the interviews and translating it into an observation checklist (see Appendix D). The flexibility of this structure means that the author is able to consider all relevant themes in exploring the two units of analysis. The author then invited the interview respondents to join her during the participant observation in the research setting.

2. Implementing participant observation by entering into the research setting.

Data collection begins after the author's entry into the research setting. Similar to the rules of the interview stage, the author has to be on time, set up and check any equipment, introduce the study, and establish rapport. As recommended by Sarantakos (2005) remained invisible and unaffected by the existing structure and functioning of the setting; in particular, the author respected the participants and was familiar with the lifestyle of the participants. The participants were asked about their experience and opinion of the route quality, route connectivity, route choice, physical outdoor activity, characteristics of walking and the physical facilities of the walkways. As suggested by O'Leary (2010) the author was ready for a range of sensory input by using all senses and intuition in gathering the data. The author also ensured that the observation reached the saturation point, and no longer yielded new knowledge, before ending the process.

3. Recording the employees' walking activity in the pedestrian environment in the case study areas.

As suggested by Sarantakos (2005) the author recorded while conducting the participant observation in the research setting as stated in the methodological framework (section 4.2.1). The common methods of recording are: writing down the information in the field notes in summary or in key words; tape recording conversations, video recording events and taking photographs. In the process of recording, the author was immersed in the study area in the AM and PM rush hours and during lunch break. The respondents guided the observer by walking through their everyday route choices such as, from their final

transit from home to the office within the case study area, or to and from the office to the eateries during lunch break. The author used mechanical aids such as:

i) A Dictaphone, model Sony I C Recorder ICD- UX200, used to record passing impressions and expressions;
ii) A digital SLR camera, model Nikon Dx7000, to record noteworthy events, situations or vistas;
iii) Observation checklist, maps and note book.

Figure 4. 15 The digital SLR camera with different lenses, a dictaphone for audio recording, maps, note book and sketching stationery.

According to Guest et. al (2013), respondents may be relied upon in the beginning to help the researcher assimilate to the situation; therefore, the statements of participants can be taken as evidence, even if their statements are rather self-serving. The researcher must also be aware of possible differences between the validity and intention of volunteered statements versus statements that are made in response to the researcher's questions.

4. Reviewing and refining

As suggested by O'Leary (2010) the author reviewed the observation records and the process flow of verbal and non-verbal communications before ending the observation. The author made sure that all data are supported by confirming or triangulating them with the data gathered from the interviews. In line with O'Leary, White and MacBurne (2013) the author was as truthful as possible.

5. Analysing data observations.

The research should remain in a balanced position between taking on the viewpoint of the group members and maintaining scientific objectivity as emphasised by White and MacBurne (2013),. On the whole, the analysis worked towards addressing the research questions in a perceptive and interpretative manner.

After a thorough discussion on the data collection techniques, table 4.9 below is the summary on the method of the investigation to find answers for the research questions.

The data put forward later within Case Study 1 and 2 (Chapter 5 and 6), presented information from both interview and participant observation–which were not distinguished in order to answer the research questions that were categorized under the relevant themes as shown in the table 4.9 below.

Table 4. 9 Research questions and the mode of investigations.

S/No	**Research Question**	**Themes**	**Method of Investigation**		
				Case Study	
			Literature Review	**Semi-structured interview (Exploratory)**	**Participant Observation (Exploratory)**
1.	To what extent does the employee perceive walking as part of transportation to workplace?	Implicit Understanding of Walking to Work	√	√	√
2.	What factors influence the employees to incorporate walking as part of transportation to workplace in the existing pedestrian environment in the city centre of Kuala Lumpur?	Influencing Factors of Walking to Work	√	√	√
3.	What are the main physical features in the pedestrian environment that encourages the employees to walk to work?	Physical Features Supporting Walking to Work	√	√	√
4.	How can employees be encouraged to choose walking as a part of transportation to their workplaces?	Dreams for a Pedestrian Friendly Environment	√	√	√

4.8 Analysing Stage

4.8.1 Research Techniques for Qualitative Data Analysis

To understand the data collected it is important to utilise the right procedures to analyse the data. As indicated previously, the data collected is qualitative in nature, meaning the data is non-statistical. Qualitative data analysis (QDA) procedures are used to analyse and transform data into meanings and finally into theory (Saunders, 2009). Yin (2009) points out that data analysis "*consists of examining, categorising, tabulating, testing or otherwise recombining both quantitative and qualitative evidence to address the initial propositions of a study*".

According to O'Leary (2010), in QDA; "*understanding is built by employing a creative process of uncovering and discovering themes that run through the raw data, and by interpreting the implication of those themes in relation to the research question*". The raw data could be in the form of documents, transcripts, images, maps and texts that needed the researcher's continuous engagement as part of an on-going process of analysis.

Creswell (2007) suggest that data analysis is the preparing and organising of data (such as transcripts) for analysis, then reducing the data into themes through a process of coding and condensing the codes, and finally representing the data in figures, tables or a discussion. On the other hand, Bloomberg and Volpe (2008) opine that this will involve lots of reading and rereading of raw data, organizing and managing data, analysing, interpreting and synthesising data and drawing the conclusion. Meanwhile O'Leary (2010) suggests that working with the QDA involves a process of drilling into the data and extracting a so-called 'theoretically meaningful understanding' as illustrated in the Figure 4.16.

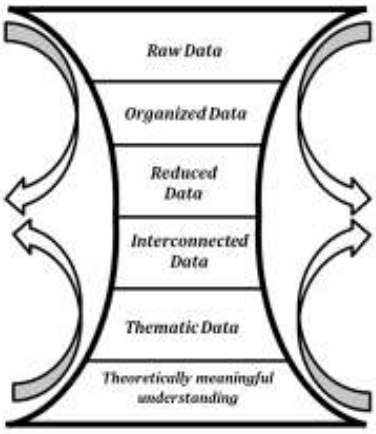


Figure 4. 16 Funnel system in qualitative data (O'Leary, 2010)

The analysis in this research uses a process of reflective qualitative analysis which requires the author to:

1. Organize all raw data from the interview transcripts, PO field notes, sketch maps and visual photographs;
2. Enter and code that data;
3. Search for meanings through thematic analysis;
4. Interpret and synthesise the meaning of the key findings emerging from the cross-case analysis using pattern matching or replication logic;
5. Draw a conclusion from the analysis.

(Adapted from O'Leary (2010) and Bloomberg and Volpe, (2008))

While carrying out the processes above, the author always keeps the bigger picture of research questions, aims and objectives, methodological constraints and the theoretical propositions clearly in mind. Easterby-Smith et al. (2008) opine that although there are various ways of analysing data, the methods of analysis chosen must be consistent with the philosophical and methodological assumptions made in the research design that supports the study.

As suggested by Eisenhardt (1989) and Bloomberg and Volpe (2008), the approach to be used is as follows:

- Select categories (in this case the categories are the employee's perception of walking to work (WtW), the factors that influence WtW, the physical features that

supporting and may encourage WtW in the pedestrian environment) and look for within-group similarities coupled with inter-group differences;

- Select pairs of cases and list the similarities and differences between each pair.

This study employs content analysis and cognitive mapping as the techniques for analysing the data collected. In identifying the concepts, content analysis is applied through the development of codes or constructs. On the other hand, cognitive mapping is used in looking at the relationships among the concepts and it is illustrated in the form of diagrams.

4.8.2 Content analysis for semi-structure interview and participant observation using code based analysis.

In order to extract meaning from the interviews, content analysis is used to analyse the transcribed data. Content analysis is done on the data in order to establish a pattern of responses. Easterby-Smith et al., (2008) define content analysis as "a relatively deducted method of analysis where codes (or constructs) are almost all predetermined and where they are systemically searched for within the data collected". In addition, Krippendorff (2004) defines content analysis as "a research technique to make replicable and valid inferences from text to a context of their use". It is further asserted that content analysis can range from word count, which involves the frequency of words in the text, with the frequency of use indicating importance. On the other hand, content analysis can be in the form of thematic analysis. This is where the text is examined thoroughly in order to check the existence and frequency of a theme (Krippendorff, 2004).

To make sense of the interviews, the author must engage in the process of coding data. The interviews are first transcribed verbatim for analysis and later, the relevant themes are identified. All transcriptions were undertaken by this author; and this has given the opportunity for the author to familiarise herself with the data in order to generate ideas and insight.

It must be acknowledged that different authors use different terms. Miles and Huberman (1994) use the term 'codes'; 'categories' (Glaser and Strauss, 1967); 'concepts' (Strauss and Corbin, 1990) and 'thematic units' (Krippendorf, 1980). Ryan and Bernard (2003) use the term 'theme' in their study as the term is "... more naturally connoting the fundamental concepts we are trying to describe". Therefore, in this study, the term

theme and codes are used interchangeably. These codes (themes) act like tags or labels for assigning units of meaning to the information assembled during the study (Miles and Huberman, 1994). In qualitative analysis, these themes are the key elements in the data. According to Ryan and Bernard (2003) codes can be built from the raw data (data-driven), the existing concepts or theory (theory-driven) or the research goal and questions (structural); most codes are data-driven or theory-driven. In data-driven and structural codes, continuous examination of the raw data is required, while for theory–driven coding, there is a need for repeated revisiting of the theory. Therefore, the development of coding is an iterative process. Taylor-Powell and Renner (2003) point out that the themes can be identified by using present and emergent categories. Present categories are identified from the literature review and are identified before the coding process. On the other hand, emergent categories appear from the data and the categories emerge after the researcher goes through the text.

Coding is the assigning of codes to the interview transcripts. Not only will it lead to data reduction but also data expansion when new connections between themes are made. It also allows transformation, whereby data are translated into meaningful units (De Cuir-Gunby et al., 2011); coding also leads to re-conceptualisation where it involves the re-thinking of theoretical associations (Coffey and Atkinson, 1996). Richards (2009) adds that the aim of coding is to learn from the data, and notes that the researcher needs to keep revisiting the data until he or she is able to see any patterns and explain them.

The data is categorised and coded into the said themes in order to bring meaning to the data. This step needs to be exhaustive as there is a need to read and re-read the text in the process of coding to ensure the data are categorised correctly. Hence, NVivo 9content analysis tool is used to assist in analysing the data. This software allows the author to manage code and model the data (Richards, 1999). It also can reduce bias through systematic analysis of large volumes of data.

4.8.3 Content analysis using matrices

The qualitative data is further analysed using matrices is conducted in two round stage namely;

i) within-case analysis (within the individual cases themselves); and
ii) cross-case analysis (across the two cases).

In within-case analysis, the empirical evidences are gathered using code based on each thematic assigned to each research questions. Each thematic constitutes sub-thematic which is variables identified in the literature review and this involves detailed writing-up for each case. As a result, this will enhance the familiarity of each case as a standalone entity. A unique pattern will appear from this process and this pattern can be generalised across cases (O'Leary (2010), Yin (2009); Bloomberg and Volpe (2008); Amaratunga and Baldry (2001)).

The cross-case analysis is to compare the findings from all two case studies and the author will identify and understand the differences and similarity of each case. Sarantakos (2005) suggested that the appropriate data presentation for cross- case analysis is through matrices which are a form of summary tables to compare the multiple case studies. From these matrices, replication logic or pattern matching; which is similar to that used in multiple-experiments will be established (Yin, 2009). The cross-case analysis involved the identification of patterns in the information given by the respondents across Case Study 1 and Case Study 2 (Refer Section 7.2 in Chapter 7). In their study, Ayres et al. (2003) conducted cross-case analysis in order to compare the experience of all participants and identify categories of significant statements that were common among them. This type of logic compares an empirical pattern with a predicted one. If the pattern matches, internal validity is enhanced. Miles and Huberman (1994) purported that the cross-case analysis is facilitated by using a variety of tools to reduce the amount of data and to display the data in a meaningful way called as data reduction. In supporting this, O'Leary (2010) suggests that data reduction is done through categorisation to build the major constructs in order to address the research questions. In the searching of patterns within cross-case studies, Eisenhardt (1989) proposed identifying the constructs or dimensions from the literature and subsequently observe for within-group similarities and inter-group differences. It is further highlighted that cross-case analysis is to be used for searching patterns.

4.8.4 Use of computer software for qualitative data analysis

There are a wide range of software choices that work for qualitative data analysis, such as NUD·IST (commonly known as Nvivo), MAXQDA, ATLAS.ti, Microsoft Visio, Decision Explorer etc. In this study, NVivo 9 software is used to facilitate the content analysis technique to analyse data obtained from interview and participant observation as mentioned in section 4.7.3 and 4.7.3. In order to support the content analysis, using NVivo 9 software helped to establish the rules of coding and categorisation; and enabled the researcher to search automatically and handle a large number of documents (Robson, 2002). In addition, Robson (2002) points out that the advantages of utilising software rather than doing the data analysis manually are as follows:

- Allows researcher to handle large numbers of documents and data;
- Searching can be done automatically, thus making it easier;
- Text can be easily manipulated or treated in a 'trial and error' manner to achieve appropriate conclusions;
- Text can be displayed in a number of ways;
- Acts as a single storage system; and
- Helps in the establishment of rules for coding.

It has been argued that the usage of software will increase the reliability and validity of the data analysis as it has made the analysis process more transparent, comprehensive and replicable (Bloomberg and Volpe, 2008). The use of software has also eased the process of retrieval of the coding and this has increased the consistency of analysis and results (Bazeley, 2007).

In this study, all semi-structured interviews were conducted in either the English or Malay languages, recorded, and then transcribed in English or Malay into a text file in Microsoft Word 2007 document format. The Malay documents were then translated, verbatim, into English in order to retain the original meaning of the interview contents. In order to effectively analyse the interview contents, each verbatim transcript was imported to NVivo 9 software. The author learned the application of Nvivo 9 software by attending courses organised by the University of Salford, and by referring to 'Qualitative Data

Analysis with NVivo' by Pat Bazeley (2007). There are nine steps used in applying this software, as follows:

1) **Starting and Setting up the project**: This is the initial stage in which the project is created. For this research, a project titled 'Understanding The Employee's Perception and Walking Experience to Advocate Walking to the Workplace in The Pedestrian Environment Of Kuala Lumpur City Centre' was envisaged. From there, the researcher navigated around the 'navigation windows' which are located at the left panel of the software. This is where the data is imported to the software.

2) **Making data records by creating and importing sources**: This particular step involves three important instructions being applied to the textual resources the researcher has transcribed. This includes the importing of the records from a word processor file. There are three types of 'sources', known as 'internals', 'memos' and 'externals'. For this particular research, 'interviews and documents are stored under the label 'internals'. Notes on theoryl and method are stored under 'memos'. Information extracted from WebPages and books is placed under 'externals'. This is illustrated as in Figure 4:

Figure 4. 17 Sources of qualitative data stored in 'internals' folder

1) *Managing data – cases, attributes and sets:* The researcher created 'case nodes' in which to gather all the information about the cases. Cases are represented as 'Case Study 1', 'Case Study 2'.
2) *Editing and linking – gaining perspective from the data:* Bazeley (2007) highlights that this process can be carried out while the researcher edits a document, annotates the sources of the evidence, write additional comments or adds notes into a memo, links it

within the data and draws up first ideas into a model. Therefore, the researcher can amend or put in more information in the transcription documents, making annotations on the transcribed sources or making alternations to the existing verbatim records with additional comments or reminders.

3) *Managing nodes and coding:* These are the important elements of the databases developed for this research. After analysis through NVivo 9, the text is coded into nodes which are a collection of references about themes, places, persons or other areas of interest for the research. The text is grouped into related nodes and labelled accordingly. A node can be considered as the 'container' for the reference materials gathered; for instance in this study, to gather all the content relating to the concept of 'implicit understanding of walking to work'.

The process of reading and gathering references into nodes is known as coding. Basically there are two types of nodes, namely tree nodes and free nodes. Tree nodes are nodes that are catalogued in a hierarchal structure, moving from a general category (parent node) at the top to more specific categories (child node). On the other hand, free nodes are standalone nodes that have no clear logical connection with other nodes and they do not easily fit into a hierarchal structure. The free nodes can be re-housed into tree nodes when necessary. Figure 4 illustrates an example of Nvivo 9 being used in the analysis:

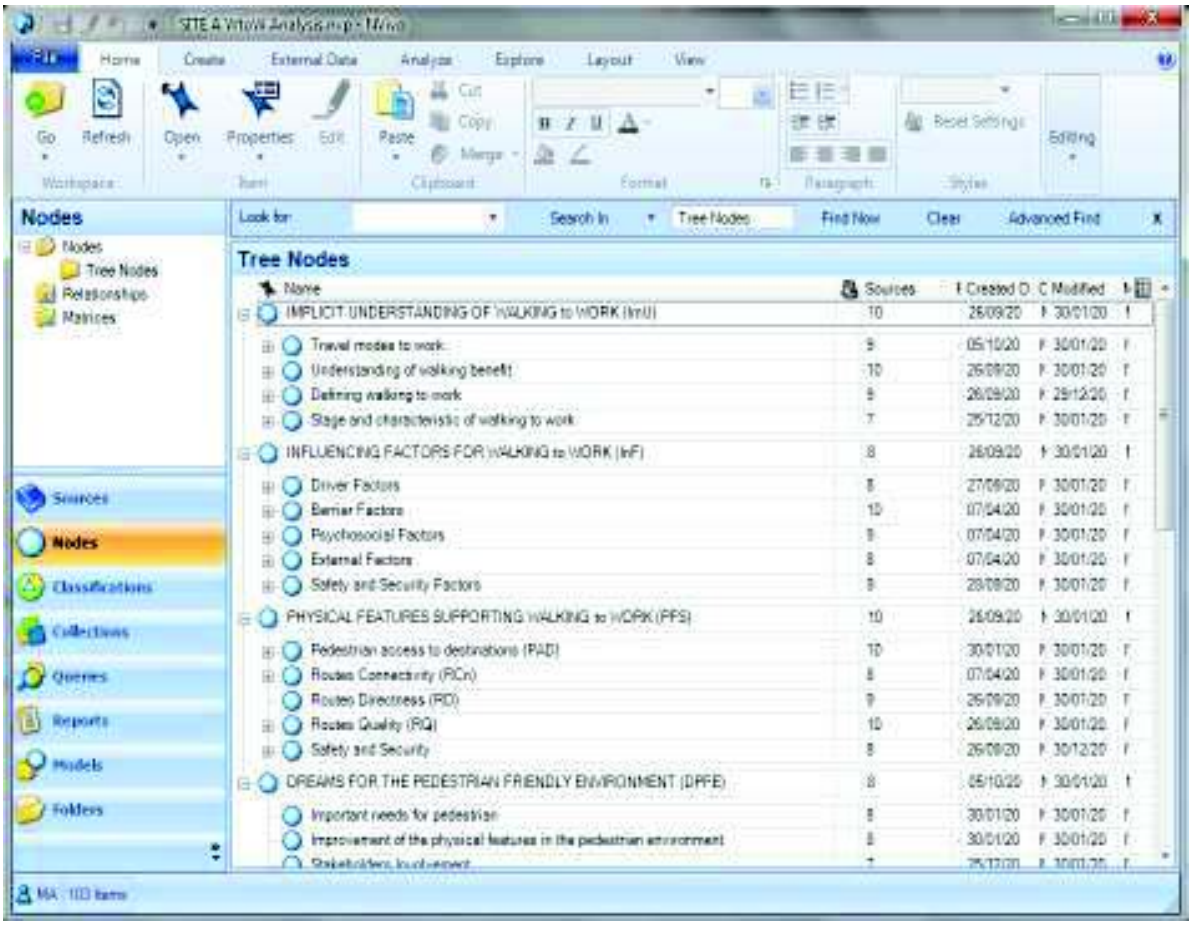


Figure 4. 18 Typical example of nodes and coding of text data in NVivo 9

Figure 4. 19 Typical example of nodes and coding for photographic data sorted and imported into “Internal Sources” using Nvivo 9.0

4) *Connecting ideas:* The author is able to discover deeper insight into the data once it has been developed into codes or tree nodes. It is the responsibility of the researcher to catalogue ideas, and to examine, amalgamate and rearrange all free nodes into tree nodes. The author is also to delete unnecessary codes and develop tree nodes that will be able to answer the research questions. All this can be undertaken by cutting, copying and pasting codes and nodes from the data collected. The researcher can be confident and satisfied with the arrangement made as long as they are logical, and bear witness to the reality of the social meanings.
5) *Development of research framework:* According to Whetten (2000), models act as a 'habit of the mind' that assists the researcher to explain constructive meanings. By using this software, models can be developed from the emerging ideas, that are able to generate meanings through a diagram. Models are a useful 'habit of the mind' (Whetten, 2000) as they encourage clear analysis and productive discourse by critiquing (diagramming) an argument and emerging evidence; summarising a body of literature, and making sense of a researcher's experiences while collecting evidence. For this research, the models are made of shapes and connectors. This is where the cognitive mapping is developed.
6) *Asking questions and version data:* Through NVivo 9, the author is able to make enquiries about the obtained data within the databases. By using this software, finding any project items in this research will be easier and quicker.
7) *Reporting and showing the project:* Reporting and showing the project are important parts of the thesis document in PhD research. Even though in the analysis chapter the tables, diagrams etc. are part of presentations that assist the author to report and illustrate the phenomena studied, the researcher needs to be able to report and exhibit the phenomena studied. After running the results in NVivo 9, the author should be able to find ways of presenting documentation, nodes, models and results produced. Revisit activities can always be done at a later stage.

4.8.5 Cognitive mapping mapping using 'Models' in Nvivo 9

Easterby-Smith et al. (2008) define cognitive mapping as "*a method of spatially displaying data in order to detect patterns and by so doing better understand their relationship and significance*". Cognitive mapping can be seen as a technique to structure ideas and to identify relationships between them in a hierarchal manner. Subsequently, the surrounding relationships and supporting information on the issues can be exploited and made explicit. It can be argued that cognitive mapping is able to bridge the gap between raw data and theory building (Kulatunga, 2008). In this study, cognitive mapping is created using the NVivo 9 software. The nodes (themes) and sub-nodes (sub-themes) are connected through links, represented in an arrow form, that indicate their relationships. These are all represented using a graphical format.

Table 4. 10 Summary of the data analysis techniques used

Data collection mode	Analysing strategies	Analysing techniques	Computer software
Semi-structure Interview	Display data Identify codes Reduce information Relating categories	Content analysis Cognitive mapping Cross-case analysis	Nvivo 9
Participant observation	Display data and visual photograph Identify code Reduce information Relating Categories	Content analysis Drawing analysis Cross-case analysis	Nvivo 9

Outcomes from the data analysis were interpreted and synthesised to draw conclusions onthe research objectives and questions. This is presented in Chapter 5, Chapter 6 and Chapter 7 of this thesis.

The following section discusses the importance of triangulation approaches or techniques used in the study.

4.8.6 Triangulation

Triangulation is the use of multiple methods, theories, data and investigators to analyse the problem which is major strength in case study research (Yin, 2009, p 114). According to Jankowicz (2000), triangulation is possible when using more than one research technique and the results from one technique are cross checked with the results of the

other to achieve reliability and accuracy of the findings. This strategy also provides greater depth and breath as well as converging chains of evidence.

Denzin and Lincoln (2000) offer four types of triangulation which are data source triangulation, investigator triangulation, multiple triangulations, and methodological triangulation. The types of triangulation were employed In this study, as shown in table 4.8 below:

Table 4. 11 Triangulation methods employed

Name	Description	Method used
Source triangulation	Multiple source of evidence	Data was collected from multiple case study (each case was treated individually using a unit of analysis)
	From different perspectives	The interviews were focused on 19 respondents. Each respondent was treated individually based on individual perceptions
Methodological triangulation	By data collection method	Use of semi-structures interviews and participant observations
	By data analysing method	Content analysis (display data, identify codes, reduce information, relating categories). Code based analysis, cross-case analysis, cognitive mapping

The above section has discussed and justified the methodological research design, data collection and analysing techniques chosen to undertake the case study. The following section discusses the methodological measures for acceptability in case study design.

4.8.7 Acceptability of case study design

The ultimate goal of conducting research is the production of new knowledge that can be trusted and relied on. Therefore the research methodology adopted for the research needs to meet certain standards and requirements. Some of the common criteria to achieve a certain standard in research methodology are: validity, reliability, generalisability, credibility, transferability, dependability, integrity and criticality.

This research adopted case study as an appropriate research approach. Eisenhardt (1989) argues that it is inappropriate to measure qualitative research using criteria applied to quantitative research, as the purpose of qualitative study is not to generalize data to a broader research sample, but to generate theories. Following on from this, Yin (2009)

recommends four tests and case study tactics to ensure validity and reliability that should be incorporated into the research design. The four steps are presented in Table 4.9.

Table 4. 12 Case Study tactics for four design tests (adopted from Yin, 2009; Easterby-Smith, 2004).

Test	Description	Tactics	Phase of research when tactic occurs
Construct validity	Establishing correct operational measures for the concepts being studied.	Triangulation - Use multiple source of evidence and establish chain of evidence	Data collection Data analysis (Triangulation data and methods)
External validity	Establishing a domain to which the study's findings can be generalised.	Replication logic in multiple case studies, to accomplish both; literal and theoretical replication	Research design Data collection
Reliability	Demonstrating the transparency of the study	Use case study protocol and database	Data collection
Generalisability	Concepts and constructs derived from the study have any relevance to another setting	Accomplished literal replication of the single case, therefore the cross-case results might be stated more assertively	Data analysis

In order to fulfil the above criteria, validity is one of the most essential components. Validity is the ability to produce truthful results and to measure what is supposed to be measured, which is an attribute of either qualitative or quantitative research (Sarantakos, 2005). This study will adopt the technique of triangulation of information from multiple sources as well as using multiple techniques for data analysis (Yin, 2009), with the sources and techniques being relevant to the data being collected (Silverman, 2007).

Construct validity and reliability are tested during the data collection stage. Yin (2009) recommends that the researcher be required to develop a sufficient operational set of measures by using multiple sources to obtain evidence. This is a way to encourage convergent lines of inquiry, because the study findings will be more accurate if based on multiple sources of information (Yin, 2009). Accuracy is achieved by employing theory triangulation and methodological triangulation. In theory triangulation, insight from the users' own experiences while walking to the workplace will be triangulated with the propositions that have been identified in the literature review (refer to Chapter 2). To ensure the rigour of this methodological triangulation, data from the semi-structured

interviews will be used together with participant observations in order to answer the research questions.

The case study protocol and database is to be established during the operation of a study, to ensure the reliability of the design test. Easterby-Smith (2002) and Gray (2006) stated that reliability refers to the stability of the data findings, which must reflect with clarity, credibility and trustworthiness the respondents' experience in the real world. The goal of reliability in research is to minimize error and biases in the study (Yin, 2009). The characteristics of reliability are as follows:

i) The instrument for collecting the data is familiar to use. This means that if the instrument is administered to the same individual on two different occasion, the the same findings and conclusions should be arrived at each time (Easterby-Smith, 2002); and

ii) Data collection procedures can be repeated with the same results (Yin, 2009).

Additionally, external validity is achieved when the results of the study (findings) can be generalized using replication logic; this is to be tested during the research design stage (Yin, 2009). The results from one case study will be replicated by conducting a second, third and even more case studies. In this study, the replication logic in multiple case studies fulfils external validity by using literal replication (within case analysis) and theoretical replication (cross-case analysis) to achieve a more robust result.

The next section explains the refinement stage of the methodological framework.

4.9 Refinement Stage

This section elaborates on the final step of the research process, that is, the refinement stage, during which the researcher disseminates all the information gathered during the investigation. O'Leary (2010) stated that the researcher is able to communicate, illuminate and share their research at this stage.

4.9.1 Thesis write up

Thesis write-up is the stage in which the final product, in the form of a report (Sarantakos, 2005), is produced. He continues that in qualitative research, the write up is not only the

last part of the project but also the final stage of analysis. Therefore, the report includes the data, statements and results used to create a relevant interpretation of the situation. The continous process of writing up helps the researcher to identify any gaps, to reflect on the study undertaken, and to refine the research process towards the end.

The purpose of research and the report vary according to the nature and content of the report. According to Sarantakos (2005), descriptive studies result in publications presenting descriptive findings; and exploratory studies generate studies from exploratory data. Similarly, studies based on action research will contain intentions of action which will demonstrate to the government or other interest groups what needs to be done to attain the research goal.

This report is meant to advise the policy makers and other stakeholders involved in matters concerning the pedestrian environment. Therefore it is structured and presented not only to advise these parties, but also to generate levels of debate and action which will lead to the enhancement of pedestrian environments, in order to support a culture of walking to the workplace. From the first, this thesis has been written with the aim of expanding, criticising and challenging the basic research idea.

4.10 Ethical Consideration

Following the University of Salford policy and regulations, the researcher has applied and been granted ethical approval from the University Ethics Committee before the commencing the data collection (Appendix F). Personal phone calls were conducted with the respondents who work in the selected site to arrange the interviews. The researcher was provided with letters issued by Salford University supporting the research task. The target respondents were invited to participate in this research via invitation letters. Together with the letter, the respondents are furnished with several documents as following:

A research brief to include the aim and objectives of the study and interview; and A consent letter indicating their willingness to participating in this research, however the respondents have the right to withdraw at any time. The informed consent also suggests that the respondent were not coerced to answer to questions that were irrelevant to

them. Informed consent from all the interview participants was obtained by the researcher as required by the ethical approval process.

4.11 Summary and Link

This chapter has discussed the many approaches to research, otherwise called research methodology. This study is using the 'Nested Approach' to guide the research methodology which integrates research philosophy, research approach, and research technique. It has identified that the methodological adopted for any research studies must relate strongly with the nature of the problem and the researcher's theoretical perspective. If the main theoretical perspectives were placed on a continuum, at one extreme would be positivism and the other interpretivism, therefore the researcher should critically understand the subject matters of her or his research and be able to position her or his stances. The difference between these two ideas has been discussed thoroughly in this chapter. Finally, a qualitative approach has been adopted using Case Study as a strategy to answer the research aim, objectives and questions stated in Chapter 1.

CHAPTER 5. PRESENTATION OF FINDINGS FOR CASE STUDY 1

5.1 Introduction

This chapter is one of two chapters focusing on data analysis. It explains the qualitative method of data collection, the selected samples and the analysis of the results as mentioned in chapter 4. It further clarifies the concluding statements of chapter 2 as to how walking could be incorporated as part of transportation mode to workplace for employees, to improve daily travel to the workplace in employment centres in the city. Based on the findings in Chapters 2 and 3, this chapter explores the following issues:

- how the meaning of walking as part of transportation to work is constructed, and how walking to work is perceived
- tangible and intangible factors that influence employees to incorporate walking to work
- what are the physical features which could support walking to work
- how employees can be encouraged to incorporate walking to work

In order to answer the above queries, this research was guided by a multiple embedded case study research approach. Data from in-depth semi-structured interviews and participant observation field notes were collected from two case study areas, looking into two units of analysis, namely the employees as pedestrians and the pedestrian environment as the real life setting. Based on the snowball sampling technique, a sample size of 10 employees from a company in one of two case studies participated in the interviews and was involved during the participant observations (refer to section in Chapter 4). This study was steered by a case study protocol throughout the data collection process. Rich data was gathered, classified, sorted and filed using computer-assisted qualitative data analysis software (CAQDAS) namely Nvivo 9 as mentioned in Chapter 4. This chapter will firstly, introduce the assignment of codes for the interview transcripts and for the participant observation field notes. This will be followed by presentation of findings about the four major emerging themes using content analysis of case study 1, for each research question as follows:

RQ 1: The implicit understanding of walking to work (ImU),

RQ 2: The influencing factors for walking to work (IFWtW),

RQ3: The physical features that support walking to work (PFS); and

RQ4: The dreams for a pedestrian friendly environment (PFE).

The next sections present the findings within case study 1.

5.2 Within-Case analysis – Case Study 1

The results displayed in this chapter emerged after going through a process of exploring, analysing and drawing conclusions from the data using content analysis for data obtained from interviews and participant observation. The author has set out to document a broad range of experiences and definitions of walking to work by way of "thick description" (Denzin and Lincoln, 2000). The aim is to provide an opportunity for the readers to not only enter this study but also to obtain a better understanding of the reality of the respondents' experiences; the emphasis throughout is on letting respondents speak for themselves. Illustrative quotations taken from the interview transcripts are used in an attempt to grasp the multiple respondents' perceptions and to capture some of the richness and complexity of the subject matter. Data from the participant observation such as field notes, sketch maps and photographs are woven into the interview data to augment and solidify the discussion. This interweaving of data gathered through both collection techniques is possible because they both look at the same units of analysis:

i) the users, who are adult employees and pedestrians who commute to work on a daily basis (refer to section 4.6.3). Face-to-face semi-structured interviews provide in-depth discussions with the users; and
ii) the pedestrian environment within the city centre which provides the setting within which the users walk to work. Walking interviews carried out with the same respondents during participant observation help to give clarity on what they really mean by walking to work and their perception on the quality of the pedestrian environment. Two site areas were identified namely Case Study 1 for Site A and Case Study 2 for Site B (refer section 4.6.4)

Figure 5.5 illustrates the relationship between the thematic concepts of walking to work for both case studies.

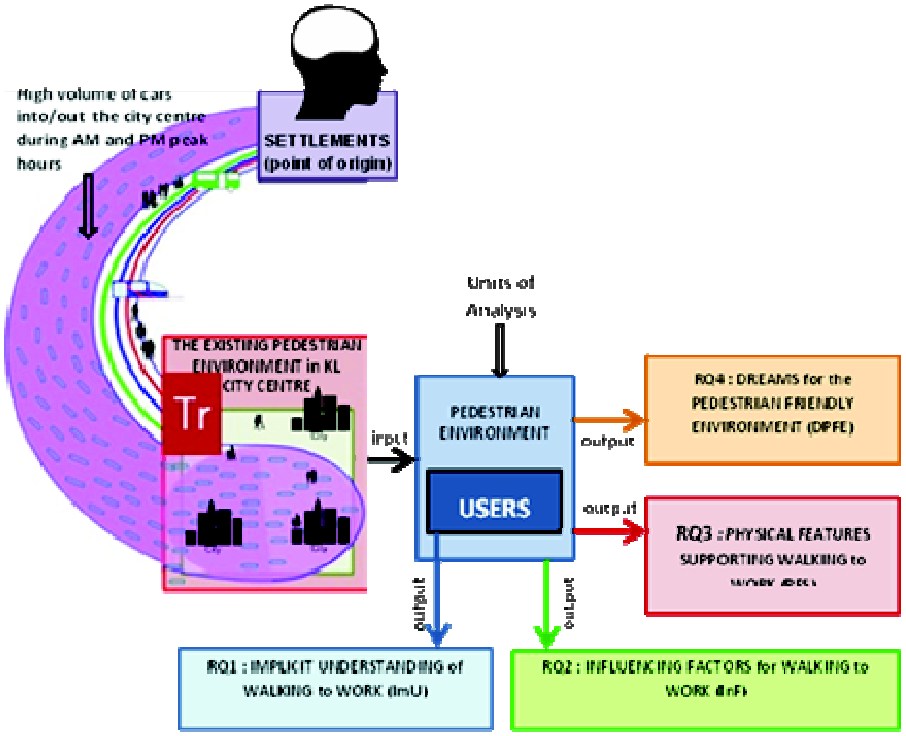


Figure 5. 1 The diagram showing the relationship between the existing pedestrian environment, units of analysis and the research question

5.3 Assignment of Coding and Structure for Analysing Data

For the purpose of anonymity and ease of analysis for this research, 19 respondents from two commercial offices in the two different sites area within the city centre will be coded. The office in Site A is coded as SA, while the office in Site B is coded as SB; data for SB will be presented separately in chapter 6. For Case Study A, 10 respondents participated in this research. The respondents were coded using the numbers 1 to 10, with letter 'R' denoting 'Respondent" before the number. For example, respondent number 1 from Site A is coded as R1-SA. The coding of the 10 respondents is tabulated as follows:-

Site A
R1-SA
R2-SA
R3-SA
R4-SA
R5-SA
R6-SA
R7-SA
R8-SA
R9-SA
R10-SA

Figure 5. 2 Assigned code for respondents for the interview technique

The assigned coding for the participant observation data for Site A is based on the themes and concepts recorded within Nvivo 9 under tree nodes as shown in Table 5.2. The following analysis is structured according to four major themes illustrated in the table 5.2 below.

TREE NODES (CASE STUDY A)	CODED REFERENCES
IMPLICIT UNDERSTANDING OF WALKING to WORK (ImU)	8
INFLUENCING FACTORS FOR WALKING to WORK (InF)	10
PHYSICAL FEATURES SUPPORTING WALKING to WORK (PFS)	10
DREAMS FOR THE PEDESTRIAN FRIENDLY ENVIRONMENT (DPFE)	8

Figure 5. 3 Four themes of walking to work under Nvivo 9 tree node for Case Study 1

A tree structure or *inverted tree* can be described as a type of data structure in which each element is attached to one or more elements directly beneath it. According to *The Free Dictionary,* from the Computer Science approach, it is a structure for organising or classifying data in which every item can be traced to a single origin through a unique path. The same dictionary also defines it as a diagram that has branches in descending lines showing the relationships as hierarchy or lineage. A typical tree structure diagram will illustrate a collection of nodes (a collection of references about a specific area of interest) called the starting node (parent node); each node is assigned its own value with a list of references (child nodes) attached (branches) to itself with the limitation that no reference

is duplicated and none points to the root. In most cases, the references will have other values attached to it which are usually at the very bottom of the inverted tree and they are called the leaf nodes. This method of data organisation is utilised in this research.

The four (4) themes mentioned above are the **parent node**/tree node/ ancestor node/theme. The references attached to the tree nodes are called the **child node**/sub-tree node while the branches attached below the child node are referred to as the **leaf node**/terminal node as illustrated in figure 5.4 below.

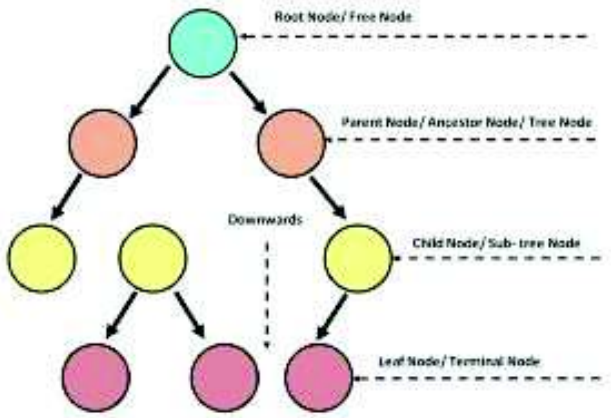


Figure 5. 4 A typical tree structure diagram (Sulaiman, 2011)

5.4 Within-Case Findings

5.4.1 Research Question 1: Implicit Understanding of Walking to Work

Data collection methods used to find the answer to research question 1 is shown in the diagram below (Figure 5.5). Inquiries related to how users construct the meaning of walking to work are collected in the interviews while for inquiries in relation to the pedestrian environment both techniques (interviews and participant observation) are applicable.

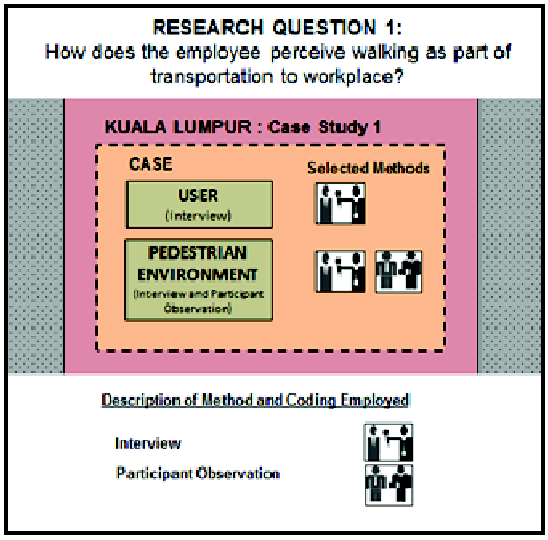


Figure 5. 5 Data collection methods applied to find the answer for RQ1.

For Site A, the perception of the employees with regard to walking to work is categorised under the parent node, 'The Implicit Understanding of Walking to Workplace'. Four main child nodes emerge from the parent node, defining walking to work, stages and characteristics of walking, travel modes to work and understanding benefits of walking. These four child nodes are meant to give an insight into what employees as pedestrians perceive while walking to work and to understand walking from all the respondents' points of view as shown in figure 5.6.

TREE NODES (CASE STUDY A)	CODED REFERENCES
2. IMPLICIT UNDERSTANDING OF WALKING to WORK (ImU)	10
+ Defining walking to work	9
o Walking for necessary purposes	6
o Walking for optional purposes	6
o Walking for social purposes	5
o Walking for transport	3
+ Stage and characteristic of walking to work	7
o Walking characteristic (WaC)	3
o Walking stages in workplace travel to and from home	11
+ Travel modes to work	9
o Driving	2
o Mixed modes	9
+Understanding of walking benefit	10
o Economy	9
o Environment	5
o Health	10
o Social	8

Parent node/ ancestor/node/tree node/theme

Child node/sub-theme

Leaf node/ terminal

Figure 5. 6 The concepts of the implicit understanding of walking to work

5.4.2 Defining walking to work

From the data collected from this site, the definition of walking to work was discussed under the leaf nodes of walking as an option, walking as a necessity (as a daily routine), walking for transportation and walking for social activities. The majority of the respondents strongly stated their reason for walking to work in this area as a necessity.

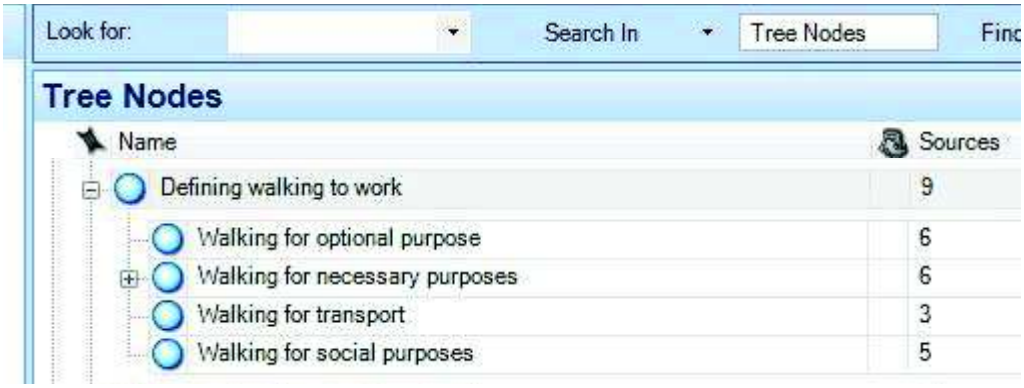


Figure 5. 7 Concepts of definition of walking to work for CS 1

5.4.2.1 Walking for necessary purposes

This type of walking is associated with pedestrians who have a specific destination when they commence their daily journey. All the respondents (10 out of 10 [100%]) stated that they walk within Site A to arrive at work. They described it as a straightforward path because there is no room for distractions on their way to work. Respondent (R8-SA) stated clearly that:

> "It is a necessity because you have to go to work so it is not an option." (R8-SA)

The next respondent (R2-SA) had a similar comment to respondent (R8-SA), saying:

> "I consider my daily walking from the Plaza Rakyat station to Maybank Tower as for necessary purposes." (R2-SA)

The following interviewee also agreed about the nature of walking to work as purely functional because there is a focus on where the origin and destination are and the time gap between the two. Respondent (R9-SA) explained:

> *"Yes, walking to work is a focused task; I would say (nodding). That is my main mode of transportation from the transit station to the office. It is only a short distance journey. I consider walking in short distance as a convenient mode of transport to reach the office."* (R9-SA)

5.4.2.2 Walking for transportation

Transport by definition is the movement from one place to another; therefore walking is a mode of transportation. The respondents stated several times over that walking is a viable transportation option. For this reason, walking can be seen as a basic mode of transportation. Walking for transport covers all types of walking because walking is any journey - long or short - undertaken on foot from one point to another. Respondent (R7-SA) acknowledged walking as a viable mode of transportation by saying:

> *"Yes, I definitely agree that walking is reasonable transportation mode for everyone"* (R7-SA)

The next respondent (R1-SA) added that walking is the most appropriate mode of transportation for short distance trips as an alternative to automobiles. Respondent (R2-SA) added that the use of a taxi is illogical and referred to walking as a convenience as below:

> *"If I walk short distance, then yes walking could be part of alternative transport"* (R1-SA)

> *"No. I never ever think to take a taxi because it doesn't make sense to me. It is because I considered it is very short distance journey and walking is a very convenient transport method to get to the office."* (R9- SA)

5.4.2.3 Walking for social purposes

Gehl (2002) characterizes social activities as a wide range of attractive optional activities, either passive or active, which include watching, listening, experiencing and interacting with other people. From his explanation of walking for social purposes, it is clear that there is no clear distinction between walking for social purposes and optional purposes. However, both would be achievable within a successful pedestrian environment. Many of the respondents speak of walking in terms of relaxation or enjoyment of the outdoor physical environment. Respondents gave reasons for walking in relation to exercise and relaxation; however, their ultimate journey is almost always either to or from work or to the eating areas for lunch. For this reason their walking cannot be categorised as being for optional purposes.

Respondent (R7-SA) shared her enthusiasm for walking as follows:

> *"Because, as I am an executive, I understand that know thinking of those who actually have regular exercise, I don't need to because walking is a part of my*

exercises, so I do try my best to walk as much as possible rather than just sitting in office." (R7-SA)

5.4.3 Travel modes to work

The child node 'travelling mode to work' refers to the method or means an individual takes to reach the Office within Site A from their place of origin. For this site, only a few respondents said they drove to the city centre everyday while others mentioned travelling to work using a mixed mode (combination of walking, LRT, buses, cars, etc.). The following are the comments given by both motorists and pedestrians in Office A.

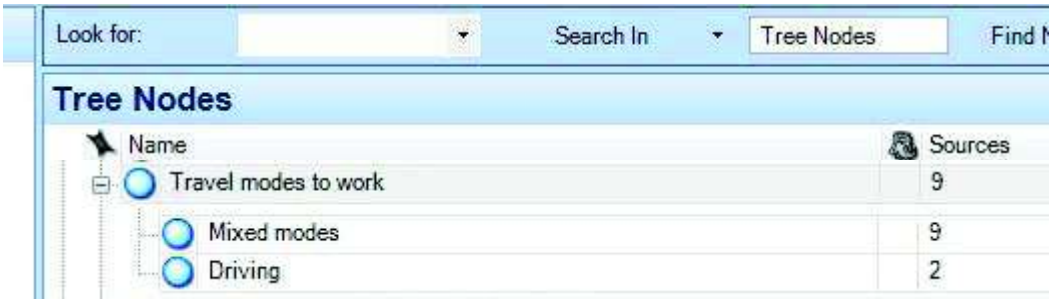


Figure 5. 8 The concepts of the implicit understanding of walking to work

5.4.3.1 Mixed-Mode Transportation

About half of the respondents (6 out of 10 [60%]) claimed to use a mixture of transportation modes to get from their respective homes to the office. Once they arrive at the LRT station near their homes, the remainder of their trip is by train and on foot. Within this sample, most of the respondents who chose this mode of travel related that they live close to the LRT stations and could therefore walk there. Respondent (R4-SA) narrated a journey involing walking to the train, using the train, and then walking again, with reference to the amount of time allowed for the entire trip.

"My home is not far from the station. Working hours start at 8.45, I have to start walking at about 8 from Pandan Jaya before arriving at Plaza Putra at 8.45. It's all about 10 to 20 min depending on LRT train frequency and speed. From the station, I'll just walk directly to the office." (R4-SA)

The next respondent stated that there are two options for travelling to the workplace. One is via bus while the other is via train. During participant observation she stated that:

"For public transport I have two options, one is by bus and another is by LRT because I live nearby." (R5-SA)

Respondent (R9-SA) narrated the journey during the walk through the site:

> *"I take a bus from Taman Desa to Pasar Seni. My arrival point would be the Pasar Seni Bus Station in the city centre."* (R9-SA)

5.4.3.2 Driving

For the purposes of this research, driving to work can be divided into different categories, namely driving as a part of mixed-mode transportation and driving as the sole mode of transportation, both with reference to transportation to and from the individual's home to Office A. 30% of the respondents commented that they use their private cars to arrive at the LRT stations in the morning after which they use the LRT to travel to the station nearest the office, and finally, they walk to Office A. Respondent (R2-SA) explained:

> *"From home, I come out around seven o'clock. Then I drive to LRT station driving I think takes around 20 minutes."* (R2-SA)

Another respondent (R3-SA) gave a similar comment to respondent (R2-SA) above. The respondent narrated:

> *"I drive to the station, Putra LRT. Then, I take LRT. I walk for ten minutes just to reach the LRT station. Then another 20 minutes from LRT to reach Masjid Jamek. Then 10 minutes to reach this building"* (R3-SA)

Respondent (R8-SA) also explained:

> *"Actually, I drive halfway to Miharja then I take LRT near Puduraya, and then walk to the office."* (R8-SA)

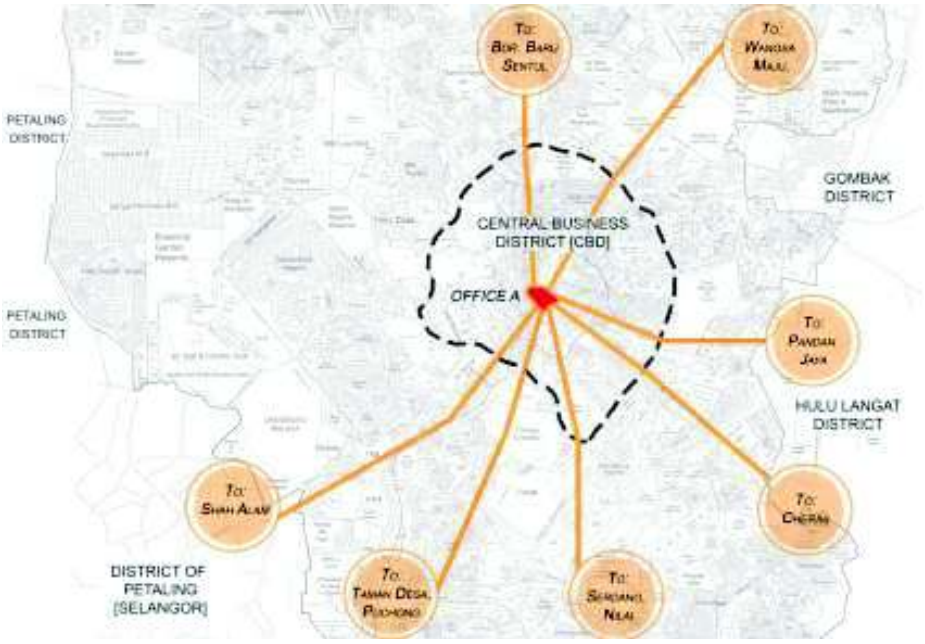


Figure 5. 9 The respondents travel pattern for CS 1 showing the dispersal of the respondents' origin (home) from their employment in city centre.

5.4.4 Understanding the benefits of walking

The benefits of walking to work (child node) are numerous, as highlighted in chapter 2. The individuals interviewed for the research pointed out benefits of walking in their comments. From these comments, the benefits of walking to work can be reflected under the themes of health, economy, social and environment, as illustrated below:

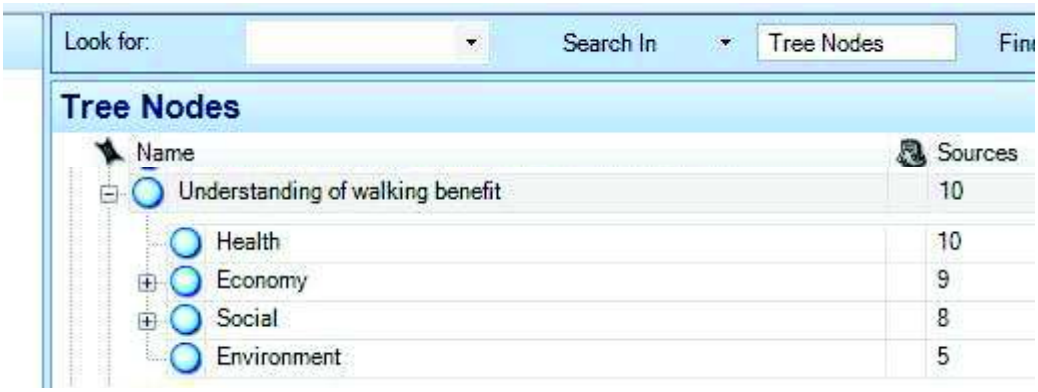


Figure 5. 10 Concepts of understanding the benefits of walking for CS 1

5.4.4.1 Health

When discussing the benefits to health, the respondents' comments showed health benefits can be either physical or mental. With physical health, most of the respondents spoke about remaining fit and reducing the cholesterol level in their bodies. As for mental benefits, they considered walking to be a stress reliever and a relief from the monotony

of working in the office. Respondent (R2-SA) explained that he seldom exercised and walking made up for the physical activities needed daily:

> *"I think walking is part of exercising… I seldom exercise every week. Sometimes twice a month. So I walk around maybe 400 meters a day from the parking place to LRT, LRT to the office and similarly on my way back home."* (R2-SA)

The next respondent spoke about walking after eating, which she believed aids digestion as such:

> *"If early in the morning, you eat quite a lot of breakfast then you walk to the office for 10 minutes, the food will digest faster. I think this is because I sweat which causes my body to process the food and use up energy faster."* (R3-SA)

Respondent (R4-SA) mentioned cholesterol levels, familiarity and relaxation during the discussion:

> *"…it's a health concern…you're reducing your cholesterol…you're sharing this road walking from point A to point B…which means I'm familiarizing with the environments and surroundings which makes it easy to relax."* (R4-SA)

Another respondent further strengthened the argument of walking around the city centre as a means to cultivate and maintain a healthy lifestyle.

> *"I seldom see those people using public transport as overweight; I think maybe it is just that they like to walk within a short distance everyday either for work, shopping, go to the destination they want. It's a very healthy way of life."* (R5-SA)

This respondent talks more about walking as a means of relaxation and enjoyment:

> *"Normally, before coming to work, I usually brisk walk in the field near my house and then I take a deep breath and sit down, as I am exercising I get really relaxed. I don't see any problem with walking."*(R8-SA)

Respondent (R3-SA) explains more about enjoying the outdoor environment, as opposed to the frustration of being in a car during peak hours.

> *"Yes, I like the fresh air. You get less frustrated compared to driving if there is a traffic jam. At least you know you will reach your office within 20 minutes. If I are driving, I will definitely get stuck in the jam, and then there is a confusion on how reach office"* (R3-SA)

5.4.4.2 Economy

All the respondents (10 out of 10 [100%]) agreed that walking to work as a part of multi-modal transport, or walking in general, allows them to be more economical in their expenses. When those who used cars and those who walked or used multi-mode transportation calculated their expenses, the results showed that those who used cars as a mode of transportation spent more on fuel, maintenance and parking on a weekly basis as compared to those who incorporated walking in mixed transportation mode. Respondent (R2-SA) calculated the cost per week as follows:

> *"If I drive the car to work, in a week I spend…[calculating]…over RM150. So I save around RM25 to RM40 per week. I buy fuel at around RM30 per week (on a good week when I have nowhere else to go), parking RM50 and car maintenance maybe around RM100 per month."*(R2-SA)

The next respondents (R1-SA) and (R-SA) said:

> *"I walk a lot. Of course, I can save a lot on the fuel, I save my time and I use up energy but I can't complain because it keeps me fit."* (R1-SA)

> *"It's definitely cheaper. Driving here in terms of mileage, it's cheaper.*(R-SA)

Another respondent further discusses the economics of travelling to work. The respondent compares the various modes of transportation and relates them to cost as below:

> *"Yes because when we travel by car to work, it is very much different from using LRT. For example, when I come to the office by car; I need to consider fuel and parking fees. But when I go to work using LRT, I just consider the parking at LRT which is only 3 Ringgit and then I use the touch and go card that cost 100 Ringgit for one month; you can go anywhere using LRT because it doesn't count the number of times it is used. So it saves more than driving to the office."*(R6-SA)

5.4.4.3 Environment

Most of the respondents (9 out 10 [90%]) are informed regarding carbon emissions but only about 50% of those who are aware took the impact of the automobile as a serious matter which needs to be addressed, particularly in relation to the issue of traffic congestion and emissions within the city. One of the respondents said:

> *"Something needs to be done about the rate of carbon emissions into the environment. It can't be healthy to live like this with all the smoke from the exhaust of the cars during congestion times."* (R1-SA)

Another respondent elaborated:

> *"Yeah, we don't think of these things so we don't feel them to be crucial until it is too late to change. More and more people use the car for transport, if this continues than we will have problems…I prefer not to use cars because I don't see the point. I can walk or use public transport. I guess it is human nature; however I drive sometimes."* (R4-SA)

5.4.4.4 Social

As in much other research, most of the respondents (9 out of 10 [95%]) felt that socializing during transportation, especially walking, is important to enliven the surroundings and make the trip worthwhile. Respondent (R8-SA) explained during the walk with the observer that:

> *"It is different…it depends on where you want to go, where you want to eat. I just walk around these parts, looking for things, which actually puts me in a very relaxed mode where I am not rushing. I don't think it's a necessity to look for food, I think it's a necessity to relax, to change mood. Sometimes I just want to sit down and chit-chat with my friends."*(R8-SA)

Another respondent's input on socializing on the way to work or during lunch breaks was discussed in terms of interaction with friends and couples as follows:

> *"Walking for social purposes is ideal but not during working hour, outside working hour for example at night, I go out with friends to walk around 10 to 15 minutes. Especially couples, I think a couple walks more because they want to enjoy the intimacy of a public space and the view around them together."*(R3-SA)

A respondent narrates the route he takes from KLCC to Bukit Bintang as follows:

> *"I feel joyful while walking with my companions as compared to walking alone...I can see a lot of advertisement in Bukit Bintang or Sungai Wang Plaza. We are rich in term of cultures, building and design."* (R4-SA)

5.4.5 Walking stages and walking characteristics

Walking stages refers to the phases involved in walking to work. It could include walking from the home to the home LRT station as the first stage, the train from the home station to the work station as the second stage, etc. Walking characteristics focuses on the type

of environment required for walking, depending on the purpose of walking to work. The following are the comments of the respondents regarding their walking pattern and activities they partake in to or from work and during lunch breaks.

Figure 5. 11 Concepts of stages and characteristics of walking to work

This respondent discusses the time it takes to reach the transit from the place of residence which can take different times depending on the walking pace:

> *"In the morning when I am rushing, it takes about 10 minutes to walk to the office from the transit. However, at a normal pace it takes 15 minutes (Easy walking) [Laugh]"* (R9-SA)

The next respondent (R8-SA) explains about how fast she walks and gives some insight into the reason she walks at this pace. During participant observation, the respondent also related her activities during the peak hours and her preferred mode of transportation:

> *"Yes, I walk fast because in the evening I still depend on public transport because my husband works around here and he comes back home really late. So I take LRT and then take another bus to get to my home. So, actually I walk very fast all the way."*(R8-SA)

Another respondent concurs with the statement of the previous respondent by discussing her perception while walking to and from work as follows:

> *"It's a different game because you are going to relax. I think it's a very different experience...when I am coming to work and when I am going home. I just want to go home to see my kids."*(R8-SA)

Respondent (R10-SA) related this about his journey home from work:

> *"If I go back home it's not like when I go to work because I use commuter and they always have delays. I have to go from Kuala Lumpur to Nilai. It takes*

> *about one hour. If I stop working early, then I manage to come home early."*(R10-SA)

Two other interviewees (respondents) stated briefly the condition of the built environment within the context of Office A:

> *"…the environment…the condition itself…There is no design for it. Kinda boring. Do you know what I mean?"* (R2-SA)

> *"And then just at the side of the narrow road, there is another store. It is a very narrow road already yet they set up a store to occupy a part of the space. So when people want to cross this building, they have to take turns."* (R5-SA)

5.5 Research Question 2: Influencing Factors for Walking to Work

Data collection methods in seeking the answer for research question 2 are shown in Figure 5.5 below.

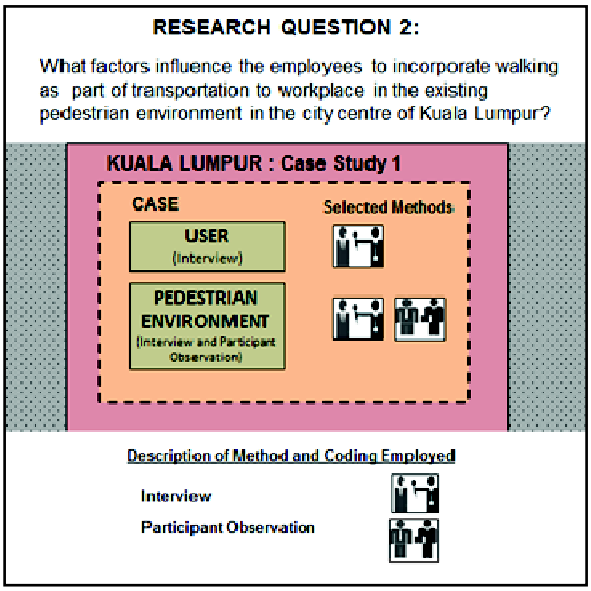


Figure 5. 12 Data collection techniques for research question 2.

These factors are the determinants that influence a person to walk or otherwise. Influencing factors for walking to work refers to both conscious and subconscious factors. The theory behind these factors has been discussed comprehensively in chapter 2. It is possible to categorise the reasons people walk in the environment into the themes below.

TREE NODES (CASE STUDY A)	CODED REFERENCES
1. INFLUENCING FACTORS FOR WALKING to WORK (InF)	8
+ Barrier Factors	10
o Discontinued protection from weather condition	3
o Disintegrated work by the authorities and stakeholders in improving the pedestrian environment	9
o Inadequate pedestrian crossing facilities	
o Negative attitudes related to walking	9
o Poor accessibility and connectivity	3
o Unpleasant feeling	3
o Unreliable public transport system	5
+ Driver Factors	8
o Availability of public transport network	6
o Encouragement from the employer	3
o Parking facilities at stations	2
o Traffic conditions	5
+ External Factors	8
o Enforcement	2
o Policy	2
o Vision towards the world class city	1
o Weather	6
+Psychosocial Factors	9
o Employee perception to walking	9
o Familiarity of the area	5
o Peer review	4
o Positive feelings about walking to the body and mind	3
o Relaxation and rejuvenation	3
o Socializing through walking	7
o Time taken	6
o Visual appreciation while walking	5
+Safety and Security Factors	9
o Crime	9
o Dangerous	9
o Harassment	5
o Traffic	7

Parent node/ ancestor/node/tree node/theme

Child node/ sub-theme

Leaf node/ terminal

Figure 5. 13 Influencing factors for walking to work.

5.5.1 Driver Factors

Driver factors are those that have the tendency to encourage or push the activity of walking in the city centre. They cover themes from availability of public transport to parking facilities. If these driving factors are absent in the environment then there is a possibility for the city to become an invaded or abandoned city. The driver factors are listed in Figure 5.14 below:

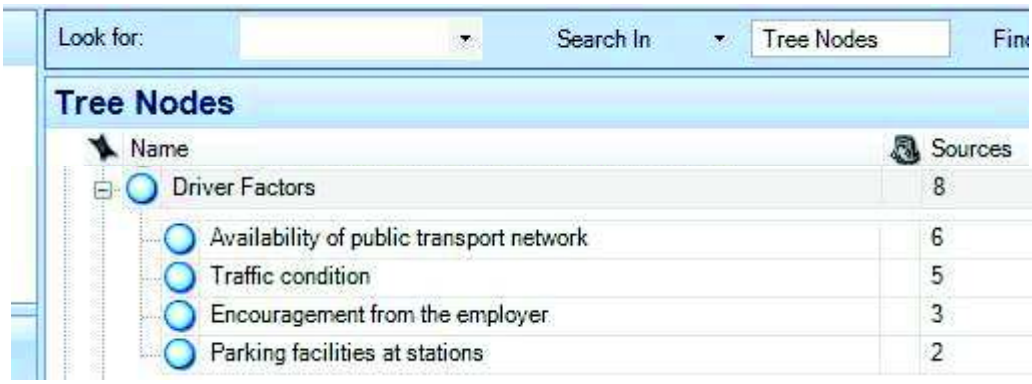


Figure 5. 14 Driver factors for walking to work.

5.5.1.1 Parking facilities at stations

The availability of parking spaces around the city and particularly in proximity to the transit station is a vital factor in determining if the public chooses to walk as part of mixed-mode transport or drive the entire way to work in the morning. A respondent, during participant observation, complained about the distance of the station from her home.

> *"When I park my car, to walk to the LRT station, it takes around 10 minutes to walk. I park around the housing area which is quite a distance to the LRT station."* (R3-SA)

Those who sometimes drive complained of the cost of the toll and parking. Respondent (R10-SA) said:

> *"When you live far away and drive to work, you have to use a toll and parking which are quite expensive especially if you have to use it every time."* (R10-SA)

5.5.1.2 Traffic Conditions

KL has suffered from heavy traffic congestion particularly on the main highways such as the Federal highway, North-South PLUS highway, MRR1 and MRR2 to the city centre. There tends to be more congestion on the road networks in KL during the AM and PM rush hours due to the fact that everyone travels from home to work at the same time in the mornings and returns from work to their homes at the same time in the evening. The fact that they do so in cars makes the car dominance worse and deteriorates the conditions for pedestrians walking in the city centre. All of the respondents (10 out of 10 [100%]) expressed serious concern about being caught in traffic jams, and cited that as the primary reason for some of them not to use private vehicles. One of the respondents said:

> *"I don't mind walking because if I am driving to the office, I'll be stuck in the traffic jam. So, I'll be spending most of my time in the car, it will get me mad. That kind of thing, I can avoid if I am walking to the office."* (R1-SA)

Another respondent stated during the participant observation:

> *"If there is no traffic jam, I prefer driving to the office. That's the only reason for not driving actually."*(R1-SA)

Respondent (R6-SA) shed light on the fact that some people have to wake up early in the morning in order to avoid traffic jams in KL. The respondent said:

> *"Yes, at 7 or 6.40 am less cars are on the road because not many people wake up that early. So, I don't want to be stuck in the traffic jam."* (R6-SA)

Respondent (R9-SA) stated:

> *"It is a little bit slow at Jalan Klang Lama, bumper to bumper but still there is movement."* (R9-SA)

5.5.1.3 Availability of Public Transport Network

The availability of public transport is a big relief to almost all the respondents due to the heavy traffic congestion they encounter on their way to work in private vehicles. Many of the respondents have identified issues while driving, such as paying toll, parking fees, and a search for an appropriate parking space. Respondent (R5-SA) commented:

> *"I have options. For public transport I have two options, one is by bus and another is by LRT."*(R5-SA)

Another respondent clearly stated his position on using private vehicles or public transportation, citing the toll:

> *"It is more efficient using public transport such as LRT. Oh! Not to mention that if I drive I have to pay for the toll around RM4.40 a day."* (R2-SA)

Some of the respondent had nothing to say regarding the pedestrian environment because they use private cars to commute.

> *"So I have to drive the car, or my father comes to fetch me to the LRT station. It's actually quite far from my house. The nearest will be Tasik Selatan. So from Tasik Selatan I can take trip of half an hour to Plaza Rakyat."*(R5-SA)

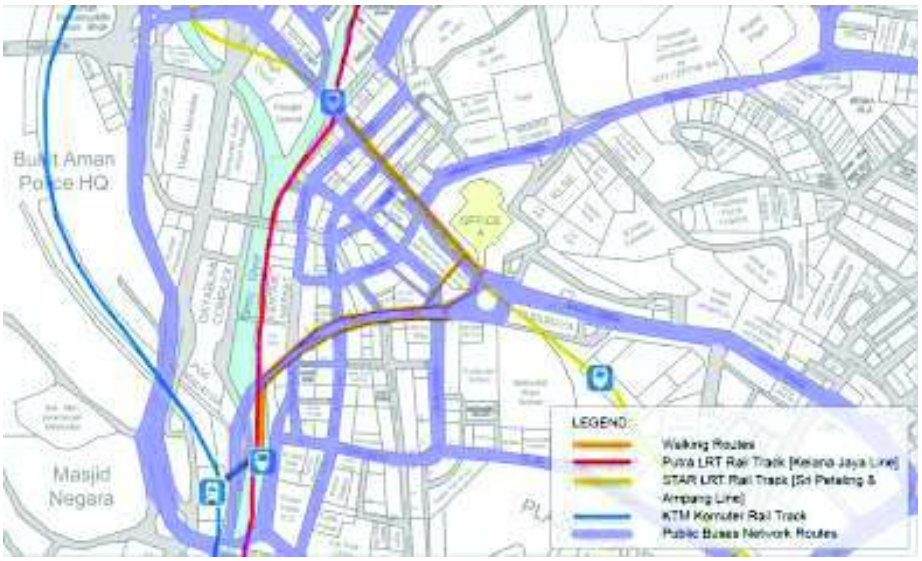


Figure 5. 15 Public transport network within Case Study 1

The next respondent (R6-SA) spoke about the closeness of the residence and the convenience of the trip, with reference to the time he wakes up.

> *"Yes, because I live in a flat and then I walk to the LRT Station in Sentul but the time I use to walk is just about 5 to 10 minutes. It's not that far. For example, if I wake late on a particular day, I can still arrive in the office before 8.45 because the journey is very convenient."*(R6-SA)

While walking through Site A, Respondent (R3-SA) gave advice to her friends by shedding light on the speed of the different trains, which affects the time it takes to get to work.

> *"To some of my friends who stay nearby, I would suggest to them to take public transport but not the commuter because it is slow. For those who are driving, I would suggest to them to take the LRT and walk to office."* (R3-SA)

The next respondent spoke about saving money and fuel and why he perceives using public buses as safer as compared to owning a private vehicle.

> *"Okay, the reason why I choose to take the bus is that I don't think that I will ever purchase a car. I think that compared to driving, using buses is safer. Second, I can save the cost and save my energy. I can have a short nap in the bus before I come to work."* (R7-SA)

5.5.1.4 Encouragement from the employer

None of the respondents were aware of any past or present plan of the employer to encourage the employees to walk to work. There is no aid to make travelling to work easier for the employees who work in office A. Respondent (R2-SA) said:

> *"My employer never shows any concern on how their employees come to work."* (R2-SA)

5.5.2 Barrier Factors

Barriers are the numerous items or aspects of travelling that are capable of increasing the time spent journeying from one place to another. These can also be referred to as obstacles to the pedestrians within their environment. The employees could face one or a combination of the following barriers daily on their way to work.

Figure 5. 16 Barriers while walking to work.

Respondent (R6-SA) spoke about the ideal conditions for walking with reference to the absence of road obstacles as below.

> *"...because when you walk in a good environment, there aren't so many obstacles and people feel relaxed and arrive at the place safely. They manage to arrive to that destination within that time. That is not usually the case here"* (R6-SA)

5.5.2.1 Negative Attitudes related to walking

Many of the respondents complained about the unwillingness of other people to walk, and how they instead resort to the use of private-owned-vehicles. They discussed the

negative attitude towards walking as a result of the car traffic environment and all the unsafe activities the motorists engage in on the road, rendering the environment unsafe for pedestrians and causing a negative feeling or attitude among respondents that use certain routes during the participant observation, as presented below.

> *"There is a traffic light there; we just have to wait for the traffic light to turn red but it takes long, about 2 minutes. Like we just saw, traffic lights show the stop sign but suddenly there are people making illegal turns."* (R9-SA)

Another respondent elaborated on the illegal traffic activities motorists undertake lightly on other routes in the same area, giving example of routes walked through during the participant observation. He explained the chaos and lack of consideration of others, saying that motorists don't only stick to their own paths.

> *"If we look at other roads in this area that are meant for buses, you will see some cars still driving on that lane. If a zone is for pedestrians only, there are still some motorcyclists who ride and cars that park in the pedestrian sidewalk...like this one. Motorcycles are everywhere. I don't think people in here can follow."*(R6-SA)

The following respondents complained of the lack of cooperation among some people who firmly believe they are incapable of walking for one reason or the other. Respondent (R8-SA) concludes that he does not see the reason for not walking.

> *"...because it will help everybody, especially Malaysians that are lazy to walk. They've got 101 'reasons' not to walk. But if you have a better environment out there, then I don't see a reason why people wouldn't want to walk."* (R8-SA)

Respondent (R2-SA) also comments on the pre-set mind of the Malaysian public.

> *"Sometimes, people have set their mind to thinking that walking as tiring. They don't even try to get the feeling of walking before they conclude."* (R2-SA)

The following respondent speaks of his reasons for driving to work and the comfortable and relaxed experience in the car.

> *"While driving of course, I don't have to beware of pickpockets or crowded spaces…just the jam but that is quite manageable. I know now through trial and error, what time to leave my house, which is around after 7.30, then I normally reach the office by 8.40. So if I come out earlier say 7.15, I can just relax and drive my car while taking in the views"* (R5-SA)

5.5.2.2 Unreliable public transport system

Among the respondents who used walking as part of their multi-modal transportation to work on a daily basis, about 60% of them narrated their trips from their homes and back and discussed the difficulties they faced in order to arrive at work on time. Respondent (R8-SA) stated the reason for not always walking as:

> *"...it is totally different. It's stressful when you depend on public transport. Walking from home to the station makes me sweaty and it takes so long. Sometimes the train is not frequent which distresses me."* (R8-SA)

The next respondent talks about how early she has to get up in the morning in order to catch a feeder bus as compared to the time she wakes up if she drives to the LRT station.

> *"It's actually -- a difference is the time, the time to depart from my house is shortened because by bus or LRT I have to get up earlier probably at 6.30 or sometimes 6.15. By car to LRT, sometimes I can depart from my home like at 7.15 or 7.30 and still manage to arrive at the office."*(R5-SA)

Another respondent (R5-SA) explained the difficulties in moving around by both car and public transport due to the location of her house.

> *"It's actually quite terrible for me because Cheras is a jammed area. So let's say I take the public transport, I have to walk about 10 minutes from my home to the bus station, I have to wait for the bus. Then after that it will take about 1 hour and sometimes one and a half hours to reach the office. My working hours run till late, 7 or 8 o'clock. It's actually quite dangerous for ladies to walk back home and use public transport after this time in my area."* (R5-SA)

5.5.2.3 Unpleasant Feeling

All the respondents (10 out of 10 [100%]) who walk in the area of case study 1, felt uncomfortable with the environment of the site, because of the perception of safety and security in that zone. During a walk, respondent (R7-SA) mentioned the people who hung around certain areas (highlighting a particular street and back alley) making it difficult to walk through because they create a sense of insecurity and potential harm among the pedestrians. He said:

> *"I walk from my office to this place, because the route is too busy. When I walk around here [pointing fingers to the site map], in front of MacDonald's, I feel it is too dark. I mean at this point, there are also a lot of immigrants*

> *working there as well. They hang around doing nothing but staring at passer-bys. So I walk through very fast."*(R7-SA)

The next respondent stated, during thee participant observation walks, why people avoid walking in the alleys:

> *"Because, for example, this dark alley has a lot of rubbish in it. It might seriously discourage people from walking near or within that area."* (R7-SA)

> *"Overall it is not a pleasant feeling walking around in the existing pedestrian environment."* (R2-SA)

Respondent (R8-SA) complained about the dangers of the infrastructure around, in relation to women and the elderly, what they wear and the difficulties they may face due to the nature of the design of the built environment.

> *"Sometimes I noticed our pedestrian bridge's stair cases are very narrow. So those people wearing skirts are wary and extra cautious especially when climbing up the stairs. When it comes to older people, they find it so difficult and then it's very steep, very high and very narrow. If you are wearing high heels you definitely can't climb up the stairs because you'd be scared of getting stuck in between the steps. So if it is not built in a user-friendly way, people are not going to use it."*(R8-SA)

During participant observation, another respondent stated an opinion about the level of safety in this environment.

> *"I think this area is sort of unsafe because you never know when people mark you if you use the same road every day. I don't know when that person marks me."* (R7-SA)

5.5.2.4 Inadequate Pedestrian Crossing Facilities

None of the respondents (0 out of 10 [0%]) had any positive remarks regarding the situation of the pedestrian crossing facilities which, according to them, were not favourable by any account. Many of the complaints were made against motorcyclists, who the respondents believed paid next to no attention to the traffic lights and the crossing signals. Many of them felt insecure about crossing the streets and even walking on the pedestrian sidewalk. Some of the respondents related their concern for the handicapped and others who might find it difficult to cross traffic. One comment was:

> *"Mothers with babies and blind people, it is really hard for them because the traffic light to cross; there is no signal for blind people crossing. If mother with baby and they use pram, it is hard."* (R9-SA)

Respondent (R6-SA) stated:

> "*Not really. Because you know In KL sometimes, those motorcyclist just ignore the traffic light*." (R6-SA)

5.5.2.5 Discontinuous protection from weather conditions

In some areas in KL, there are pedestrian shelters over the pavement and there are also five foot ways or veranda ways to protect pedestrians from the hot sun and heavy rain. While walking through Site A, respondent (R8-SA) explained:

> *"Yes, we definitely need shelter, it's hot. There, throughout the Petaling Street is covered. It is so much better for people who walk and it has encouraged people to go there. There are no covers on streets like this one."* (R8-SA)

Another respondent (R8-SA) discussed how she likes to be sheltered from the elements when she is on the street and further narrated the issues pedestrians face in the hot weather on the street:

> *"I prefer the shading trees because as it is more natural as compared to man-made structure. If it is covered there are no excuse not to walk, but if it is all open air and you have to walk in between these, by the time you reach, you are sweating, you are uncomfortable then you would want to drive, those people who are driving would not want to walk, so it all depends on individual."* (R8-SA)

5.5.2.6 Un-integrated work by the authorities and stakeholders in improving the pedestrian environment

The respondents believe that there is a lack of concern on the part of the authorities on the maintenance and design of the built environment that functions well and encourages pedestrians to walk around freely.

> *"Yes, if they [the authorities] are willing to spend on that; it could be great for us because a lot of parties [stakeholders] normally will be engaged with the roads and the open spaces improvement. When the roads are re-tarred in an incorrect manner, it could create a lot of problems that could put the public at risk because they tend to trip and fall."*(R1-SA)

The next respondent (R1-SA) stated:

> *"...when they redo the road and it has not properly been done then it creates problem. That could put the public at risk"* (R1-SA)

5.5.2.7 Poor accessibility and connectivity

Many of the respondents complained about the lack of connectivity in the area surrounding Office A. The facilities provided to them for access and connectivity are insufficient, therefore moving around within the site is difficult for the employees as pedestrians. Employee (R7-SA) said:

> *"The walkways are very slippery when it rains. Because sometimes when I take the LRT at Masjid Jamek, I will use the one that meant for the blind people because the normal pavement is quite slippery for me. When I wear high heel shoes, I just use the yellow pavement because it has a rough surface compared to the normal one."*(R7-SA)

The following respondents mention obstacles in the pathway on the walk from the LRT station to the office:

> *"The road is direct. But look, there are many obstacles in between. If I stand here, in front of Masjid Jamek, I can see my office. So I can just walk down there*." (R4-SA)

5.5.3 Psychosocial Factors

The term psychosocial refers to an individual's psychological development and the relationship formed and interactions with the social environment. The term was coined by psychologist Erik Erikson (1968) in his theory of *Psychosocial Development Stages*. In this case, the individuals are made to become aware of their relationship with the environment via earlier discussion of the research, as well as the questions asked during the interviews. Psychosocial factors are discussed through the following themes:

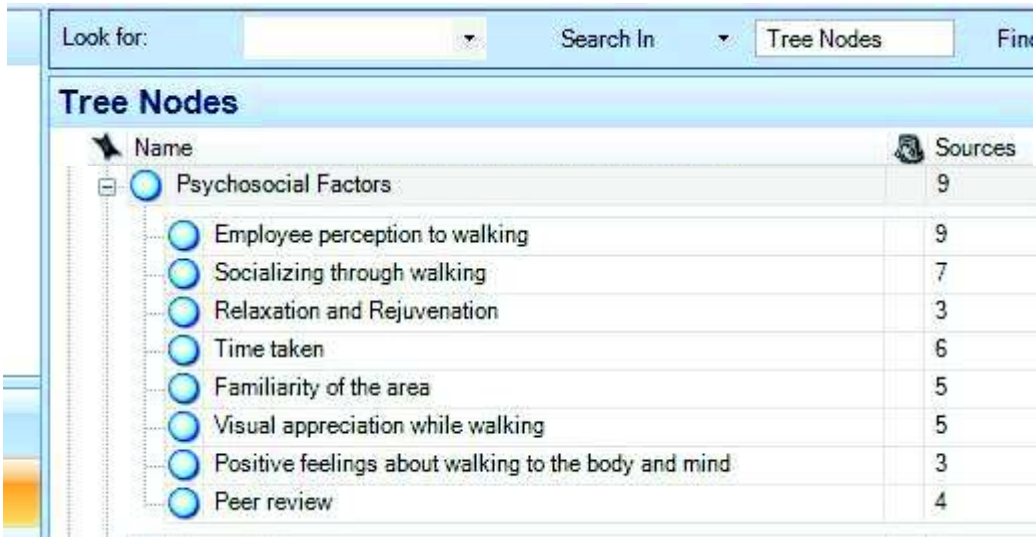


Figure 5. 17 Psychological factors for CS1.

5.5.3.1 Positive feelings about the benefits of walking to the body and mind

Collectively, all respondents within Site A were not satisfied about the nature of the pedestrian environment. Below is one of the comments made by a respondent on the feeling she gets while walking home:

> *"I normally go back home about 7.00 pm. We work till 5 pm. The jam starts at 5.45 pm. I choose to go back home about 7.00 pm because I want to avoid being stuck in traffic. I continue doing my task in the office because it is better than stuck in the traffic jam. I honestly do not like the jam and I prefer not to walk in those hours"* (R7-SA)

Another respondent said during the participant observation:

> *"Actually for me, I get to unwind. When I walk around, I get to see what's happening around me which makes the walk for me pleasant, when I walk I see all kinds of people doing all kinds of things but I do not really enjoy walking in this area compared to other areas."* (R8-SA)

This respondent explains her morning routine while walking as follows:

> *"…when I wake up early I take longer time to dress up partly because I live on the fourth floor and there is no lift. So I wake up early and walk to the station. I feel fresh because it is some sort of exercise. So, when I arrive at the office I have my breakfast and 8.45 am sharp, I am ready to work. So, there is no rush from me and I don't feel tired or rushing and running. Just walk with a free mind."*(R6-SA)

The next respondent discusses the general delights of walking:

> *"One thing is, in the car you can only smell the air conditioner, when you walk, and you take in fresh air then and see more people instead of sitting idle in the car. It is a small space and your mind feels somehow constricted, when you walk you can see everywhere and you will see so many people outside. Sometimes, you see people at the pathway, they sing to get money."* (R6-SA)

5.5.3.2 Socializing through walking

Most of the respondents gave responses which suggest that for them, walking without socializing can be boring and tiresome. It is important for them to socialize particularly during lunch breaks with friends. The following respondent commented as an afterthought while walking through the site:

> *"…I don't like to eat lunch alone, I walk with my friends and we can chit-chat our other social activities and everyday gossips. It strengthens our relationship."* (R3-SA)

Another respondent (R8-SA) describes walking and socializing over lunch as relaxing and necessary. He says:

> *"It is different…it depends on where you want to go, where do you want to eat, or if you just want to walk around looking for things and you actually feel like you are in a relaxed mode. I think it's a necessity to relax, to change mood from sitting in the office and have fun with friends."*(R8-SA)

> *"It is a short break but it is meaningful. In a way, sometimes you are rushing and chit-chat way then you realize it is time for me to go back, but you are a bit reluctant to go and when you finally do, it is a good memory to keep you happy for the rest of the day."*(R8-SA)

Respondent (R7-SA) contradicts the enjoyment aspect of walking, by stating that using the bus can give rise to the same joys of interacting with people:

> *"Because I take the bus every day I know the driver and conductor and they are really nice to me. I feel safe with them. I know them well and they know me well too."* (R7-SA)

5.5.3.3 Peer Review

Individual self-reflection happens when the respondents try to compare themselves with their peers in the same workplace. The following respondent related the responses of several friends' who have a negative view of walking as a mode for transportation:

> *"...only some of my friends think that travelling to work via walking and public transport is efficient. Some of them don't feel that way at all. For example one of my friends from Puchong prefers to drive to work. They said that driving is more convenient especially after working hours in the evening. Sometimes, people have pre-set their mind to thinking walking is tiring. They don't even try to get the feeling of walking first."* (R2-SA)

Respondent (R6- SA) discusses a friend's experience:

> *"…when he walks, because he lives in a flat area, sometimes there are people who keep an eye on him when he walks so he is extra careful even in the day. He tries to walk with his other friends as much as possible and never walks alone." (*R6-SA)

5.5.3.4 Relaxation and Rejuvenation

Many of the respondents did not describe walking within the Site A as a way to relax or rejuvenate either while going to or coming from work or during lunch breaks. Most did not even acknowledge walking for this purpose. They understood walking to do different things for them in the morning when they wake up to come to work. Respondent (R9-SA) however, uses walking as a way to provide the boost needed to give him energy for the remainder of the day. She said during the participant observation:

> *"In morning, I feel sleepy when I prepare myself for work but when I step out from the bus to walk to the office, I feel refreshed."* (R9-SA)

Another respondent who drives to work on certain days was of the opinion that:

> *"…if I wake up in the morning, I feel like I'm still somehow attached to my dream. If I choose to walk on a particular day, walking for a few minutes makes me feel refreshed. But if I drive to work, I still feel like I am dreaming. Some of them are still dreaming that's why accidents happen."* (R3-SA)

The next respondent talked about walking mainly for achieving a purpose.

> *"Most of the time, I walk when I look for food. If I don't feel like it, I just ask someone to buy for me. But then when I feel so bored in the office or maybe too stressed out, some colleagues and I just go out to take fresh air."* (R6-SA)

5.5.3.5 Familiarity with the Area

About half of the respondents are familiar with the site and they describe this familiarity through sounds, seeing the activities on the streets, accustomed sense of direction, road patterns and turnings, etc. During the site walk, respondent (R8-SA) said:

> *"Sometimes you hear them hassling over the prices and bargaining in this area. I like to hear them. So it's another way of releasing your stress."* (R8-SA)

Another respondent also mention during the walk that she preferred to walk to feel the sense of familiarity with the place.

> *"So far I am familiar with this area. It would be better to walk around an area instead of driving so we can familiarize ourselves with the place."* (R2-SA)

The next respondent understood walking in a similar way to the respondent above:

> *"Along this way, I enjoy seeing what happens around me. Firstly, it is good exercise; secondly I really enjoy the journey. The route between my final point and arrival point would always include whatever happens around me."* (R7-SA)

Respondent (R9-SA) and respondent (R10-SA) indirectly talked about safety:

> *"…I don't know whether the place is safe or not and is it far. If I am familiar with that route, I will only follow that one."* (R9-SA)

> *"Yes, if someone never passes by there, he will say that is dangerous and they don't want to try it. But if we already tried, we know it is safe."* (R10-SA)

5.5.3.6 Time Taken

This refers to the time taken to complete commuting from the place of residence to work either in the AM or PM hours. During the participant observation, Respondent (R3-SA) gave a short narration of the routine undergone early in the morning, and the time taken to complete the journey.

> *"I drive and park my car close to the Putra LRT station then I walk for ten minutes to reach the LRT station. It takes another 20 minutes by LRT to reach Masjid Jamek and finally, 10 minutes to reach this building"* (R3-SA)

5.5.4 External Factors

External factors in this research refers to actions normally taken by one or a group of parties (policy makers) or a campaign in order to influence something else (pedestrian environment for the sake of the employees as pedestrians and the general public). Here these factors will be discussed under the themes of weather, policy, vision for aworld class city, and enforcement.

Figure 5. 18 Child nodes for the external factors.

5.5.4.1 Vision for a world class city

Malaysia aims to achieve world class status by the year 2020 in order to attain excellence and become a fully developed country.

The respondents however are very doubtful if this vision can be achieved in the stipulated time due to the condition of the transportation network. Some of their comments were:

> *"…well the surrounding is not in such a good shape. I think we can make it if the government start doing something about it now to fix everything and make it better. Their seriousness and commitment is what the country needs. At the rate we are going, I doubt it can change by 2020."* (R7-SA)

> *"I would love to see Malaysia become a world class city but I'm not sure. Nothing is being done to improve the pedestrian environment and other sectors that need attention. We are so use to living like this. We should focus on the problems that are important before randomly building fancy buildings. The environment needs a lot of improvement if KL is going to be world class."* (R8-SA)

5.5.4.2 Advocacy

Advocacy is the act of supporting a cause (a better pedestrian environment) usually for the betterment of humanity. In the case of this research, advocacy covers policies, procedures, campaigns or active speaking and learning about the benefits and importance of walking to work for employees and pedestrians, in order to create a better understanding among people of the effects of incorporating walking as a mode of transportation in the pedestrian environment.

As previously stated in chapter 3, policies are minor laws to be enforced; in this context, they are meant to ensure that pedestrians get the environment they desire for walking,

that there is continuous maintenance of the environment and finally that the environment is being used by all pedestrians in the proper manner.

Respondent (R2-SA) said:

> *"Many organisations need to start campaigning about walking to work to motivate people to do so. If they don't, the traffic jam will be worse and the CO_2 emissions will rise more."* (R2-SA)

5.5.4.3 Enforcement

Enforcement is usually done by a particular body to make sure all the regulations and policies set forth are followed by all those in the area at all times. Many of the pedestrians complained that although there are some areas that are patrolled in the day, there is little enforcement in the area. Respondent (R3-SA) commented:

> *"…we need to talk about the quality of the pavements, make sure all the sky bridges are well lit and to enforce the proper use of the zebra-crossing when there are traffic lights. Enforcement is still going to be the issue, without enforcement anything we do will be a waste."* (R3-SA)

5.5.4.4 Weather

Weather is a major concern when pointing out the issues of people walking in Malaysia. It rains frequently and when there is no rain, the sun bears down harshly on pedestrians. All of the respondents have a problem with the climate outside the building. Respondent (R5-SA) expressed her concerns with regard to the weather as follows:

> *"The weather, as far as I'm concerned is a great discomfort. If we have roof shelters for the pedestrian, it is actually good enough. In Malaysia when it is hot or raining, most of people carry umbrellas along."*(R5-SA)

Respondent (R6-SA) complained about rainy days saying:

> *"On rainy days, it's quite difficult for us to walk in narrow pathways because you open your umbrella and everyone else does the same thing. If you give them space, you will get wet."*(R6-SA)

5.5.4.5 Stakeholders

Stakeholders are all the parties involved in the topic under discussion. However, 'stakeholder' here specifically refers to the parties involved in improving the pedestrian environment in order encourage employees as pedestrians in the city centre to walk to

work.

> *"I think that we need support from the government itself and also the awareness of the pedestrian because sometimes the pedestrian walkway is okay but sometimes there is element of vandalism to such facilities. That's what makes it worse."* (R2-SA)

5.5.5 Safety and Security Factors

Safety and security factors include the fear of crime, violence, fear of accidents and fear of strangers. It also includes dangers the pedestrian environment could cause to the pedestrians such as the absence of pedestrian crossings in certain places where they are required. When pedestrians walk within the built environment particularly in areas with a poor quality of life, they develop insecurities about these places. These insecurities create fears within them of the elements above. The themes related to safety and security are listed in the Nvivo 9 image below.

Figure 5. 19 Safety and security factors for CS1.

Respondent (R6-SA) commented on why he uses certain roads and prefers them to the commonly used roads around Site A below.

> *"Okay, I prefer going to Central Market because there is less traffic. You don't have to cross so many times and the path for you to walk is much bigger than that in Masjld Jamek. You need to pass the shops and sometimes so many people from the opposite site. So you need to squeeze through them which is quite uncomfortable."*(R6-SA)

Respondent (R8-SA) related her fear regarding people loitering about and risks pedestrians take just to get to their destination. Snatch theft is also stated as a major concern the employees feel exposed to:

> *"Sometimes, there are so many beggars loitering about. I don't know whether they are really beggars or muggers. They could also be snatch thieves and sometimes when I walk a long distance alone especially at night, I don't know who else is up there so I actually take risks when I walk up there on the pedestrian bridges."* (R8-SA)

During the participant observation, Respondent (R7-SA) talked about the insecurity that is felt when crossing a particular road, while point out examples:

> *"…when I come using this way, it is not really safe because I have to walk on the road surface and then cross over when there are no cars. So this area is not really safe."* (R7-SA)

The next respondent complained about the safety of the area by again referring to the poor infrastructural facilities available in the area. In this case, the absence of sidewalks is mentioned, as it forces pedestrians to share the car traffic space with motorists.

> *"I don't think it's very safe, because sometimes when we cross that road and we want to move through the car zone fast. We walk at the side at the road, there is no actual pavement for us to walk on there, and so we basically walk on the road surface."* (R8-SA)

Another respondent narrates the insecurities felt at certain times while walking as:

> *"Firstly, I have to make sure that there is no motorcyclist near me. Whether I enjoy the journey at the same time is another thing... What I am really concerned about is everything happening around me. I can't really enjoy the walk on weekday but in weekend it's a bit better. When I'm walking with my friends and family like shopping then I can enjoy."* (R7-SA)

5.5.5.1 Harassment

There were several complaints of harassment. Many of the respondents who walked in the area had experienced one form of it or another. The employees talked about the absence of law enforcers when these things happen which creates a feeling of insecurity because no one is available to help them. Respondent (R9-SA) expressed the uderstanding of harassment as having no respect for personal boundaries.

> *"… I wanted to cross the road when suddenly a guy from the other way that had crossed came towards me, and blew his nose at this area. It did not touch me but it was too near."* (R9-SA)

Respondent (R3-SA) continues with the menace of snatch theft as a fear in the area. This comment also gives an insight into the harassment the employees face on the street as pedestrians.

> *"Because they are exposed to the snatch theft, some of the people they like to disturb any girls even in the LRT, they like to touch the ladies which my friend experience before that's why I wouldn't recommend them to take public transport, for guys yes."* (R3-SA)

5.5.5.2 Crime

Most of the respondents who walked in the area complained that there are many petty crimes that they fear in the vicinity. They claimed that this reduced their eagerness to walk around in the area especially after certain hours. Those who did not make use of the pedestrian environment but drove around this area agreed that the chances of being exposed to crime are high in Site A. Respondent (R5-SA) said:

> *"… outside there are unexpected things happening like crimes. Inside I know at least there are no snatch thieves, maybe just pickpocket to be wary of so it's safer."* (R5-SA)

During the participant observation, respondents explained their reasons for driving in the area as below:

> *"One of the reasons I sometimes drive in this area is because I fear that something might jump out at me some day from the dark. This place is unsafe…"* (R8-SA)

5.5.5.3 Traffic

In a discussion, the employees declared that they felt unsafe in the car traffic environment. They talked about the issue of construction sites around the area forcing them closer to the car traffic environment. Respondent (R3-SA) explained:

> *"…because they are rushing. We understand that people are quite frustrated especially after work when they are trying to go back as quickly as possible but sometimes pedestrians want to cross the road and we face difficulties to cross because all the cars pass by so fast. We barely have time to think."* (R3-SA)

Another respondent talked about damaged roads in Site A:

> *"…because as I said the security lies in roads. You can have this experience when you drive from Plaza Rakyat through Times Square where there are a few construction sites. Congestion is not the only problem but the road has been damaged and accidents could happen."* (R4-SA)

5.5.5.4 Dangerous

There are numerous dangers within Site A, including infrastructural elements, construction sites, crimes and the traffic environment. All these were cited by respondents as posing dangers to pedestrians. Respondent (R3-SA) discussed the dangers in relation to the pedestrian crossing facilities:

> *"No one wants to allow you to walk, unless the traffic light works. Some of the roads, they don't have pedestrian traffic light. And some of them don't work so we couldn't press. It's not that we don't want to press, it's not functioning. That's why we are forced to cross when there is no car."* (R3-SA)

Another respondent talked about walking in terms of how the weather can contribute to a dangerous situation in the pedestrian environment.

> *"No, it's just that when I walk in Plaza Rakyat, when it is raining and you wear slippery shoes, and accidentally step in a puddle, you will slip. You need to be extra careful there."* (R6-SA)

The next respondent talked about the narrowness of lanes where stalls intrude into pedestrian space, forcing pedestrians too close to the cars. The respondent pointed out while walking that because illegal kiosks occupy sidewalk space along with the pedestrians, space is narrowed even further.

> "*Sometimes there is a narrow lane and then the car passes by suddenly as you pass by the stalls. This kind of thing is definitely dangerous. As you are walking you really don't know what's behind you…"* (R8-SA)

> *"Look over there. The kiosks sometimes are parked on the sidewalks in places like that causing discomfort and making the space even narrower. In other places around KL they are legal but I'm not sure about this one. They should not be in the same place people walk; maybe a bit further back."(*R8-SA)

5.6 Research Question 3: Physical Features Supporting Walking to Work

Figure 5. 20 Research techniques on the unit of analysis to answer research question 3.

The method used to collect data for measuring the physical features is much more elaborate than others due to the fact that of all the research questions, research question number 3 relating to physical features is an actual physical quantity that can be both observed and measured as compared to others which are more perception-based questions.

The research techniques used to measure this research question are participant observation, which involves walking with the participants through their preferred routes (refer to chapter 4, section 4.7.), and observation, which involves the use of a checklist in the form of the values embedded in the inverted tree structure. Observation was conducted with the aid of photographs of certain places in the site, with a corresponding mapping of the place on the site map. Site mapping was also used to mark out preferred pedestrian routes that the respondents claimed to be their choice of walking path in the site.

The coding used for the observation maps is in the format **SA/RC/Wr1-1**, for example. This coding links to field notes collected within the area on site. **SA** stands for Site A, **RC** represents route connectivity, **Wr1** refers to Walking Route 1 while **-1** refers to field note-

one discussing the first image on the map (refer to chapter 5, section 5.6.1). The images on the maps in this chapter display information in a series of photographs that are meant to be studied together, while the field notes discusses each image.

Physical features that support walking to work are all the components or elements within the pedestrian environment that encourage pedestrians to walk. These features should also be flexible enough to allow them to walk for any purpose and to any destination such as walking to and from work. This section will examine the nature of the pedestrian environment of Site A under the headings of route choice, route connectivity, route directness, route quality and safety and security.

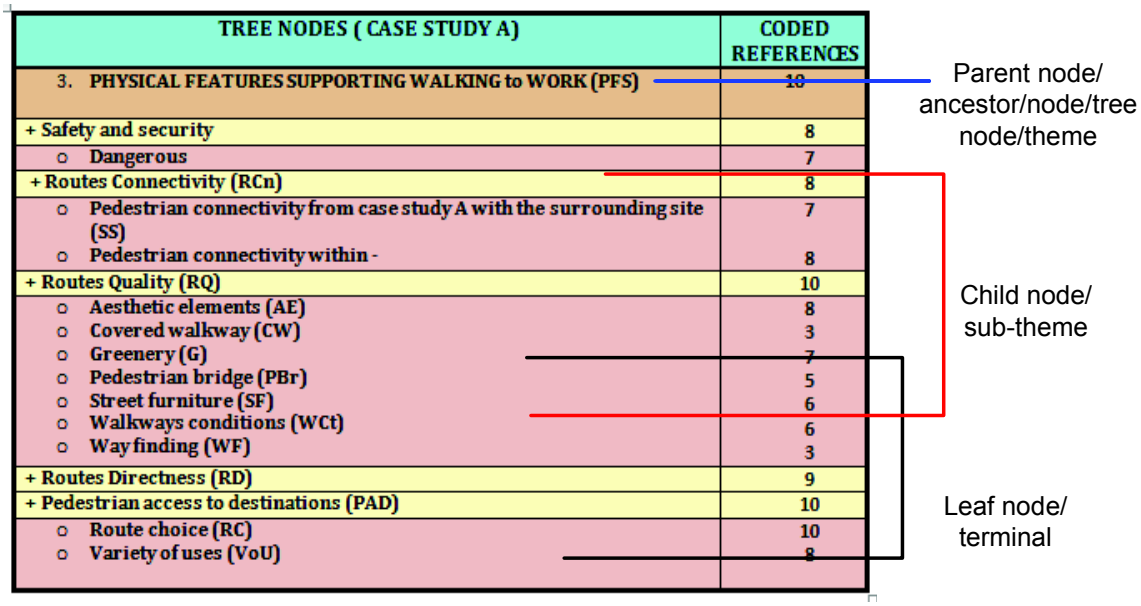


Figure 5. 21 Tree nodes screen of physical features supporting walking to work for CS2.

5.6.1 Pedestrian access to destinations (PAD)

i. Access to main destinations (from home to Office A)

Figure 5. 22 Pedestrian access to destinations.

5.6.1.1 Route choice (RC)

During the interviews all respondents traced out their desired line of movement from their arrival point in the city centre to Office A on the case study map. The desired line in this study is the chosen walking route to access the destination of the respondents. In total there are six walking routes identified for case study 1 namely:

Walking route 1 (Wr1): Walking from Masjid Jamek LRT Interchange Station through Jalan Tun Perak

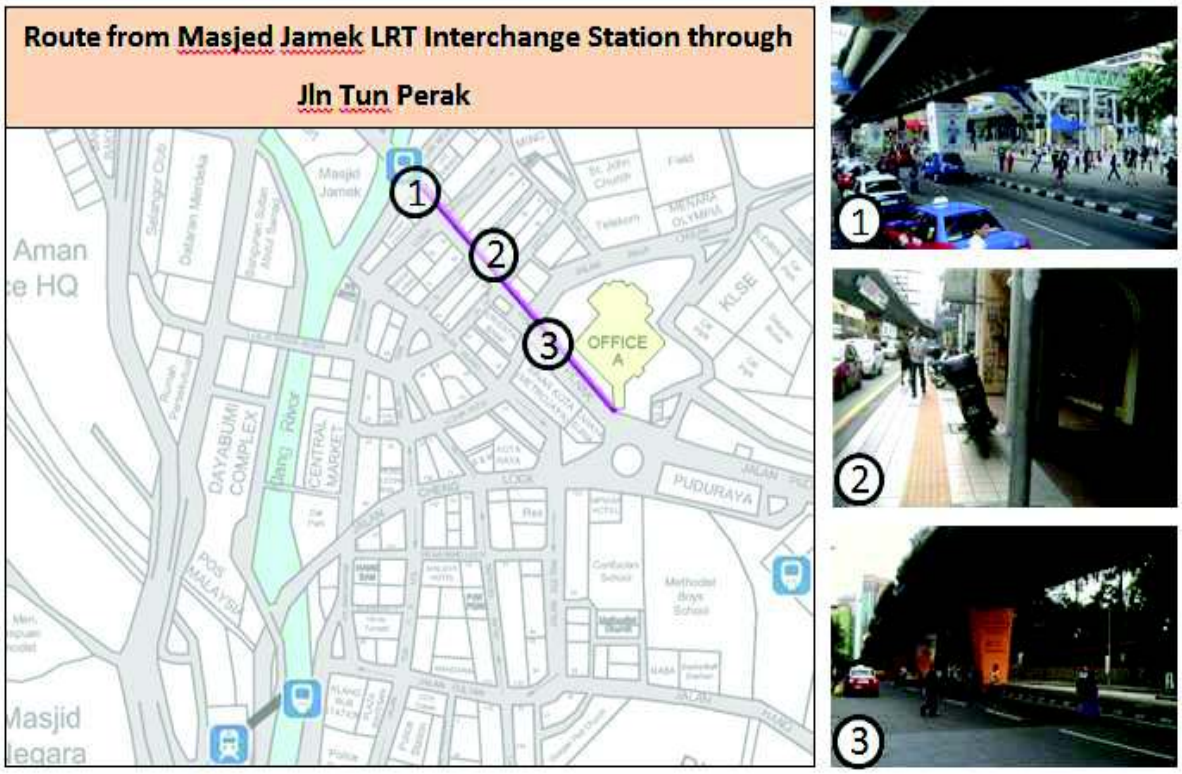
Walking route 2 (Wr2): Walking from Plaza Rakyat LRT Station

Walking route 3 (Wr3): Walking from Pasar Seni LRT Station through Jln Tun Sambanthan & Jln Tun Tan Cheng Lock

Walking route 4 (Wr4): Walking from Pasar Seni LRT Station through Leboh Pudu

Figure 5. 23 Site mapping of the selected route choice by respondents in CS1.

Walking route 1 (Wr1): Walking from Masjid Jamek LRT Interchange Station through Jalan Tun Perak



SA/RC/Wr1-1: A view of pedestrians crossing car traffic zones without crossing facilities.

SA/RC/Wr1-2: A view along Jalan Perak where motorcyclists also park in the pedestrian zone causing discomfort and narrowing the pedestrian space.

SA/RC/Wr1-3: A view of pedestrians crossing randomly through the car traffic environment due to the lack of crossing facilities for them to move through safely. There are is no pedestrian crossing or signal where they cross.

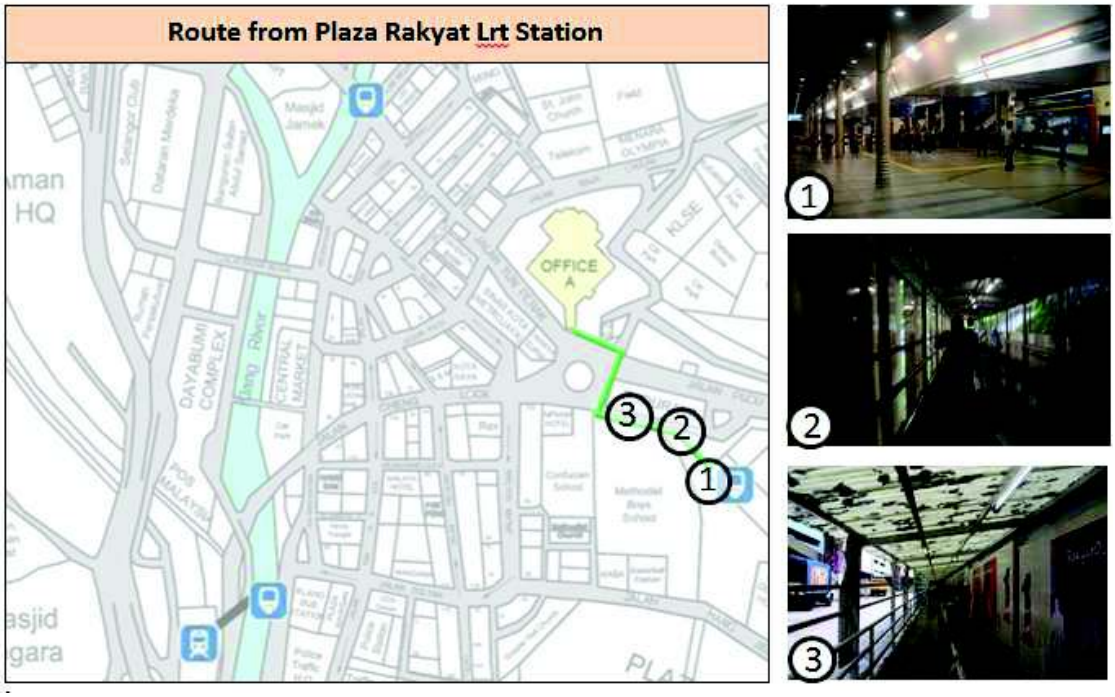
Figure 5. 24 Graphic illustration of walking route 1 from the Masjid Jamek station through Jalan Perak with images taken while walking on the route.

During the walk through route Jalan Tun Perak, respondent (R4-SA) explained that the road is not up to standard or satisfactory but she is forced to use it because there are no other options. Respondent (R4-SA) gave a suggestion on the route pattern. Both respondents say:

> *"When I walk down here from Masjid Jamek, there are few roads that are not really good but I still use that because it's necessary for me to walk using that road."*(R4-SA)

> *"… but from Masjid Jamek, the pathway that I need to walk along have shops and a few traffic lights. There are many cars and I have to wait for a long time before I can cross the road. It is more convenient to drop by Plaza Rakyat than Masjid Jamek even though from Masjid Jamek, the office is nearer."* (R6-SA)

Walking route 2 (Wr2): Walking from Plaza Rakyat LRT Station



SA/RC/Wr2-1: A view of the interior of Plaza Rakat Station with environment for pedestrians to move around and exit the station.

SA/RC/Wr2-2: A view of the path looking from outside station Plaza Rakyat. The path is boxed to protect pedestrians who use public transport.

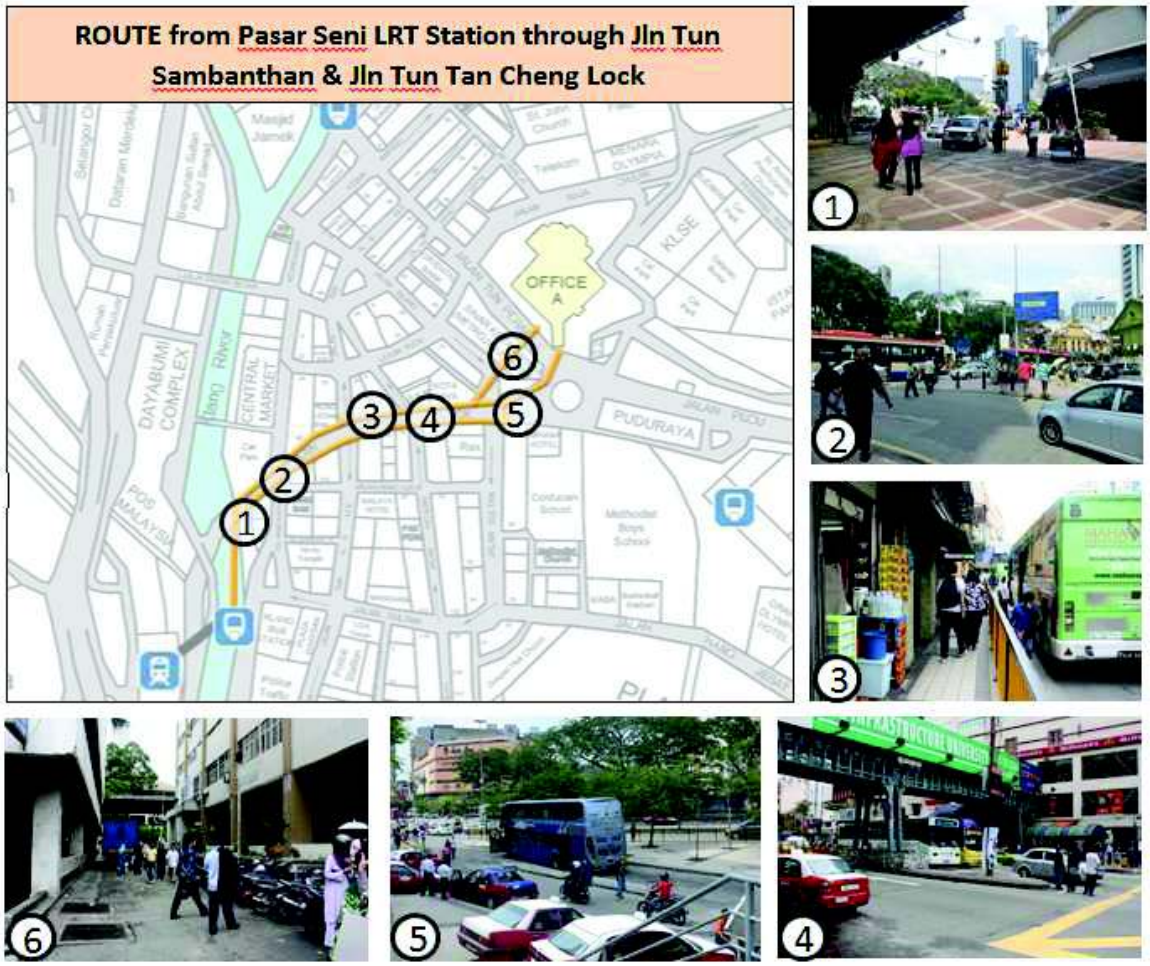
SA/RC/Wr2-3: A view of the path outside the station.

Figure 5. 25 Graphic illustration of walking route 2 through the Plaza Rakyat LRT with images taken while walking on the route.

Respondents that use the Jalan Pudu route explained their travel pattern form their home to the station and finally the office:

> *"Some people like to drop by at Masjid Jamek because they said that MasjId Jamek is nearer than Plaza Rakyat. But for me, from Plaza Rakyat I just walk straight. There are not many cars and the traffic lights are less here."* (R6-SA)

Walking route 3 (Wr3): Walking from Pasar Seni LRT Station through Jln Tun Sambanthan & Jln Tun Tan Cheng Lock



SA/RC/Wr3-1: A view of the large open square-like space in front of the Pasar Seni LRT station meant for pedestrians; however, motorists drive through the space.

SA/RC/Wr3-2: A view of the street after the open square space in front of Pasar Seni LRT where there are no crossing facilities but pedestrians still cross over.

SA/RC/Wr3-3: A view of the narrow path beyond the street with only a guard rail as a means of protection. Pedestrians still walk outside the rail because the sidewalk is too narrow.

SA/RC/Wr3-4: A view of the chaos on the street with three pedestrians standing in a two way road with no help from traffic signals.

SA/RC/Wr3-5: A view of a pedestrian crossing the road with on-coming motor traffic and approaching motorcyclists.

SA/RC/Wr3-6: A view of the path leading to Office A through the building in front of it.

Figure 5. 26 Graphic illustration of walking route 3 from Jalan Tun Sambanthan and Jalan Tun Tan Cheng Lock with images taken while walking on the route.

During participant observation on the walk along Jalan Tun Sambanthan and Jalan Tun Tan Cheng Lock, respondents who use this route explained how they connect from the Pasar Seni LRT Station to the office:

> *"Yes, because it is too far from Menara if you really want to follow the traffic light, then crossing to come back here which is not practical. So, from Menara Maybank we just cross from this end to that end and then we cross here. (Referring to map)"* (R8-SA)

> *"Just before Sinar Kota, you follow the back lane. There are a lot of shops and stalls there. We walk through that lane and come out near Jalan Silang. Actually there's a short cut straight to Bangkok lane."* (R8-SA)

Respondent (R8-SA) further complained, during the walk, about the lack of continuity in the pavements

> *"The pavements must not break in between path like here all the time. It is very important."*(R8-SA)

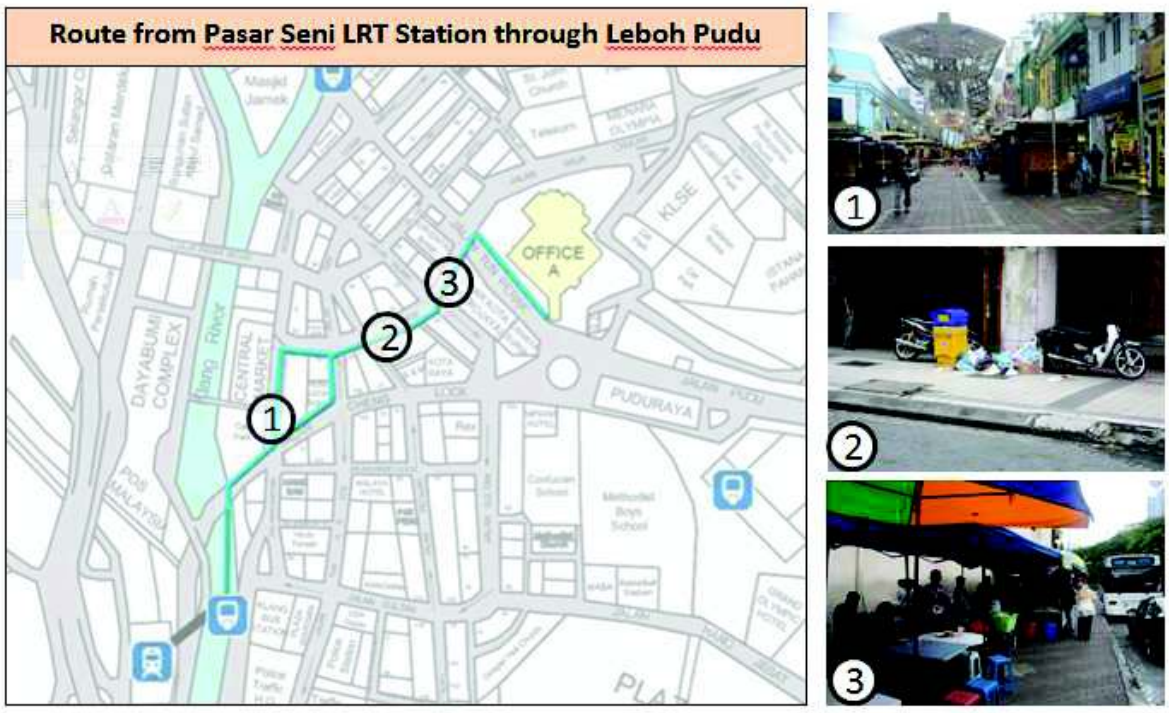
> *"In between I have to wait (crossing the road) and walk another distance for the next one (crossing the road), and then it's difficult for the pedestrian. A pavement must be continuous for someone to walk. If I choose to walk where there is a pavement on the walkway, the next walkway doesn't have a pavement, so what should I do between these two?"* (R8-SA)

The next two respondents talked about the dangers and difficulties pedestrians face along this route:

> *"I would rather walk to the main route. The inner route is a bit dangerous. There are still some cars there."* (R3-SA)

> *"Because, if we look at other road, it is a bus lane but some cars still drive on that lane. If it is for pedestrians only, some motorcyclists still ride on that too. I don't think people in here can follow."* (R9-SA)

Walking route 4 (Wr4): Walking from Pasar Seni LRT Station through Leboh Pudu



SA/RC/Wr4-1: A view between the old shop-houses that make up the central market area; only pedestrians and two rows of kiosks on both sides is allowed to use the space.

SA/RC/Wr4-2: A view of space near the Central Market where motorcycles park illegally in the pedestrian zone, serving as an obstruction, along with the garbage thrown out on the street.

SA/RC/Wr4-3: A view of the Kiosks that encroach into the pedestrian sidewalks, narrowing the space and making it difficult for pedestrians to move freely without moving into the car traffic environment.

Figure 5. 27 Graphic illustration of walking route 4 from Leboh Pudu to office A with supporting images taken while walking on the route.

While moving from Leboh Pudu to office A during the participant observation, respondents discussed the nature of this route and the obstructions along the way.

> *"…Here are only slightly attractive at the front, but not at the back. There is so much rubbish; I can have this experience when I walk behind that building. There are rats and the environment is not so nice there."* (R4-SA)

> *"Okay, I prefer going to Central Market because there is less traffic. You don't have to cross so many times but the path you walk is much bigger than if I go to Masjld Jamek."* (R6-SA)

5.6.1.2 Variety of uses (VoU)

For this research, variety of uses refers to the different land uses within the area.

Figure 5. 28 Graphic representation of the variety of uses such as retail, various types of eateries, offices, cultural centres, shop-house developments, transportation services, etc.

Giving a general overview while walking through the Site, respondents discuss what they see when they walk along the route when commuting and when going for lunch breaks.

> *"In terms of variety, there is a variety of shops in this area. There are a lot of roads and it's easy to find found 7E, MacDonald's, etc. It is okay."* (R9-SA)

> *"Yes. The eateries area is actually here. There are many Chinese foods."* (R5-SA)

> *"Yes, because they are a lot of people and varieties. The price is also cheap around here."* (R10-SA)

"Most stalls and magazine shops attract me." (R6-SA)

5.6.2 Route Connectivity (RCn)

Route connectivity refers to how well the routes are connected with one another and with key attractors such as public transport, schools, workplaces, leisure destinations, etc. They should connect at a local and district level in order to create an understandable network. Route connectivity here is discussed within Site A (Jalan Tun Perak to Jalan Pudu, Jalan Tun Sambanthan to Jalan Tun Tan Cheng Lock and Leboh Pudu) and the surrounding site.

Figure 5. 29 Route Connectivity and its components.

5.6.2.1 Pedestrian connectivity Within Site (WS)

This refers to the respondents movements from the LRT stations around Office A to Office A. It covers the activities of the respondents within the Pudu area which are mainly the journey to eating places, to Office A and the preferred station. The movement patterns are:

- To and from the (Masjid Jamek, Plaza Rakyat and Pasar Seni) LRT Stations and Office A (AM and PM time periods)
- To and from Office A to the eateries within the site during lunch breaks

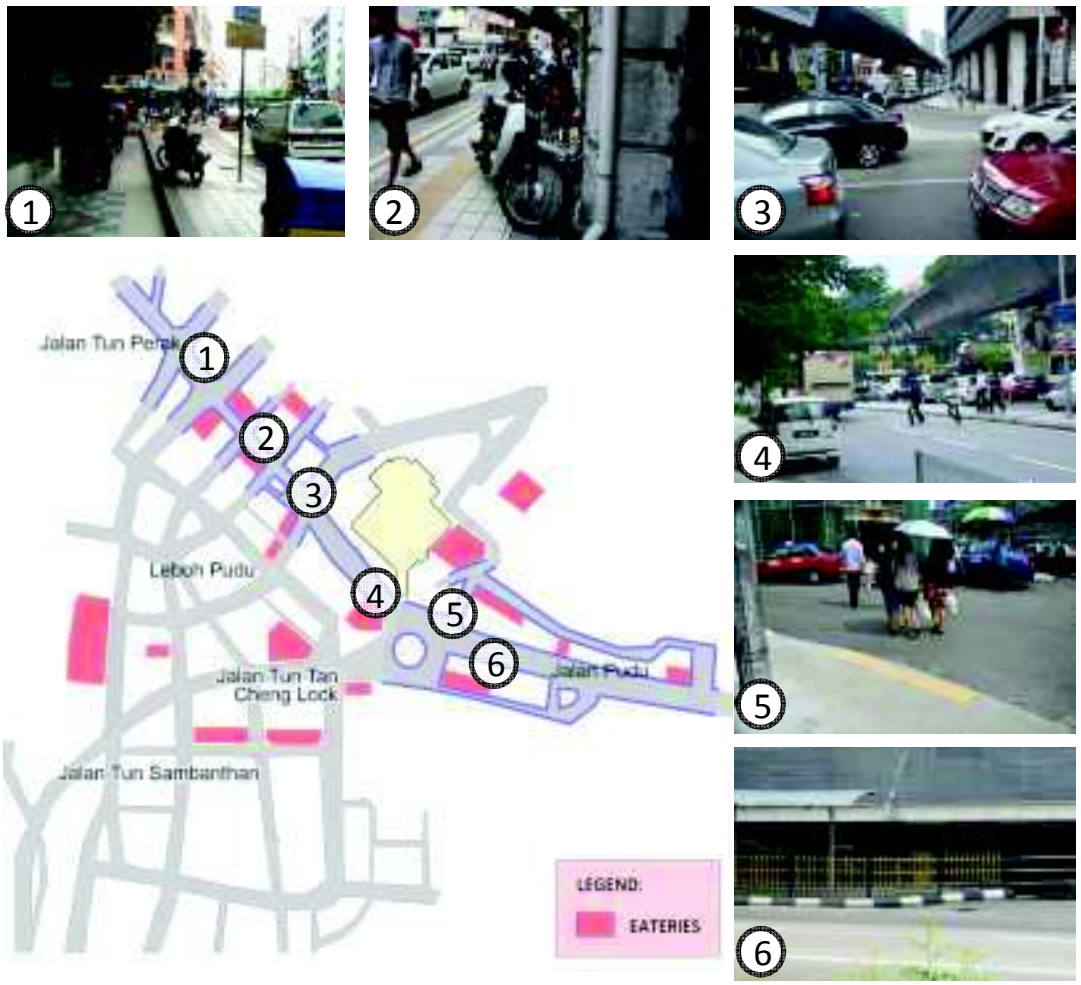
The types of walking facilities are mainly sidewalks. All these pedestrian movements are illustrated above in Wr1, Wr2, Wr3 and Wr4.

5.6.2.2 Pedestrian connectivity from Case Study Awith the surrounding site (SS)

Route connectivity in the surrounding site is concern with the crossings, links and perimeter streets surrounding Case Study A.

Linking facilities:	These are elements in the environment that connect two positions together such as footways (and their interruptions if any).
Crossing:	The facilities provided for pedestrians to easily cross the streets without needing to wait for long periods at a time or being exposed to danger due to their absence.
Surrounding Streets:	The streets surrounding site A. In this case it is an automobile dominated zone. The boundary was defined by the perimeter roads of Jalan Pudu, Jalan Tun Perak, Jalan Tun Tan Cheng and Leboh Pudu.

Surrounding Site (SW1): Walking on along JalanTun Perak to Jalan Pudu



ROUTE CONNECTIVITY: JALAN TUN PERAK - JALAN PUDU

SA/RCn/WS 1-1:	A view of a motorcycle parked on the middle of the pedestrian walkway.
SA/RCn/WS 1-2:	A view of more motorcycles parked on a narrow sidewalk making movement more difficult, forcing pedestrians to move into the car traffic.
SA/RCn/WS 1-3:	A view of the abrupt discontinuity of the pedestrian sidewalk with no crossing facility
SA/RCn/WS 1-4:	A view of pedestrians crossing the road without signals.
SA/RCn/WS 1-5:	Avi ew of pedestrians crossing at a left turn which has no crossing

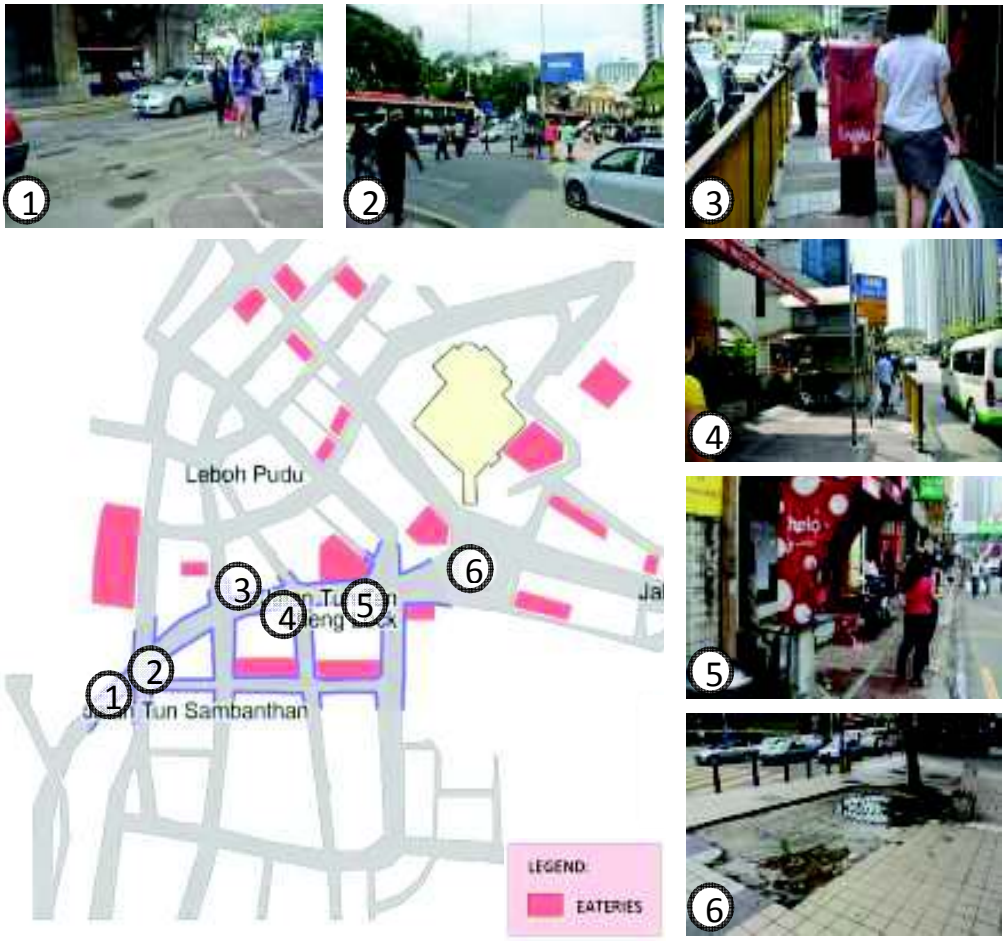
Figure 5. 30 Graphic representation on the streets around office A with supporting images of their conditions.

During the walk from Jalan Tun Perak to Jalan Pudu, respondents commented on the connectivity on these two street saying:

> *"Yes. It is not easy to cross near my office because we don't have much pedestrian crossing here…"* (R8-SA)

> *"But I have to be aware because sometimes I have to wait for 5 minutes just to cross the road, because there are no crossings here. It's quite a busy road, very busy road."*(R5-SA)

Within Site (WS2): Walking along Jalan Tun Sambanthan to Jalan Tun Tan Cheng Lock



ROUTE CONNECTIVITY: JALAN TUN SAMBANTHAN – JALAN TUN TAN	
SA/RCn/WS 2-1:	A view of the intersection of Jalan Tun Sambanthan and Jalan Tun Tan Cheng Lock where there is no order as to the pedestrians crossing and the cars moving.
SA/RCn/WS 2-2:	A view looking into the interior of the underground tunnel from KLCC Suria to Mandarin Oriental Hotel.
SA/RCn/WS 2-3:	A view of a narrow sidewalk with a phone booth at the centre serving as an obstruction to the pedestrians and limiting flow within the pedestrian environment.
SA/RCn/WS 2-4:	A view of a Kiosk taking up the width of the sidewalk, forcing pedestrians to make use of the car traffic environment to pass.
SA/RCn/WS 2-5:	A view of a narrow sidewalk due to the presence of phone booths at the edge of the sidewalk.
SA/RCn/WS 2-6:	A view of tiles missing from the pavement creating a

Figure 5. 31 Graphic representation of the streets further down from office A with supporting images of their condition.

While the group walked from Jalan Tun Sambatan to Jalan Tun Tan Cheng Lock, respondent (R8-SA) explained the reason she feels they use this connector:

> *"People will use another route because it's nearer, you don't have to cross over like this. It is also impractical, because from the office to go over that site is like one minute walk, but when you have to go there, you have to wait for the traffic light. And then, you have to cross there and cross another line. It's going to take a lot of time. And by the time you reach there you get so irritated because just to wait for your turn to cross. It is three road junctions so you have to wait three times for the light to change just to get over there."* (R8-SA)

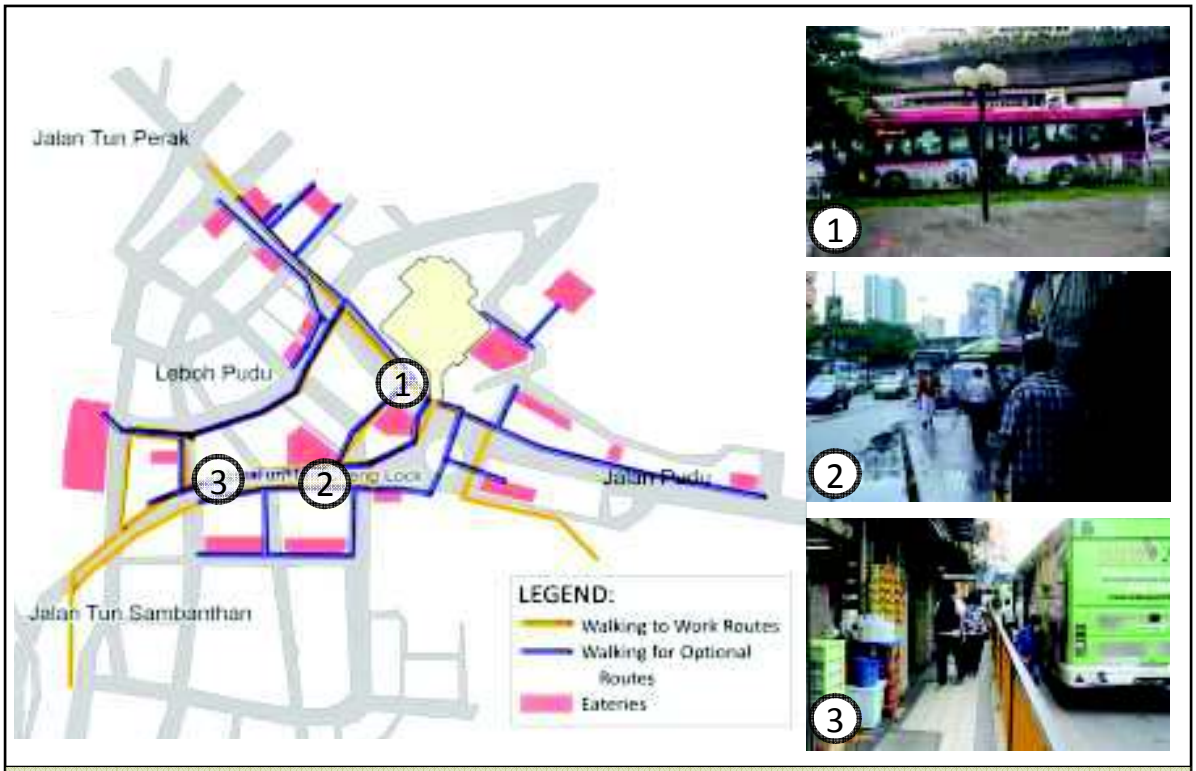
Within Site (WS3): Walking along Leboh Pudu

ROUTE CONNECTIVITY: LEBOH PUDU

SA/RCn/WS 3-1:	A view of a high road bump and a wet tiled floor making it easy for pedestrians to trip or slip and fall.
SA/RCn/WS 3-2:	A view of pedestrians crossing the road with no crossing facilities.
SA/RCn/WS 3-3:	A view of a motorcycle parked on the narrow sidewalk and a signage pole at the centre of the sidewalk.
SA/RCn/WS 3-4:	
SA/RCn/WS 3-5:	A view of a sudden depression in the sidewalk due to broken tiles. The hydrant in the centre of a narrow sidewalk and piled-up garbage act as obstructions to the pedestrians
SA/RCn/WS 3-6:	A view of a pedestrian jaywalking on a crossroad.

Figure 5. 32 Graphic representation of the streets of Leboh Pudu with supporting images of their condition.

5.6.3 Route Directness (RD)



SA/RD/WOp-1:	A view of a bus stopping in front of Office A with no sidewalk and no direct route to the office compound.
SA/RD/WOp-2:	A view of kiosks on the pedestrian sidewalk functioning as obstacles to movement.
SA/RD/WOp-3:	A view of the underground tunnel from Mandarin Oriental Hotel to KL

Figure 5. 33 Graphic representation of the directness of the routes around the site with supporting images of their condition.

While walking on Jalan Tun Tan Cheng Lock, respondents' responses to the ambiguity of the route were as follows. Respondent (R6-SA) talked about the preferred route depending on the ease it takes to arrive at the destination.

> *"Of course I will take somewhere like Plaza Rakya because it is much more direct and I don't have to think of anything. I just walk and there are not much stairs. In Masjid Jamek, I can see if something happened, the escalator is broken, the stairs are so many that I have to climb."*(R6-SA)

Respondent (R8-SA) talked about a preferred route and a conscious avoidance of other routes for certain reasons:

> *"Firstly, because I wouldn't use that one, that is not necessary for me. Secondly is because I will avoid using this way. Let's say I want to go to Plaza Rakyat I will cross in front of the traffic light."*(R8-SA)

Respondent (R4-SA) also spoke about being selective with routes as below.

> *"I think it is more comfortable to walk. Right now, I prefer certain roads because they are direct but from the environment perspective, it is not convenient; the condition. When everything is good, I think it is okay."* (R4-SA)

5.6.4 Route Quality (RQ)

Route quality refers to the availability of certain facilities in the pedestrian environment that are capable of enhancing the experience of the pedestrians and encouraging more walking in that area. The themes that are discussed under route quality for this research are greenery, street furniture, walkway conditions, aesthetic elements, way-finders, pedestrian bridges and covered walkways.

Figure 5. 34 Concept for route quality.

Street furniture (SF)

Street furniture refers to all the facilities available for pedestrians to use when moving through public spaces. The images of the study area with the street furniture available for the conveniences of users are illustrated in Figures 5. 35 to 5.41:

Figure 5. 35 Shelter types for bus stops

Figure 5. 36 Types of dustbins

Figure 5. 37 Various lighting types

Figure 5. 38 Types of seating

Figure 5. 39 Public phones

Figure 5. 40 Fire hydrants and bollard

Figure 5.41 Post box and public toilet

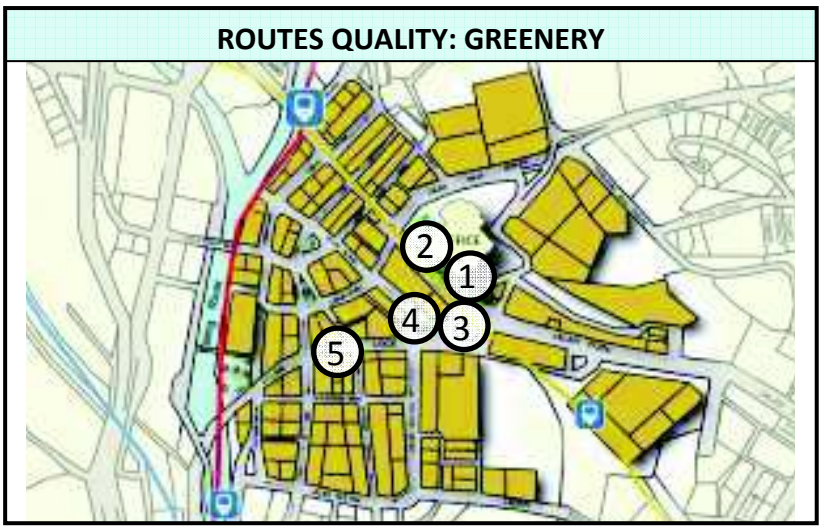
While walking through the site, respondent (R5-SA) and respondent (R10-SA) gave negative comments about the street furniture available in Site A:

> *"Sometimes the lights here are too dim and sometimes they have no lights at all. So it's not safe, but maybe it's just my area. I am not sure other areas."*(R5-SA)

> *"There is no place to sit down except at the bus stops. If there is, it is at Kota Raya and Pasar Seni but usually it is people waiting for the bus that are sitting there. So, we usually don't have place to sit down."* (R10-SA)

Greenery (G)

Greenery refers to the landscaping design of the site and how much the design is integrated with natural elements.



SA/RQ/G-1: A view of the front of Office B with several roofs overlapping each other progressively and greenery seen inside the development.

SA/RQ/G-2: A view of the greenery within the office boundary.

SA/RQ/G-3: A view of single isolated trees planted with surrounding hardscape. There is a visual and physical imbalance of softscape and hardscape.

SA/RQ/G-4: A view of a scantily planted softscape to serve the restaurant behind it.

SA/RQ/G-5: A view of a single tree in the middle of the hardscape, which does nothing to soften the visual appearance of the scene.

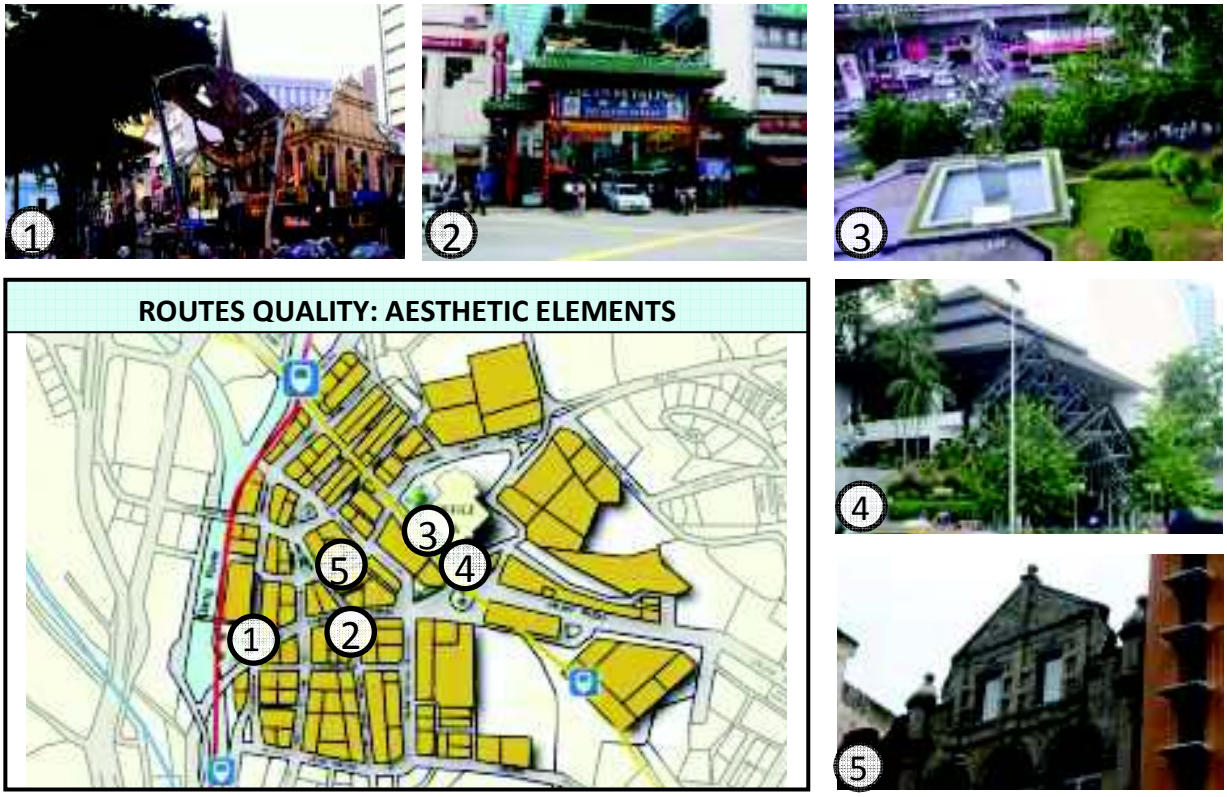
Figure 5. 42 A view of the green areas around Site A with a map showing the greenery and scenery visible while walking on the streets.

While observing the greenery during the walk around the site, respondent (R5-SA) and (R7-SA) commented:

> *"I actually do not notice anything when I walk in this area. I just walk. But I do hear things, see the buildings and notice some strong smells around."* (R5-SA)

> *"…well that depends. Some people might not enjoy this area in terms of see things but I feel it is very vibrant. The shop-houses are old and part of our history but unfortunately it gets worse with no renovations. Not much green to add to that also"* (R7-SA)

Aesthetic elements (AE) Aesthetic elements are things in the site to be seen and appreciated for their beauty. The site is surrounded by a robust culture of traditional shop-houses, temples, markets places, etc. The respondents were very interested in what aesthetic quality could be added to the site; however they generally agreed that the site lacked an aesthetic quality.



SA/RQ/AE-1:	A view of the energetic and vibrant Central Market with traditional shop-houses in various colours inviting the public in.
SA/RQ/AE-2:	A view of the Chinese-style gateway in front of Petaling Street serving as an inviting entry point for the public.
SA/RQ/AE-3:	A view of a pool with a sculpture in front as architectural landscaping.
SA/RQ/AE-4:	A view of a pool with a sculpture in front as architectural landscaping.
SA/RQ/AE-4:	A view of the tiers of the roof in front of office A.
SA/RQ/AE-5:	A view of the neoclassical architecture of a shop-house.

Figure 5. 43 A view of the visually pleasing buildings around Site A with the map.

Below are some of the responses of the respondents recorded during participant

observation. Respondent (R2-SA) complained of the dullness of the site:

> *"Yeah, it's dull here...Very dull."*(R2-SA)

> "*Yes, just when I pass by Maybank there's advertisement on board. So we often glance, and oh this is Maybank and what they are offering. Definitely the advertisement will enhance our walking experience."*(R3-SA)

Respondent R3-SA conveyed his frustration with the aesthetics in Site A:

> *"It's not attractive. There is no advertisement here, nothing."*(R3-SA)

Respondent R4-SA remarked that good advertisements can only be found in the hot spot areas of the city centre. He said:

> *"I feel joy while walking with my companions as compared to walking alone as I can see a lot of advertisement in Bukit Bintang or Sungai Wang Plaza. We are rich in term of cultures, the building, the design, everything. But we don't use it well, is what I feel."* (R4-SA)

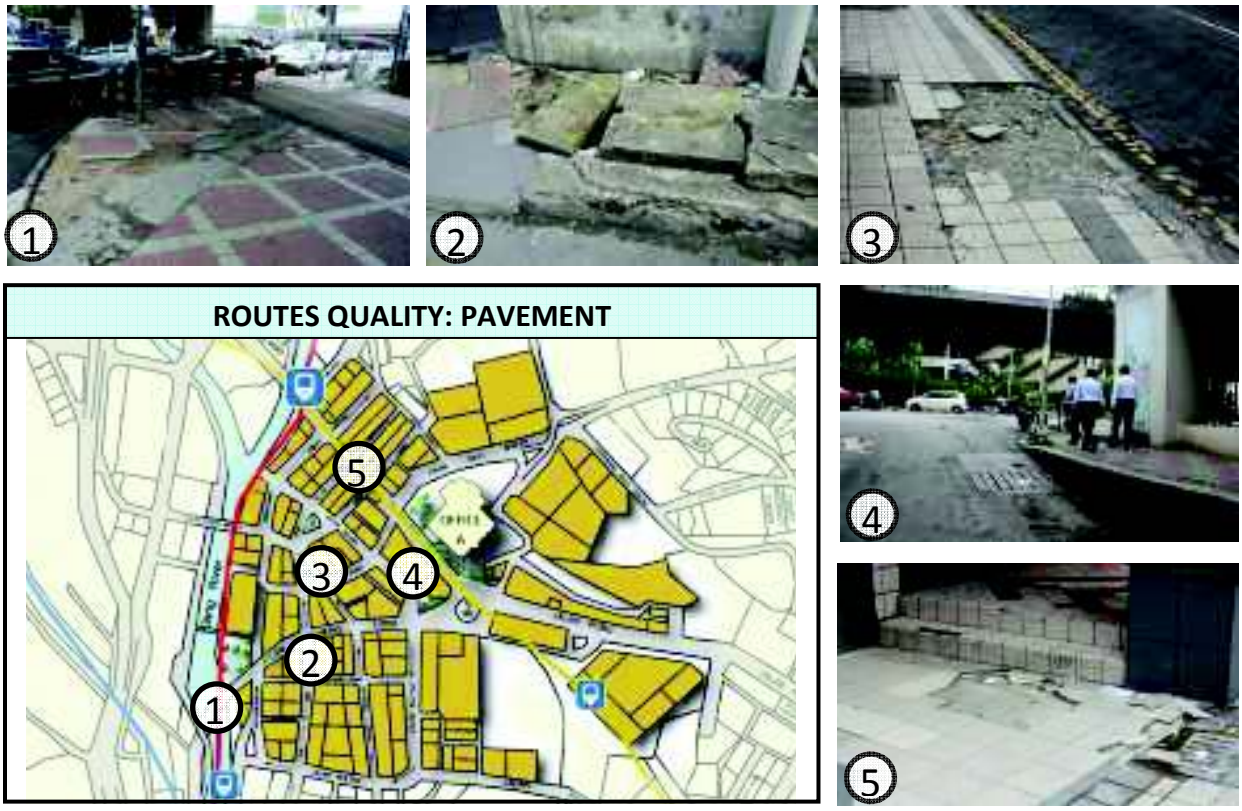
During the participant observation, respondent (R4-SA) said:

> *"If there are more attraction points in front of these buildings then people would love to walk." (R4-SA)*

Respondent (R6-SA) commented on the Plaza Rakyat area, saying:

> *"…I don't think the word is attractive, but more too practical, when you go there it's like a tunnel, there is nothing there, you just walk without the need to discover and suddenly you arrive at the LRT Station. There is no good scenery."* (R6-SA)

Walkway Conditions (WCt)



SA/RQ/P-1: A view of a broken pavement did not mend poorly with a patch of cement which creates aesthetical harmony nor functions well for the public especially the handicapped.

SA/RQ/P-2: A view of a completely broken narrow sidewalk covered with concrete slabs. The entire area appears neglected.

SA/RQ/P-3: Broken tiles on the pavement making the path more inaccessible for the handicapped.

SA/RQ/P-4: A view of the large gap between the pavement/sidewalk and the road, making crossing difficult for pedestrians.

SA/RQ/P-5: A view of more broken and un-mended pavements around Site A.

Figure 5. 44 A view of broken tiles on the walkways along the routes to the office in Site A.

While walking around the site, many respondents expressed concern about the pavement condition:

> *"The quality of these roads doesn't really define KL as a world class city."*(R4-SA)

> *"I don't like this pathway so much it makes the route not smooth. So when I wear high heels I slip over easily."* (R5-SA)

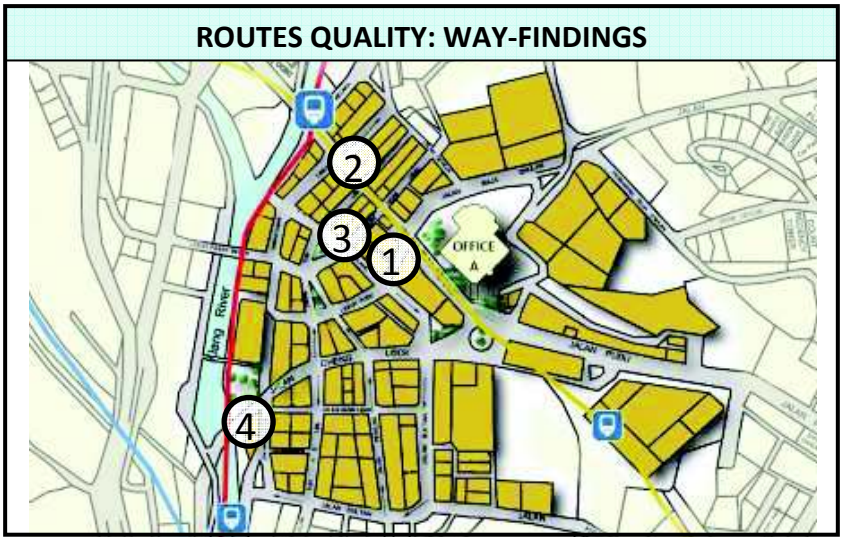
> *"No, it is not good because this path is not even. There are some places where a lot of people fall because it is slippery. Usually pavements should be rough but this one is slippery."* (R9-SA)

> *"Sometimes the walkway is narrow and sometimes we have to walk beside and on the road."* (R10-SA)

Respondent (R8-SA) complains about the poor pedestrian route:

> *"Actually walking around this lane (referring to the walk from Jalan Pasar to activity centre during the lunch break), there is not much crowd. It's just that you have to walk around the alleys, between people's shops and then you have to go in between the narrow lanes to get to your destination. It's not that route is but a building block. If we have a proper pedestrian route, for sure we will use it."* (R8-SA)

Way finding (WF)



SA/RQ/WF-1: A view of a turn finder the people make use of although it is unclear and plain-looking.

SA/RQ/WF-2: A view of a yellow sign with unclear writing.

SA/RQ/WF-3: A view of how street signs are sometimes hung on walls of shop-houses.

SA/RQ/WF-4: A view of a falling signpost.

Figure 5. 45 A view of the signage around Site A with the map their positions.

During the participant observation, respondent (R3-SA) commented about the confusion new comers would face in the area because of the lack of clarity of signs and directions to particular places.

> *"If you are new here, I don't think you can find places easily as there are no sign-boards, nothing to direct you to the place that you want to go. The most that you can do is to keep on walking until a building appears [referring to a landmark] in front of you."* (R3-SA)

Respondent (R6-SA) narrated a story during the interview, about getting lost because of the difficulty in finding and following the signage around KL city centre.

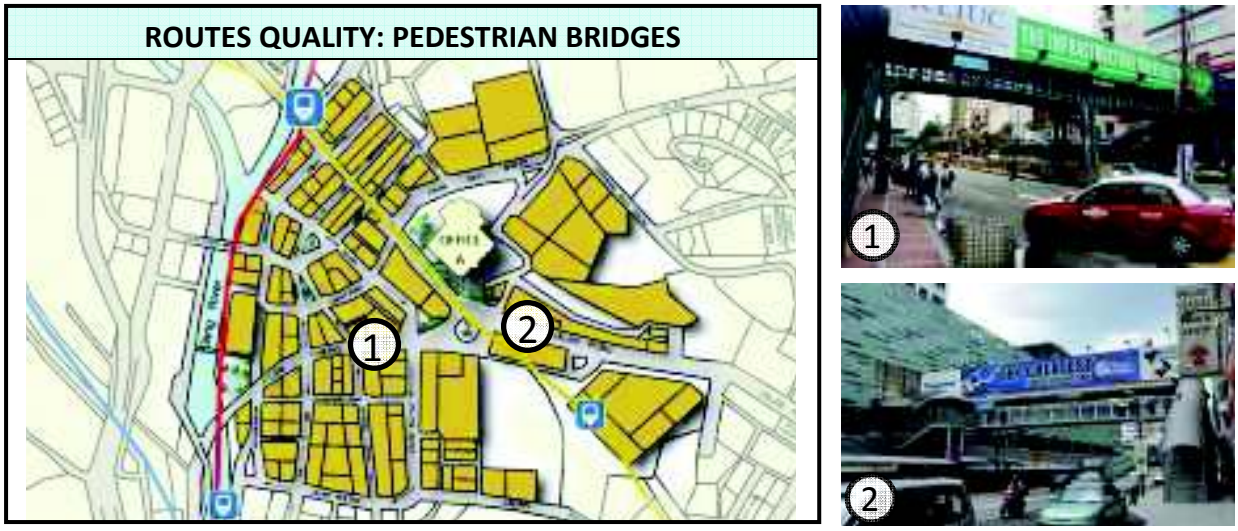
> *"… last time when I tried using the signage, I was driving from Pandan going back to Ipoh. Because I am not really familiar with the place, I didn't know how to go to Toll Duta so I tried using the signage to Ipoh and I just followed them but suddenly they were gone. I didn't know what way to go. I was lost for about an hour and it wasted my time, that's why I don't think that our signage is good..."* (R6-SA)

While walking through the site, respondent (R9-SA) and respondent (R2-SA) added:

> *"I don't really notice the signage for pedestrian but I think the signage is more useful to tourists. Meaning that, the signage for them is insufficient. Sometimes, from this Klang bus stand they ask, where the Central Market is. It is near, just in front of it but the signage is unclear."* (R9-SA)

> *"… it is complicated, because there was no proper signage from Masjid Jamek to Central Market"* (R2-SA)

Pedestrian Bridges (PBr)



SA/RQ/PB-1: A view of a pedestrian bridge which runs over Jalan Tun Tan Cheng Lock. Pedestrians still choose to cross at the street level.

SA/RQ/PB-2: A view of the bridge over Jalan Pudu.

Figure 5. 46 A view of some of the bridges around Site A with the map of their position.

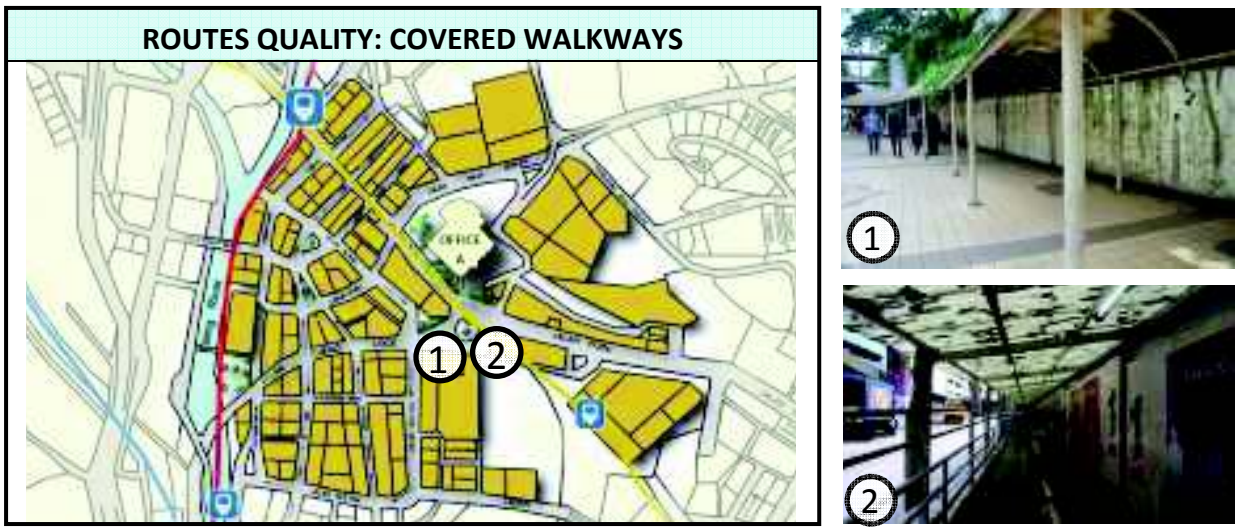
During participant observation, respondent (R6-SA) made a suggestion regarding the pedestrian facilities around the site, particularly the pedestrian crossings:

> *"The design of the pedestrian crossings here as elsewhere should be corrected so that all people can use it whether they are ladies, kids or handicapped. Pedestrian bridges which are so high up are not easy for the kids, pregnant ladies, elderly and disabled person to walk up there using staircase, it's a real challenge to some of them."* (R6-SA)

Respondent (R8-SA) argued that pedestrian bridges are not the most suitable or practical solution in most cases.

> *"Yeah, that's why from Kota Raya to go over to Chinatown, you have to use the pedestrian crossing which is so high up. And when you have a traffic light which is so practical you just have to cross over here, you don't have to climb so many stairs to get over there."* (R8-SA)

Covered Walkways (CWy)



SA/RQ/CW-1: A view of the covered walkway on Jalan Tun Tan Cheng Lock, which is not properly maintained or interesting to walk under.

SA/RQ/CW-2: A view of the covered walkway to Plaza Rakyat Station LRT.

Figure 5. 47 A view of the covered walkways around Site A with the map of their position.

5.7 Research Question 4: Dreams for the Pedestrian-Friendly Environment

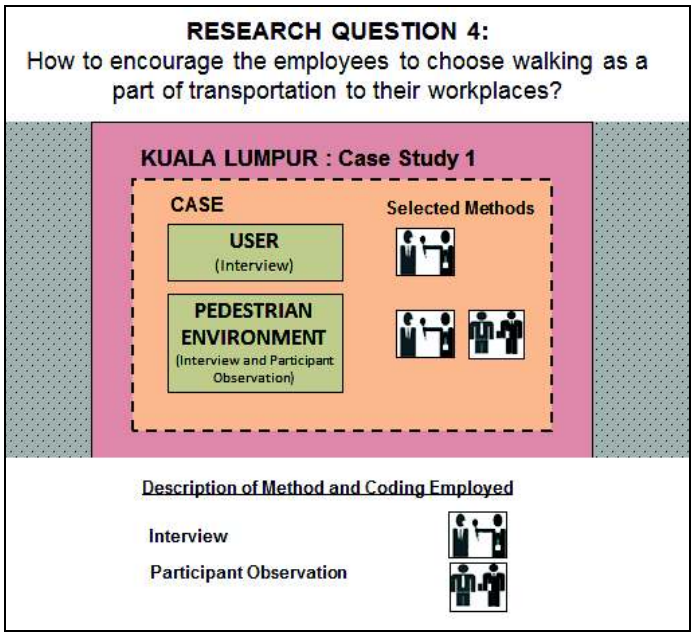


Figure 5. 48 Research techniques on the unit of analysis to answer research question 4.

This section discusses the hopes the pedestrians have for the environment they commute to daily. At the end of the interviews, the employees were asked what they want improved and what would make them opt to walk in the pedestrian environment.

TREE NODES (CASE STUDY A)	CODED REFERENCES
1. **DREAMS FOR THE PEDESTRIAN FRIENDLY ENVIRONMENT (DPFE)**	**8**
+ Important needs for pedestrian	**8**
+ Improvement of the physical features in the pedestrian environment	**8**
+ Stakeholders Involvement	**7**

Figure 5. 49 Dreams for a better and friendlier pedestrian environment

Based on the responses given by respondents, a set of suggestions will be proposed in later chapters (after the synthesis) as the first step towards improving the quality of the pedestrian environment. This section will also discuss the parties whom the pedestrians feel are responsible for acting on these suggestions and improvements.

Respondent (R3-SA) talked about the main party that is capable of changing the current situation in the pedestrian environment. The respondent also spoke about how this can help improve the economy and decrease government expenses. The comment made during the walk-through of the site in a group was:

> *"If our government encourages us to walk, using public transport to reach wider area rather than Kuala Lumpur; we can say that it leaves room for a better economy because in some forms it reducing car consumption and increase revenue for government, example petrol and car taxes but in terms of eco-friendly, more environmental friendly, it helps."*(R3-SA)

The results of the interviews on the hopes of the employees are categorised according to the themes below.

5.7.1 Important needs for pedestrian

These are the needs the pedestrians mentioned throughout the conducting of the interviews. If these needs are provided for, people believe they and others will be more encouraged to walk in the city centre and enjoy themselves while doing so.

5.7.1.1 Improvement of the physical features in the pedestrian environment

Most of the responses and observations showed that main problems within the site are with the infrastructural facilities present. One of the respondents also made a comment about the improvement of elements of security and safety in the surrounding areas of the site. The respondent also spoke about what constitutes a good pedestrian environment, and how people would prefer to walk in good conditions:

> *"…of course, when let's say, the condition is very good, more people would like to walk through… the journey more people would like to walk at that path. For me, it is safer..."* (R7-SA)

Another respondent commented on how walking in certain areas in the city centre is better than walking in other areas. The respondent states:

> *"Yes, it feels more convenient to walk around the town with specific pedestrian walkway."* (R1-SA)

Another respondent gave an answer regarding the possibility of including advertisements around Site A, as is in KLCC. The respondent believed most of the problems would be solved.

> *"If you want to make it attractive, like in Putra, they can use the same method also. Those advertisements they just put on a wall and it will automatically change in the KLCC. I am sure that kids will love to see it"* (R6-SA)

5.7.1.2 Stakeholders' Involvement

Many of the respondents were unfamiliar with which body in particular is responsible for the improvement of the pedestrian environment. However, they felt that the government should be able to improve the condition of the pedestrian environment be passing laws or appointing a set of officials that would monitor the progress of the environment, manage the car dependency of the public and focus on creating a better, more pedestrian-friendly environment. Respondent (R4-SA) said:

> *"I think it has become critical for the government to look into this matter fast. If they continue to ignore it, it will gradually get worse and it might spin out of control. I only have an idea of what they can do but they need to investigate the issue. I understand they try some stuff but most of the time it doesn't work. It is important to check this quickly."* (R4-SA)

Another respondent directed comments to the planners, architects, authorities and also the pedestrians:

> *"The authority and designers should take our experience and idea if they want the pedestrian environment of the city to be World Class…To achieve to the level of world class city it should be efficient in many aspects. Also there needs to be a shift in mentality of the people and they need to walk."* (R2-SA)

5.8 Summary and Link

This chapter presented four key findings revealed by this study. Findings were organised according to research questions. Data from individual interviews and critical discussion during the participant observation revealed the respondents' perceptions based on their own experiences of commuting to workplace. As this research adopted a qualitative approach, extensive sample quotations from the respondents are included in the report. The author has used the respondents own words with the aim to build the confidence of readers by accurately representing the reality of the persons and phenomena studied.

The research has investigated the two units of analysis using the appropriate methodology as described in Chapter Four. The analysis is done within Case Study 1 following the themes and coding assigned for each research question. These themes form the key findings for this chapter in which the first key findings revealed that the almost all respondents were supportive and diligently answered the research questions. The theme 'The implicit understanding of walking to work' has exposed thick and rich information on how people assign meaning to walking to work, the travel modes involved in their daily commuting, the level of understanding of the benefits of walking, and the description of their own walking practice and the characteristics of walking to work.

The second finding was the factors that the respondents believed might influence them to incorporate walking as part of transportation to workplace. There have been many debates on the tangible and intangible factors, such as barriers, drivers, psychosocial, external and safety and security for the employees, which will influence people to opt for walking in combination with public transport.

The third finding was that the lack of quality physical features in the pedestrian environment might hinder them from walking to work. There are numerous obstacles in

the existing pedestrian environment that make their walking experience unpleasant, when they are walking just for the sake of reaching a particular destinations.

The fourth finding was that the majority want an improvement to be made to their pedestrian environment. Suggestion were given ranging from the need for well-designed pedestrian facilities, proper enforcement by the police and authorities to stop other road users from parking their motorised vehicles on the pedestrian pavement, change of attitude among motorists to make them respect pedestrian rights, etc.

Findings from participant observation are interwoven with the feedback gathered in the interviews. The participant observation provides visual data from the photographs and maps, giving added value and confirming the verbal data gained from the interviews.

CHAPTER 6. PRESENTATION OF FINDINGS OF CASE STUDY 2

6.1 Introduction

As with Chapter 5, this chapter concentrates on data analysis by presenting the findings for Case Study 2. The same units of analysis, methods of data collections, research design, research questions, research instrument, etc., are used as in Chapter 5. The main reason for this is to ensure that the reliability and validity of the undertaken approach is applicable to other areas within the context of Kuala Lumpur city. The second reason is that by using the same units of analysis and so on, this study allows for the next level of data analysis, called cross-case analysis (refer to Chapter 8). As mentioned in Chapter 4, the cross-case analysis will help the author to obtain the replication logic that will take the data to the higher level of interpretation and synthesis.

Like Chapter 5, Chapter 6 explores the following:

- The construction of the meaning of walking as part of transportation to work and how walking to work is perceived
- Tangible and intangible factors that influence the employees to incorporate walking to work
- The physical features and how they can support walking to work
- How to encourage the employees to incorporate walking to work

This chapter will present the findings in Case Study2 for each research question based on the four thematic concepts below:

- RQ 1: The implicit understanding of walking to work (ImU),
- RQ 2: The influencing factors for walking to work (IFWtW),
- RQ3: The physical features that support walking to work (PFS); and
- RQ4: The dreams for a pedestrian friendly environment (PFE).

6.2 Within-Case Findings

Case Study 2 is located within the mega development area of Kuala Lumpur City Centre (KLCC). The details of the site have been mentioned in Chapter 4 (Section 4.6.3) and briefly mentioned under 'KLCC development' in Chapter 3. This site was selected to provide some comparison and contrast with Case Study 1. The reasoning behind this is to find the links between the evidence and the proposition deduced from the literature review in Chapter 2. Another reason is to assist the author to confirm or to reject the main propositions, and from that, to develop the final framework of this study (refer to Summary of chapter 7 and the discussion in chapter 8). As with chapter 5, this study applies multiple data collection methods, namely in-depth face-to-face semi-structured interviews as well as participant observation, as previously mentioned in Chapter 4 and Chapter 5. The objective of using multiple data methods is to reduce the bias that may emerge if just one method is used; the second method can help to mentally separate the author's thoughts from those of the pedestrians, thus not to getting overly attached to either perspective. The author believes that this is the way to arrive at a holistic perspective of the situation of the pedestrian environment in Kuala Lumpur.

6.3 Assignment of Coding and Structure for Analysis for Case Study 2

There are nine respondents were participated from office B in Site B and is coded as SB. Similar to Case Study 1, the respondents were coded using the numbers 1 to 9, with letter 'R' denoting 'Respondent" before the number. For example, respondent number 1 from Site B is coded as R1-SB. The coding of the 9 respondents is tabulated as follows:-

Site B
R1-SB
R2-SB
R3-SB
R4-SB
R5-SB
R6-SB
R7-SB
R8-SB
R9-SB

Figure 6. 1 Assigned code for respondents for the interview technique

As mentioned in chapter 5 section 5.3, the structure of the chapter for the presentation of findings follows an inverted tree structure. The four (4) themes listed in the introduction section refer to the **parent node**. The references attached to the tree nodes are called the **child nodes** while the branches attached below the child node are referred to as the **leaf nodes,** as illustrated in table 6.1 below. Each of these will be discussed from the respondents' point of view.

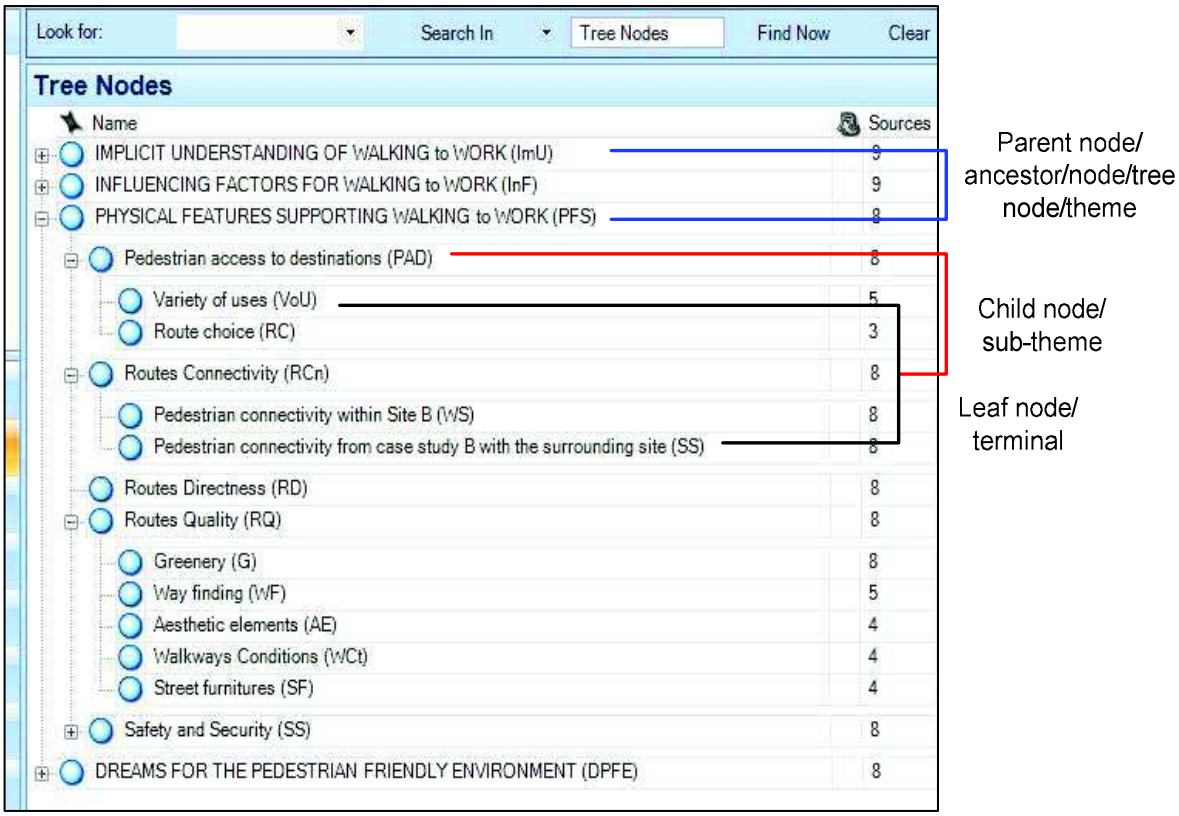


Figure 6. 2 Assigned themes and sub-themes for Case study 2.

6.4 Research Question 1: Implicit Understanding of Walking to Work

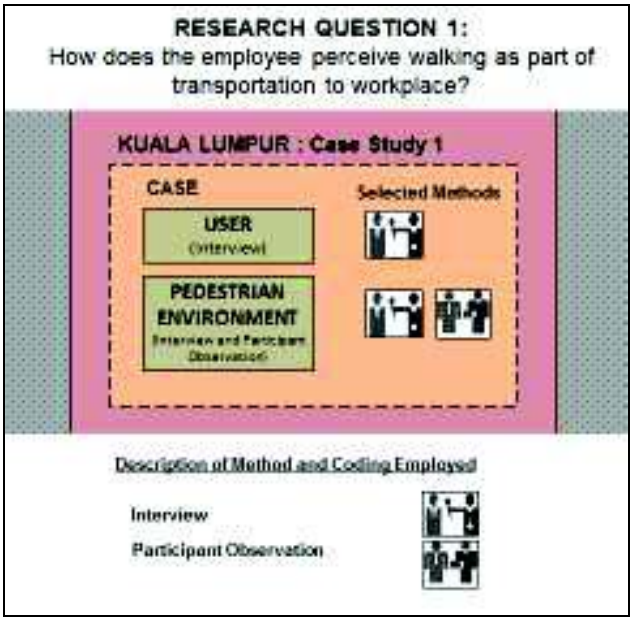
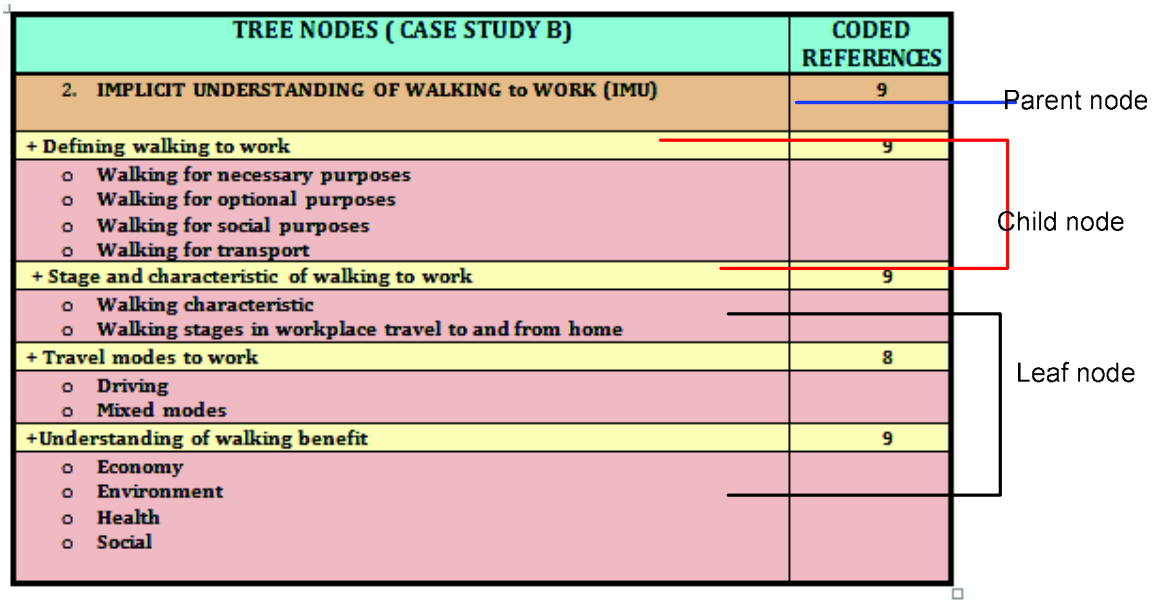


Figure 6. 3 Research techniques used on the two units of analysis to answer research question 1.

The employees' perception of walking as a part of transportation to work is grouped into four themes, namely: Definition of Walking to Work, Travel Modes to Work, Understanding the Benefits of Walking, and Stages and Characteristics of Walking, with sub-concepts listed below each identified theme. Table 6.3 represents the themes in relation to the employees' perception of walking as a possible mode of transportation to work by those who work in the Case Study 2 area.



TREE NODES (CASE STUDY B)	CODED REFERENCES
2. IMPLICIT UNDERSTANDING OF WALKING to WORK (IMU)	9
+ Defining walking to work	9
o Walking for necessary purposes o Walking for optional purposes o Walking for social purposes o Walking for transport	
+ Stage and characteristic of walking to work	9
o Walking characteristic o Walking stages in workplace travel to and from home	
+ Travel modes to work	8
o Driving o Mixed modes	
+Understanding of walking benefit	9
o Economy o Environment o Health o Social	

Figure 6. 4 Sub themes 'implicit understanding of walking to work' for CS2.

6.4.1 Defining walking to work

All respondents (9 out of 9 [100%]) described walking to work as a physical activity that serves a necessary purpose. Among the responses cited were those by respondent (R9-SB), who said:

> *"I think it is walking for necessary purposes. I describe walking for a purpose as walking with a very specific and set target...The purpose is to come to work and I am very focused while doing it. Even though I am focusing on my destination, it is quite relaxing to walk to work"* (R9-SB).

Another respondent also shared the same view with (R9-SB) that walking to work is considered as:

> *"Walking for necessary purposes… Since I go to my work place every day"* (R6-SB).

Another respondent suggested that walking is a physical activity and is also a possible means for transportation to work*:*

> *"… Definitely. Walking is a major means of transportation to work especially for short distance journey"* (R3-SB).

The respondents were questioned about their routine walking practice and purpose apart from the usual purpose of walking to work, as well as about how they define that type of walking. All 9 respondents reported that walking during lunch breaks is also part of their

daily walking routine as employees in the KLCC area. Walking trips during lunch breaks occur between 12 noon till 2 pm as follows;

i) from the office to the food courts within the vicinity of office B such as in KLCC Suria Shopping Mall, Jalan Pinang, Ampang Park and others; and
ii) From the food courts as mentioned above back to Office B.

Most of the respondents considered walking during lunch breaks as walking for social purposes. Although there is a cafe in the office building, respondent R8-SB emphasised during the participant observation that:

> *"....actually we can decide to have our lunch in the cafe in this building but we usually want to go outside with friends and then…yeah! Socialise"* (R8-SB).

Respondents (R3-SB) and (R1-SB) also shared the same experience:

> *"For me, if I talk and walk, I won't say it would be a 'formal' walk. Even if it is a planned trip when I am walking to lunch, most of the time I won't be alone walking. I have to be with friends and in a group for some discussion and we will also be talking about some issues over lunch"* (R3-SB)

During the participant observation respondent (R1-SB) said:

> *"I have a group of friends and we usually meet up for lunch. We go in a group of four or five and we walk to any of the eateries around this area. We all look forward to the 1 hour break to release the tension that builds up during the work hours [explain excitedly]. We tell stories while walking...Lunch time is the best time to talk about many issues. Yes! [Relief voice expression], it is necessary to release tension [at work] while socializing. We also discuss and get some ideas about work"* (R1-SB).

6.4.2 Travel modes to work

Majority (8 out of 9 [88%]) of the respondents indicated that they chose to travel to work through mixed-mode transportation. Cognitive mapping in figure 6.5 shows the travel pattern of the respondents from their home to the office. The main reason is because their homes are in close proximity to a public transport network which brings them directly to their workplace. When they arrive at their station, the rest of the trip can easily be covered via walking. Several respondents made this point during participant observation:

> *"I take LRT from my home to here because that's the most convenient for me"* (R1 SB)

He continued;

> *"My home is in Gombak and I take PUTRA LRT to come to work. KLCC station is the 10th station from Gombak. From the station, there are two ways to come to the office [pointing finger to the desired route lines undertaken on foot on the site map provided during the interview]"* (R1-SB).

Commuting to the workplace in the city centre via mixed-mode transport is generally accepted by the majority (6 out of 9) although some have to drive their cars from home to the nearest rail station. One of the respondents who lives furthest distance from the City Centre stated:

> *"For me, the distance from my house to the train station takes about 15 minutes by car. From there it takes about 1 hour because I stay in Beranang and I take the train from Bangi station"* (R2-SB).

> *"Yeah I used to…actually even when I first started working, I used to take the LRT... so I would drive to the LRT station in Kelana Jaya, and then I'll take LRT to KLCC and then I'll walk to the office"* (R7-SB).

Among all respondents only one reported giving up on mixed-mode transport to Office B and opted to drive in a single occupancy vehicle (SOV). Asked why she chooses to drive rather than to take public transport, respondent (R5-SB) replied in an exhausted tone saying:

> *"If I go to work using public transport, I have to endure the congestion of an overly crowded train [the stations and in the LRTs] especially during the peak hours. Whereas when I drive, I do still have to endure the traffic jam but I prefer to endure it in the car where I can enjoy it on my own at my own time and in my own space [in her car environment]. I also am more mobile at all time*" (R5-SB).

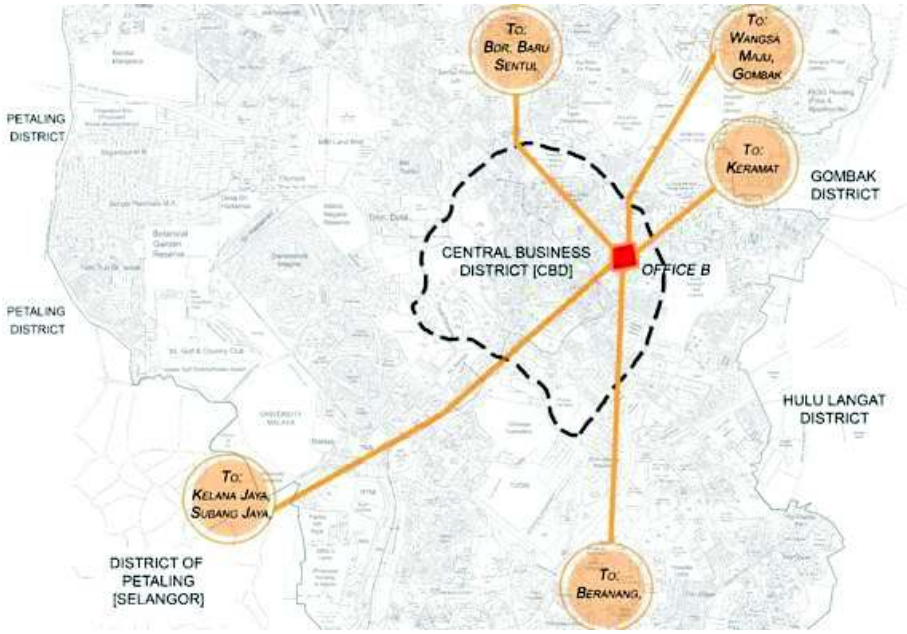


Figure 6. 5 The cognitive map presenting travel pattern to work for Case Study 2.

6.4.3 Understanding the Benefits of Walking to Work

Different people perceive the benefits of walking to the workplace differently, based on the individual's past and present walking experiences. The categories of the benefits of walking as understood by employees are as illustrated in Table 6.4:-

Tree Nodes

Name	Sources
Understanding of walking benefit	9
Health	8
Economy	7
Environment	8
Social	8

Figure 6. 6 Concepts of understanding of walking benefits for Case Study B

6.4.3.1 Health

The majority of the respondents (8 out of 9 [90%]) were quick to recognise the benefits of walking to their heath. Some began by comparing the health benefits of walking to those of driving to work. The following are some of the opinions the respondents expressed about the benefits of walking to their health:

> *"Firstly, you'll get sweaty because all the muscles move when you walk and eventually you burn some calories. If you are driving, you just sit and only your foot is working by pressing the pedal. Not much physical movement is being done while driving."(*R2-SB)

> *"Yeah it is good…for example in KLCC you have a park, a very beautiful park in the middle so that the mood is enhanced while walking. Sometimes you can even walk through the park if it is not raining. It is good to walk through the park because you will feel your mind is refreshed."* (R4-SB)
>
> *"To me it is part of exercise. I feel I don't put on weight that much. Although I eat quite a lot but I don't put on weight. It keeps me fit and feel very fit because of the walking and I don't need to register in a gym"* (R9-SB).

Respondent R3-SB expressed his frustration at those whom he considered as ignorant of the benefits of walking. He said:

> *"Yes, definitely people don't want to take it seriously, because they have no idea of the immediate effect to their health in a positive manner".*

6.4.3.2 Economy

Most of the respondents (7 out of 9 [80%]) responded in a positive manner that walking helps save money that would have otherwise been spent on monthly travelling expenses. A few of the regular practioners who walk as part of transportation mode to work reflected on their experiences as follows:

> *"If you decide to walk, you don't have to pay...Driving, you have to pay for the petrol and riding train, you have to pay for the ticket, you know. However, it depends on your convenience. If I'm staying in Kelana Jaya, you cannot expect me to walk to the office which is 30 to 40 kms distance. I would have to take train*" (R9-SB)
>
> *"If I take the car with the traffic jam...Wait* [taking a piece of paper and a pencil ready to calculate the expenses]...*The train ticket cost me RM 2.10 X 2 ways return = RM 4.20 a day. Parking payment here is RM 110 a month. RM 4.20 X 25 days = RM 105. That is my expenses* [by Putra LRT]. *If I take* [drive] *the car, RM 110 which is my parking fee. The fuel is about 13Kms X 20 cent= RM 22.60 x 2 ways return x 25 days = RM 130. RM 110 + RM 130= RM240 a month. That is without traffic jam especially in the evening rush hour. If I calculate that in, let's put around RM 60. Altogether it is RM300 [driving] compare to RM 110* [public transport and walking]. *The difference of RM190 cost saving. It is more than double the price of taking public transport and walking. To tell you the truth, it is not about saving,* [if I am driving my car] *I can have my own comfort, time pace, environment and get less communicating with people however you save your exercise [physical] which is the greatest benefit to your life. To me exercise* [by walking to work] *is the big benefit. I have been doing this* [walking to work] *for 6 years already. I seldom do an actual exercise except after work on Friday evening in the park"* (R1-SB)

> *"...it is cost saving compared to driving which costs me around RM 30 to RM 40 a day for the fuel, toll fees and parking charges. Travelling by train to work cost me approximately RM15 per day"* (R2-SB)

6.4.3.3 Environment

Many of the respondents (8 out of 9) mentioned that they are fully aware of the negative impact of carbon emissions, which are caused mainly by automobiles, on the environment. One of the respondents displayed his genuine understanding of the greenhouse effect:

> *"If I take [drive] the car, do you know how much I alone pollute the earth with the CO and CO_2 emissions? When we talk about walking that means my car is not moving. If my car is not moving, what does it mean in terms of the environment? It means I saved my share of the environment by not adding to the greenhouse effect that deteriorates the world. Whenever I save fuel, I am not polluting the world. By walking I can save the world*. (R1-SB)

Eight (8 out of 9) of the respondents used terms related to environmental destruction such as greenhouse effect (R1-SB), carbon emissions, and air pollution (R1-SB,R3-SB,R6-SB). 70% of those (6 of 9) indicated combining public transportation and walking from any given trip means less depletion of the atmosphere and outdoor air quality. One of the respondents mentioned that he strongly supports GO GREEN initiatives in reducing environmental destruction; this motivates him to practice a healthier lifestyle. He said:

> *"I take LRT to support with the GO GREEN Initiative. I don't drive. From the station I walk to the office which is about half a kilometre. I further support the GO GREEN Initiative by using the LRT which is also economical for me comparatively. I do make do of my day without the early morning stress of where to park (referring to the car), how long I park and I have money for parking fees. This gives rise to two things...of course it will lower the level of carbon emissions into the atmosphere and encourage a good and healthy lifestyle"* (R3-SB).

6.4.3.4 Social

All 9 respondents described their perception of the benefits of walking to their social life. Respondent (R4-SB) narrated how he has benefited from walking in his daily life:

> *"…we have a very good cafeteria here in the office on level six…and the food is also good, but for my colleagues and I, most of the time we just go out of the building just to get some fresh air. And for that purpose normally we don't go through the hallway (covered hallway in the KL Convention*

> *Centre building) but we just take the pedestrian walk outside the building. It is for socializing because we get to meet our friends".*

Another respondent saw his experience of walking to work and walking for lunch breaks as having a positive impact on the way he sees walking for himself and for others:

> "*…here you walk to work, the other one is, it is good for your health, and you will have a nice, good, healthy life. When you walk with your circle of friends, you meet with a lot of people, you greet them, everyone is in a different mood, and some are rushing, walking with high heels, some with shoes, slippers. You can see lots of things happening [face expression with joy]"* (R3-SB).

6.4.4 Stages and Characteristic of Walking to Work

With regard to walking stages, many (8 out of 9 [95%]) of the respondents in Case Study B stated that their journey to work engages a series of stages combining walking with other transportation modes. Respondents framed the stages of walking on their journey to work as follows:

> *"I walk from home to LRT station Sentul Timur. It takes around 10 minutes to walk...then I stop at Masjid Jamek interchange. From Masjid Jamek, I proceed to KLCC station and then I walk to the office."* (R6-SB).

> *"My final stop is in KLCC station after KL Sentral. Oh, in the case PUTRA line is down, there are 2 options to get to my office. I can walk all the way to Bukit Nanas for the monorail line and stop at Jalan Raja Chulan. If i am not taking monorail, I need to consider taking other public transport such as a few buses or a cab. But I never take these two modes because I sometimes end up caught in the traffic similar to what happens when I drive a car."* (R2-SB).

Some of the walking stages experienced by the respondents in Case Study B have been discussed in section 6, 'Travel modes to work'.

Characteristic of Walking while going to and returning from work might differ depending on several aspects such as the time of the walk, (AM or PM), the state of body and mind, and the pedestrian facilities available along the route taken. Respondent (R8-SB) pointed out:

> *"…usually going to work would happen faster than coming back. Probably because my mentality has been set that I'm heading to start my day and I don't want to be late. So, yeah and when I go to work in the morning, the shops in the shopping centre are not yet opened. Mostly they are all office worker heading almost hurriedly to their offices so yeah, that is a different ambience. Whereas when I come back, I'll usually be more relaxed because I'm done (with my work) for the day..."* (R8-SB)

Although the lunch-break period is approximately one hour, from 12pm to 1pm or 1 pm to 2 pm, the employees seem to have calculated the time it takes for them to walk from and to the office to the eateries located within and around Site B. Respondent (R9-SB) stated:

> "*Yes, I do walk from KLCC to the office and also during the lunch break. For lunch break I always walk around Jalan Ampang and Wisma Bungaraya. If I go to Wisma Bungaraya for lunch, I take around 10 minutes to go there and 10 minutes' walk back to the office*." (R9-SB)

6.5 Research Question 2: Influencing Factors for Walking to Work

Figure 6. 7 Research techniques on two units of analysis to answer research question 2.

The influencing factors for walking to work are grouped into five key categories namely Driver Factors, Barrier Factors, Pyschological Factors, External Factors and Safety and Security Factors. Figure 6 represents the tree nodes on the concepts under the influencing factors for walking to work for Case Study 2. The themes and concepts are recorded within Nvivo 9 under tree nodes as shown in Figure 6.8 below.

TREE NODES (CASE STUDY B)	CODED REFERENCES
1. INFLUENCING FACTORS FOR WALKING to WORK (INF)	8
+ Barrier Factors	9
o Lack of integration work by the authorities and stakeholders in improving the pedestrian environment	3
o Physical facilities related to walking	5
o Discontinued protection from weather	8
o Negative attitudes related to walking	7
o Poor accessibility and connectivity	8
o Unpleasant feeling	7
o Unreliable public transport system	5
+ Driver Factors	9
o Availability of public transport network	8
o Encouragement from the employer	5
o Parking facilities at stations	3
o Traffic conditions	9
+ External Factors	8
o Enforcement	4
o Policy	4
o Vision towards the world class city	4
o Weather	8
+Psychosocial Factors	9
o Employee perception to walking	9
o Familiarity of the area	7
o Peer review	8
o Positive feelings about walking to the body and mind	6
o Relaxation and rejuvenation	6
o Socializing through walking	2
o Time taken	7
o Visual appreciation while walking	4
+Safety and Security Factors	7
o Crime	5
o Dangerous	7
o Harassment	3
o Traffic	5

Parent node

Child node

Leaf node

Figure 6. 8 Tree nodes screen of factors influencing walking to work for CS2.

6.5.1 Driver Factors

The concept of economic drivers is as illustrated in Figure 6.9:-

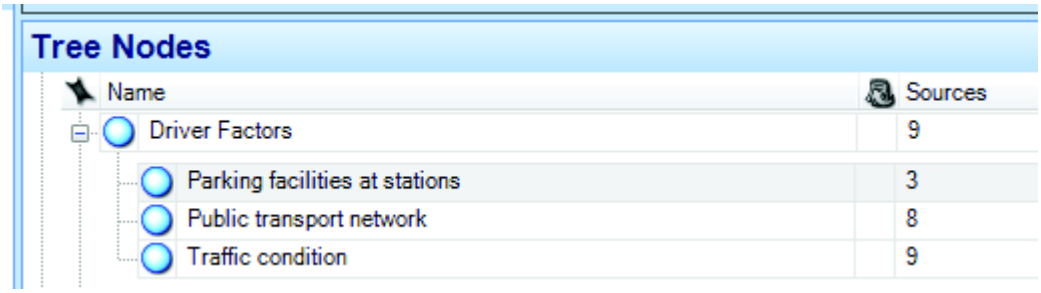


Figure 6. 9 Concept of driver factors for CS2.

6.5.1.1 Parking facilities at the stations

Acknowledging the presence of parking facilities at the train stations, respondent (R2-SB) recognised the effectiveness of travelling to the place of work using a mixed mode transportation which includes walking:

> *"I am thankful that by choosing to park my car at LRT Jelatek, then take LRT to KLCC station and then walk there, to my office, it saves the fuel,*

> *parking fees, saves the time, it saves everything. So really, I appreciate that. Even though I did apply for the external car park for my car in February this year…I should do the follow-up actually, but I did not because I actually don't mind if I do not get it. So, I'm just enjoying the way I am now."* (R8-SB)

One of the respondents (R7-SB) commented that she has to plan ahead to reach her workplace early in order to find a parking space for her car at the LRT station. The respondent commented*:*

> *"…Yeah in fact earlier... around 6.15 am, but that's because of other constraints because if I were to take the LRT then I will need to park my car at the station, and there is very limited parking space there so I need to reach the station early"* (R7-SB).

6.5.1.2 Traffic condition

KL suffers from heavy traffic congestion particularly on the main highways such as the Federal highway, North-South PLUS highway, MRR1 and MRR2 to the city centre. Traffic tends to be heavier on the road networks in KL during the AM and PM rush hours due to the fact that everyone travels from home to work at the same time in the mornings and returns from work also at the same time in the evening. The fact that they do so in cars makes the car dominance worse and deteriorates conditions for pedestrians walking in the city centre. All respondents (9 out 9[100%]) claimed that traffic congestion is a big issue for them while commuting during the AM and PM rush hours. The stress of driving associated with traffic congestion is, for some respondents, a problem and a motivating factor for using public transport. During participant observation respondent (R4-SB) commented:

> *"…in KL city traffic congestion is very high, so driving is definitely not a good option unless you really have to do it".*

Respondent (R9-SB) said, immediately after the previous respondent, that:

> *"The main reason I commute by train because I don't really enjoy the traffic jam. Just look at the road…*".

Respondent (R8-SB) asserted that certain public transport modes are effective in tackling the traffic congestion issue. She said:

> *"…because if I take bus, I will be stuck in the traffic jam, so I chose LRT*" (R8-SB).

Respondent R5-SB explained:

> *"…If possible I try to avoid the peak hours but it is really troublesome to do so. It means I have to get up really early and go back really late. Sometimes when we go back towards the end of the peak hours at about around 7:30 or 8:00 but there are still congestion depending on the situation"* (R5-SB).

6.5.1.3 Availability of Public transport

PUTRA LRT, monorail and KTM commuter train are thought of by eight respondents (8 out of 9 [89%]) as the most reliable, frequent and comfortable modes of transportation to work. Respondent (R2-SB) explained that the availability of multiple modes of public transportation is important; if one of the systems was down, it would then be easy to rely on another alternative to get to Office B. The respondent asserted:

> "*Just in case PUTRA line is down, there are 2 other options to get to my office. I would walk all the way to Bukit Nanas for the monorail line or in Jalan Raja Chulan. If I do not use the monorail, then I need to consider using other public transport such as buses or a cab. But I will never use these two modes because I will end up caught in the traffic similar to if I drive a car"* (R2-SB).

According to respondent (R3-SB) during the participant observation, the LRT services, including PUTRA LRT, have improved tremendously over the last two years as shown in Figure 6.5. He further stated:

> *"At least the crowds have been reduced, the duration of trains coming is much shorter however, the other modes of transport especially buses, definitely need a lot of improvement"* (R3-SB).

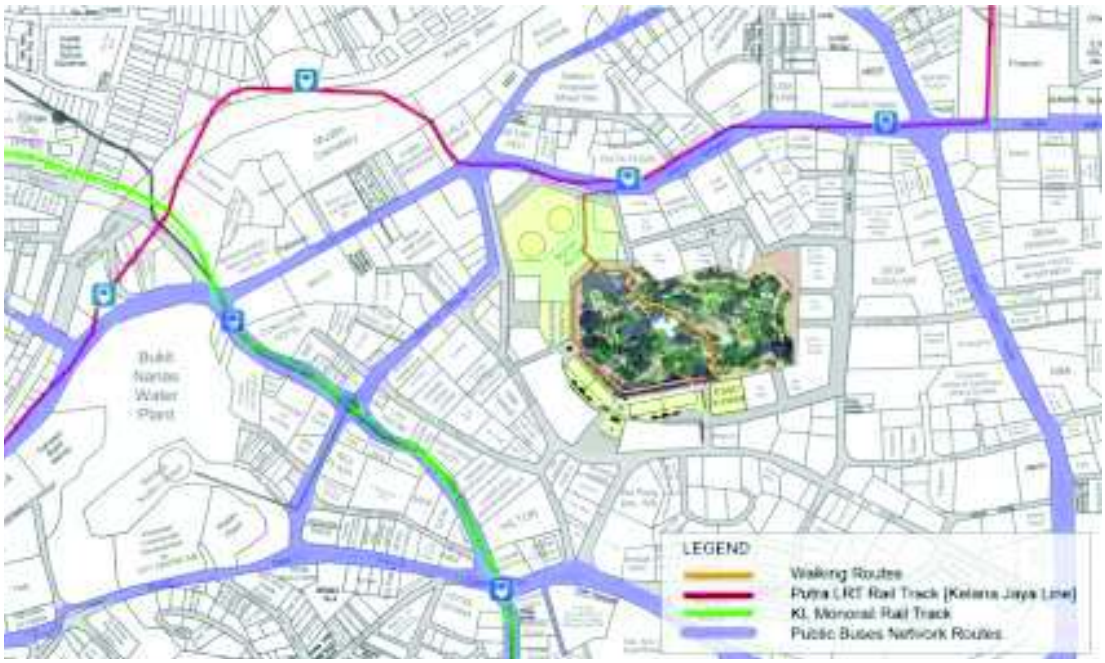


Figure 6. 10 The Public transport network connecting the employees to Case Study B.

6.5.1.4 Encouragement from the employer

According to Respondent (R2-SB), the sedentary nature of office work and its impact on health and productivity among employees should be a driving factor for the promotion of walking at the workplace. Employers need to encourage walking as part of a healthy lifestyle for employees, as a healthier lifestyle would also increase productivity during working hours. During the walk on the routes, Respondent (R2-SB) explained:

> *"I have been in this company for about 3 years, so far they [the company] do promote in terms of health for example that encourage brisk walking including walking to the train station. They conduct a yearly event here for medical health check-ups that is held by the recreational section in the company. The company also gives us some health safety token such as blood pressure monitor and this year they gave us a pedometer to record at least 10,000 steps a day. I also started to use this in the KLCC Park for brisk walking for at least 7,000 steps a day.* (R2-SB)

Another initiative undertaken by the employer is that employees are encouraged to car-pool to the office to promote a greener environment. Respondent (R9-SB) highlighted upon reaching the office that:

> *"We used to practice carpooling at one time. We try not to have too many cars on the road. With the company support, we have initiatives to help to make a sustainable environment. The company agreed that the cars for carpooling would have special parking lots…meaning that if 4 people*

> *carpool, they can use the same parking lot. There is only minimum payment for the lot which is an incentive to us" (R9-SB)*

The employer also displays concern for the welfare of the employees and emphasises safety on a regular basis in and outside Office B. Respondent (R9-SB) confirmed this during the participant observation:

> *"Our company does not encourage the staff to walk near this area [hotel under construction next to the office] and expects the employees to walk within the KLCC and Convention Centre to get into the office building. Yes, I would say they are caring and for them (employee) safety comes first and then family. So that it enhance the quality of life for us the worker"* (R9-SB)

6.5.2 Barrier Factors

The concept of barrier drivers is as illustrated in Table 6.6:-

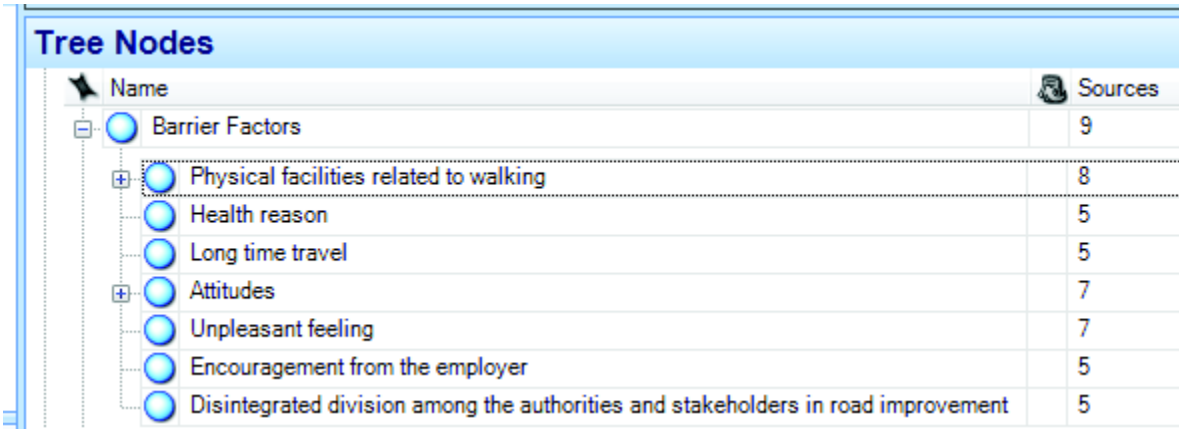


Figure 6. 11 Concepts of barrier factors for CS2.

6.5.2.1 Negative Attitudes related to walking

According to respondent (R3-SB), the attitude of car drivers and motorcyclists has made walking in the pedestrian environment in KL even more challenging. Over time, drivers have come to show less respect to other road users especially the NMT. According to (R3-SB), walking can be dangerous because of motorists:

> *"…depends on how much you trust the zebra-crossing. I definitely have no confidence in it because 80% to 90% of the time, the cars passing won't stop"* (R3-SB).

While walking in the respondent group, respondent (R1-SB) added:

> *"The motor cycles simply ignore them [the zebra crossing]. There's a lot of accident because of them [motorcyclist]. In fact most of them [motorcyclist] don't care about the traffic lights." (*R1-SB)

The findings also suggest that car users have a strong attachment to their car and it would be very difficult to discourage them from using their cars and using public transport instead. From the interviews, most indicated they have no intention to stop using their car because they imagine life without a car would be very difficult. One of the respondents (R5-SB) felt that the cars allow people to have the lifestyle she aspires to. Respondent (R5-SB) explained:

> *"…compare to driving. I still have to endure the traffic jam but I prefer to endure it in the car where I can enjoy it at my own time and in my own space [in her car environment]. I am also more mobile at all times".*

From her next comment, it is apparent that she is less concerned about the environment outside the car as compared to the other respondents. She says:

> *"I know and understand that I have to spend more money on fuel but I don't mind so much and I honestly don't think much of carbon emission. Although it contributes to carbon footprint it is still comparable to walking...I do think that if you walk and take public transport, there is still need to use some amount of energy (human energy to walk and fuel for bus). The energy is obtained from eating some food whereas by driving, the energy is consumed by the car. There is some kind of energy involved, it is just that I don't get tired in my car."* (R5-SB)

Another respondent related an experience he had with using the car for short trips that can be covered quickly by walking. He narrated:

> *"During the last Hari Raya Haji, my relatives came to my house and then they wanted to go to my neighbours' house which is about 100 or 200 metres but they choose to use the car instead of walking. In fact, I did propose that walking because of the short distance, I mean, it's less than 5 minutes away but they insisted on using the car."* (R8-SB)

6.5.2.2 Unreliable public transport system

Walking is perceived by 60% of the respondents (5 out of 9) as a combination of walking with public transportation for commuting in the city centre. Travel time is an important reason for the mode choice for travel to work. There are several aspects that these

respondents have encountered while incorporating walking as part of transportation to work:

i) The area they live in is far from the public transportation system. Feeder buses are essential.
ii) waiting time for public transport, particularly buses, is too long,
iii) lack of control over the frequency and efficiency of public transport
iv) The condition of the pedestrian environment is not pleasant for walking.

Respondents expressed the issues of unreliable transportation in the following ways:

> *"I think it depends on the area where people live. In some areas there is no LRT line and some people have to walk quite far to reach the public transport like myself. There is no feeder bus as well*" (R2-SB)

> *"Actually there are feeder buses but I don't like to wait so I choose to drive in own convenience. Also...[Thinking]…the timing is not consistent. It's not as punctual as the transportation system back in UK where they have the timetable at the bus stands, they are accurate and they are set, right? But in Malaysia, that's not the case"* (R8-SB)

During the participant observation, respondent (R8-SB) talked about:

> *"…poor public transport system. So, people choose to have their own car instead of waiting for the buses, for LRT sometimes have a delay in the system and so people have to wait. I have had this experience so many times. So that's the reason and then the second is…I can say the pedestrian environment while walking is not so pleasant. They don't enjoy it. Just look over there…"* (R8-SB)

> *"I think from my experience and what I know from my department and some of my colleagues, those who are living next to public transportation; they choose to walk to work because it's convenient for them to get to the train and come to work. But those who stay far away from the city and do not have public transportation access that easily, choose to drive which in reality is most people."* (R4-SB)

6.5.2.3 Unpleasant feeling

It was also noted that although the internal pedestrian environment within Site B is friendly to the user, respondents expressed their concerns about the technical aspects of the underground walkways. This was mentioned in the comment during the walk in the underground walk way:

> *".... If there is no air condition in this underground walkway it would be very hot, like an oven. Nobody would want to walk here.*" (R1-SB)

Another issue highlighted by a few respondents was the fact that they are forced to share the walking path with electric buggies. Respondents walking on the external walkway of Site B during participant observation said:

> *"…another problem of walking on the outdoor route is that we have to share this route with the buggy. The buggies are used to transport hotel visitors to Suria and KLCC Twin Tower which is quite inconsiderate if you think of it. We are pushed out of the walkway. I am not happy with the matter. Those buggy drivers drive in at a very high speed. Imagine…while walking, a buggy suddenly appears from behind and starts forcing its way between the pedestrians. It was scary and make me feel very uncomfortable... and I am afraid that one day an accident might happen...somebody might get seriously injured"* (R1-SB).
>
> *"The accident might occur…because we share (the outdoor walkways) with the electric buggy from the hotel and the motorcycle used by the guards patrolling the KLCC area"* (R8-SB).

6.5.2.4 Lack of integrated work by the authorities and stakeholders in improving the pedestrian environment

The respondents recognised that the pedestrian environment within the KLCC area is well planned and they enjoy the walking facilities within the area particularly from the LRT station to the office and from eating places to the office. As they walk out of the boundaries of KLCC, however, they note a drastic change in the condition of the pedestrian environment and notice the presence of oddities in pedestrian facilities. While walking around Site B, respondents (R2-SB) commented:

> *"...everything should have been done equally. If these kind of facilities are present here, why can't the same thing be done in places like Chow Kit [poor community and pedestrian condition]? The government pay too much attention on tourist areas and they fail to see the benefits of doing it in small and areas especially the communities"* (R1-SB)

This is in line with respondent (R8-SB) who spoke about campaigns as below:

> *"I think they should look into this matter seriously. I know that there is a campaign for advocating walking 10,000 thousand steps a day, it shows that the government is encouraging people to have healthy lifestyles through walking, but they also need to have a look at what they have provide to the people in terms of infrastructure, public transport. They also encourage people to use public transport but they haven't improved the public transports to the best that it can be"* (R8-SB)

6.5.2.5 Inadequate Pedestrian Crossing facilities

The respondents expressed their dissatisfaction with pedestrian crossing facilities. This was a problem that arose often during the course of data collection. When all the respondents described their walking experience, they focused mainly on the difficulties in crossing roads at the perimeter streets around the Case Study B area; the lack of crossings causes delays and creates a sense of insecurity. One of the respondents stated during the walk that:

> *"Yes it is becoming more chaotic because of the traffic… You cross the road junctions at your own risk anytime fewer cars are passing. It is not safe at all for children…The crossing facilities are not enough. Even though there are places like out here that have zebra crossing, the rules of a zebra crossings are not being observed therefore rendering it unsafe…Oh…it is a nightmare when I need to cross these roads"* (R1-SB)

Another respondent (R3-SB) explained:

> *"Of course, having a pedestrian walking on ground level is much easier because less effort is used up in going up. Furthermore, if you have a trolley or heavy load, or you are handicapped, certain places are very limited in accessibility. It also largely depends on how much you trust the zebra-crossing. I feel insecure about it because the cars rarely ever stop".* (R3-SB)

Another respondent R7-SB commented that walking within Site B is enjoyable but that the walking experience on perimeter streets outside the site boundary seems to be complicated. Respondent (R7-SB) said:

> *"If I were to walk to Suria [KLCC shopping mall] there aren't any crossing that I need to take there, whereas if I were to go to Bukit Bintang say Pavilion, there are quite a few which is a little bit off to me because … crossing is hard in Malaysian cities and towns. They don't normally follow the traffic greenman [laughs]"* (R7-SB)

Respondent (R4-SB) commented on the insufficient number of crossings, as well as the fact that they are not located on the desired route. Furthermore he added that other road users are also not able to predict the route of pedestrians who are about to leave the kerbs. Respondent (R4-SB) during participant observation, and respondent (R1-SB) during the interview, both said:

> *"Ok, for example when you walk over here on Jalan Sultan, pedestrians does not know the point they have to cross the road. Because cars are coming from all three different directions, so they [the pedestrian] have to be watchful of all three roads at the same time and there are no zebra crossings, neither are there traffic lights here to control their movement in the car environment."* (R4-SB)

> *"The crossing facilities are not enough…even though there are places with zebra crossings they remain unsafe for pedestrians to use. The motorcyclists simply ignore them [zebra crossing]. There are a lot of accidents because of them [motorcyclists]. In fact they [motorcyclists] don't care about the traffic light at all." (R1-SB)*

6.5.2.6 Discontinuous protection from weather conditions

The majority of the respondents expressed their frustration at the discontinuity of the covered walkway protecting them from rain and sunshine on the existing route. The respondents agreed that this condition has created an unpleasant Walking environment.

Respondents (R4-SB) and (R8-SB) respectively narrated their experience while walking to the office during rainy days as below:

> *"So when I am walking I get scared that I would get wet. Ok, for example, it is impossible to walk all the way from the Traders Hotel to the ExxonMobil Building without getting wet from the KLCC station up to the Traders [Hotel] entrance. When you cross the road and arrive at the ExxonMobil Building you'd be soaking wet because there's no shelter or no roof between the two buildings. So that is a reoccurring issue in KL"* (R4-SB)

While walking with the respondents in Site B, respondent (R8-SB) said:

> *"Yes. In fact from this building to the Convention Centre there is no shelter there. When it rains heavily, people get stuck waiting especially those who don't have umbrellas. They will just have to wait until the rain clears just to go across a very short distance."* (R8-SB)

The photographs below visually represent the missing links between the covered walkways as described by the above respondents.

Figure 6:

6.5.2.7 Poor accessibility and connectivity

Almost all respondents described the pedestrian environment and the atmosphere within Site B as good and enjoyable; however, they noticed that accessibility and connectivity in most other areas around the city centre are still in a poor state. They indirectly

acknowledged that the presence of a continuous pavement designed for people on foot is an important factor to create confidence within the pedestrians while walking in the city centre. One of the respondents remarked:

> *"Right now, not to say all, but most of it most of the pavements are not designed with the pedestrian ease of walk. For every 10 steps you have to step down (on the road surface) and you have to step up again (on the sidewalks) at least once…who would expect that such an environment is for walking? It has to be even and in a manner that it can be user-friendly which it is not at the moment. In certain places, don't even have pavement for people to walk on. We are talking about KL city centre here...They have pavements which are not user-friendly at all to the extent that people feel insecure while they walk."* (R3-SB)

The respondents were also concerned about the clarity of the areas legibility incertain parts of the city. Respondent R8-SB voiced out her irritation, during participant observation, on the absence of good quality pedestrian infrastructure such as sidewalks, pavement design, and signage and way-finders, etc. She observed:

> *"Firstly, the sidewalk and its infrastructure are not really convenient and I really don't enjoy walking by this roadside because I must be cautious. Secondly ... the environment for walking from here to there is not very encouraging like I can feel that I will not enjoy going into a certain place. When I first visited Pavilion, I went with a friend but the walk I was a blur. I remember saying, "where should we go now?" a lot because there are no good pavements for the pedestrian and I felt uncomfortable. "I was like, are we walking in the right area?" The sense of direction going to Pavilion is terrible"* (R8-SB).

6.5.2.8 Poor Maintenance

The respondents all viewed the pedestrian area within KLCC developments as properly maintained. Some expressed uncertainty about when maintenance might be scheduled and what other possible routes to take such at such times, such as respondent (R8-SB) who during the participant observation said:

> *"Yeah…and I can remember the KLCC committee once did the restructuring of the pavement surfaces around the KLCC park. So for those who like to use the park to cross from this building to LRT KLCC, the longer way has to be taken [laugh]. This is the Menara [referring to map] so they were repairing this site [KLCC Park], usually I crossed the park but when I arrive here [referring to map] there is an obstacle and I need to go through the side over here [referring to map] and then come back and walk on."* (R8-SB)

> *"Conducive. Fan, air condition or mist is all good. For example if there is no air condition in the underground walkways it is going to be very hot... Nobody would want to walk there. The place is always cool so I assume the air-con is always working. That, I think, means it is maintained well"* (R1-SB)

Respondent (R3-SB) expressed his feelings about the sidewalk as follows:

> *"…they don't even have pavement to walk in certain places, but you are talking about KL city… They should come and fix these things regularly."* (R3-SB)

6.5.3 Psychological Factors

The term psychosocial refers to an individual's psychological development and the relationships formed and interactions with the social environment. The term was coined by psychologist Erik Erikson in his 'Stages of Social Development'. In this case, the individuals are made more aware of their relationship with their environment via the questions asked during the interviews as well as previous discussion of the research. The following sub-headings elaborate on an understanding of psychosocial factors in relation to the employee's perception of his pedestrian environment.

The themes and concepts are recorded within Nvivo 9 under tree nodes as shown in Table 6.7 below.

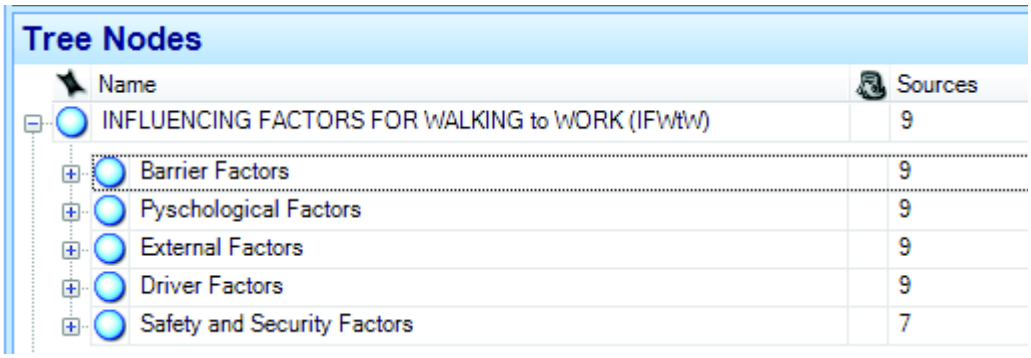


Figure 6. 12 Tree nodes screen of the influencing factors for walking to work for CS2.

6.5.3.1 Positive feelings about walking for the body and mind

Collectively, all respondents from site B were very cooperative regarding the inquiry about their level of understanding about commuting. Below is one of the examples of an answer to a question posed by the interviewer:

Interviewer : Do you really have a positive understanding on the purpose of walking to work and do you think that more people should be aware about this?

Respondent R8-SB: Yes. I strongly agreed with that.

Another question about feelings while walking to work was posed to respondent (R1-SB). In his statement he was very proud of his attitude towards walking to work; he felt positive because he gained good health and a fit body. According to (R1-SB), he made a clear decision to opt for walking instead of driving to work. Respondent (R1-SB) stated:

> *"Physically I am quite healthy and fit compared to other people ... I think you can see the difference. I purposely don't take a car to work…the morning walk to work makes me sweat. I enjoy it"* (R1-SB)

Several of the respondents have indicated that walking forces people to depend on public transport rather than being overly dependent on cars. Respondent (R2-SB) pointed out that in the process of travelling to work, people gain new knowledge about their surroundings. He said:

> *"The other good thing about commuting [to work via train] is walking which gives the advantages of really seeing the world. You can witness and be part of what is happening around. Again you are meeting people. It gives a physical challenge for some people…what I mean is especially during rush hour you've got to stand up (when travelling with the public transport)...Your leg muscle are intense. For me, all those kind of things are like an increase in endurance level for us*" (R2-SB)

Another respondent agreed with (R2-SB) on travelling to work via public transport. While walking through a selected route, he said:

> *"Yes. I strongly agree. We don't need to take a car or taxi to move around in the city centre because it is already congested especially during rush hours, walking like this is more convenient."*(R4-SB)

Another interesting point presented by respondent R3-SB is the choice of footwear which he believed to be one of the important factors for convenient walking. He stated:

> *"...people shouldn't only blame the pot holes along the pavement. They should start wearing proper shoes because I see many people wear slippers after they reach their work place. It is very important to recognize the type of shoes you are wearing..."* (R3-SB)

6.5.3.2 Socializing through walking

Many of the respondents emphasised the need to socialize during lunch breaks mainly as a stress reliever. The fact that they have a chance to meet their friends and talk while walking, over lunch, and while walking back from lunch was the reason they choose to endure the street conditions on the perimeter of the KLCC development area as respondent (R1-SB) points out:

> *"The thing that brings people together is our [his] group of friends. We feel relieved [from work]…that is, we look forward to see them because we want to talk and socialize. Socializing is the main reason of going far from the KLCC area otherwise we wouldn't travel that because of the barriers and obstacles."* (R1-SB)

Respondent (R8-SB) added to the previous comment during the participant observation by saying:

> *"Yeah...but I think... because we can opt to have our lunch in the café in this building but we opt to go outside with friends and then…yeah, socialize."*

Respondent (R8-SB) goes on to say:

> *"…personally, from this office to KLCC Suria during lunch, I choose to walk through the KL Convention Centre [laugh] because of the cool temperature, but sometimes I do choose to walk outside the Convention Centre because I feel so cold inside Menara Exxon so I choose to walk outside but again the stress that comes with the space for pedestrian to walk. So I enjoy the space with my friends…next to me…two or three of us. Then when we arrive at the Convention Centre, sometimes we choose to go down through the subway because we can pass through the shop-lots."* (R8-SB)

While walking through the site, one of the respondents said:

> *"Yeah, In fact I love to just go out from this building during lunch hour to KLCC just for a walk not to have anything, not to have lunch or even a drink.. And I walk with my neighbour next door. Sometimes we are just like "ok, let's go for a walk here at lunch time but no lunch." We go and then come back feeling so 'light' and joyful. Apart from giving a happy feeling, this could also be for my health and fitness."* (R8-SB)

6.5.3.3 Peer Review

A few respondents cited their friends' experiences:

> *"I think from my experience from what I know from my department and some of my colleagues, those who are living nearby public transportation they choose to walk to work because it's convenient for them to get the train and come to work. But those people who are staying away from the city and who do not have public transportation, and they choose to drive" (R9-SB)*

6.5.3.4 Visual appreciation while walking

All of the respondents (9 out of 9 [100%]) agreed that they appreciated the ambience created within the KLCC Park and that they enjoyed seeing many people in these common areas. The greenery in the park and the absence of visual barriers in the form of clustered items on the streets makes the walking experience all the more pleasing for them. One of the respondents explained:

> *"When I walk in the morning, I feel great walking through the park and enjoying the scenery. In the evening, it is good to look at the children playing in the playground of the park and the fountain while I jog. As you walk you enjoy the scenery, people, places, everything. It is almost difficult to feel stress after this."* (R1-SB)

Respondent (R9-SB) briefly discussed the scenery of the park as the group walked through the park:

> *"Yes, I like to walk through the greenery. There are many things to see in these areas, there is water feature and trees. It's not like other areas in KL where there are too many things on the streets."* (R9-SB)

6.5.3.5 Relaxation and Rejuvenation

For most of the respondents (7 out of 9 [70%]), walking is understood as possibly having therapeutic effects because it is in some cases viewed as a rest period. These effects are seen in the context of people's lives, and as embodied interactions between the individual and the environment. It can enable people to feel refreshed, calm and soothed.

Respondent (R3-SB) explained in the middle of a walk with the author that:

> *"An aspect of walking that I enjoy is walking at a slow pace. It allows me to appreciate the details of the scenery around me and it is very relaxing to walk at a slow pace because I enjoy the scenery and clear my mind"* (R3-SB)

Most of the respondents were just happy to walk through the park in a leisurely manner on their way back from work or at the end of the day. Some use the end of their day for physical relaxation of the body and mind. The next respondent to give input talked more about taking time to forget troubles and stress as below:

> *"I really like to jog through this park. I relax and refresh myself at the same time. The environment is very nice to do these things. Sometimes I let my mind wander when I'm under a lot of stress in other parts of my life"* (R5-SB)

Respondent (R1-SB) spoke about walking as a mood enhancer:

> *"Yeah it's good…for example in KL city you have a park, very beautiful park in the middle so that enhances your mood of walking. So even sometimes you can walk through the...if it's not raining, it's dry, you can just walk through the park. Then it's like it's good to walk through the park, you will feel you mind refreshed."* (R1-SB)

Another respondent added while walking:

> *"For the moment going back home from office is enjoyable since it's the end of the day, since I'm going home, so I choose to go at my own pace."* (R8-SB)

6.5.3.6 Familiarity of the area

When walking from Site B to other areas around the site, the majority (8 out of 9 [85%]) of the pedestrians displayed and commented on a sense of disorientation while walking outside the KLCC area. Respondent (R5-SB) explained the situation in relation to the pedestrian's sense of direction in the surrounding site. The decision to use a car or cab in this area is not because the site is not familiar, but because the pedestrian environment is in such a chaotic state that people are forced to take cabs. The respondent explained:

> *"I would go to the offsite meeting in the nearby hotels by walking if it is within walking distance but still would prefer to take a cab. I tend to get lost and tired. I also don't have a good sense of direction. To save time I take a cab because I get frustrated. The driver always knows where and how to get to the place."* (R5-SB)

During participant observation, Respondent (R8-SB) expressed a sense of uncertainty about directions in the area outside KLCC:

> *"When I first went to Pavilion, I think I was with my friend. But during the walk I was feeling a blur, "where should we go now?", because there are no good pavements for pedestrian. And I was like, are we walking on the right lane or pedestrian? The sense of direction to go to the Pavilion is unclear from this area and I feel, even if I walk regularly in the area, I will still get confused at times."* (R8-SB)

6.5.3.7 Time Taken

Some of the respondents (6 out of 9 [65%]) brought up the fact that, if they do not allocate their time properly and efficiently before they leave Office B, they might spend more time eating than the time actually allocated for the lunch break. Walking to the eateries and back takes a long time even within the KLCC area. Respondent (R9-SB) elaborated on her concerns about time, saying:

> *"During the lunch time, I feel like we are chasing after time because we only have an hour unless we have our lunch in KLCC Suria (all the time)…"* (R9-SB)

The same respondent then went on to express her concern about the time taken to go to eateries in the surrounding areas, and how this is affected by the pedestrian environment. She mentioned that she did not consider the amount of time that it takes to cross the roads and various barriers in the way. She went on to explain during the participant observation that:

> *"…we really need to divide and estimate the time. We walk there in 10 minutes and walk back in 10 minutes and then let's not even mention the time spent on the queue getting food and eating everything. So that's really a concern for me. If I just go out for a walk I can feel pleasant."* (R9-SB)

6.5.3.8 Positive feelings

When asked, about half of the respondents said that they do have a positive feeling while walking (7 out 0f 9 [75%]). Some of the reasons they gave were very close to the feelings for relaxation and rejuvenation. However, no some new data arose when respondent (R1-SB) related these positive feeling to health as below:

> *"Physically I feel healthier because of my daily walks. That's why I prefer not to drive. I know I can do it [drive] but I feel better when I walk….it also makes me feel good about myself and I feel somehow energized to carry on with the remainder of my day."* (R1-SB)

One of the respondents described her feelings in relation to the pedestrian environment:

> *"Yes, of course I do. I feel connected with my surrounding when I walk. It makes me feel like I should be there at that time. But it honestly depends on the situation and the place I walk in. Sometimes the environment is so bad that I feel like I just want to leave. I think the environment should be better"* (R8-SB)

> *"The pedestrian infrastructure is not adequately equipped making the pedestrian vulnerable to snatch thief. Sometimes it does give a negative perception to the pedestrian to walk especially if they are not familiar with the area. By having proper walkways and good pedestrian infrastructures in a way it may generate a positive thinking in people's mind because we are human, if we see something good than it means good to us."* (R2-SB)

6.5.4 External Factors

External factors refer to all those outside factors that are more directly concerned with, or influence, the pedestrian environment and in turn have an effect on the pedestrians. Below are sub-headings relating strongly to the present condition of the physical environment and how it relates to walking in terms of policies, visions for the future of the city, weather, and the stakeholders involved.

6.5.4.1 Vision for a world class city

One of the respondents (R8-SB) discussed her concern for Kuala Lumpur in terms of it developing into a world class city. She expressed the opinion that many parts of it fall short of what she considered to be World Class. Though the other respondents knew little about the matter, they responded based on what they knew. Respondent (R8-SB) said:

> *"I believe that visitors love to walk. I mean, the PETRONAS Twin Towers and various islands have attracted tourists from all over the world to Malaysia. Malaysia being world class should provide the world class infrastructure for pedestrians as well. What we have is still not acceptable. KLCC should not be the only place that tourists should have…"* (R8-SB)

Later while walking through a selected route the same respondent went on to say:

> *"The quality environment inside KLCC should be repeated around the whole city, especially in areas like this [surrounding site], to create a better environment for tourists and locals."* (R8-SB)

6.5.4.2 Advocacy

A large number of the pedestrians agreed that there needs to be some sort of a campaign to advocate walking within the KLCC and surrounding areas. They acknowledged the fact that the government does provides certain facilities such as the pedestrian bridges over roads with heavy traffic; however there seems to be a drawback in that people do not use them as they should. Respondent (R3-SB) was of the opinion that:

> *"The passive part of the heart is where the mind doesn't work. This is why there should be both videos and posters to shift people's mind-set towards an awareness of the importance and benefits of walking. There needs to be a connection between the mind and the heart. When that connection is achieved, then part of the job is done…The government provides some of these things but I've seen ladies, and even men being hit by motorcycles because they cross on the road instead of going on the bridge…"* (R3-SB)

Respondent (R8-SB) had a similar opinion to respondent (R3-SB) but she added that not enough is being done to encourage walking in the city centre. Her argument was:

> *"I think that they should look into the matter more seriously. There is a campaign now of everybody walking at least 'ten thousand steps a day'. It shows some level of encouragement on the government's side for people to live healthy lifestyles by walking but they also need to have a look at the public transportation system and infrastructural facilities and how these areas can be improved to further encourage people to walk. Campaign without improvements in all other parts seems like empty words. No one will listen."* (R8-SB)

6.5.4.3 Enforcement

All the respondents (9 out of 9 [100%]) agreed that there is very little action being taken by the law enforcement agencies in Malaysia regarding the pedestrian environment. Many complained that, although there are many officers present at certain areas, nothing is being done to give everyone in the pedestrian environment equal rights. Respondent (R1-SB) was the first to comment on this issue during the participant observation, and his input was as follows:

> *"There is a lack of enforcement law around here because they know that the policemen don't take serious action. The penalty is very low. We should get more people to work on this law enforcement"* (R1-SB)

Next was respondent (3R-SB) who narrated several of his experiences with the law enforcers of the city, focusing on their lack of interest and misunderstanding of their responsibilities. He discussed the issue further while participant observation was being conducted:

> *"…there is no law enforcement at all in this place. If you ask me, I would say 5% of the laws are being enforced because I do see traffic police officers everywhere but they do nothing. I did once intervene from the car asking them "why don't you do your job?" They usually respond by saying they have other jobs, or that is not their problem/job. I see cars cross the zebra crossings when pedestrians are waiting and have been waiting for a long time. They don't care for the rules."* (R3 -SB)

He then goes on to compare Malaysia's traffic congestion issues, road networking, public transport system and law enforcement agencies to the neighbouring country of Singapore. He questions:

> *"Why do we have all these problems in Malaysia? Just across in Singapore, things are extremely different. People are becoming more afraid every day to drive in Malaysia…How can we improve?...why are doing nothing?..."*(R3 -SB)

6.5.4.4 Weather

All the respondents (9 out of 9 [100%]) complained about the heat and humidity of the climate in Malaysia. It does not allow them the chance to walk around freely without sweating. They complained that this would cause discomfort for the remainder of the day. For this reason, when they arrive at the KLCC station, they prefer to use the coolest path to reach the office. One of the respondents explained:

> *"A lot of people don't like the sunlight, that is why they prefer to walk at the underground walkway. But for me I really love sunlight and air."* (R9-SB)

Another respondent complained about the unpredictability and severity of the heat and rain in Malaysia. She commented that:

> *"You have to be prepared for any weather turn about that might happen and my advice to all is carrying an umbrella. Umbrellas go both ways. If it is sunny, then use it and if it's raining then you got to use it!"* (R3-SB)

Respondent (R5-SB) compared Kuala Lumpur's walking condition in terms of weather to walking in Manchester. The respondent recalled:

> *"When I was in college in Manchester, I used public transport and walked a lot. I didn't get too tired. Whereas in Malaysia, the weather is hot and humid; I get sweaty easily and tired faster because it is too hot. I don't prefer walking as much in here. Something needs to be done about it."* (R5- SB)

When asked the question below, Respondent (R6-SB) responded as follows:

> *Interviewer:* *"Beside the CCTV, what other element is important to you as a pedestrian?"*
>
> *Respondent:* *"Shelter from hot weather and rain."*(R6-SB)

Respondent (R8-SB) noted a similar point while walking through a route:

> *Interviewer:* *"Okay, build the shelter. So that you can walk in the rain and shine, right?"*
>
> *Respondent:* *"Yes. In fact if you notice from this building to the Convention Centre there is no shelter. When it is raining heavily people will be stuck and for those who doesn't have umbrella will just wait until the rain clear just to go across those short distance."* (R8-SB)

6.5.4.5 Stakeholders

From the interviews conducted, the respondents expressed their opinion that the government is the most influential stakeholder in the pedestrian environment in KL. They believe that a lot more can be done for the other stakeholders by the government in terms of creating a more pedestrian-friendly environment. A respondent commented and question with concern:

> *"One thing is the support from the government. If the government do not give the support necessary, then it cannot improve… [It is going to be very difficult]. When the civil servants go on tour, what do they bring back to our country? What do they contribute to the country? Learning, understand and implementing ideas from other parts of the world is their role and duty. They have got to start doing something about the situation… "*

Respondent (R1-SB) discussed the issue in relation to some of the covered walkways in KLCC. The respondent seemed to be aware that not all walkways were the responsibility of the government. The respondent explained that:

> *"This covered corridor is not open at all times to the pedestrians. Not all the covered walkways belong to the government. It is still subjected to the management of the Convention Centre (CCM). The CCM handle many events from time to time such as seminars to make sure the*

> *guards have a tight hold of the covered corridor. It has happened to me here once before. My friends and I had to walk outside on an adjacent path which exposed us to rain."* (R1-SB)

6.5.5 Safety and Security Factors

Much of the research on walkability has pointed out that feelings of safety and security are a priority to pedestrians. Feelings unsafe can be related to fear of accidents as well as to fear of crime, violence and strangers. Most of the respondents commented of security issues in relation to the dangers mentioned above. Below are some of the safety and security issues expressed by the respondents.

6.5.5.1 Harassment

All the respondents agreed that there is a potential to be harassed in the public spaces around KLCC. They did not face this problem while they walked within the KLCC Park and KLCC Suria. They cited areas like Bukit Bintang where shop owners forced their products on them instead of allowing them the choice to walk in as they pleased. This is a particular problem on streets where there are hawkers in Kiosks that encroach on the public spaces. Respondent (R1-SB) showed irritation in relation to the above problem:

> *"…really inconvenient to have a lot of stalls on the walkways…Where there is a crowd, you can be sure to have kiosks in the middle of the walkway. Sometimes in some places, it occupies the entire walkway. Walkways should be free from all hindrances. The kiosk owners call and disturb people while walking. They easily attract children with toys which is not good."* (R1-SB)

Another respondent commented on other areas of the city centre, in particular, the old Central Business District, and expressed genuine concern for women who walk in this area. He said:

> *"I think people who walk in Kota Raya and Chow Kit [the Old CBD areas] tend to always be on guard. I think it is slightly better for men but women need to be very careful as they are a bit defenceless."(*R2-SB)

A respondent narrated a strategy used by snatch thieves to trick people into exposing their wallets so that they can be robbed. He related:

> *"The tactic is to request for RM 2 from a foreigner so that when he brings out his wallet to give the money, another person comes along to snatch the*

> *wallet. It's a planned work. They are foreigners and they don't know the things happening so they have to be careful. "* (R3-SB)

6.5.5.2 Crime

As mentioned above, the main concern respondents have with regard to crime is a fear of violence and strangers. In the case of Office B in KLCC, the respondents discussed their reluctance to walk around alone especially at night. They talked about walking in groups at all times and avoiding walking around the city centre after dark. This is not the case within the KLCC development, where they were quite satisfied with safety levels. They said during the walk through the site:

> *"I do not walk here in the park but I walk on the provided pathway. I do see some security guarding the place at all time."* (R9-SB)
>
> *"I have no problem walking inside KLCC at night. The only thing is that the shops close at 10 pm so there is nothing to do and slowly people start going back to their homes. The problem is with people who walk alone outside the KLCC developments. They do have security guards on some properties especially in the morning. I don't encounter and foresee any danger unless I walk to far dark place or I'm alone. KLCC is a safe environment"* (R4-SB)
>
> *"For ladies, walking in certain areas around the KLCC is dangerous because they own handbags and purses. Walking alone is an even bigger problem because of snatchers and drug addicts who harass people at will…"* (R9-SB)

6.5.5.3 Traffic

They went on to discuss their fear of walking on paths or sidewalks too close to the car traffic zone. Some of the pedestrians, like respondent (R7-SB), prefer to walk on routes inaccessible to motor vehicles, like the environment found within the KLCC development.

During the participant observation, respondent (R7-SB) said:

> *"Yeah I would feel walking at the sidewalk next to the main route with the vehicle dangerous in Malaysia. Because the pedestrian walk that I'm choosing like this one, doesn't include roads with cars, it's mostly inside the building going out the pedestrian tunnel coming up"* (R7-SB)

6.5.5.4 Danger

Within the KLCC developments, all the respondents (9 out of 9 [100%]) feel safe walking around till closing hours. However, once they were beyond they KLCC boundaries, their insecurities set in again. While walking through the site respondent (R9-SB) discussed the

hazards posed by the construction work in the surrounding areas, respondent (R3-SB) talked about the quality of the infrastructure and (R1-SB) mentioned the kiosks:

> *"There are a lot of construction works going on outside the KLCC area along the roads, oh look there. That one. It is quite dangerous for me in the day and at night if I walk along these road paths"* (R9-SB)
>
> *"More importantly, we talk about the quality of the pavements, make sure all the sky bridges are all light up and the enforcement of the zebra-crossing when you have traffic light, red - it means stop. "* (R3-SB)
>
> *"Dedicated walkways…free from all of the hassle from traffic and kiosk [physical barrier]. Second thing is security definitely for the ladies. Like in this KLCC underground walkway. It would be good to have security guarding this place"* (R1-SB).

6.6 Physical Features Supporting Walking to Work (PFS)

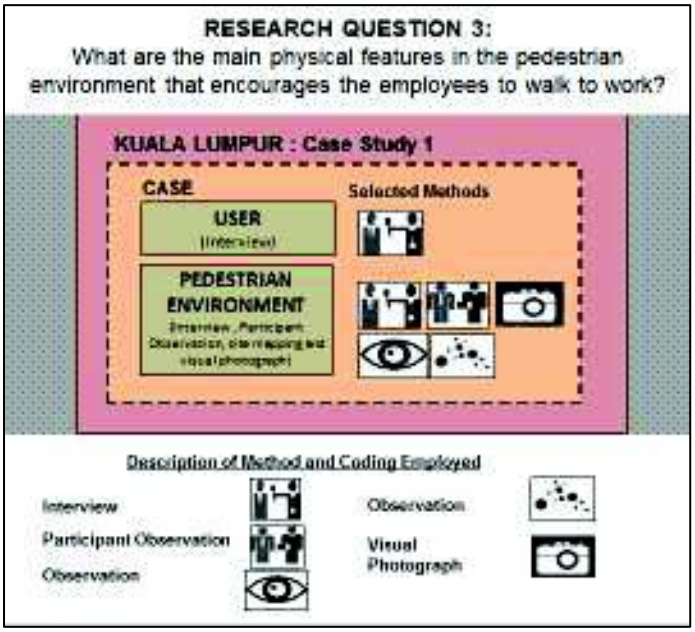


Figure 6. 13 Research techniques on the unit of analysis to answer research question 3.

As mentioned in chapter 4 and chapter 5, the method used to collect data for measuring the physical features is much more elaborate than others due to the fact that of all the research questions, research question number 3 refers to an actual physical quality that can be both observed and measured as compared to the others, which are more perception based questions refer to chapter 4, section 4.6 and 4.7; and chapter 5, section 5.3).

The coding used for the observation maps is in the format **SB/RC/Wr1-1**, for example. This coding links to field notes collected within the area on site. **SB** stands for Site B, **RC** represents route connectivity, **Wr1** refers to Walking Route 1 while **-1** refers to field note-one discussing the first image on the map (refer to chapter 6, section 6.6.1). The images on the maps in this chapter display information in a series of photographs that are meant to be studied together, while the field notes discuss each image.

Physical features refer to facilities that can be seen to create a friendly or unfriendly pedestrian environment for the employee. The concepts that constitute the physical features of the pedestrian environment that supports walking to work are identified in Figure 6.14.

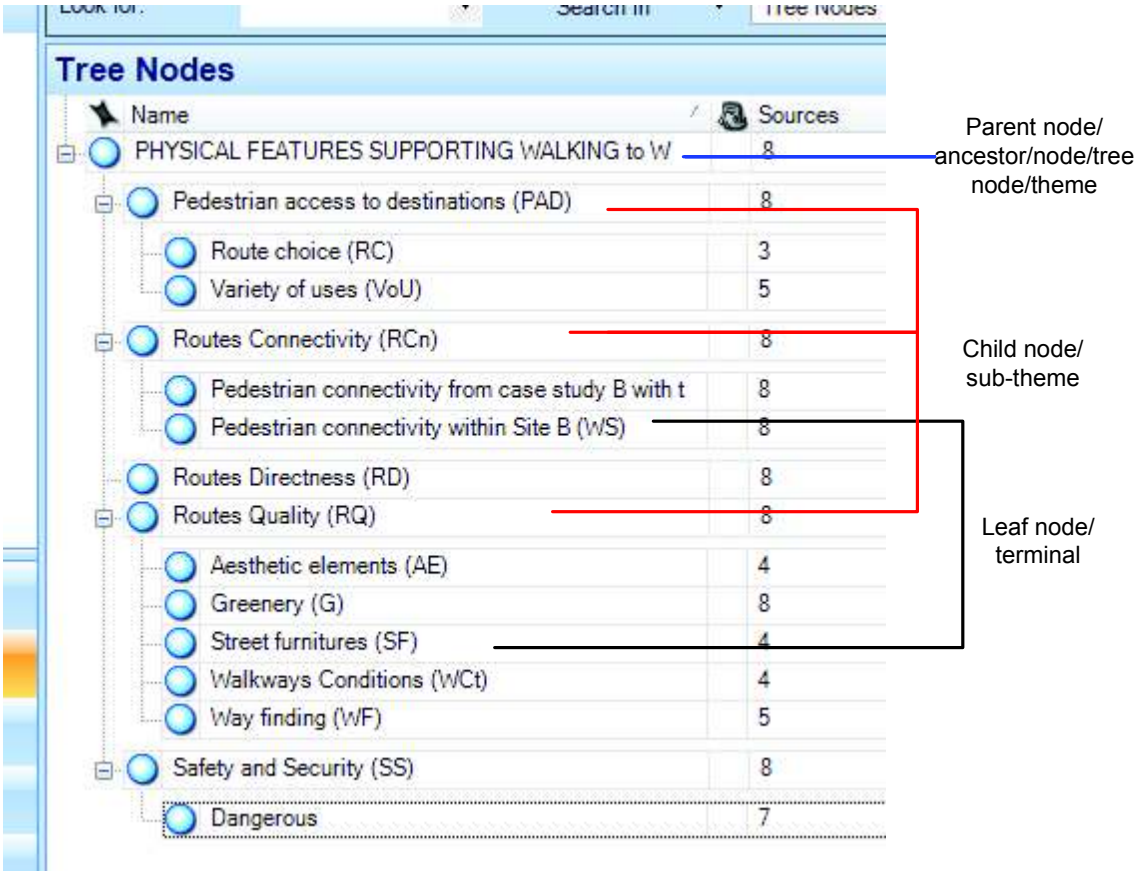


Figure 6. 14 Tree nodes screen of physical features supporting walking to work for CS2.

6.6.1 Pedestrian Access to Destinations

i. Access to main destinations (from home to office B)

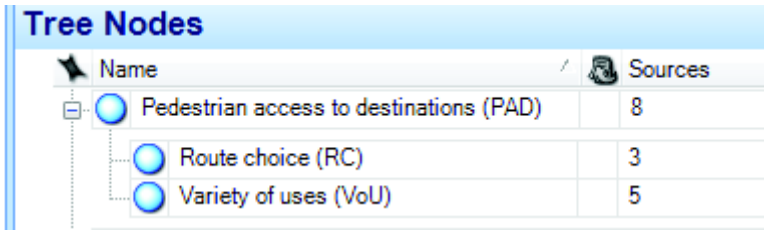


Figure 6. 15 Sub themes for pedestrian access to destinations

6.6.1.1 Route Choices (RC)

During the interviews all respondents traced out on the case study map their desired line of travel from their arrival point in the city centre to Office B. The desired line in this study is the chosen walking route to access the destination of the respondents. In total there are six walking routes indentified for case study 2 namely:

Walking route 1: Walking through the underground tunnel from KLCC LRT station

Walking route 2: Walking through the retail outlets in KLCC Suria

Walking route 3: Walking through the internal hallway of KL Convention Centre

Walking route 4: Walking on the walkways outside the KL Convention Centre

Walking route 5: Walking through the walkways in the KLCC Park

Walking route 6: Walking through a series of roads from Raja Chulan Monorail Station

The six walking routes taken daily by the respondents on their way to their workplaces are illustrated in Figure 6.16:-

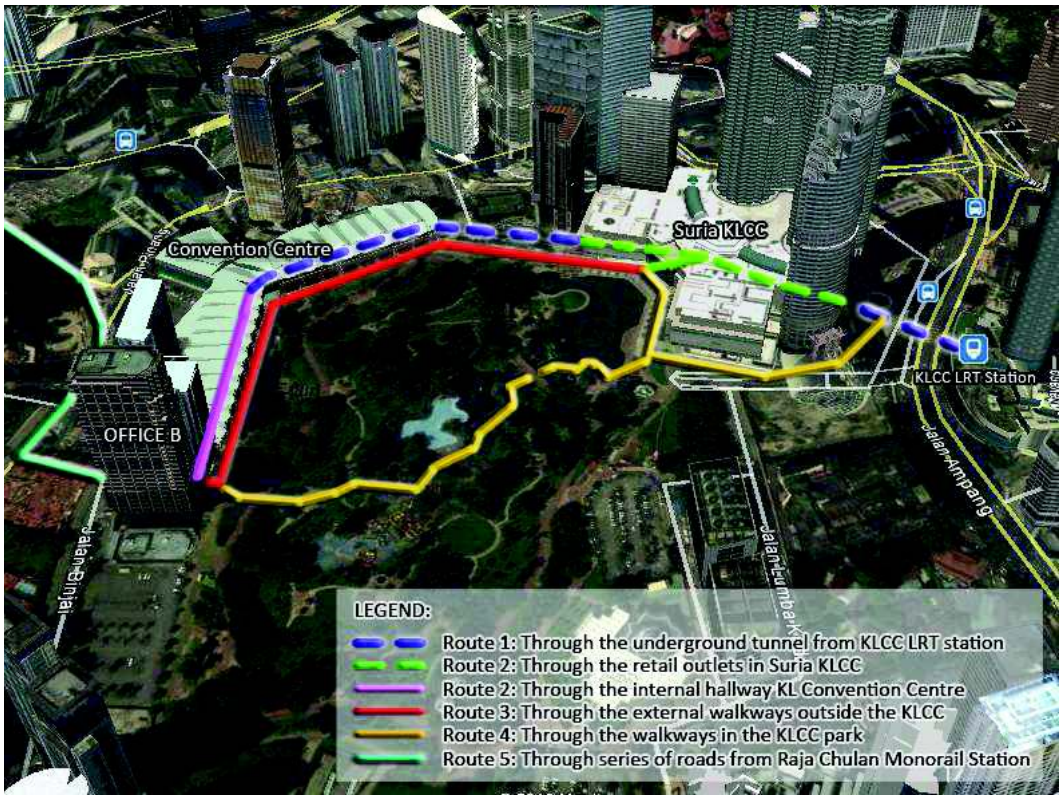


Figure 6. 16 Employees' selected walking routes in case study 2 (Graphic adaptation from Google Earth accessed on 1/7/2012)

The reason for selecting a particular route differs depending on the respondent's preferences. The respondent's feelings play a crucial role in determining the nature of the pedestrian environment selected by the pedestrians on their way to work in case study 2. Among the reasons for selecting the preferred routes are:

> *"... because you see, this stretch from KLCC to the Convention Centre is air conditioned; it is not like an ordinary tunnel. You can feel it is very cooling and comfortable to walk. Then when we come out from the station there is a shopping complex and open spaces"* (R9-SB)
>
> "*I would say it is good that they have many choices of routes around this area...the KLCC LRT station is at the lower ground...we have to take the lift to come up to the ground floor. Then from the ground floor I walk through the park"* (R9-SB).

During participant observation, while walking through the respondent's selected routes, pictures were taken using a Digital SLR Camera Nikon DxD7000 and then analysed. The routes are described using a series of images taken while walking along each route drawn on the site map as shown in Figure 6.16.

Walking route 1 (Wr1): Walking through the underground tunnel from KLCC LRT station

Route through the underground tunnel from KLCC LRT station

SB/RC/Wr1-1: A view of the interior of KLCC LRT station at the underground level.

SB/RC/Wr1-2: A view looking into the interior of the underground tunnel from KLCC Suria to Mandarin Oriental Hotel.

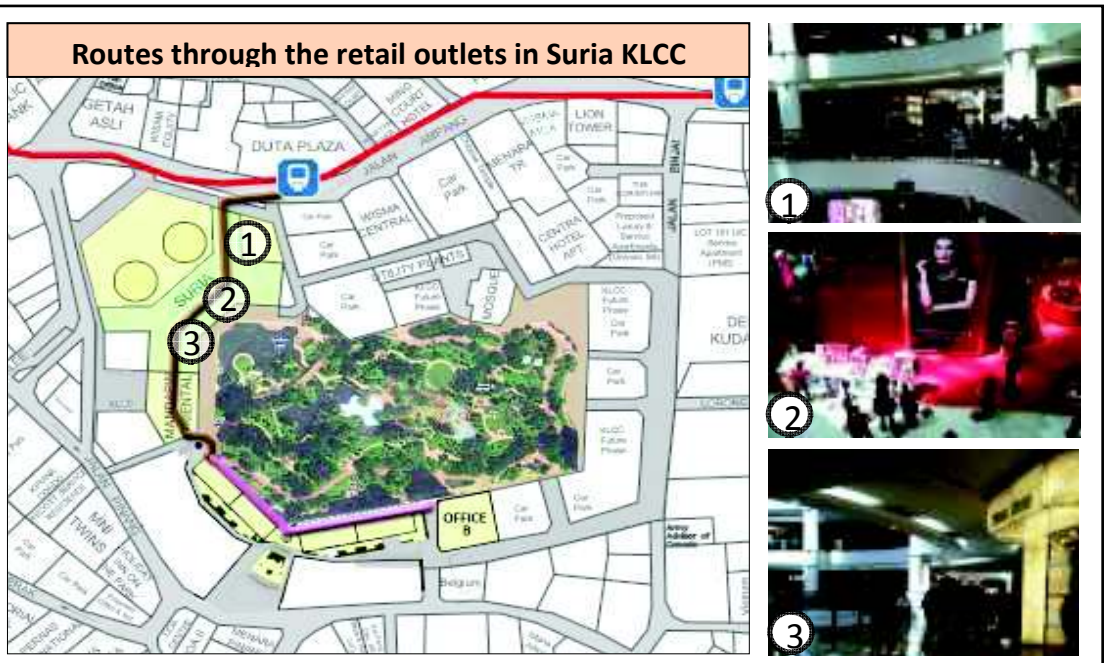
SB/RC/Wr1-3: A view of the underground tunnel from Mandarin Oriental Hotel to KL Convention Centre.

Figure 6. 17 Graphic illustration of walking route 1 through the underground tunnel with images taken while walking on the route.

Respondent (R9-SB) described her feelings while walking along route 1 within the KLCC development as very satisfying; however she mentioned feeling more engaged with the outdoor environments when walking outside:

> *"Here in the underground walkway, it is quite a nice and very cool place to walk. There are a lot of lights and advertisements. It does give me an enjoyable and pleasant feeling but I still prefer to walk in an outdoor space like the park".*

Walking route 2 (Wr2): Walking through the retail outlets in KLCC Suria



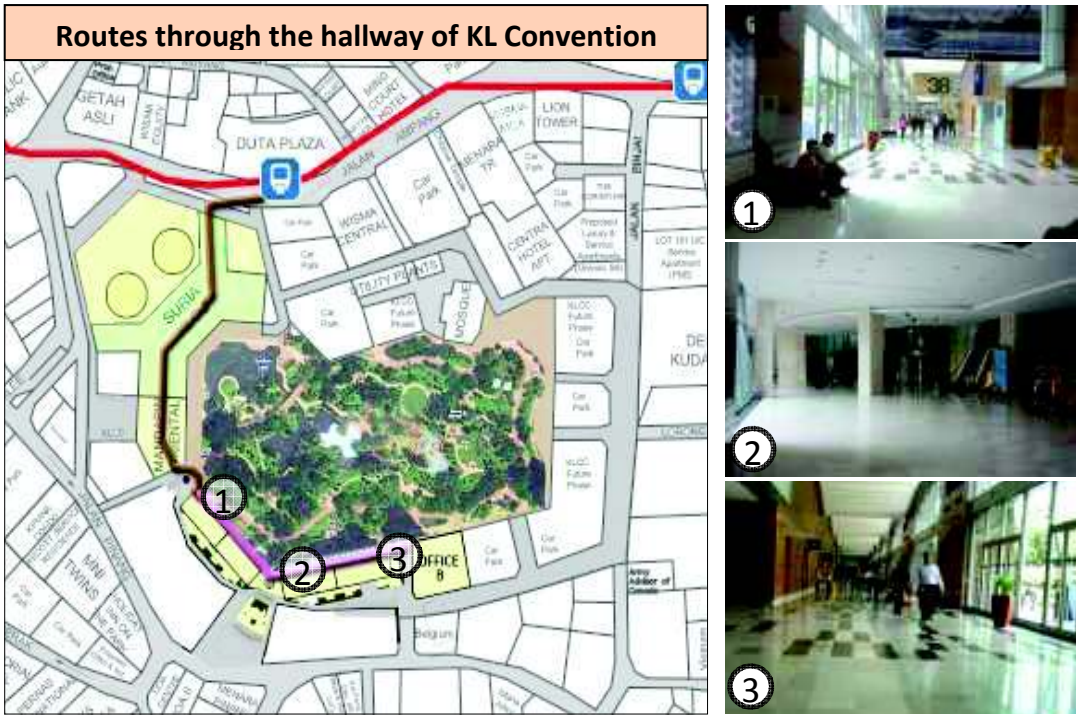
SB/RC/Wr2-1: A view of the interior of KLCC Suria looking at the outlets on the other side of the atrium.

SB/RC/Wr2-2: A view looking into the atrium and the retail and advertising activities taking place on the ground level.

SB/RC/Wr2-3: A view of the interior of KLCC Suria with people walking along retail outlets to the side of the walkway.

Figure 6. 18 Graphic illustration of walking route 2 employees enjoy while walking to work through KLCC Suria with images of the indoor retail outlets.

Walking route 3 (Wr3): Walking through the hallway of KL Convention Centre



SB/RC/Wr3-1: A view of the hallway from Mandarin Oriental to the KL Convention Centre.

SB/RC/Wr3-2: A view through the centre of the building before proceeding to the exhibition hall in the KL Convention Centre. The employees in Office B also use this point to access the eating area located on the lower ground floor.

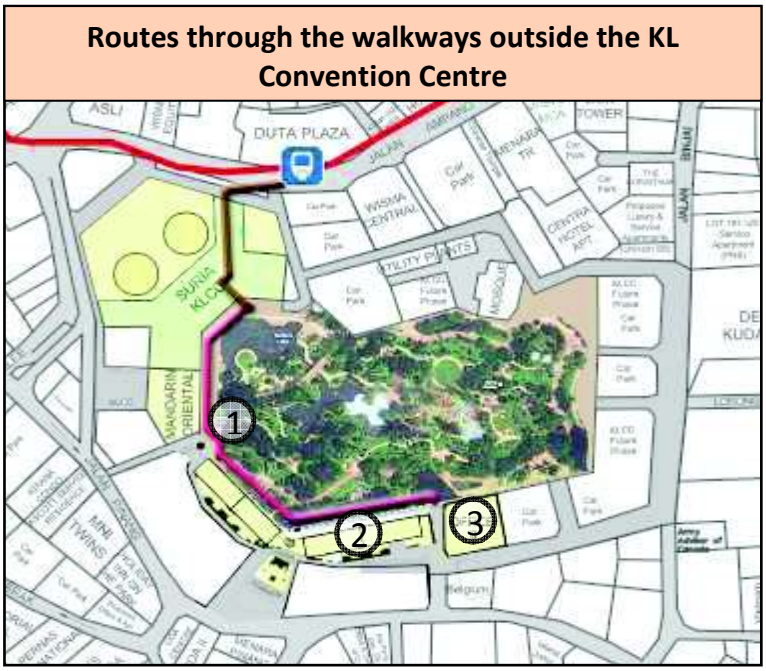
SB/RC/Wr3-3: A view between the KL Convention Centre and Office B.

Figure 6. 19 Graphic illustration of walking route 3 while walking from Mandarin Oriental through KL Convention Centre to Office B.

Walking along the 3rd route (Wr3) was very comfortable for many of the respondents in case study 2 as it is an indoor environment with an air conditioning system used to cool the space. While walking through the site with the group, one of the respondents said:

> *"It's kind of attractive [laughs] because well…it's covered; the buildings are nice as we go through the convention centre. There are some exhibitions that also attract tourists to go around here"* (R7-SB)

Walking route 4 (Wr4): Walking through the walkways outside the KL Convention Centre



SB/RC/Wr4-1: A view of the outdoor environment between the KLCC Park and the KL Convention Centre

SB/RC/Wr4-2: A view of the walkway in KLCC with the park on the left side and the KL Convention Centre on the right

SB/RC/Wr4-3: A view of the space and facilities outside the park and the ambience of

Figure 6. 20 Graphic illustration of outdoor walking route 4 employees use to reach Office B with supporting images of the ambience of the environment.

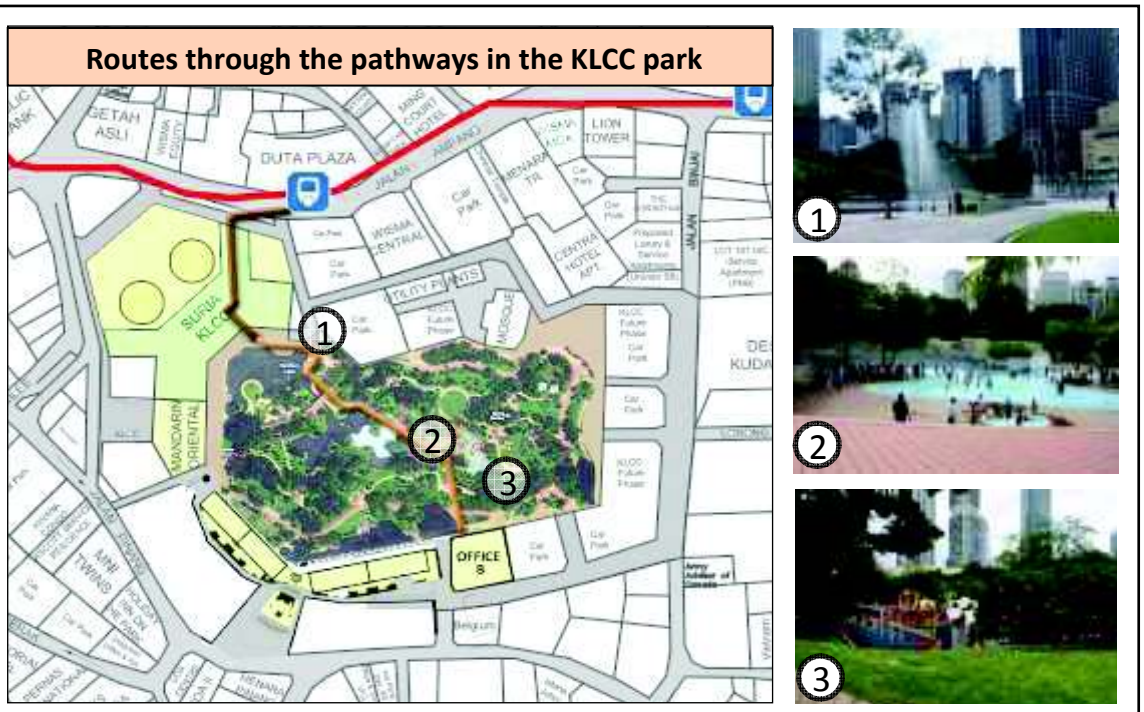
These maps give some insight into the nature of the route within the KLCC boundary. From the three images above and the comments below, elements such as route connectivity, directness and infrastructure are very apparent in the site. While the participant observation was in progress, some respondents said:

> *"Then when we come out from this station, there is a shopping complex and open spaces."* (R8-SB)

> *"Yeah, it is because we actually walk around the perimeter. We were crossing straight from that road to the office."* (R7-SB)

"Because I get to see a lot of things, it's comfortable, and it gets me directly to where I want to go especially to the office." (R7-SB)

Walking route 5 (Wr5): Walking through the pathways in the KLCC park



SB/RC/Wr5-1: A view of the starting point of the KLCC Park where people gather to enjoy the fountain and socialise with others

SB/RC/Wr5-2: A view of the centre of the KLCC Park with a pool where people also gather to enjoy the scenery and water

SB/RC/Wr5-3: A view towards the end of the KLCC Park before arrival in Office B

Figure 6. 21 Illustration of walking route 5 employees enjoy while walking to work through KLCC Park with images of the activities, buildings and scenery of the environment.

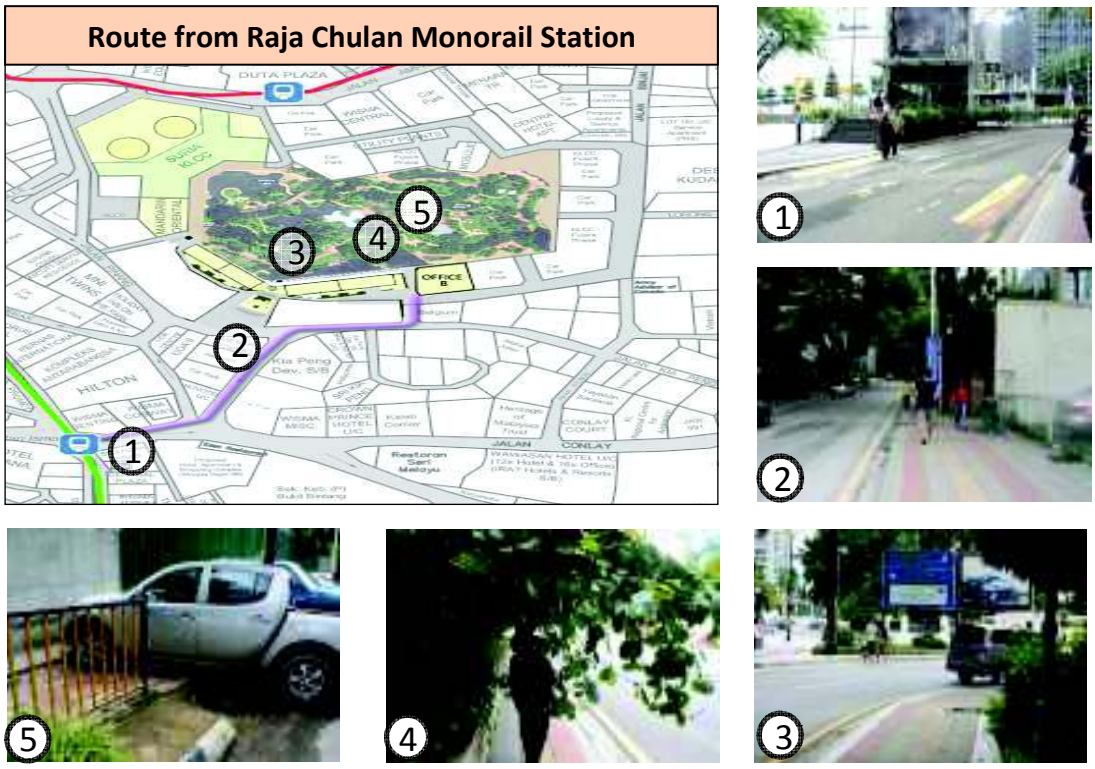
This is one of the most popular routes through the KLCC Park, not only with the employees but also the general public due to its aesthetic qualities and the positive feeling people experience as they walk through. The respondents commented during the participant observation that :

"A lot of people don't like the hard sun which is why they prefer to walk at the underground walkway. But for me I really love sunlight and air. But many

people enjoy walking through the park because it has nice scenery and you can walk and talk with friends." (R9-SB)

"Yes. Apart from the hot weather again [laugh] I think people would choose to walk through the park using this pavement because of the good scenery." (R8-SB)

Walking route 6 (Wr 6): Walking through a series of roads from Raja Chulan Monorail Station



SB/RC/Wr6-1: A view from the intersection of Jalan Raja Chulan and Jalan Sultan Ismail (monorail station) with a badly faded zebra crossing and no traffic light.

SB/RC/Wr6-2: A view of Jalan Kia Peng with a lamp post and a banner in the centre of the sidewalk.

SB/RC/Wr6-3: A view of the intersection of Jalan Kia Peng and Jalan Pinang with no zebra crossing or traffic light.

SB/RC/Wr6-4: A view before the turing into Office B with overgrown tree branches along the sidewalk.

SB/RC/Wr6-5: A view at the turning to Office B with a sidewalk barrier in the form of a car.

Figure 6. 22 Graphic illustration of walking route 6 while walking to work through Jalan Kia Peng from Raja Chulan Monorail station with images of the path obstructions on the way to Office B.

The images and route above represents things going on in the site surrounding KLCC particularly on the perimeter streets. It shows the physical barriers and obstacles the respondents need to overcome in order to reach their destinations. Respondent (R5-SB) commented while walking through the route from Jalan Raja Chulan to the Monorail Station:

> *"…it is just too much trouble moving on these roads outside because there are too many things in the way like crossing the roads, those bad sidewalks and even some objects on sidewalk. It's a real hassle."*(R5-SB)

6.6.1.2 Variety of Uses (VoU)

Proximity to amenities, services, path availability (including sidewalks, walkways, and crosswalks), as well as natural or green spaces were features cited as important to the respondents during the observation. These uses are illustrated with the help of images below.

Figure 6. 23 Graphic representation of the variety of uses such as retail, various types of eateries, offices, playground, recreation, parks and accommodation, in the sketch map of the KLCC master plan.

One of the respondents (R4-SB) commented about the variety as the group walked through the area:

> *"…so why I choose this one is because of the path that I go through. Because, if I were to come through the KLCC building and I would have a lot of things to look at...I could shop, if I wanted to buy anything for my home, food or anything so it's very-very easy to get it there"* (R4-SB).

6.6.2 Route Connectivity

From the interviews, it was reported by the respondents that movements within and interaction with the environment are determining factors for the selection of a preferred route from the station to Office B. Route connectivity in this research is mainly concerned with the pedestrian's (respondent's) ease of movement either within the site or in the area surrounding the site.

6.6.2.1 Pedestrian connectivity within Site B (WS)

This refers to the respondents' movements from KLCC LRT station to Office B which are both located within the KLCC development. It covers the activities of the respondents within the KLCC area, which are mainly journeys to eating places, to Office B and the KLCC station. The movement patterns are:

- To and from the KLCC LRT Station and Office B (AM and PM time periods)
- To and from Office B to the eateries within the site during lunch breaks

The types of walking facilities are:

- Indoor walkways – hallways and retail
- Outdoor walkways
- Underground walkways
- Pathways in the park

The main characteristic of the environment within the site boundary is its separation from the vehicular traffic outside the KLCC area.

All these pedestrian movements are illustrated above in Wr1, Wr2, Wr3, Wr4 and Wr5. Wr6 is a special case as it is not located within the site but it is used for commuting during the AM and PM hours. However, since it is not within the site, it is not classified here.

6.6.2.2 Pedestrian connectivity from case study B to the surrounding site (SS)

The issue of route connectivity in the surrounding site is concerned with the crossings, links and perimeter facilities at Case Study B's boundary.

Linking facilities: These are elements in the environment that connect two positions together such as footways (and their interruptions if any).

Crossing: The facilities provided for pedestrians to easily cross the streets without needing to wait for long periods at a time or being exposed to danger due to their absence.

Perimeter Road: The roads/streets which surround the site immediately beyond the boundary of the site. In this case it is an automobile-dominated zone. The boundary was defined by the perimeter roads of Jalan Ampang, Jalan Pinang, Jalan Binjai and Jalan Kia Peng.

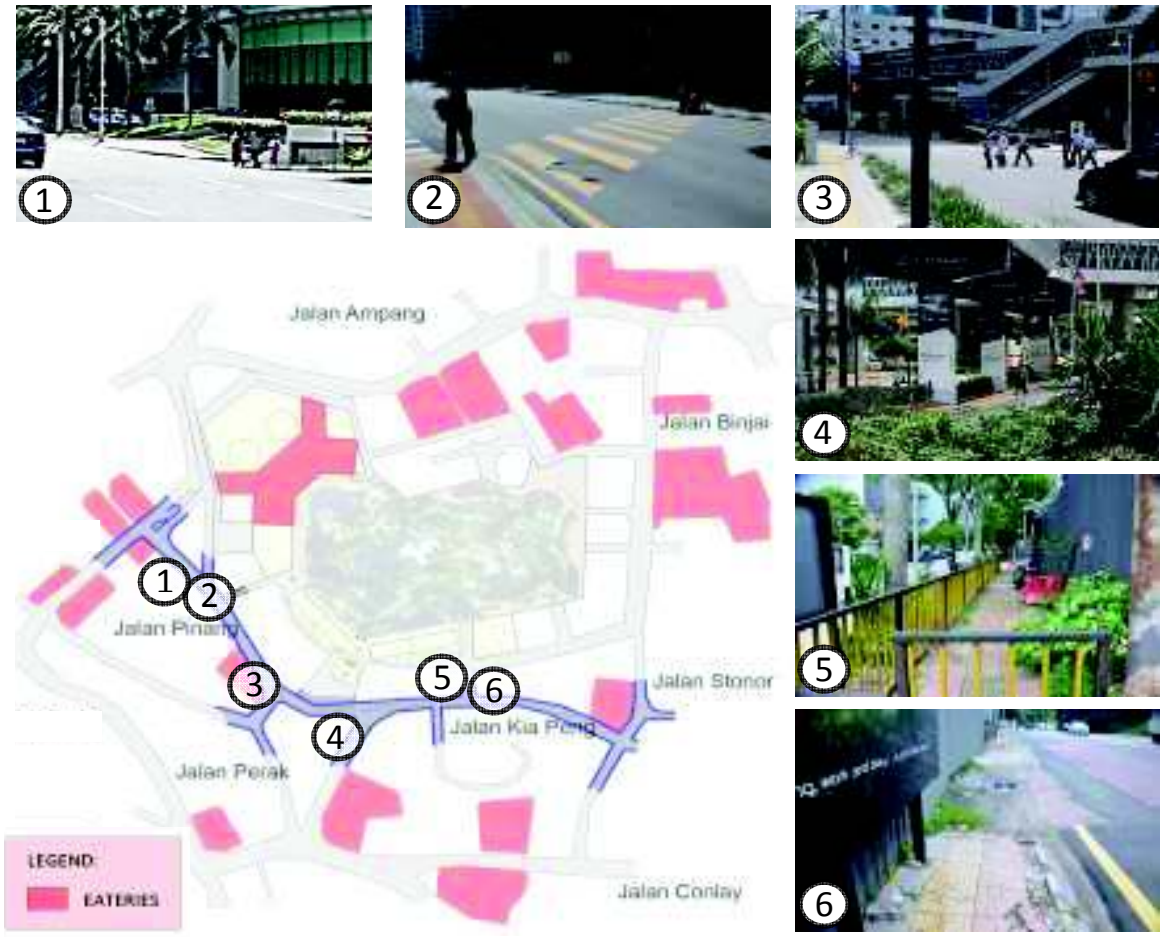
The respondents discussed what was going on around the area surrounding Site B during the walk around the area. Respondent (R1-SB) explained:

> *"What I understand is that they are building a covered walkway from the KLCC to the adjacent hotel here [pointing on the map showing the overhead pedestrian bridge connecting Convention Centre to Hotel Impiana] up to the Pavilion. That is good because I used to walk to there during lunch time and to cross this road is big problem."* (R1-SB)

Another respondent (R9-SB) talked about his walk on Jalan Ampang and Jalan Kia Peng:

> *"More often I go to KLCC and from there I branch out to Jalan Ampang and Jalan Kia Peng. That is the not so convenient for me to walk."* (R9-SB)

Surrounding Site (SS1): Walking on the southern perimeter streets of the KLCC development namely Jalan Pinang, Jalan Binjai and Jalan Kia Peng



ROUTE CONNECTIVITY: JALAN PINANG - JALAN KIA PENG

SB/RCn/SS1-1: A view of the interuptions on the path to the eateries. Sudden break in the sidewalk with no pedestrian crossing facilities.

SB/RCn/SS1-2: A view of a pedestrian crossing with poor accessibililty for the handicapped at the change in level from the road to the sidewalk.

SB/RCn/S1S-3: A view of Jalan Perak beside the elevated walkway, with no pedestrian crossing nearby, and with people crossing the street at random.

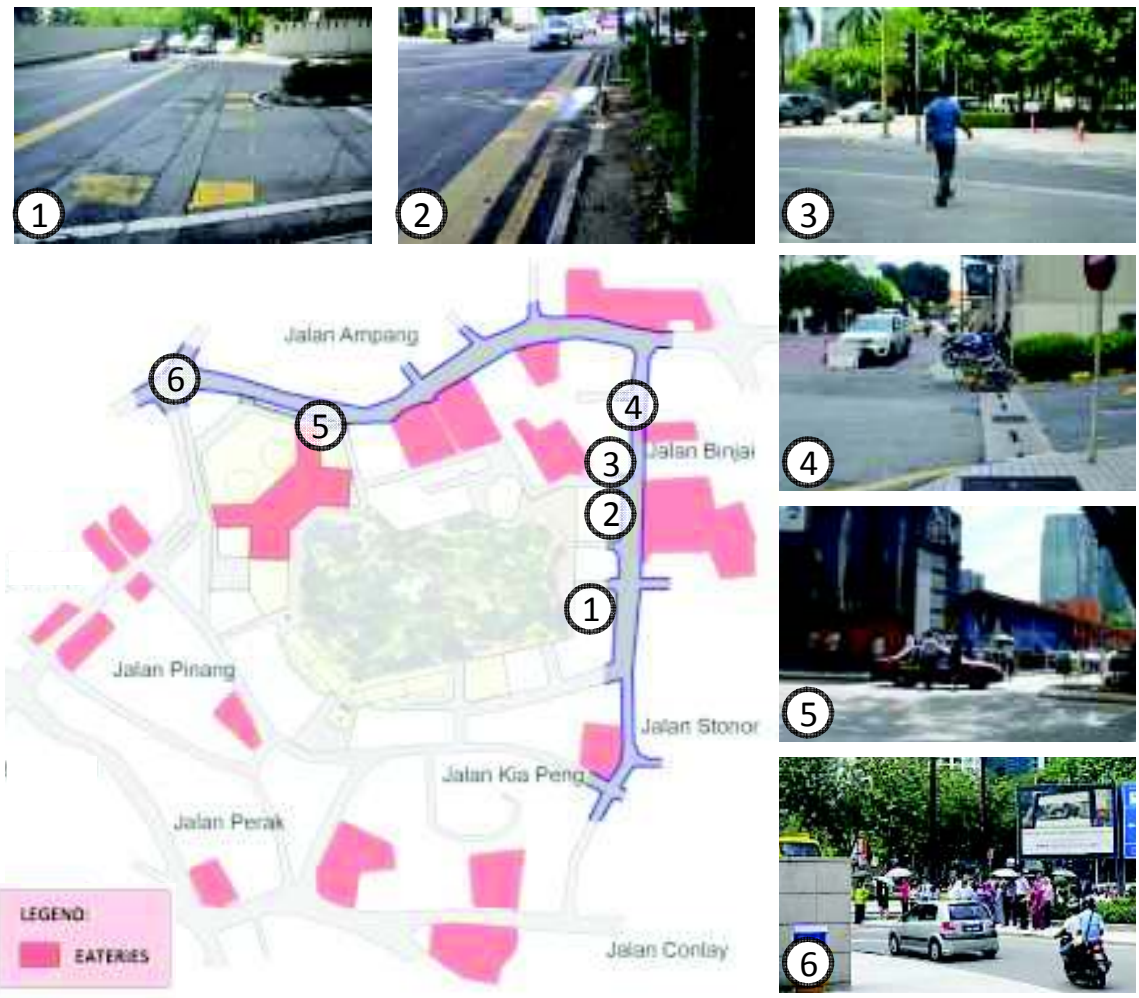
SB/RCn/SS1-4: A view of Jalan Kia Peng under the elevated walkway. Pedestrians still use the ground level regardless of the presence of the elevated walkway.

SB/RCn/SS1-5: A view of a wrongly placed guard rail which divides the sidewalk in two, forcing pedestrians to walk outside the guard rail where the barriers are more numerous.

SB/RCn?SS1-6: A view outside a construction site with the hoarding very close to the road, forcing pedestrians to walk in a very limited and poory maintained space.

Figure 6. 24 Graphic representation of route connectivity on the south-western perimeter of the KLCC development and Case Study B.

Surrounding Site (SS2): Walking on the northern perimeter streets of the KLCC development namely Jalan Ampang, Jalan Binjai and Jalan Stonor



ROUTE CONNECTIVITY: JALAN AMPANG – JALAN BINJAI

SB/RCn/SS2-1: A view of a sidewalk interruption with a faded pedestrian walkway and no other crossing facilities.

SB/RCn/SS2-2: A view of Jalan Binjai with the lack of a sidewalk. Pedestrians are exposed to the car environment.

SB/RCn/SS2-3: A view of Jalan Binjai with no pedestrian crossing facility. Pedestrians cross the streets anywhere and expose themselves to danger from incoming cars.

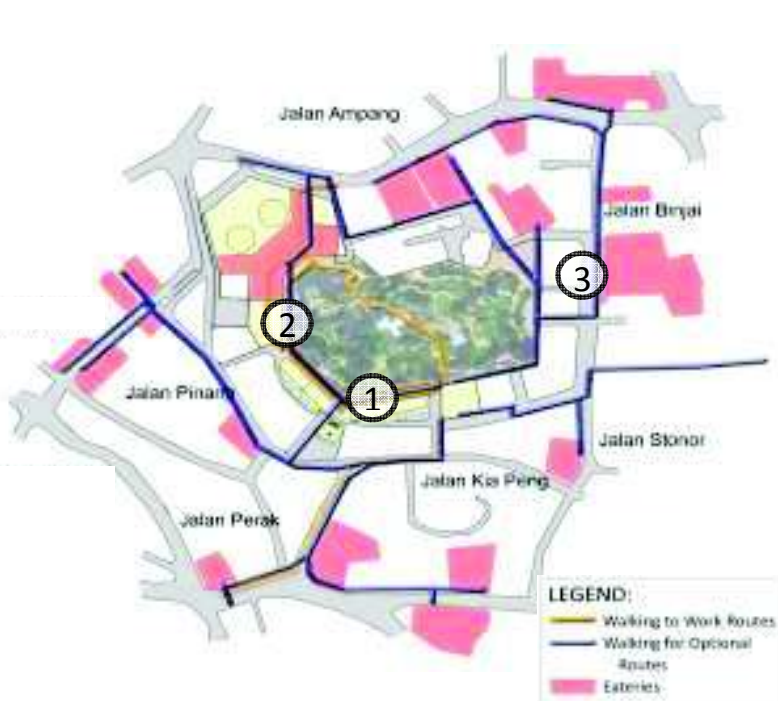
SB/RCn/SS2-4: A view of a sidewalk interruption with poor accessibility for the handicapped and illegal motorcycle parking on the pedestrian sidewalks

SB/RCn/SS2-5: A view of a taxi stopping in the middle of a junction to pick-up passengers because of the absence of a taxi stand.

SB/RCn/SS2-3: A view of Jalan Ampang with a poor pedestrian crossing system.

Figure 6. 25 Graphic representation of route connectivity on the north-eastern perimeter of the KLCC development and Case Study B.

6.6.3 Route Directness



ROUTE DIRECTNESS: SITE B

SB/RD/WOp-1: A view of the hallway in the KL Convention Center. There are no physical or visual barries or obstructions on the path. The path is clear, straight-forward and direct.

SB/RD/WOp-2: A view of the KLCC Park showing a good pedestrian environment where there are no obstructions on the path and the scenery is visually pleasing. Due to the absence of car traffic within the area there are no sudden pathway interruptions.

SB/Wr5-3: A view of Jalan Binjai where pedestrian facilities are absent. There is no sidewalk for pedestrians to use as a movement space along the street; nor are there crossing facilities for crossing the streets.

Figure 6. 26 Graphic representation of route directness within and surrounding the KLCC development of Case Study B.

From the map of the route directness above, within the KLCC boundary, respondent (R4-SB) commented on the directness of the route he takes while walking with the group:

> *"It's just I mean… Aquaria is underground and then I just…I only need to cross that road basically. I can't really say whether it's pleasant or not it's just the crossing way. Meaning that it is a direct route"* (R4-SB)

With regard to the surrounding site, there were certain obstructions in the way making the route to the eateries and the route to the Raja Chulan Monorail (Wr6) more difficult to navigate. The respondents explained during the participant observation that:

> *"The structure of these sidewalks needs to be even surface, enough space… Some places do not even have sidewalks…"* (R8-SB)

> *"…from the surface the walking surface, it should be enough structured. It is difficult to maneuver myself through this path outside the KLCC especially on my way to Raja Chulan Monorail and when I go out of KLCC to eat."*(R8-SB)

From the above, it is clear that route directness within the KLCC boundary at Site B is in better condition than in the surrounding areas.

6.6.4 Route Quality (SB/SF)

This idea refers to the extent to which good facilities such as street furniture are provided within the site. Referring to Site B, all the respondents agreed that up-to-par facilities have been provided for the KLCC development. Respondent (R6-SB) said:

> *"The environment is good; people won't be bored to walk. I know I'm not* (R6-SB)

6.6.4.1 Street furniture (SF)

The respondents commented positively on the covered furniture within the KLCC boundary:

> *"More importantly, when we talk about public spaces, they should be fun. Not to be misused or ill maintained. I think everyone agrees that these seats, gazeboes and many other aspects within the KLCC make it better."* (R3-SB)

Images of the study area highlighting the street furniture available for the conveniences of the users are illustrated in Figures 6.27 to 6.31 below:

Figure 6. 27 Shelter types

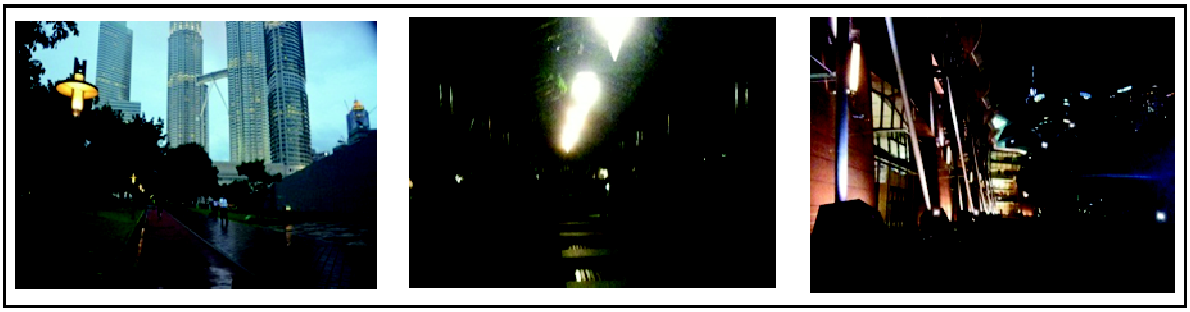


Figure 6. 28 Various lighting types

Figure 6. 29 Types of seating

Figure 6. 30 Bollard (left picture) and Rubbish Bin (right picture)

In terms of the shelters found within the KLCC Park, they are meant to serve as a protection primarily and then secondarily to add aesthetic value to the park. However, these shelters do not run the length of the path. While standing with the group in the KLCC Park, respondent (R4-SB) said:

> *"So when they walk there is a chance of getting wet. Ok, for example, from the Traders Hotel there to the ExxonMobil Building, if you can walk all the way without getting wet from the KLCC station up to the Traders [Hotel]*

entrance, then cross the road to get to the ExxonMobil Building, you'd get soaked because there's no roof between the two buildings."(R4-SB)

6.6.4.2 Greenery (SB/G)

The urban landscape in the middle of Site B was planned as a focal point for the urban community from within and around the Case Study 2area to congregate in outdoor spaces. KLCC parks attracts a large volume of people who use the pathways for several reasons such as passing through to get to their workplaces, homes, or recreation areas and for fulfilling their tourist itinerary. The majority of the respondents elected to walk through the park to get to Office B from the LRT station and vice versa after office hours. One of the respondents noted:

"Most of the time its okay, it's within the park, so of course you will feel it's green, fresh and you feel love" (R2-SB).

Another respondent shared her experiences while walking in the park:

"*Yes, I like to walk through here where it is green. There are many things to see, there are water features and trees"* (R9-SB).

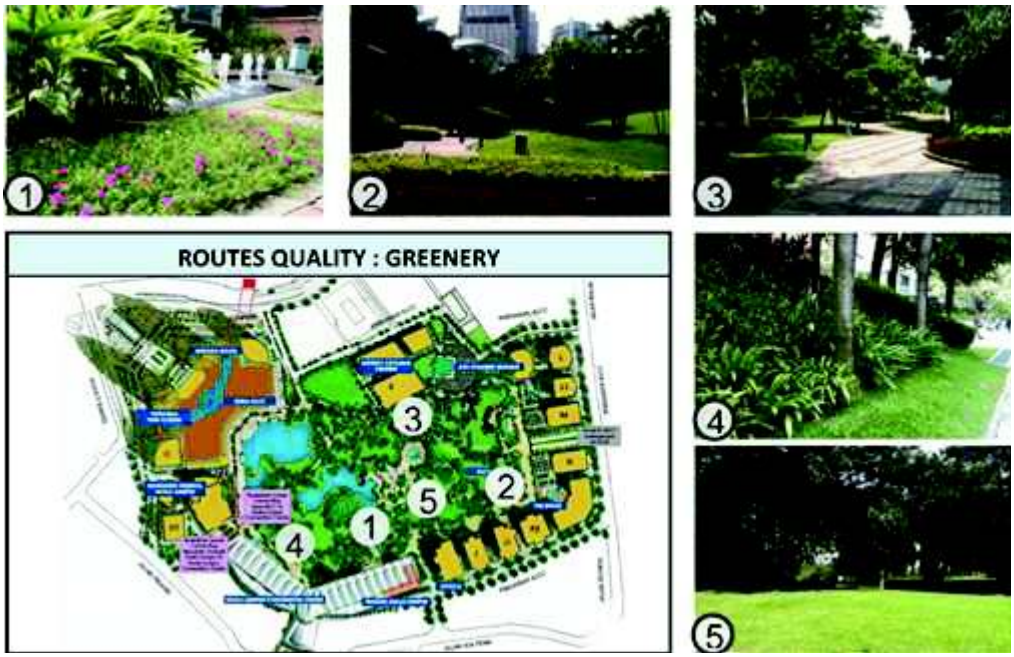
The same respondent was then asked:

Interviewer: *"Another thing is the attractiveness along the route, how do you find it?"*

Respondent: *"Excellent. So far I am happy with the pedestrian environment in this area"* (R9-SB)

While walking through the routes choice of one of the respondents, she said; *"Yes, this park really make me happy and contributes to a sense of enjoyment to everyone" (R8-SB).*

Visual photographs and field notes taken during the walk with respondent R8-SB's as shown in Figure 6.32 below.



SB/RQ/G-1: A view of softscape such as ground cover plants, shrubs, water features etc. and hardscape such as pavements, lighting, seating etc. in the park.

SB/RQ/G-2: A view of the landscape planted in hierarchy such as ground cover, shrubs and deciduous trees.

SB/RQ/G-3: A view taken through the park. A comfortable walk in the shadows of the deciduous trees along the pavements.

SB/RQ/G-4: A view taken along the walkway in walking route 3. The combination of softscape and hardscape contributes to a pleasant and positive walking experience.

SB/RQ/G-5: A view of the trees and open space beyond which Office B is located.

Figure 6. 31 The view towards the KLCC parks with the map showing the greenery and scenery.

During the participant observation, respondent (R9-SB) stated:

> *"I am not sure whether I know that walking is enjoyable because I always walk with purpose, but I love to see flowers. Sometimes I see lovely wild plants, I wish that I could plant them at home [laugh]. To me greenery is very important, similar to this area. The government should really think about how to have a pleasant walk something like this, but in a different design when they are dealing with different places which are relevant and suitable to that area."* (R9-SB)

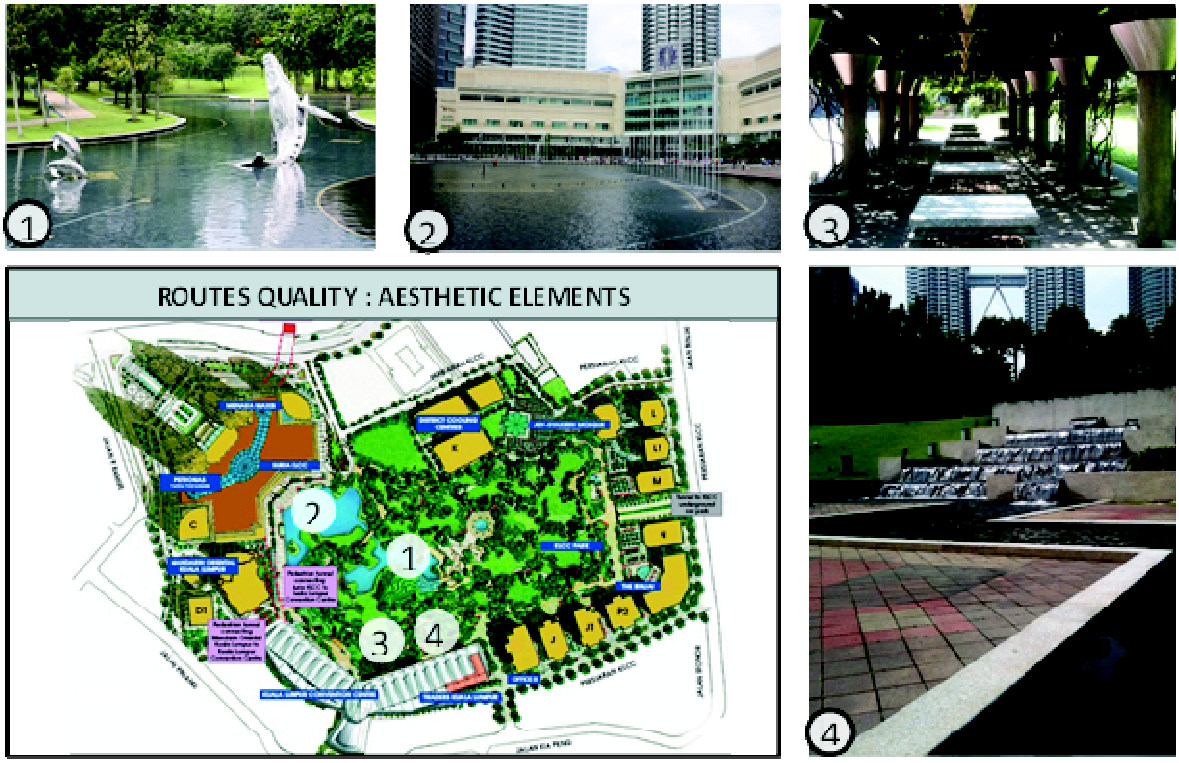
6.6.4.3 Aesthetic elements

The public seem to be interested in the arts and exhibitions being incorporated into the public spaces. Aesthetic elements such as the scenery in the KLCC Park attract people to places. During the group discussion in the park, respondent (R2-SB) suggested including the arts with regard to improvements within the KLCC site:

> *"I believe that art as visual attraction is important to invite people to use pedestrian walkway, it is also act as a landmark for people. I'm just advising. This park is a beautiful place as it is…"* (R2-SB)

Another respondent gave input about the surrounding site:

> *"…I don't see anything aesthetically pleasing outside the site on the street level but some of the buildings around here are nice to look at."* (R6-SB)



SB/RQ/AE-1: A view of the aesthetically pleasing sculptures that appear to be floating on the pool in the park.

SB/RQ/AE-2: A view of the fountain in front of the building with trees behind the water works that define the entrance of the building.

SB/RQ/AE-3: A shelter from the weather with a sitting area underneath, with some tropical elements with regard to the material, form and vines growing around it.

SB/RQ/AE-4: Small steps of waterfalls that flows into a small stream on the ground level.

Figure 6. 32 The view towards the KLCC Park showing the softscape and hardscape.

6.6.4.4 Walkway Condition

Respondent (R6-SB) explained that the area was free of barriers, interruptions and obstacles but the case is different in the surrounding site:

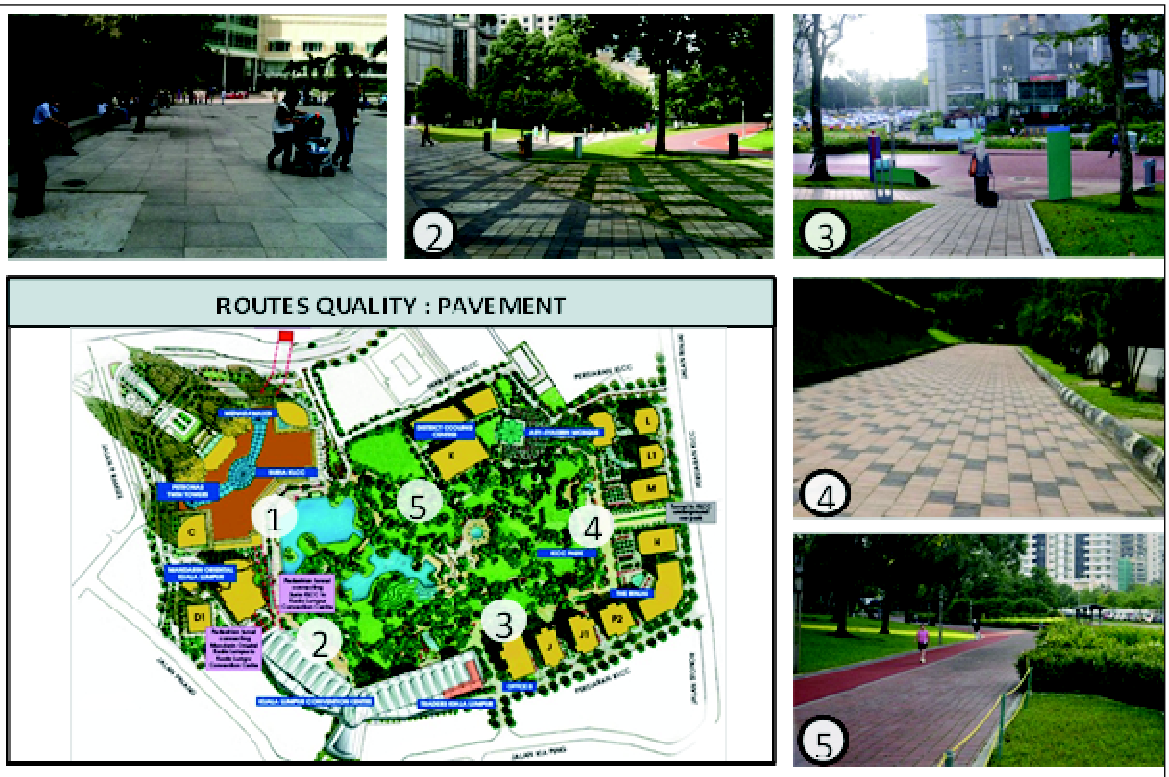
> *"Pedestrians have their own space to enjoy within the site. In the surrounding site, they are in a push into the car traffic environment at all times due to the lack of continuation and its bad condition.* (R6-SB)

6.6.4.5 Pavement condition

Respondent (R3-SB) commented on the pavement during the participant observation:

> *"Actual needs for the pedestrian are of course a good pavement [like that], good tools to walk which they feel secure [like that], they feel safe and of course good linking facilities from point A to point B"* (R3-SB)

Visual photographs and field notes taken during walk through with respondent R3-SB as shown in Figure below 6.34.



SB/RQ/P-1: A view of the pavement immediately outside KLCC Suria connected to the water feature where people gather with family and friends.

SB/RQ/P-2: A view of the shaded, unobstructed pavement path in front of the KL Convention Centre.

SB/RQ/P-3: Paved paths serve the buildings directly with no car traffic or any other interruptions on the way.

SB/RQ/P-4: A view of the paved pathway behind the other buildings in the KLCC area that leads directly to the exit at the side of the KL Convention Centre.

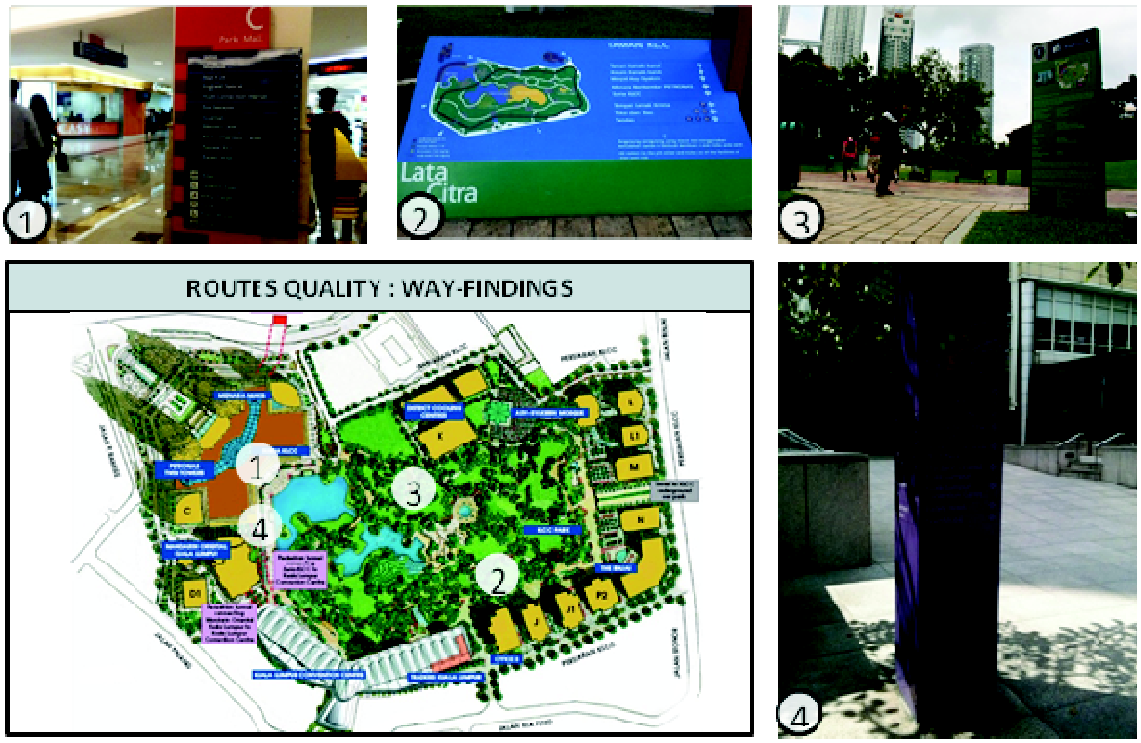
SB/RQ/P-5: A view of the paved walkway which is used by the public in the early morning and evening hours as a jogging track.

Figure 6. 33 The view towards the KLCC Park showing the pavement condition and the directness of the path which is clear of barriers.

Within the KLCC Park the respondents reported that they had no difficulties in finding directions when they got lost because of the frequency of signage and way finders within the park and KLCC Suria. Respondent (R9-SB) had positive remarks regarding the signage within the KLCC Suria site. During participant observation he stated:

> *"Plus, where I am right now the signage is really good. Once I am out from this area (Site B), out from highway, I would say that it wouldn't be so good. It could be quite misleading. There are some cases where the signage is not in proper place, for example signage for turning point, by the time you reach the turning point is already too late to realize the signage"* (R9-SB)

R9-SB who pointed out the ease which she can find her way around within the KLCC area, however she found it difficult once she leaves the vicinity. Below is the series of way finding facilities as shown in Figure 6.35.



SB/RQ/WF-1: Signage inside KLCC Suria on the lower ground level.
SB/RQ/WF-2: Map of the KLCC Park showing the paths around the park.
SB/RQ/WF-3: Another map of the KLCC Park showing the routes around the park.
SB/RQ/WF-4: Signage outside KLCC Suria but before the KL Convention Centre.

Figure 6. 34 Way finding facilities available in Case Study 2.

6.7 Research Question 4: Dreams for the Pedestrian-Friendly Environment

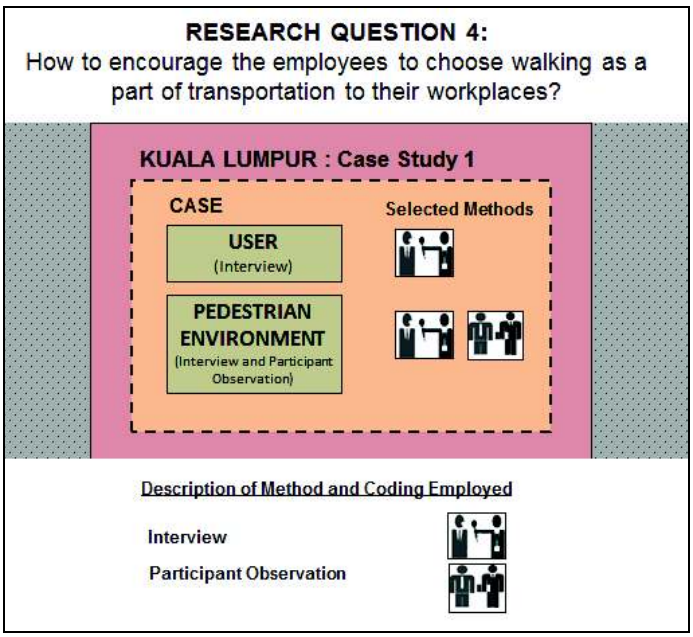


Figure 6. 35 Research techniques on the unit of analysis to answer research question 4.

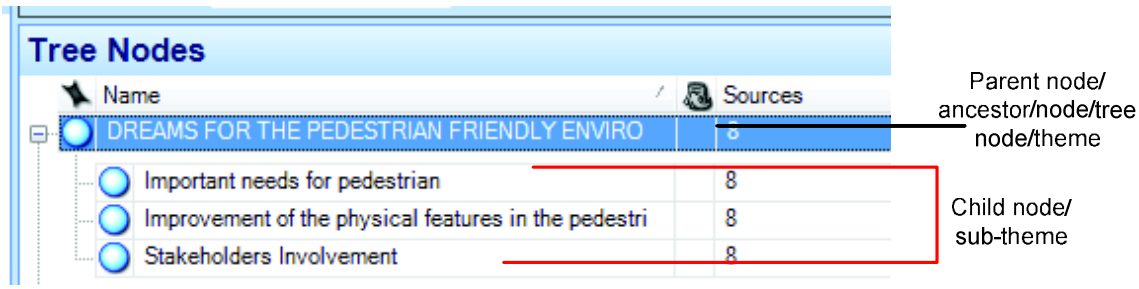


Figure 6. 36 Concepts of dreams for a better and friendlier pedestrian environment

During the course of the interviews the respondents were asked what kind of improvements they hope to see in the future in their environments. They were asked in order to determine what they (as the users) want from the pedestrian environment. Receiving a response to this inquiry for the users of the pedestrian environment will justify the suggested improvements made later on in chapter 7.

Based on their answers, a list of suggested improvements for the pedestrian environment will be formulated, to act as a guide for the body responsible for the implementation of the improvements.

In addition to accumulating the responses of the users (respondents), this section will also discuss briefly what the interviewees perceive as the stakeholder's (responsible body's) responsibility towards the environment.

Many of the respondents shared their hopes for a better pedestrian environment for the entire city, which they believed could then act as an example to all other districts and towns in Malaysia. Respondent (R1-SB) was enthusiastic about this because she saw a potential for Kuala Lumpur to become world class.

> *"I have the hope that Kuala Lumpur can be much better but we have to start with KLCC. KLCC could be a model in which other area or district can learn from. Every day the cleaners clean the pavements. I never see this being done in other places so far. The government should spend on maintaining it. Almost every project in other places has no maintenance ... After two years they become run down then a request is put forward for a budget for a new structure. It keeps changing. So you must think of maintenance of the infrastructure."* (R1-SB)

Respondent (R2-SB)'s comment below was in coherence with respondent (R1-SB)'s hope for a World Class City.

> *"Yes. I think if we were wanted to be a world class city, it is possible. To create a real world class city, then everything needs to be world class. No short cuts and a lot of hard and sincere work. It's possible."* (R2-SB)

Based on the interviews, the requirements for the pedestrian environment from the viewpoint of the pedestrians themselves, is presented below. The needs of the pedestrians are discussed along with the suggestions put forth by the respondents on what the responsible bodies can do to meet the needs of the employees as pedestrians.

6.7.1.1 Important Needs

'Important needs' refers to the most important things than are needed by the pedestrians in order to facilitate walking in the city centre and to discourage the use of cars as the

primary mode of transportation in KLCC and surrounding areas. The first comment regarding Site B was one of satisfaction with the facilities:

> *"In general, yes definitely. Within here is 95% okay. But outside, if you can improve that it will definitely increase the quality and also will encourage people to walk."* (R3-SB)

The next respondent gave a general comment that applies to the city centre in general, and made a suggestion in relation to transportation networks and car dependency:

> *"Yes, I do agree because it doesn't matter what happens, people still prefer to drive to the city centre. They will continue to drive unless there is something that restricts them from doing so such as congestion charges. However, we need to improve the infrastructure; train (LRT) network must reach almost all areas in KL Metropolitan Area; bus service should be consistent up-to-par. It would be good to have buses that are integrated with the train station … I think people would be very happy"* (R2-SB)

Another respondent added to the suggestion of better quality infrastructure but looked at it from a different perspective. The respondent argued that having good infrastructure that encourages people to walk and rest in comfort gives a feeling of enjoyment. The respondent explains:

> *"Walking requires a certain level of focus, because of course you meet people on the street while you walk and you have to greet them at least. But if you want to talk, it would be good to have a place to sit and relax for a while and socialize."* (R9-SB)

6.7.1.2 Improvement to the Pedestrian Environment

1. *Improvements to physical features*

A respondent pointed out the problems with the current infrastructural facilities and the serious need to improve them. This respondent also made a comment about improvements to security and safety in the areas surrounding the site. He added that encouraging people to walk is pointless if there is no provision of up-to-standard facilities within the built environment.

> *"The actual needs for the pedestrian are of course good pavements, good tools to walk which they feel secure, they feel safe and of course good linking*

> *facilities from point A to point B. Coverage, lighting, good signage and the provision of drinking stations. Maybe you can have free water during pick-up times. If you are walking and you need some refreshments. If these are not done then you can't expect people to listen to you when you say they should walk more. "* (R3-SB)

Another respondent again cited Singapore as an example to be followed in terms of city planning in terms of transportation networks. The public is encouraged to walk using visual attraction and non-verbal forms of encouragement to walk:

> *"I think we need to put Singapore as an example, they often put artwork along the pedestrian walkway. I believe that visual attraction is important to invite people to use pedestrian walkway, in way it is also act as a landmark and meet up point."*(R2-SB)

2. *Aesthetic features*

Respondent (R2-SB) talked about the city centre in general but tied it back to KLCC as a good example to follow for the rest of the city centre. The respondent commented on aesthetic values during the participant observation:

> *"I think yes but it can still improve, put some shading to avoid bad weather in these areas. Condition of alley also needs to improve, in terms of smell and etc because people tend to look at these small things. Why not they redo the alley, come out with bright colours, proper light etc. for example KLCC when they do renovation, they put up nice artwork"* (R2-SB)

The next respondent talks about cost and improvements and is sceptical about the budgets given in comparison with the changes done over the past 10 years:

> *"Yeah more budget on that but I see that over the past ten years our improvement in pedestrian walks is minimum. I feel that there is an identity but not beauty added to it. It seems like we stopped treating these aspects a long time ago."* (R4-SB)

6.7.1.3 Stakeholders' Involvement

The respondents reacted very strongly during discussions about responsible parties in the creation and maintenance of pedestrian environments. All the respondents (9 out of 9 [100%]) felt that not enough is being done to improve the pedestrian environment. They all hoped that their suggestions on the improvements that need to be done will be taken into consideration hereafter.

As discussed in chapter 2, the theoretical proposition was constructed and solutions for the pedestrian environment pointed more at the work that needs to be done by the responsible parties in advocating walking in the public realm. This will be further elaborated in the cross-case analysis in chapter 7. One of the comments made regarding the stakeholders involvement was:

> *"I believe that the parliament or cabinet should sit and discuss this issue because it is a very serious one. It not only involves the general public or us employees but the tourists and tourism as well. I am afraid that one day, the situation will be so bad that there will be very few people walking and even the cars will have serious problems moving for long periods of time similar to what can be seen in less developed countries in the world. Something needs to be done by the politicians to stop this from happening."* (R3-SB)

6.8 Summary and Link

Chapter 6 dealt with the data analysis for Case Study 2. It is appropriate to say that there is a general level of satisfaction about the area from the respondents within Site B. The respondents are very familiar with the area included within the site and surrounding the site as well.

The first finding was expanded from the first theme 'The implicit understanding of walking to work'. The majority of the respondents agreed that the pedestrian environments within the case study area are pleasant to walk in during the AM and PM rush hour. The majority fully understand the benefits of walking for their health to stay fit. In financial terms, the respondents are aware of the benefit of combining walking with public transport to give them more control of their finances. Based on their calculations, their average monthly travel expenses by mixed mode is half what they spend when driving. In terms of social benefits, the respondents who practice walking are more active, have a more positive mind set and are sensitive to the physical changes in their pedestrian environments as opposed to those who drive all the way to the workplace. Obliviously, these drivers care little about the carbon foot print they have contributed to the environment.

The second finding was that the majority of the respondents appreciated the fact that their office location was within a development that prioritised the pedestrian over the car, thus enhancing their walking experience. They felt safe and secure

from motorised vehicles and were very confident about walking whether in the day or night. The availability of a good public transport network also increased their willingness to incorporate walking as part of transportation to work. The respondents however complained that they have difficulties with the public transport from their home to the nearest transit station, as the pedestrian environments in these areas are poor.

The third finding was that all 9 respondents understood that physical features are vital to enhance their walking experience in the pedestrian environment. All of them were satisfied with the variety of route choices available within the site. They also mentioned that they fully utilise the pedestrian facilities such as walkways in the parks, underground walkways, covered and uncovered walkways. The variation of greenery such as deciduous trees, shrubs and ground cover not only cool the area but also create balance between hard and softscapes within and at the perimeters. Based on participant observation, it was revealed that route accessibility, route connectivity, route directness, street furniture and way-finders within the site area support and encourage the employees to walk not only to and from the transit but also within the entire site. The respondents, however, expressed their sense of frustration when walking in the surrounding site area, in which the quality has changed drastically for the worse.

The fourth finding was that the majority of the respondents suggested a need for improvement of the quality of the pedestrian environment across the whole of Kuala Lumpur city, rather than just in the tourist areas. They urged the government to take prompt action before the motor vehicles conquer the city and completely destroy pedestrian rights.

CHAPTER 7. CROSS CASE ANALYSIS: SUMMARY OF FINDINGS

7.1 Introduction

The multicase study approach was selected for this research, which investigates issues about walking to the workplace using a group sample of employees and their pedestrian environments in Case Study 1 and Case Study 2. The study looks at:

i) their perception of how and whether walking could be part of their transportation mode to the workplace;
ii) why the pedestrian environment has an influence on the way people travel to work;
iii) the physical features that support employees while walking in the pedestrian environment; and
iv) the best possible environment for walking according to the user; this will provide insight about good ways to support and encourage employees to change the way they travel to work in the city centre.

The research focuses on how people behave when in a natural setting. For this reason, qualitative data was gathered by administering extensive interviews in the primary study. The secondary level of study included collecting complementary data by using participant observation field notes, photographs and mental sketch maps. Nineteen respondents who work in the city centre of Kuala Lumpur were used as key informants in this study. The data was coded, categorised, analysed and organised initially according to corresponding research question and then by themes and concepts, using Nvivo 9's tree nodes.

This chapter presents a summary of Chapter 5 and Chapter 6 in the form of a cross-case analysis of Case Study 1 and Case Study 2 in answering the research questions below:

1) To what extent does the employee perceive walking as part of transportation to the workplace?
2) What factors influence the employees to incorporate walking as part of transportation to the workplace in the existing pedestrian environment in the city centre of Kuala Lumpur?
3) What are the main physical features in the pedestrian environment that encourage the employees to walk to work?
4) How can employees be encouraged to choose walking as a part of transportation to their workplaces?

7.2 Cross-case analysis – Case Study 1 and Case Study 2

From the first stage of data analysis within the individual cases, patterns have emerged from the findings in the form of unique themes and sub-themes/concepts as discussed in Chapter 5 and chapter 6. In the second stage, cross-case synthesis is undertaken to integrate these themes and sub-themes/concepts across Case Study 1 and Case Study 2. This is done in order to search for patterns that can generate new insights and uncover patterns that may not be immediately apparent in the first stage of the analysis.

Eisenhardt (1989) suggests the approach to be taken in searching for patterns within cross-case studies is to first identify dimensions or constructs from the existing literature and then look for within-group similarities and inter-group differences. According to Bloomberg and Volpe (2008), the ability to see the whole picture from the findings could be developed through cross-case classification matrices. According to Yin (1994) the advantage of using multiple cases is that they are discrete experiments that serve as replications, contrasts, and extensions to the emerging theory. In line with Yin, Eisenhardt and Graebner (2007) emphasise that:

> *"...while laboratory experiments isolate the phenomena from their context, case studies emphasize the rich, real-world context in which the phenomena occur. Its emphasis on developing constructs, measures, and testable theoretical propositions makes inductive case research consistent with the emphasis on testable theory within mainstream deductive research".*

Cross Case Analysis: Summary of Findings

Eisenhardt (1991) and Miles and Huberman (1994) suggest that using multiple cases in research could increase generalizability through comparisons that clarify emergent patterns about the events, as processes in one well-described setting are not wholly idiosyncratic or consistently replicated by several cases. Multiple cases also enable broader exploration of research questions and theoretical elaboration.

The author has extended the above suggestions, and has also made use of the advantages of conducting the multiple embedded case study approach for this research. The cross-case analysis in this study uses the process that Yin (1994) calls replication logic, or pattern matching. Based on this process, the cross-case analyses were displayed and discussed using a series of matrices and mapping concepts for each theme and sub-theme/concept.

The next section presents the discussion of the cross-case analysis of the employees' perceptions of walking to work, the factors influencing people to incorporate walking to work, physical features in the pedestrian environment that encourage more people to incorporate walking to work and the user's dream of a preferred pedestrian environment. The first stage, analysing the data within the individual cases, has seen the emergentce of patterns from the findings in the form of unique themes and sub-themes/concepts as in Chapter 5 and chapter 6. Subsequently, the second round stage is cross-case synthesis is undertaken to integrate each theme and sub-theme/concept across Case Study 1 and Case Study 2. This is done in order to search for patterns that can generate new insights and uncover patterns that may not be immediately apparent in the first stage of the analysis.

Eisenhardt (1989) suggests that the best approach in searching for patterns within cross-case studies is to identify dimensions or constructs from the literature and thereafter look for within-group similarities and inter-group differences. According to Bloomberg and Volpe (2008), a broader and more holistic picture can be developed from the findings through cross-case classification matrices.

According to Yin (1994) the advantage of using multiple cases is that they are discrete experiments that serve as replications, contrasts, and extensions to the emerging theory. In line with Yin, Eisenhardt and Graebner (2007) emphasise that:

> "...*while laboratory experiments isolate the phenomena from their context, case studies emphasize the rich, real-world context in which the phenomena occur. Its emphasis on developing constructs, measures, and testable theoretical propositions makes inductive case research consistent with the emphasis on testable theory within mainstream deductive research*".

Eisenhardt (1991) and Miles and Huberman (1994) suggest that using multiple cases in research could increase generalizability through comparisons that clarify an emergent finding of the events and processes in one well-described setting, which is not wholly idiosyncratic or consistently replicated by several cases. Multiple cases also enable broader exploration of research questions and theoretical elaboration.

The author has extended the above suggestions and combined them with the advantages of having used the multiple embedded case study approach for this research. The cross-case analysis in this study uses the process that Yin (1994) calls replication logic, or pattern matching. Based on this process, the cross-case analyses were displayed and discussed using a series of matrices and mapping concepts for each themes and sub-theme/concept.

The next section presents the discussion on the cross-case analysis of the employee's perception on walking to work, the factors influencing people to incorporate walking to work, physical features in the pedestrian environment that encourage more people to incorporate walking to work and the user's dream of preferred pedestrian environment respectively.

7.2.1 Theme 1- Synthesis on Implicit Understanding of Walking To Work for Case Study 1 and Case Study 2 (RQ 1)

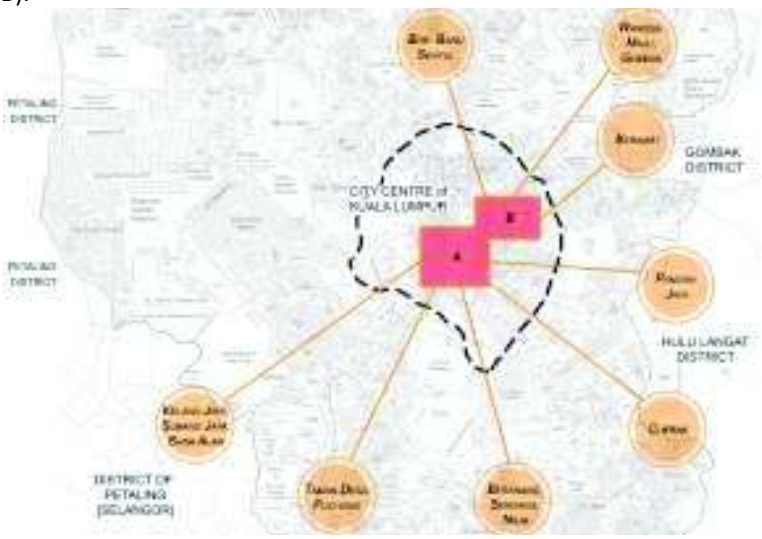
Cross case analysis of theme 1 is explained under sub theme 1-1 to 1-4: Defining walking to work, Travel modes to work, Understanding and Stages and Characteristics of Walking:

Sub-Theme 1-1 and 1-2: Synthesis on the Definition of Walking to Work for Case Study 1 and Case Study 2

Sub Theme/ Concept	Case Study 1	Case Study 2
1-1) Defining walking to work	• Walking to work is considered as destination directed. • The nature of walking to work is purely functional because there is a focus on where the origin is, where the destination is and the time gap between the two. • Walking from station to office is described as a straightforward path because there is no room for distractions • Walking is the most appropriate mode of transportation for short distance trips as an alternative to automobiles. • Walking for lunch break is considered a regular activity for the purpose of socializing with companions.	• Walking to work as a physical activity that serves the functional purposes categorised as necessary. • Walking to work means walking to transit. • Walking with a very specific and set target for the purpose of going to work. • Body and mind focused on reaching the destination, i.e. home or work. • Walking for lunch break is considered as routine practice for the employee • Walking for lunch break is acknowledge as being for purposes of socialising
Replication logic for 1-1	The pattern matching between cases is represented above by the use of the same colour. Although the definition of walking to work depends on the invidual's perception, there are similarities between perceptions as can be seen from the replication in CS 1 and CS2. This will be further discussed in 7.3	

Sub-Theme 1-2: Synthesis on Travel Mode to Work for Case Study 1 and Case Study 2

Sub Theme/ Concepts	Case Study 1	Case Study 2
1-2) Travel modes to work	 • A mixture of transportation modes from their respective homes to the workplace in the city centre. • Study of the travel pattern reveals that the walking trips have been incorporated in the overall mixed-mode or driving journey to work. • The origin of the people who work in the city centre is distributed outside KL City Centre boundary	 • 95% of the respondents use a mixture of transportation modes to commute to the workplace in the city centre. • Walking trips to transit are considered as part of travel pattern to workplace. Incorporating walking as one of the modes of transportation is mostly preferred by the respondents, so as to avoid severe traffic congestion. • The origin of the people who work in the city centre is distributed outside KL City Centre

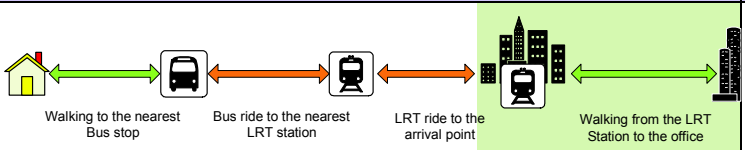
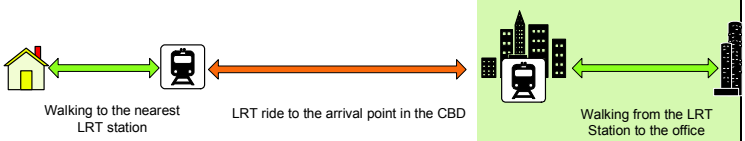
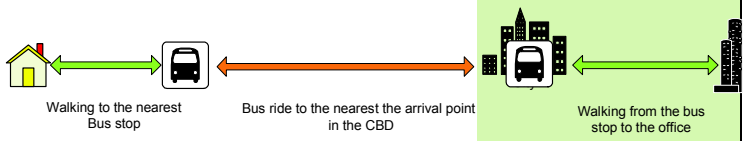
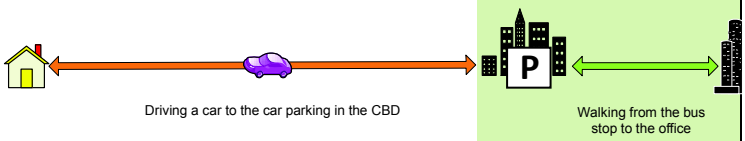
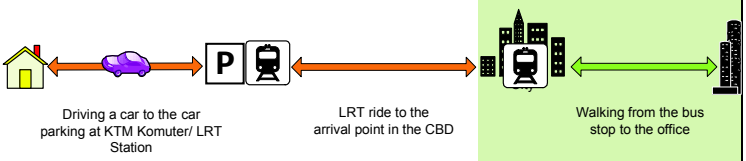
		boundary.
Replication Logic	Diagram below shows the graphic representation of travel patterns matched for both cases, Site A and Site B. Several points of origin have been identified for respondents from both case studies; they live outside the city-centre , whether in the FTKL, KL Metropolitan area, or adjacent states. The common travel modes to work for the employees in Case Study 1 and Case Study 2 are: i) A combination of walking with public transport or the use of private vehicle with public transport; and ii) The use of private vehicle throughout the journey from home to the workplace. Walking emerges as the main mode of transport from the final transit station as they arrive in the city centre to their destination (office A and B) and from the parking lot to the destination (office A and B). 	

Sub theme 1-3: Synthesis from understanding the benefit of walking to work for Case Study 1 and Case Study 2

ASPECT	PERCEIVED BENEFIT OF WALKING FROM CASE STUDY 1 AND CASE STUDY 2	Case Study 1											Case Study 2										Replication Logic
		R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	T (%)	R1	R2	R3	R4	R5	R6	R7	R8	R9	T (%)	
Health	• Promotes healthy mental state and improves the quality of life	/	/	/	/	/	/	/	/	/	/	100	/	/	/	/	/	/	/	/	/	100	MERIT – active living; manage to walk average 8000-10000 steps a day; positive feeling while walking; form of exercise; reducing stress at work & surrounding environment; increased fitness; feeling fresh; alert to the surrounding environment DEMERIT – hot humid region; sweating a lot especially morning walking to work; sweating while walking in lunch break
Economy	• Helps maintain control of personal expenses on travelling costs and time spent	/	/	/	/	-	/	/	/	/	/	95	/	/	/	/	-	/	/	/	/	89	MERIT – save travelling costs through walking via mixed modes of transportations; save on monthly travel expenses DEMERIT – difficult to control travelling time due to traffic congestion; unreliable public transport
Environment	• Reduce damage to environment	/	/	/	/	-	/	/	/	/	/	95	/	/	/	/	-	/	/	/	/	89	MERIT – route qualities provision & appreciation; pedestrian connectivity & directness

																						DEMERIT – lack of awareness; due to past experience → consciously ignore the environment; inadequate pedestrian crossing facilities; unpleasant feeling
Social	• Provides direct interaction with the built environment within and surrounding the site context	/	/	/	/	-	/	/	/	/	/	95	/	/	/	/	-	/	/	/	/	89	MERIT – learning process; take control of individual's mind; direct contact with the city environment; familiarity with the area DEMERIT –
	• Allows for social interaction with friends over lunch break • Enables observation of what happens in the outdoor environment	/	/	/	/	-	/	/	/	/	/	95	/	/	/	/	/	/	/	/	/	100	MERIT – familiarity of the area; relaxation & rejuvenation from work load; regain freshness DEMERIT – focus on social interaction overshadows the focus on walking while walking is obstructed by bad route quality

Sub Theme 1-4: a) Synthesis of the walking stages in the travelling to workplace for CS1 and CS2

Type of travel modes practiced by the employees in CS 1 and CS2	Graphic Representation of travel behaviour to workplace from home to the City Centre for CS 1 and CS2	Replication Logic of walking stages
1. Mixed mode Category 1 No. of Respondents CS 1=1 out of 10 CS 2=0 out of 9		i) Walking from home to the nearest bus transit ii) Walking about at the bus-LRT interchange iii) Walking from transit to the office in City Centre
2. Mixed mode Category 2 No. of Respondents CS 1=3 out of 10 CS 2=5 out of 9		i) Walking from home to nearest LRT/ train transit ii) Walking from transit to the office in City Centre
3. Mixed mode Category 3 No. of Respondents CS 1=2 out of 10 CS 2=1 out of 9		i) Walking from home to the nearest bus stop ii) Walking from bus transit to the office in City Centre
4. Driving Category 4 No. of Respondents CS 1=1 out of 10 CS 2=1 out of 9		i) Driving from home to the city centre. ii) Walking from car park to the office
5. Combination driving & mixed mode Category 5 No. of Respondents: CS 1=2 out of 10 CS 2=2 out of 9		i) Walking from home to nearest LRT station and parking. ii) Walking from transit to the office.

Sub Theme 1-4: b) Synthesis of the stages and characteristics of walking to workplace from transit in the city centre for CS1 and CS2

The Stage of Walking	Time Travel	The Characteristics of Walking to Work	Replication Logic of PE Condition and Needs
1.Walking from the final transit point in the city centre to the workplace	AM rush hour	• Common to walk alone • Fast walking pace	• Straight forward and direct routes • transit choices closer to the workplace

No. of Respondents: 89% (17 out of 19)		• Fear of falling for ladies • Body and mind are pressured by time.	• efficient public transport network and services • safety and security along the routes • minimal obstacles on the sidewalks, pathways • efficient pedestrian infrastructure and facilities.
2. Walking from the workplace to the transit point for home No. of Respondents: 89% (17 out of 19)	PM rush hour	• Walk at a leisurely pace, • Body and mind are more relaxed about time • Have more time to observe surroundings	• Safety and security along the routes • looking for more varied uses along the routes such as cafes, retail outlets, art works • attractiveness and details of sidewalks and route design • adequate street furniture and lighting
3. Walking from workplace to break places No. of Respondents: 94% (18 out of 19)	Afternoon break	• Fast walking pace • best time to rejuvenate and refresh the mind and body, • socializing while walking • walking with colleagues	• Looking for more varied uses along the routes such as cafes, food outlets and retail outlets • focus on destination to reduce travel time • straight forward and direct routes • safety and security along the routes • minimal obstacles on the sidewalks • efficient pedestrian infra and facilities
4. Walking from break places to workplace No. of Respondents: 94% (18 out of 19)	Afternoon break	• Fast walking pace • walking with colleagues	• straight forward and direct routes • safety and security along the routes • minimal obstacles on the sidewalks • efficient pedestrian infra and facilities

The 'implicit understanding of walking to work' are grouped into four key categorical themes namely Defining walking to work, Understanding of walking benefits, travel modes to work and Stage and characteristic of walking to work with the concept(s) underneath each identified theme which have been discussed in the above matrices (refer section 7.2.1). Figure 7.1 represents the cognitive map related to the how the employees construct the meaning of walking to work and perceived walking as part of transportation to work for Case Study 1 and 2.

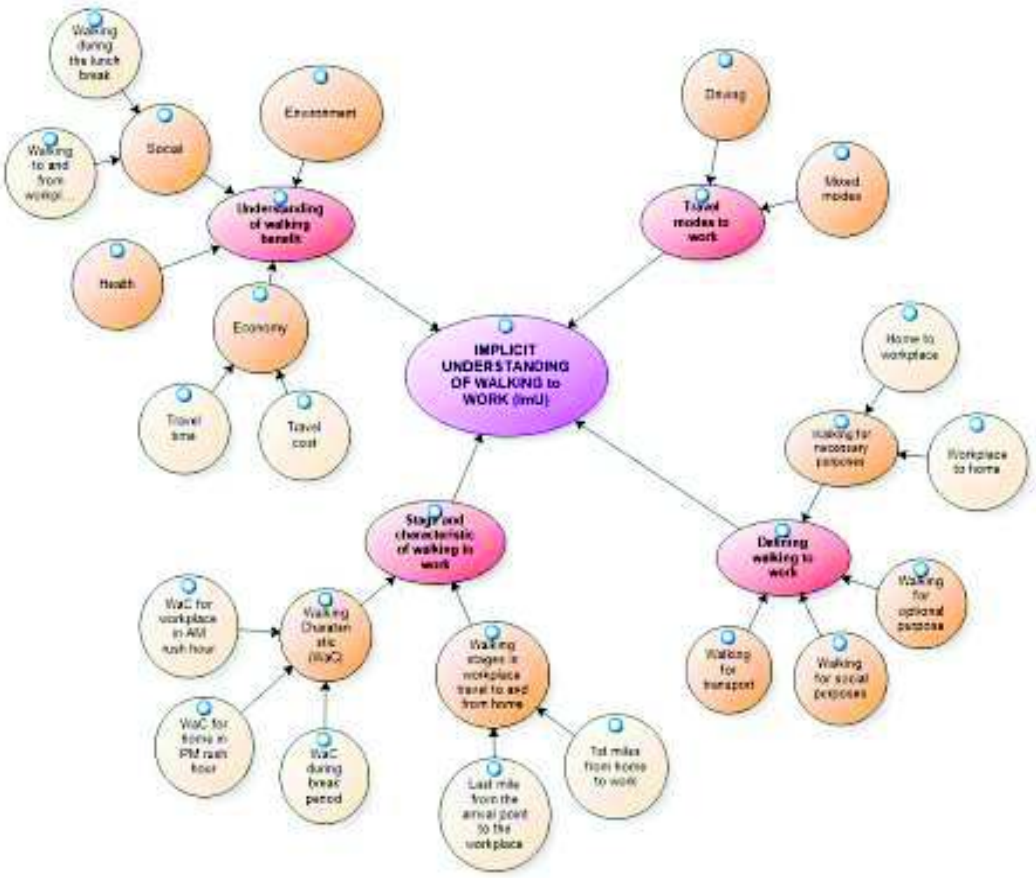


Figure 7. 1 Cognitive mapping under theme 'the implicit understanding of walking to work' for Case study 1 and Case study 2.

7.2.2 Theme 2- Influencing Factors for Walking To Work For Case Study 1 and Case Study 2 (RQ2)

Cross-case analysis for theme 2 is explained under sub-themes/concepts 2-1 to 2-5; [2-1] Driver Factors; [2-2] Barrier Factors; [2-3] Psychosocial Factors; [2-4] Safety and Security Factors; and [2-5] External Factors:

Sub-Theme 2-1: Synthesis of Driver Factors For Case Study 1 And Case Study 2

Sub-Theme/ Concept	Case Study 1	Case Study 2	Replication Logic
2-1.1) Car Parking facilities at stations	• The availability of parking spaces at the train/LRT stations has been acknowledged as a synergising factor for respondents to opt for using public transport to workplace in order to avoid traffic jam.	• The presence of car parking facilities at the train/LRT stations has been recognised as a preferable option to incorporating walking while commuting to work. • The fact that respondents plan their days ahead in order to find a parking space at the stations encourages	• Respondents who reported the presence of car parking facilities at the train or car parking station were more likely to incorporate

		them to schedule their day.	walking into their commuting journey to work.
2-1.2) Encouragement from the employer	• None of the respondents were aware of any past or present plan of the employer to encourage the employees to walk to work. However the respondents felt that the employer has a role to play in encouraging employees to make walking part of the journey to work.	• The employer is attempting to play a role in encouraging the employees to incorporate walking in their daily commutes to work. • Incentives were given to those who car pool. • Encouraging the employee to walk for health by completing 10,000 steps a day with the aid of pedometer.	• Importance of the role of the employers as a motivator for walking to work as part of transportation
2-1.3) Traffic conditions	• Being caught in a traffic jam has become a serious concern for travelling to the workplace in AM and PM rush hours. • Traffic congestion seems to be a catalyst for using public transport and walking to/from transit to the office instead of fully driving to the city centre during these times.	• Traffic congestion while commuting during the AM and PM rush hours was seen as a major issue by all respondents. • Stress of driving associated with traffic congestion has been identified as a motivating factor for using public transport.	• Traffic congestion is a barrier to driving during rush hour. • Pedestrians are motivated to use public transport due to congestion.
	Case Study 1	**Case Study 2**	
2-1.4) Availability of Public Transport Network within the case studies			
a) Proximity of transit to the office (viable if closer to the transit)	Distance from Office A to Masjid Jamek LRT Interchange = 455 m Distance from Office A to Plaza Rakyat Station = 336 m Distance from Office A to Pasar Seni LRT = 648 m Bus Stations & Bus Stops are scattered within the site.	Distance from Office B to KLCC LRT Station = 572 m Distance from Office B to Raja Chulan Monorail Station = 648 m	• There is some accessibility to public transport a few hundred meters away.
b) Total Walking Time	Walking time from all transits to the office is within 5-10 minutes	Walking from all transitd to the office is within 5-10 minutes	Falls within the recommended time for daily walking.

Sub-Theme 2-2: Synthesis of Barrier Factors For Case Study 1 And Case Study 2

Sub-Theme/ Concept	Case Study 1	Case Study 2	Replication Logic
2-2.1) Negative attitudes related to walking	• Car traffic environment with illegal traffic activities poses as an unsafe environment which causes insecurity among the pedestrians. • People have negatively preconceptions that walking is tiring although they have not previously engaged in it. • People face issues such as petty theft and harassment in the pedestrian environment and therefore turn to driving as a better option to avoid these problems.	• Other road users such as drivers and motorcyclists lack consideration and respect for pedestrians. • Pedestrians felt a sense of insecurity and low confidence while walking in the car traffic environment due to lack of pedestrian crossing facilities. • People tend to compare the car environment with the pedestrian environment and conclude that the car environment is better because of the difficulties experienced in the pedestrian environment.	• Pedestrians in the car traffic environment feel threatened. • There is insecurity among pedestrians in the car traffic environment. • There is difficulty in using the pedestrian environment.
2-2.2) Unreliable public transport system	• Inefficient public transport is a drawback to walking to work.	• The unavailability of public transport in KL and its fringes has made people opt for driving.	• There is an issue with the availability of public transport, pushing people to drive instead.
2-2.3) Unpleasant feeling	• Pedestrians feel uncomfortable with the presence of people loitering in the narrow walking spaces, turning them into less preferred route. • The sense of safety and security while in the pedestrian environment is associated with and tainted by this unpleasant feeling. • Sense of dangers is deemed to be due to pedestrian infrastructure with standard design deficiencies.	• Pedestrians are concerned about the technical aspects of pedestrian movement such as: i) air-condition mal-function in the underground walkways ii) shared walking surface with electric buggies and patrolling vehicles • Being caught in a traffic jam has become a serious concern for travelling to the workplace in AM and PM rush hours.	• Pedestrians have concerns about safety, facilities and time.
2-2.4) Inadequate pedestrian crossing facilities	• Crossing facilities were not favoured by the pedestrians as they are perceived as dangerous and life threatening. • The overall quality of crossing facilities in the pedestrian environment in the study area is representative of other	• The difficulty in crossing roads has caused dissatisfaction among pedestrians. • The insufficient number of crossing facilities causes a time delay and creates a sense of insecurity during pedestrian ambulation.	• There is an inadequate number of pedestrian crossing facilities that function well.

	parts of KL city centre.	• The inadequacy of the crossing facilities is similar throughout KL city centre.	
2-2.5) Discontinuous protection from weather condition	• The f covered walkways are sometimes misused by street hawkers, whose carts serve as obstacles to the movement of pedestrians. • Pedestrians perceive that the availability of covered walkways would remove the negative mind-set among those who create excuses not to walk in the pedestrian environment.	• Protection from rain and sunshine on the existing route is deemed to be a crucial element in the pedestrian environment. • The discontinuity of the covered walkway has created discomfort and unpleasantness for pedestrians.	• The discontinuity or blockage of protective walkways is an issue of great distress to the pedestrians.
2-2.6) Unintegrated work by the authorities and stakeholders in improving the pedestrian environment	• The pedestrians see the lack of care in path maintenance as being due to the lack of integration among the authorities, leaving the pedestrians at a loss. • The pedestrians want the authorities to manage pedestrian matters more efficiently.	• Sudden changes in the condition of the pedestrian environment as the pedestrians walk across the site boundary makes them notice inconcsistency in pedestrian facilities surrounding KL city centre. • The pedestrians want the authorities to provide a balanced pedestrian environment for the other parts of the city centre.	• Pedestrians feel more can be done by the authorities to maintain and manage the pedestrian environment
2-2.6) Poor accessibility and connectivity	• Access and connection points are insufficient; therefore moving around in a traffic jam is a serious concern for travelling to the workplace in AM and PM rush hours. • The lack of connectivity to surrounding areas is a problem for the employees as pedestrians.	• The presence of a continuous pavement designed for people on foot is an important factor to create confidence among the pedestrians while walking in the city centre. • Accessibility and connectivity in most parts around the city centre are still in a poor state. Adding on to that, urban spaces in KL need legibility.	• There are many issues raised about poor connectivity and accessibility especially during rush hour.

Sub-Theme 2-3: Synthesis of Psychosocial Factors For Case Study 1 And Case Study 2

Sub-Theme/ Concept	Case Study 1	Case Study 2	Replication Logic
2-3.1) Positive feelings about benefits of walking to the body and mind	• Pedestrians feel that they get to unwind and open up their minds to their surroundings. • Walking to work in the morning serves as a positive boost to start the employees' day.	• Positive attitudes towards walking have helped people change the way they see the world and also given them increased endurance levels. • Walking from station to workplace motivates people to use public transport. • Walking is an enjoyable	• There is a feeling of refreshment and relaxation after walking at any time in the day.

		activity. Choice of footwear is believed to be one of the important factors for convenient walking.	
2-3.2) Socializing through walking	• The need to socialize during lunch break is important to pedestrians mainly as a stress reliever. • The joy of interacting with people enhances the bond between them.	• The need to socialize during lunch break is necessary to pedestrians mainly as a stress reliever and for companionship. • Pedestrians walking within the city centre feel 'light' and joyful, which could be associated with their health and fitness levels.	• Socializing is an essential part of walking especially during working hours.
2-3.3) Peer review	• People living in areas far from the workplace would have to stop at many interchange stations if they were to take public transport, and so prefer to drive to work.	• Pedestrians choose to drive to work when the distance between the station and the residence is large.	• People tend to judge other people's driving habit and this reflects on themselves
2-3.5) Relaxation and Rejuvenation	• Pedestrians spoke about walking in the morning as an activity to rejuvenate them from the previous night's sleep. • People tend to enjoy the time they take while walking for relaxation.	• Pedestrians prefer to walk in this area as a way to relieve the built-up stress at the end of the day. • The environment gives more room for the pedestrians to enjoy walking in the city centre.	• There is enjoyment in walking activity before or after work.
2-3.6) Familiarity of the area	• Pedestrians attach familiarity to an area via sounds, street activities, and accustomed sense of direction, road patterns and turnings. • By frequently walking in the area, people can identify if it is safe, comfortable and enjoyable.	• People try to remember places by associating objects and paths with them. • People attribute feelings of frustration and insecurity while walking to disorientation because of a lack of directions.	• People need a sense of familiarity to navigate through the pedestrian environment.
2-3.7) Time taken	• The people tend to divide the time they need for walking and using public transport to travel between places. • Pedestrians and motorists experience a form of obstruction while commuting. Motorists experience obstructions in the form of traffic jams.	• Pedestrians allocate their time properly and efficiently before leaving for work or lunch break. • The presence of barriers that decrease the level of accessibility and connectivity to the workplace are time consuming to the pedestrians	• Pedestrians are aware of the time while they walk in the pedestrian environment. • They tend to pre-plan the time for journeys.

Sub-Theme 2-4: Synthesis of External Factors For Case Study 1 And Case Study 2

Sub-Theme/ Concept	Case Study 1	Case Study 2	Replication Logic
2-4.1) Achieving the vision of a world class city	• Generally, people are doubtful about KL reaching world clas status by the appointed time of 2020 due to the situation of the pedestrian environment. • The public complained about the current situation of the pedestrian environment.	• Pedestrians recognise that there is a plan to make KL a world class city but agree it falls short of what they considered to be World Class. • The pedestrians expressed their opinion that the surroundings are not in good shape.	• Pedestrians generally feel there is more work to be done and more needed, to meet the criteria for a world class city.
2-4.2) Advocacy	• The people acknowledged the need for the government to support pedestrians and create a more conducive pedestrian environment. • The seriousness of the matter was understood by pedestrians.	• Pedestrians agreed that there needs be some sort of a campaign to advocate for walking in KL. • People believed the government should take the pedestrian environment more seriously.	• There is an agreement that there needs to be a bridge (advocacy) between stakeholders.
2-4.3) Enforcement	• Pedestrians complained that there are areas patrolled in the day; however, there is little enforcement in the area	• The public agreed on the fact that very little action is being taken by the law enforcement agencies in Malaysia regarding the pedestrian environment.	• Law enforcement needs to divert attention to certain areas.
2-4.4) Weather	• People talked about sweating in KL while walking. • Generally people complained of the need to carry an umbrella around with them due to the harshness of the sun and the unpredictability of the rain.	• Pedestrians complained about the humidity level in Malaysia and the rate at which they sweat in public spaces and how easy it is to get tired. • The need for better protection from the rain was also presented.	• The climate in Malaysia is not suitable for walking without proper cover.
2-4.5) Stakeholders	• Pedestrians believe that the need for support from the government is necessary to create awareness among the pedestrian. • Sometimes there is vandalism to the facilities.	• The government/authority was pointed out as the most influential stakeholder in creating a better pedestrian environment.	• There needs to be action by all the stakeholders involved in the process.

Sub-Theme 2-5: Synthesis of Safety and Security Factors For Case Study 1 And Case Study 2

Sub-Theme/ Concept	Case Study 1	Case Study 2	Replication Logic
2-5.1) Harassment	• The people complained about other people approaching them and standing too close. • Some pedestrians narrated experiences of women being harassed on the streets and in certain areas around the city centre.	• Pedestrians tend to feel fear when they are approached by strangers, particularly when the stranger crosses their personal boundaries. • Some of the people expressed genuine concern for women who walk in areas of the old Central Business District.	• Pedestrians feel fear towards other individuals especially those who are overly friendly.
2-5.2) Crime	• Pedestrians who walked in the area complained that they are fearful because there are many petty crimes and sudden attacks in the vicinity.	• The people discussed their lack of eagerness to walk around alone especially when night falls and prefer to walk in groups near Suria KLCC.	• Petty crimes occur in certain areas
2-5.3) Traffic	• The presence of numerous construction sites around KL has caused the sidewalks to be narrower due to the hoarding sheets. The narrow space forces pedestrians into the car traffic zone.	• There is insecurity among pedestrians when they move too close to the car traffic environment due mainly to the narrowness or absence of the sidewalks outside Suria KLCC.	• The disappearance of sidewalks near the streets are a concern politically, socially and economically.
2-5.4) Dangerous	• People cited the numerous dangers that lie in the KL city centre, including infrastructural elements, construction sites, crimes and the car traffic environment.	• The pedestrians disclosed their fear of walking outside KLCC on a path or sidewalk too close to the car traffic, construction works all around, etc.	• There are several aspects of danger when walking.

The 'Influencing Factors for Walking To Work' are grouped into five categorical themes Driver Factors; Barrier Factors; Psychosocial Factors; Safety and Security Factors; and External Factors with the concept(s) underneath each identified theme which have been discussed in the above matrices (refer section 7.2.2). Figure 7.2 represents the cognitive map related to why the pedestrian environment has an influence on the way people travel to work for Case Study 1 and 2.

Figure 7. 2 Cognitive mapping of 'Influencing Factors for Walking To Work' for Case study 1 and Case study 2.

7.2.3 Theme 3- Physical Features Supporting Walking To Work For Case Study 1 And Case Study 2 (RQ3)

Cross-case analysis for theme 3 is explained under sub-themes/concepts 3-1 to 3-4: Pedestrian access to destinations; Route connectivity; Route directness and Route quality:

Sub-Theme 3-1: Synthesis of Pedestrian access to destinations (PAD) for Case Study 1 And Case Study

Sub-Theme/ Concept	Case Study 1	Case Study 2	Replication Logic
3-1.1) **Route choice (RC)**	• To a certain degree, pedestrians agreed on the interesting aspects of certain routes in the area as they cut through markets and outlets which create a curiosity while walking in the area. • Pedestrians chose their desired route based on route directness, route quality, safety and comfort.	• Pedestrians have a variety of choices of routes when they arrive within the KLCC boundary. There are paths that cross the park, with beautiful scenery, pavements at the edge of the park, various external approaches from the parking lots, etc., enriching the	• Pedestrians like to keep themselves busy while walking, with interesting things like scenery, shopping, etc.

		pedestrian experience.	
3-1.2) **Variety of uses (VoU)**	• People agreed that the variety of stalls, malls and the multicultural and architectural elements that can be seen along the pathway on the site provide added value.	• There is an element of interest that can be seen in the KLCC developments such as retail outlets, recreational areas and office buildings. • Variety of other uses along the pathway enhances the walking experience to workplace.	• There are some interesting items, shops and buildings in these areas.

Sub-Theme 3-2: Synthesis of Routes Connectivity (RCn) for Case Study 1 And Case Study

Sub-Theme/ Concept	Case Study 1	Case Study 2	Replication Logic
3-2.1) **Pedestrian connectivity within the Site**	• People agreed that when walking between destinations, there is no easy access, which forces pedestrians to engage in jay-walking, etc. • There are many obstacles along the path that act as barriers and discourage pedestrians from walking. There are also obstructions due to poor site maintenance.	• The public generally agreed that it is a good environment that leads easily to and properly connects locations within the site. • Pedestrians made mention of barriers like the presence of a buggy which obstructs pedestrians and maintenance machinery that damages the pavements.	• There is a general agreement among people on the need for easy connection between places. • There are obstructions present on sites.
3-2.2) **Pedestrian connectivity in the surrounding site (SS)**	• Pedestrians complained of the amount of barriers that obstruct paths in the area, for example, the parking of motorcycles on the pedestrian sidewalks, which is illegal but happens in many places in KL. • There is an insufficient amount of pedestrian crossing facilities in the city centre.	• The narrowness of the pedestrian sidewalks due to construction works tends to push pedestrians into the car traffic environment. • Due to the lack of and wrongly placed pedestrian crossing facilities, pedestrians admit to crossing roads without proper navigation and in an unsafe manner.	• Facilities that should aid walking seem to be the ones serving as barriers to the pedestrians.

Sub-Theme 3-3: Synthesis of Route Directness (RD) for Case Study 1 And Case Study

Sub-Theme/ Concept	Case Study 1	Case Study 2	Replication Logic
3-3.1) Rroute directness	• Pedestrians in this area seem to have gotten accustomed to many of the routes that connect places. They also seem to understand where obstacles are and the time taken for each selected path and how to manoeuvre themselves through the area. • There are some barriers that prevent pedestrians from being able to access the site directly except via the front entrance.	• People do face difficulties in moving around the surrounding area because of chaos and disorganisation, particularly those who move between KLCC and Bukit Bintang. They say there are too many things in the way. • Within the site there is better access to surrounding buildings and there are very few obstructions on the path.	• Pedestrians are familiar with the obstructions that prolong their journey to work.

Sub-Theme 3-4: Synthesis of Routes Quality (RQ) for Case Study 1 And Case Study

Sub-Theme/ Concept	Case Study 1	Case Study 2	Replication Logic
3-4.1) Street Furniture	• The street furniture available on the site was not up-to-par mainly because of the lack of maintenance and checking of these items on a regular basis • Pedestrians complained of dim street lights which makes them feel insecure while walking	• Street furniture such as seats, street lamps, etc. is meant to serve as protection primarily, and then to add aesthetic value to the park. This furniture fits well and suits the environment. • Pedestrians enjoy their time spent in the area; however some complained about the discontinuity of covered walkways.	• There is a need for street furniture in urban spaces.
3-4.2) Walkway conditions	• The pavement conditions around the site have slowly fallen into disrepair due to the lack of maintenance and the improper use of the sidewalks	• The conditions of the pedestrian walkways are generally good as agreed by the pedestrians who use the site; however there are times when heavy machinery causes the pavements to be obstructed.	• The condition of the sidewalks must be maintained at all times.
3-4.3) Aesthetic elements	• There are very few aesthetic elements in the site to engage pedestrians while walking except for those within boundaries in the form of sculptures.	• The site itself represents many aesthetic elements in the form of sculptures and beautiful scenery especially within the site. • There are very few aesthetic elements in the surrounding site except for the ubiquitous advertisements.	• Aesthetic elements are necessary to promote walking in any place.
3-4.4) Way Finding	• The way-finders in the site are not clear and are usually hard to read. Many pedestrians complained of	• Way-finders on this site are very clear and accurate, with little ambiguity, and they are	• Way-finders are important to pedestrians for

	the difficulties in reading signage while walking, so familiarizing themselves with the area was a better option.	placed at relevant spots throughout the area.	orientation and directions.
3-4.5) Greenery	• Pedestrians did not see any attractive greenery around the site but did not appear to notice this until they were asked about it.	• The site is filled with vegetation that the pedestrians claimed helped enhance their experience. • The surrounding sites lack greenery and are instead filled with advertisements.	• Greenery enhances the walking experience.

The 'Physical Features Supporting Walking To Work' are grouped into four key categorical themes namely Pedestrian access to destinations; Route connectivity; Route directness and Route quality with the concept(s) underneath each identified theme which have been discussed in the above matrices (refer section 7.2.3). Figure 7.3 represents the cognitive map related to what are the physical features that support employees while walking in the pedestrian environment for Case Study 1 and 2.

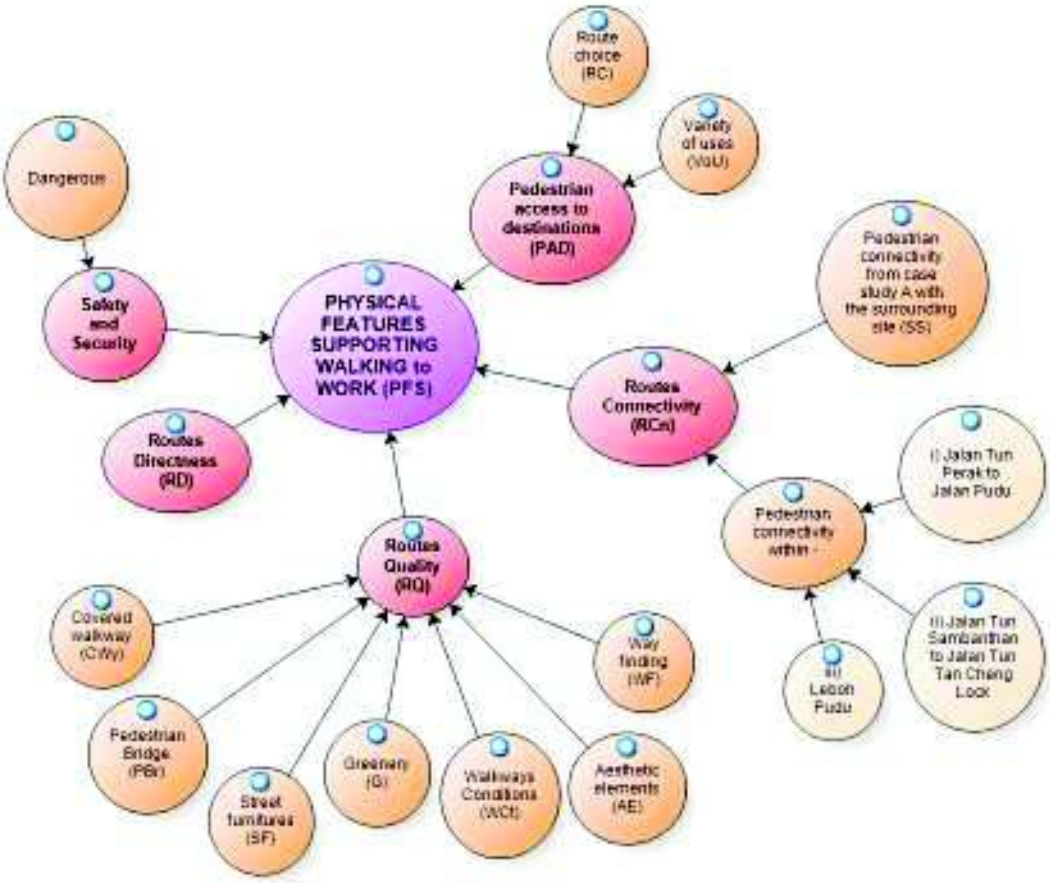


Figure 7. 3 Cognitive mapping of 'physical features supporting walking to work' for both Case Study 1 and Case Study 2.

7.2.4 Theme 4- Synthesis of Dreams for the Pedestrian Friendly Environment For Case Study 1 and Case Study 2 (RQ4)

Sub-Theme/ Concept	Case Study 1	Case Study 2	Replication Logic
4-1.1) Important needs	• There is a crucial need to rectify the pedestrian environment in the city centre and to improve the quality of life in these areas. • The public agree that there needs to be more input on the side of the government regarding public spaces.	• Pedestrians suggested an improvement of the quality of the surrounding infrastructure. • The authorities need to involve themselves more in reducing the number of vehicles entering the city centre.	• There is a general agreement among pedestrians about the need for improvement of the quality of pedestrians spaces.
4-4.2) Improvement of the physical features in the pedestrian environment	• People agreed that there needs to be an improvement of elements of security and safety in the surrounding areas of the site. • There are many roads in poor condition which should be repaired. • There were suggestions for more evenly distributed repair of facilities and infrastructure in all areas of the city centre.	• Safety and security are the primary facilities that need to be looked into. • People commented on the situation of the pedestrian facilities particularly at crossings. • People also agreed about the need to disperse the availability of proper maintenance.	• There are safety issues that need to be looked into. • Pedestrian crossing facilities need to be improved. • Pedestrian environment needs better maintainance.
4-4.3) Stakeholders Involvement	• People asked that the local authorizes to involve them in creating a better pedestrian environment.	• All pedestrians placed emphasis on the responsibility of the parties involved in getting the right conditions for the pedestrian environment.	• There needs to be a relationship developed between all stakeholders involved in the walking to workplace process.

The 'Dreams for the Pedestrian Friendly Environment' are grouped into three key categorical themes namely Pedestrian's Important needs, improvement of the physical features in the pedestrian environment and stakeholders which have been discussed in the above matrices (refer section 7.2.4). Figure 7.4 represents the cognitive map related to what are the best possible environment to encourage walking according to the employees' views for Case Study 1 and 2.

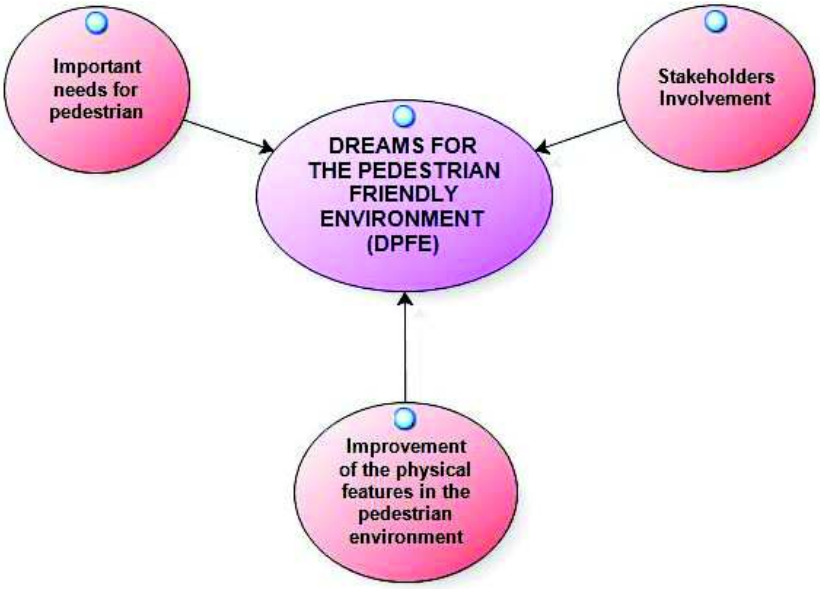


Figure 7. 4 Cognitive mapping of 'Dreams for the Pedestrian Friendly Environment' for Case study 1 and Case study 2

7.3 Summary and Link

From the information gathered in chapter 5, chapter 6 and the cross-case analysis of chapter 7, the author found that apart from the existing and initial themes brought out in RQ1, RQ2, RQ3 and RQ4, there is also a need to analyse the data emerging from the chapters mentioned above. This is done to broaden the specific data to a more general level that produces a universal statement about the social phenomenon. Here, the term 'universal' is used to refer to social phenomena within a specific context similar to that found in Kuala Lumpur. The statement can also extend to other developing countries in Asia and Africa if there are enough similarities between the two situations. As becomes clear from the literature review in Chapter 2, the author's intention is to be specific to the context as in Chapter 3, in line with other researchers who create generic criteria for walking conditions in pedestrian environments in their own context. This is to highlight how information of a specific context is essential before the application of a solution from a foreign context.

The cross-case matrices used in this research narrate the experiences of 19 individuals; these experiences have proved to be repetitive and identical, regardless whether the

responses are negative or positive. That is, the replication logic reveals that similar reasons were given whether for positive or negative answers. The data collected from the individuals reached a saturation point, where no new knowledge emerged beyond a certain number of respondents. From the findings, it became clear that the 19 individuals are representative of the population within the context of Kuala Lumpur city only. The author also concludes that the phenomena are representative of all sites in Kuala Lumpur city.

Because the author has managed to apply the users and the setting (Case study 1 and 2) to the larger context of Kuala Lumpur using replicable social phenomena, a new framework (as stated by Research Objective 5 in chapter 1) will be developed in the following chapter.

Research Objective 5

> *To develop a framework that will serve as a recommendation to all stakeholders for the enhancement of the walking experience for employees in the pedestrian environment in the city of Kuala Lumpur.*

When trying to place the settings under the research questions into Research Objective 5 in chapter 1, the literature review in chapter 2, and the context situation in chapter 3, the author found that though the data collected is relevant to the topic of enhancing the pedestrian environment for walking to workplace, it needs to be analytically induced to achieve the objective. For this reason, a new theme is retroactively introduced; it is referred to in this research as the analytic categories for the holistic understanding of walking to work. The research questions are categorised into these four analytical categories tabulated below.

	Analytic category	Research Questions
1	User Understanding & Knowledge Of Walking To Work	RQ1
2	Mixed Mode of Transportation To Work Place	RQ 1, 2 and 3
3	Physical Features of Pedestrian Environment	RQ1 and 3
4	Stakeholders' Involvement	RQ1, 2, 3 and 4

Figure 7. 5 Matching analytic category with research questions.

Cross Case Analysis: Summary of Findings

The diagram below links the research questions and analytic categories with the theoretical propositions and the units of analysis while treating the chapters as the regulators for the development of the proposed framework for walking to the workplace, which will be discussed in the next chapter.

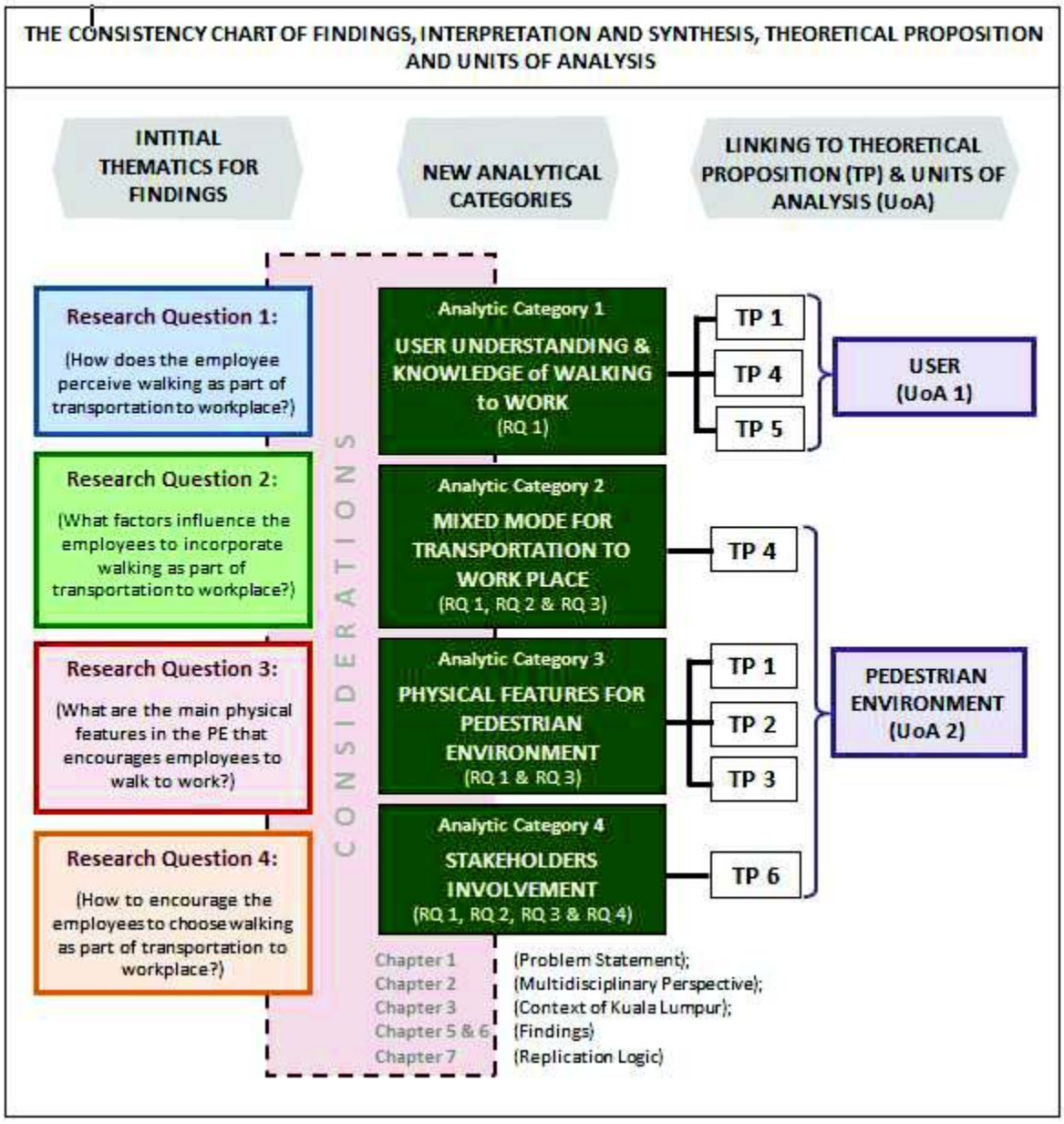


Figure 7. 6 The development of the conceptual framework to link the findings, interpretation, synthesis, theoretical propositions and units of analysis.

CHAPTER 8. DISCUSSION

8.1 Introduction

In qualitative research of this kind, the emphasis is on the users' (employees') understanding of the situation. It is essential to interpret the data collected for the findings, as Patton (2002) explains: "an interesting and readable report provides sufficient description to allow the reader to undertand the basis of interpretation, and sufficient interpretation to appreciate the description". The importance of the interpretation is that it gives a new dimension of understanding on the subjects under investigation, and involves reading through or beyond the findings.

According to Bloomberg and Volpe (2008), "*the interpretation requires more conceptual and interrogative thinking than data analysis alone because it involves identifying and abstracting important understanding of the detail and complexity of the findings*". It in effect moves the whole analytical process to a higher level.

Synthesis is the process of pulling the findings apart and searching for connections between the separated data. What should emerge is a discussion that is presented in a layered form. The author has provided a graphic representation of this process in figure 8.1, entitled 'The Consistency Chart Of Findings, Interpretation and Synthesis'. This is part of the conceptual framework development that guides the discussion in the form of a well-thought-out conversation that integrates the findings with the cross-case analysis, literature review and research, and links it with the theoretical propositions and units of analysis. This part is organised in four (4) analytic categories as mentioned in the summary of chapter 7:

1. User Understanding & Knowledge Of Walking To Work;
2. Mixed Mode For Transportation To Work Place;
3. Physical Features For Pedestrian Environment; and
4. Stakeholders' Involvement.

The previous theme, namely *the implicit understanding of walking to work; the influencing factors for walking to work; physical features supporting walking to work;* and *dreams for the pedestrian friendly environment* were directly aligned with each of the research questions in this study. These same themes were used to present the findings in chapters 5 and 6. The new themes come from a categorising and retrofitting of the most important aspects of incorperating walking to workplace emerging from the initial themes. They came about after the author discovered a new emerging pattern in the initial theme, arising from the most frequently and strongly expressed responses, as well as from the main reason for looking into multidisciplinary perspectives on incorporating walking to work as discussed in chapter 2.

As a secondary level of analysis, the relevant framework (enhancing experience of walking to workplace) is developed and tied in, as these categories are matched with the discussion of the literature in chapter 2.

The previous chapter presented the findings through cross-case analysis in order to generalise certain aspects of the findings and form a replication logic of the study based on the initial theme to produce a readable narrative. The purpose of this chapter as discussed earlier, is to provide intrepretative insight into the findings. Whereas the finding chapters split apart and separated the pieces of the data to tell the story of the research, this chapter is an attempt to bring together minor details of research to form larger components that can be studied individually. The chapter goes further to combine the components established to form a big picture of the issues of walking to work. The discussion takes into consideration the literature on walking in association with the built environment from a multidisciplinary perspective. The chapter concludes with a reexamination of the conceptual framework, which was identified in the second chapter, and a summary of the chapter.

8.2 The iteration of important components of the research

The need for this study arose from the determining of the two units of analysis, namely the users (in chapter 2) and the setting (in chapter 3). Based on these two units of analysis, the literature review was developed, with special attention paid to the problems faced within the units of analysis. The literature review examined and discussed various factors proposed by other scholars regarding how the issues surrounding the unit of analysis can be corrected. However, their results were too generic. The author carefully looks at how the existing literature applies to the selected settings and the factors which exist in Kuala Lumpur. It was discovered that though the information provided by the literature is relevant to the issues, there is a need for a context specific study in Kuala Lumpur city.

A theoretical proposition was developed as a summary to the literature presented in chapter 2. This was done to enable the author to tie the current discussion (chapter 8) to the literature without bringing new irrelevant information into the discussion and literature. Embedded in the literature review, and as an extension of the theoretical propositions, are the issues within the research questions which respond to the research problems. Four themes based on the research questions were developed and used to structure the findings in Chapters 5 and 6.

After collecting the evidence, the author discovered emerging patterns which needed to be recategorised under analytic inductions in order to solve the specific issues of the context and move the research away from producing generic solutions that can be replicated in any country. This is also done to lead to the framework that will explain the phenomenon within the context of Kuala Lumpur city. The explanation above is depicted in the diagram below (Figure 8.1). The reason for presenting the diagram in flow chart form as below is to properly highlight the relationships between the research questions which arose from the initial themes with the developed analytic categories which will be explained in the following section.

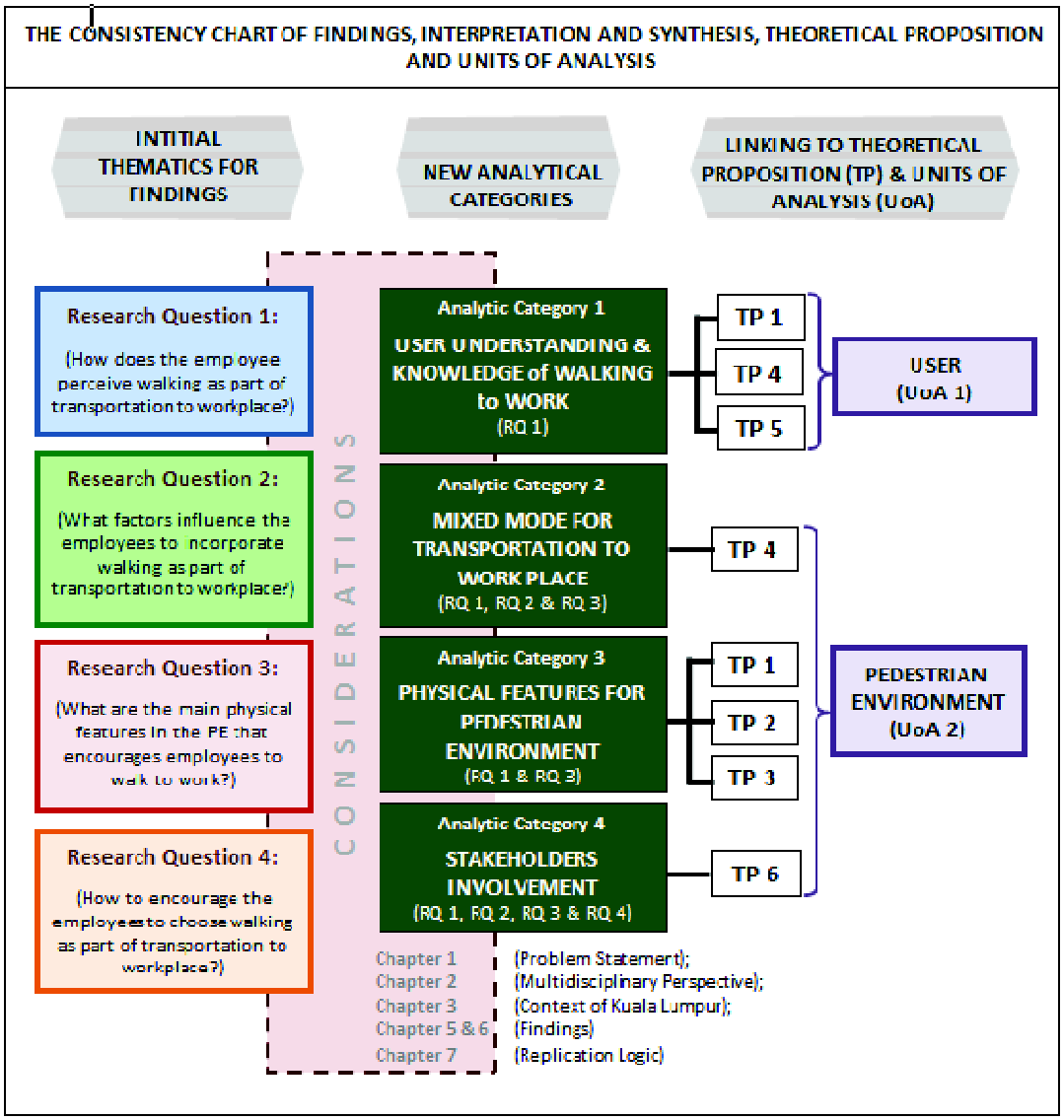


Figure 8. 1 The iteration process using the consistency chart of findings, interpretation and synthesis, theoretical proposition and units of analysis.

8.3 Analytical category 1: User knowledge and understanding of walking to work

This analytical category was induced from the findings emerging from within-case and cross-case analysis to answer research question 1. The author found three significant explanations about how the employees as users perceive walking as part of transportation to workplace, as explained in the following sections.

8.3.1 Individuality of mind and its repetition among pedestrians

The idea behind asking the respondents to define the meaning of walking is to understand how they understand their own actions based on their previous experiences and how they attach a subjective meaning to their action. According to Cuff and Payne (1984) and Schutz (1967), people's experience of the world depends on their ability to grasp the essence of the phenomena they perceive. However the foundation of experience does not reside within the mind of an individual in isolation, but rather as part of the broader world which includes the influence of others in the social world (Cuff and Payne, 1984, Patton, 2007 and Seamon, 2010). It creates a picture of the social world as something which is subjectively understood by each and every individual within it, but at the same time appears to assume that this subjective understanding will somehow turn out to be sufficiently alike for social relationships and social interactions to be conducted successfully (Cuff and Payne, 1984).

In this research it is significant that although individuals construct the meaning of walking based on individual experience, the results imply that the definition of walking to work is generally similar across both case study areas within the city centre of Kuala Lumpur.
This is why definitions can be seen to emerge along with a matching pattern between both case studies. The evidence for the definition of walking to work for Case Study 1 and Case Study 2 is in the synthesis 7.2.1 under sub themes 1-1, 1-2 and and 7.2.2 under sub theme 2-3.

The replication logic from the synthesis has provided a new insight into the actual meaning of walking to work, showing that the respondents accord different values to walking within the AM and PM rush hours, and have different purposes or motives for walking at different times (section 7.2.1). For example, walking during the AM and PM peak hours is defined as walking for necessary purposes, purely functional and focused with the set target to travel from the origin to the destination. While walking during the lunch break is considered as a social activity that has a psychosocial impact on the employee such as relaxation, refreshment and rejuvenation (section 7.2.2). For both types of walking, that is, to work and during lunch break, positive feelings emerge about the value of walking to the body and mind; it becomes a routine practice for the

employee (section 7.2.1 and 7.2.2). It also implies that walking is a viable form of transportation for short-distance journeys from transit to the office or from the car park to the office based on the individual's familiarity with the walking spaces within both case study areas (section 7.2.1 and 7.2.2).

The above results emerged as having a significant link to the 5th proposition deduced from the literature in chapter 2, that is:

> *the pedestrian environment provides a strong relationship with the sensory expression and social interaction derived from everyday walking practices which nurtures a sense of belonging, familiarity, emotional attachment and thoughts to the area which is being walked* (Giles and Corti, 2002; Saelens, 2003; Gehl, 2004; Ewing, 2006; Aytur, 2007; Lapintie, 2010; PQN, 2010).

8.3.2 The self-consciousness of pedestrians in the pedestrian environment

According to Cuff and Payne (1984) on Mead (1964), "*human beings are not tied down by the stimulus-response relationship.*" They continue that humans display a high degree of flexibility in how they behave and conduct themselves. For example people may behave in a given situation in a particular way at one time but mayreact completely differently at another time when the same action is repeated again. People tend to plan their behaviour in accordance with their expectations of how they want things to happen.

The world contains both the unusual and the routine, as well as the ordinary and the surprising. However, the world in which these things take place is not something of which people are very aware. Peoples' experiences to them are not objects of conscious awareness; rather, things just happen without much thought going into how they might have happened differently or of what larger experiential structure they might be part (Seamon, 2010).

This research immerses itself in the reality of the pedestrian environment in the unique context of Kuala Lumpur. The author took the initiative to be part of the process of the entire study to understand the sub-conscious behaviour of the people's actions in the

reality of the social world. During the study, the author found that the routine behaviour among people in the pedestrian environment does not make their experiences in the life world an object of conscious awareness. For example, with reference to sub themes 2-2 (section 7.2.2) barriers serve as obstacles for the pedestrian; however, the nature of the barrier is not restricted to just the physical objects on the sidewalk.

The pedestrian consciously anticipates the future of walking in the pedestrian environment by reflecting on the past and sets certain preconditions, based on issues such as safety (section 7.2.2 under sub-theme 'safety and security'), dilapidated walkways (section 7.2.2 under sub-theme 'barriers' and 7.2.3 under sub-theme 'walkway condition') and time taken while walking (section 7.2.2 under sub-theme 'psychosocial factors').

The findings confirmed the 1st proposition which states that:

> *People will be encouraged to walk to their workplace in the city if they are facilitated with access to a good quality pedestrian environment that meets their needs* (Gehl, 2001; Low,2003; Sealens, 2003; Southward,2005 and Ewing, 2006, Talen, 2002; Clifton and Handy, 2001; Barton, 1998; Handy, 1996).

8.3.3 Implication of positive and negative attitudes towards walking

This study has revealed key insights about how the social and built environment has had an impact on walking behavior for individuals with positive and negative attitudes towards walking to work. Individuals with negative attitudes toward walking were more likely to drive more and to be less sensitive to the pedestrian environment. Bean et. al (2008) state that driving involves a less sensory experience than walking because all experiences of the exterior are filtered through the car environment controlled by devices such as air conditioners or stereos. Pedestrians have stated that "...we do not get the respect from motorists when we want to cross the road (R8-SB)". Here the pedestrians refer to some instances where, when they are about to cross the road, motorists rush past them without being conscious of what that behaviour could do to the pedestrian.

Although these motorists know the effect of driving on the environment, they lack an

understanding of their individual contribution to the further depletion of the environment.

> *"I know and understand the situation of carbon emission and everything, but I don't mind spending money on fuel. I also don't think much about the carbon emissions although it contributes to the carbon footprint, but I don't think it's that much. I do think that if you walk and take public transport, there is still a need to use some amount of energy (human energy to walk). The energy is obtained by eating food whereas by driving, the energy is consumed by the car. Of course that energy will contribute to the carbonemissions. There is some kind of energy involved,its just that I don't have to get tired in the process of going to work"*
> *(R5-SB).*

Respondent R5-SB is a representative of all the people who displayed negative attitudes related to walking as in section 7.2.2, sub-theme 2-2.1. They use the pedestrian environment and feel they know what they are doing, but do not have an understanding of the impact on other pedestrians who use the environment. This strengthens the author's argument that the experience in the life world is not an object of conscious awareness. With respect to this respondent, the experience just happens without consideration of how it happens, whether it could happen differently or larger experiential structure she might be a part of (Seamon, 2010).

In relation to the 4th proposition in chapter 2: *Different people perceived walking to workplace with different views based on individuals' past and present walking experiences before they could make their decision to opt for walking as part of their transportation mode to workplace combined with public transport, instead of driving their private vehicles* (Gehl, 2001, Tuan, 1997; Shaftoe, ; Wunderlich, 2008); respondent R5-SA and R5-SB both consciously decided to drive to work every day and insisted on never walking or making use of public transport again. A negative response was given by respondent R5-SA in which she said:

> *"..I used to walk from home and take a bus to the nearest LRT to work daily for about a year. It is not a good experience that I had. For some concrete reasons I will not consider that mode again*." (R5-SA)

In contrast, those who have positive attidudes towards walking are most likely to make

walking an alternative means of transportation to the workplace. The implication of positive attitudes is that the users take control of the environment and see walking in the pedestrian environment as being to their benefit. Feeling refreshed and relaxed after walking at any time in the day has also encouraged employees to be active and abanded the sedentary lifestyle. This sentiment was expressed by many respondents in this study and was best reflected by one, who said:

> "*The other good thing about commuting [to work via train] is walking which gives the advantages of really seeing the world. You can witness and be part of what is happening around. Again you are meeting people. It gives a physical challenge for some people…what I mean is especially during rush hour you've got to stand up (when travelling with the public transport)...Your leg muscle are tense. For me, all those kinds of things are like an increase in endurance level for us*" (R2-SB)

In response to the respondents comments above, according to Cuff and Payne (1984) on Mead (1964):

> *"If human beings are to anticipate the future, to plan their action and to reflect the past conduct, they must be able to reflect on themselves, to look at themselves in the same way as they look upon any other object."* (p 118)

This means that the past and present experiences will affect pedestrians in different ways in relation to a particular issue; this can be seen in the case of two employees with positive and negative attitudes towards walking who took the same situation and managed to arrive at different decisions as to whether or not to incorporate walking as part of their transportation mode to work.

8.3.4 Understanding walking characteristic to and from work

According to Sauter and Tight (2010), knowledge of the characteristics of walking is essential in creating good urban spaces that consider the needs, abilities and wishes of the pedestrians. The need to understand characteristics of walking means a need to know and understand the system properties of pedestrian traffic, and use that as a base to make it work.

This is the first study that investigates the association between walking to and from home and the workplace during AM and PM rush hour, and the characteristics of the pedestrian environment from the employee's perspectives.

From the replication logic emerging from cross-cases analyses of both case studies, the author could generalise the findings as being representative of the employees within Kuala Lumpur generally. Time duration, stages of walking and pedestrian facilities appeared to be significant factors in the walk to and from transit points to the workplace. 89% of the respondents noted that walking from the final transit point in the city centre to the workplace during AM rush hour produces different characteristics and needs, as compared with the same walk during the PM rush hour. Among the common walking characteristic during the AM rush hour are a fast walking pace, fear of falling for ladies wearing high heels, physical and mental pressure because of the need to rush to clock in on time, and insecurity arising from walking alone. The respondents felt that the main physical needs during this time are straightforward and direct routes, efficient public transport, minimal obstacle along the sidewalks and safety and security along the routes.

In contrast, walking characteristics are slower and more relaxed, allowing more time to observe the surrounding environment, during PM rush hours. At this time the pedestrians also look for a mixture of activities and uses along the routes to suit the more leisurely walking pace.

In the context of walking from the workplace to eateries during the lunch break, most employees defined it as a necessity, to find their lunch. The remaining respondents defined it as walking for socialising. Although the interpretations for this type of walking are different, they share some commonalities such as a fast walking pace to and from the eateries as the entire process must be completed within 1 hour. 94% of the respondents said that they prefer walking with colleagues, although it is to a specific destination, as they feel more refreshed and relaxed in body and mind (refer to section 7.2.1 under sub theme 1-4b)

8.4 Analytical Category 2: Mixed modes of transportation to workplace

This analytical category was induced from the findings emerging from research questions 1, 2 3 (section 1.5 in Chapter 1). The inquiries centre on: how people perceive walking as part of transportation to the workplace; what factors influence the employees to incorporate walking to work; and what are the physical features in the pedestrian environment that encourage them to walk to workplace. The next section discusses these inquiries.

8.4.1 Connecting people to the employment centres in the city centre

People need to stay connected even though travel behaviour is complex. The complexity of travel behaviour involves the body and the psychological factors of perception, attitudes and habits of the pedestrians in the built environment (Beirao, 2007 and Clifton and Handy, 2001, Ajzen, 1991). People have the opportunity to select various transport modes which have their own specific advantages, disadvantages, costs and characteristics. Depending on the type of journey, the choice of a particular mode of transportation can vary over time. Private car and public transport are used by many employees to commute to the city centre from their settlement. The separation between the settlement and the employment centre is a result of segregation of land use functions and transportation networks. The evidence of this situation is tabulated in the synthesis of travel modes to work in section 7.1.2 (sub theme 1-4b). The effect of the lack of integration between the two has caused employees to commute longer distances and time, which has resulted in an increase in car dependency among the people. This is shown in Chapter 3 which discusses the current scenario in Kuala Lumpur where the city is clogged by vehicles during the AM and PM rush hours.

This causes employees to decide on driving their own private vehicles in order to better connect them to city centre. This is the point where they start to perceive the positive benefits of travelling by car to their workplace, which when repeated, develops into a habit. This habit becomes stronger and eventually car owners drive more and use other modes of transportation less, even for short-distance trips which can be undertaken via walking (refer to the synthesis 7.2.1 under sub-theme ‘travel mode to work’). This repeated habitual action creates a detachment of the conscious mind of the driver from

the environment outside the car; this detachment leads to pedestrians feeling marginalised in the pedestrian environment, as evidenced by the answers of the respondents in both case studies. As one of the respondents commented:

> *"The crossing facilities are not enough…even though there are places with zebra crossings; they remain unsafe for pedestrians to use. The motorcyclists and cars simply ignore them [zebra crossing]. There are a lot of accidents because of them. In fact they don't care about the traffic light at all."* (R1-SB)

This dissatisfaction is tabulated in the synthesis under safety and security (section 7.2.2 sub-theme 'safety and security') and route connectivity and route directness (section 7.2.3 under sub-theme 3-2 'route connectivity' and sub-theme 3-3 'route directness'). The images of route connectivity and route directness depict obstacles along the pedestrian movement space, such as motorcycles parking on the sidewalks and cars parking within the pedestrian environment. This shows the marginalisation of the pedestrian in the pedestrian environment, and has implications for the users' level of confidence. Moreover, it creates a sense of danger and insecurity because cars encroach into the pedestrian space, thereby making it narrower and pushing pedestrians into the car traffic environment.

8.4.2 Different walking stages for walking to workplace

Proposition 4 in Chapter 2 states that:

> *Different people perceive walking to the workplace in different ways based on individuals' past and present walking experiences; this affects how they make a decision about opting for walking combined with public transport as part of their transportation mode, instead of driving their private vehicles* (Gehl, 2001, Tuan, 1997; Shaftoe, 2008; Wunderlich, 2008).

In investigating the above proposition, the walking stages in commuting to workplace across both case studies have been synthesised to identify 5 possible ways of getting to work from home to the city centre. In order to get a clear picture of how transportation modes for commuting to the workplace were chosen, the author tabulated those travel mode patterns into three possibilities, as shown in the next section.

1) Driving to workplace

Figure 8. 2 Driving from home to the city centre and walking from the car park to the office.

This category is a representation of the general population who commute to the workplace in the AM and PM rush hours via motor vehicle and contribute to the sky-rocketing number of cars entering the city centre daily (Chapter 3, section 3.3.2). In addition, they contribute to the increasing amount of carbon oxides (CO and CO_2), air and noise pollution and traffic congestion in the city centre. This is in congruence with the current situation explained in Chapter 3.

This category has the most negative impact on both the pedestrian and the environment. The reality is that the health of the pedestrian is at stake because they are exposed directly to the contaminated air at least twice a day as discussed in Chapter 2 and Chapter 3. Banister (2000) states that increase in air pollution led to the adoption of national air quality standards; those recommended by the World Health Organisation 1997 have been exceeded in many cities. Air pollution is a severe danger to health causing respiratory diseases and impaired visibility. It also causes damage to buildings and the local ecology, thus reducing the quality of urban life.

The motorists themselves are also affected by this phenomenon. Regardless of the perceived benefits of driving, the culture tends to incline people to a sedentary lifestyle, and can result, mental stress, inactive and depression (refer to Chapter 2).

2) **Incorporating walking into the car journey**

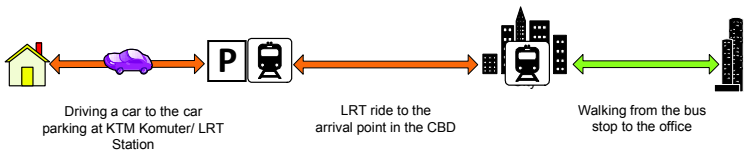


Figure 8. 3 Walking from home to nearest LRT station and parking and walking from transit to the office.

This situation represent the employees who drive from home to the nearest transit station for reasons such as proximity, availability of feeder buses, safety issues and traffic congestion on the way to work. This shows better understanding of the advantages of mixed-mode transportation, such as lower cost, shorter travel time, more opportunities to socialise, better physical and mental health and increased sensitivity to the environment. Respondents mainly commented on the lack of feeder buses, frequency of public transport, high number of people per unit area in the train making it crowded during the AM and PM rush hours and proximity to the transit stations as tabulated in section 7.2.2 under sub-theme 'driver factors and barrier factors'.

3) Combining walking with various mixed modes

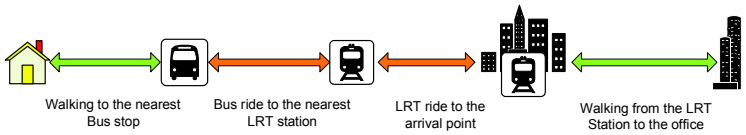


Figure 8. 4 Category 1 -Walking from home to the nearest bus transit then walking about at the bus-LRT interchange and walking from transit to the office in City Centre.

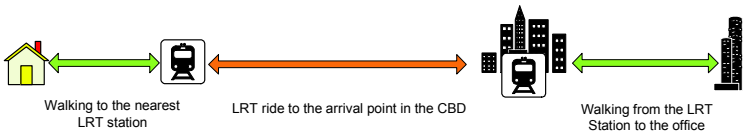


Figure 8. 5 Category 2- Walking from home to the nearest LRT/ train transit and walking from transit to the office in City Centre.

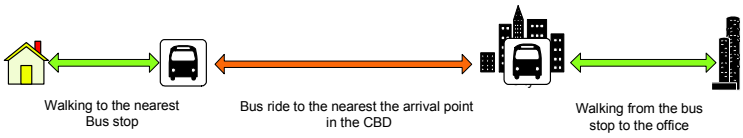


Figure 8. 6 Category 3 -Walking from home to the nearest bus stop and walking from bus transit to the office in City Centre

This study has identified 3 commuting categories which represent the employees who use mixed-mode transportation restricted to walking and public transport. These represent

the highest level of understanding of the case presented in both case studies in the research on the Kuala Lumpur City context. It is appears this group of people have a positive outlook on their life because walking gives them a sound state of mind and physically healthy body. Panter et. al (2013) suggests that those car users who commute into the city centre are more likely to incorporate walking to avoid traffic congestion in the inner city. This research also shows that this is one of the reasons that influence the employees to incorporate walking into their commuting to workplace in the city of Kuala Lumpur. Although Panter's study follows people commuting to the workplace based on home and workplace locations, the study mainly focuses on the characteristics, conditions and perceptions of car commuting on or along the entire route to work. Furthermore, the influencing factors and the characteristics of the route, was absent in this study.

In contrast, this study has reflected on the influencing factors that encourage employees to incorporate walking to the workplace based on the individuals' past and present walking experiences before they make a decision for opting to walk as part of their transportation mode to the workplace. The factors are as follows;

- driver factors to opt for mixed mode,
- barrier factors that hinder the decision to opt for mixed mode,
- psychological factors that affect the perception of combining walking with other modes of transportation,
- external factors related to walking which are beyond the users' control such as weather, enforcement and stakeholders' involvement
- safety and security factors which are the priority needs of the users while walking to the workplace (refer to section 7.2.2 in Chapter 7).

Those who walk also look at their peers who drive as inactive because according to them, the friends drive even for short distances of less than 1 mile, instead of choosing to walk. This implies that people who already walk are able to see the disadvantages of using private cars, which outweigh the positive aspects of driving; they therefore opt for a mixed mode of transportation that includes public transport.

Previous research has revealed that using public transport can involve a substantial amount of walking especially walking to transit, therefore the tendency for commuters

who use public transport to walk more than those who travel by car is high (Yang et al, 2012 and Morency et.al, 2011). Walking stages as discussed above provide strong evidence that the availability and proximity of a public transport network to the office is one of the reasons walking to work is adopted, thus confirming the suggestion made in proposition 4.

8.4.3 Sustainability aspect of the benefits of walking

Employees who walk have a detailed understanding of how walking benefits one's health, the economy, and social and environmental aspects, as tabulated in section 7.2.1 under sub-theme 'understanding the walking benefits'. In the health context, the recommendation is for people to walk for 30 minutes, at least 5 times a week on average; most employees who walk fall into the recommended time for walking to improve health, and they are thus encouraged to abandon the sedentary lifestyle.

Gilson et. al (2011), opine that employees spend a large percentage of their workday sitting, and suggest that small changes in incidental movement or short walks tend to integrate with, rather than disrupt, habitual work practices. This initiative has been practiced repeatedly, in some cases unconsciously, among the employees across both case studies, as represented in the table below. On average, the employees walk for 34 minutes a day in case study 1 and 34.3 minutes a day in case study 2; this can be rounded up to 35 minutes of walking a day. This habit is repeated 5 days a week which corresponds with the health recommendations of the British Heart Foundation (BHF).

Previous research by Panter et. al (2013) shows an average of 12 minutes of walking per day for participants using active modes of transport in combination with the car. Besser and Dannenberg (2005) found that transit users spend 19 min daily walking to and from transit. Respondents in this study, by walking around thirty minutes a day, have not only met but exceeded the average walking time suggested by previous research. Results are shown in tables 7.1 and 7.2 below. This is in the agreement with the health argument made in chapter 2 about reducing health epidemics such as obesity and high mortality risk diseases (cardiovascular diseases, high blood pressure, diabetes, etc.) across the city.

Table 8. 1 Walking to/from Work: Duration for Respondents of Site A

RESPONDENTS	WALKING DURATION PER TRIP (minutes)		TOTAL WALKING DURATION (minutes)	
	Walking to Work	Walking to Home	Per Day	Per Week
R1SA - M	15	15	30	150
R2SA - M	10	10	20	100
R3SA - M	20	20	40	200
R4SA - F	5	5	10	50
R5SA - F	-	-	-	-
R6SA - F	15	15	30	150
R7SA - F	13	13	26	130
R8SA - F	15	15	30	150
R9SA - F	15	15	30	150
R10SA - F	20	20	40	200
			Mean = 34	

Table 8. 2 Walking to/from Work: Duration for Respondents of Site B

RESPONDENTS	WALKING DURATION PER TRIP (minutes)		TOTAL WALKING DURATION (minutes)	
	Walking to Work	Walking to Home	Per Day	Per Week
R1SB - M	15	15	30	150
R2SB - M	20	20	40	200
R3SB – M	-	-	-	-
R4SB - M	20	20	40	200
R5SB - F	10	10	20	100
R6SB - F	25	25	50	250
R7SB - F	-	-	-	-
R8SB - F	15	15	30	150
R9SB - F	15	15	30	150
			Mean = 34.3	

According to Batman and Cartwright (2011), results from the study of the effect of Low Impact Physical Activity on Employee Health and Wellbeing reveal that where employees walk, there is a significant improvement in all aspects of employee psychological wellbeing (such as confidence, self-esteem, sleep and concentration levels) and a significant reduction in all types of stress. Their study shows that employees who already reported taking 10000 and more steps a day were seen to be more productive at work than those who reported taking fewer steps. They then conducted an experiment to evaluate how employees fared after the implementation of the daily walking recommendations set by the WHO. After the experiment, employees who started taking more than 7500 steps a day felt significantly more productive. The results further showed that there appear to be even greater benefits to taking more than 7500 steps a day.

Looking at the case studies presented in Chapters 5 and 6, assuming a sample of 10 employees (as in Chapter 5), 9 out of the 10 respondents (90%) practiced using mixed mode transportation to work in the city centre of Kuala Lumpur. If this were repeated through the entire employee population of KL, with 9 out of every 10 employees incorporating walking in combination with other modes of transport such as trains and buses, there would be a significant reduction in car dependency and other related urban issues (traffic congestion, carbon footprint, poor health, etc.) in Kuala Lumpur in general.

8.5 Analytical Category 3: The quality of Physical Features that Support Walking to Work in the Pedestrian Environment

Research question 1 and research question 3 discuss the quality of the physical features that support walking to work in the pedestrian environment. This analytical category discusses the connection between the users and the physical features in the pedestrian environment; and also looks at how employees perceive walking to work in the pedestrian environment in the city of Kuala Lumpur.

8.5.1 Accessibility and connectivity of elements in the pedestrian environment

Physical activity can be facilitated or constrained by the built environment. Physical environmental factors are associated with physical activity and active travel behaviour (Burbidge and Goulias, 2008). It is necessary to note that the relationship between driving and the built environment is not the same as the relationship between walking and the built environment. In the relationship between driving and the built environment, the car is a barrier between the two, functioning as an entity that stops the driver from connecting to the environment outside the car. This is different from the way that the pedestrian would connect with the external environment because there is no barrier between the two, allowing them the freedom to use all their senses to occupy the pedestrian environment with complete attention. Amato (2004) states that embodiment in the city is interwoven with walking; thus walking as a form of transportation allows one to experience the city.

With respect to the relationship between walking and the built environment, accessibility can be brought about by locating points of origin and destination close together and

decreasing the friction space largely through improved transportation as well as by increasing contact potentials through institutional and other means (Pasaogullari and Doratli, 2004). Physical and visual accessibility of public spaces can be evaluated by its connection to the surrounding urban areas. According to Whyte (2000), the success of movement space is determined by how easy it is to get there and how visible it is, up close and at distance. The findings reveal that the careful planning of development allows pedestrians the freedom to select from a variety of criteria of physical elements that support walking to work. The criteria are: direct pedestrian access to destinations, well connected routes, eases route directness and good route quality. The evidence Whyte presents above is clearly seen within Case Study 2, the KLCC development (refer to Chapter 6). In contrast to Case Study 2, respondents in Case Study 1 complained about the physical elements in the pedestrian environment within the site. Respondent R6-SA, functioning representatively for the respondents in Case Study 1, said:

> "...because when you walk in a good environment, there aren't so many obstacles and people feel relaxed and arrive at the place safely. They manage to arrive to that destination within that time. That is not usually the case here" (R6-SA)

The criteria determining the physical features that support walking to work in the pedestrian environment will be discussed in the following sections.

8.5.2 Pedestrian access to destination

Poor accessibility is a major hindrance affecting the use of the pedestrian environment. This is one of features that have a significant impact on route choice from transit to the office. Route choice refers to the multiple options available to connect one point to another. From the findings across the case studies, Site B was found to be more pedestrian friendly with regards to route choice. In addition to the number of route choices available, pedestrians are able to have different experiences on each route, which they appear to enjoy. Among the variety of route choices, there were options for using underground walkways, indoor spaces (hallway and retails), outdoor walkways and pathways in the parks. The variety of uses coupled with the route choices creates a positive walking experience for the employees. According to Rapoport (1987) and Sauter and Tight (2010), pedestrians move more slowly than vehicles therefore they are more aware of and sensitive to their surroundings. This is linked to proposition no 1 which

relates that pedestrians will walk if provided with proper walking conditions. The evidence stands because of the argument made by the following employees in Site B (Case study 2):

> *"In general, yes definitely. Within here [KLCC area] is 95% okay. But outside [other areas in city centre], if you can improve that it will definitely increase the quality and also will encourage people to walk" (R3-SB)*

In line with respondent R3-SB, respondent R4-SB also said:

> *"…as you can see in the KLCC area it is better compared to all other area, because it is the point of attraction so they have good facilities for the pedestrian to walk. The quality deteriorates as you go further and further away from KLCC area…fewer things to see and it's a plain walkway". (R4-SB)*

This final point is confirmed by the conditions in Site A in Case Study 1 where poor facilities are seen, and as respondent R4-SB mentions, this reoccurs as the pedestrians move further away from KLCC development. This is due to the island developments that dominated KL city development, as discussed in Chapter 3. According to the findings presented in Chapter 5, respondents from Site A have very limited route options while walking to work. Compared to employees in Site B, employees in Site A face the additional difficulty of having to select and switch between routes in order to avoid barriers (section 7.2.2 sub-theme 'barrier factors') and to maintain a certain level of safety (section 7.2.2 sub-theme 'safety and security factors'). Multiple route choices are essential because the speed selected during the trip should be the easiest and most comfortable, requiring a minimum amount of energy expended (refer to Chapter 2 and the images of route choice traces in case studies 1 and 2 in Chapters 5 and 6).

8.5.3 Route Connectivity

As with route choice, route connectivity within Case Study 2 was found to be of good quality. The pedestrians could see and feel that the approach to any building within the area was easy and attractive, without the pressure to avoid motor vehicles, because they are confident that the space belongs to them. However, the surrounding site which begins along the perimeter roads of Site B does not show the same respect for the

pedestrians; there is a frequent discontinuity of the sidewalks, inadequate pedestrian crossing facilities, and lack of attention from motorists.

It can be induced that the conditions in Site A in Case Study 1 are very similar to the poorer conditions on the perimeter surrounding the KLCC development area. Respondents complained of confusion along the route due to repeated interruptions by obstacles on the sidewalks, lack of maintenance and little consideration on the part of motorists to remain in their own zone. These conditions are reflected in the theoretical proposition 3 which states:

> *Physical barriers, obstacles and interruptions along the pedestrian movement path are perceived as unpleasant and time consuming due to the effort people must exert in order to avoid them* (Inman, 2006; Gehl, 2004; Southworth, 2003).

Furthermore, employees expressed their concern over the amount of time it takes for them to cover a short distance while walking, particularly when they arrive at the final transit station and are required to walk from this station to the work place. They complained that the barriers and the fact that they have to continuously change between routes increases the time taken to arrive at their workplace (synthesis in section 7.2.2 under sub-theme 'psychosocial factors' and section 7.2.3 under sub-theme 'route connectivity').

8.5.4 Route Directness

This research found that route directness, like route connectivity, gets worse as the pedestrians move from within the site to the surrounding area of Site B. Within the site of Case Study 2, the approach from the parks to the building is direct, clear and precise making it difficult for the pedestrian to get confused or feel insecure while walking however this situation does not last throughout the case study area. After a while, route directness starts to disappear beyond the perimeter roads, where it becomes increasingly difficult to cross over or enter any building. This occurs even more in Case Study 1 where the conditions of route directness were not in any way favourable to the pedestrians (refer to Chapter 5,6 and synthesis in section 7.2.3 under sub-theme 'route directness'). This is confirmed by the first theoretical proposition which states that:

> *Physical barriers, obstacles and interruptions along the pedestrian movement path are perceived as unpleasant and time consuming due to the effort people must exert in order to avoid them* (Inman, 2006; Gehl, 2004; Southworth, 2003).

The condition of route directness in these two cases can be extrapolated to represent most of the area in Kuala Lumpur city. Current development in Kuala Lumpur is based on the concept of island development as mentioned in Chapter 3, and this has affected the larger urban spaces in the city. The evidence shows that route directness gets more difficult as it goes beyond the site boundary (refer to section 5.6.3 and 6.6.3). The implication of this condition is that it decreases the user's confidence in their built environment due to inconsistencies in the quality.

8.5.5 Route Quality

According to Whyte (2000), four key elements contribute to the making of a successful public space: accessibility, the engagement of people in activity, a high-quality, safe and comfortable space, and a sociable space for interaction, as stated in proposition 3:

> *A pedestrian environment that is safe, comfortable and pleasant which provides a positive experience to the pedestrian while walking to the workplace (Gehl, 2004; Patton, 2007).*

In relation to the proposition above, much can be said about route quality in the pedestrian environment because it is a key factor in determining whether pedestrians will make a decision to walk in the area. Route quality is the main contributor to comfort and enjoyment in the public space, where it can serve as a point of attraction because it includes walkway condition, aesthetic elements, street furniture, greenery and way findings. Adding on to that, the quality of the pedestrian environment, such as the presence of street lighting, benches, landscaping, trees, and other amenities has also been cited by some as a key determinant of walking behaviour (Forsyth et al. 2008).

Within Case Study 2, KLCC development offers the pedestrian a better route quality as compared to the site surrounding KLCC, and the area within Case Study 1. This study found that the elements of good route quality mentioned above are directly related to

the pedestrian's thoughts and experiences, in that these elements could cast a positive light on the walking experience, and could act as incentives to the pedestrian to walk. The author learned that the urban design elements were thought through in the master plan from the early stages; thus the overall pedestrian environment is friendly to users.

Allan B. Jacobs in his book Great Streets explains the importance of walking on the city street (1993);

> "It's on foot that you see people's faces and that you meet and experience them. That is how public socializing and community enjoyment in daily life can most easily occur. And it's on foot that one can be most intimately involved with the urban environment: with stores, houses, the natural environment, and with people".

8.5.6 Street Furniture

The findings show that the urban design element such as street furniture is provided at appropriate points in the KLCC Park, and comes in many designs to suit the site. According to Gehl (2004), the presence of street furniture provides a venue for people to interact; he refers to this as 'sitting in the urban living room'. Case Study 2 shows that there is a balance of pedestrian activities such as sitting, standing and walking, which all occur at the same time within the site. As one of the respondents noted:

> "*More importantly, when we talk about public spaces, they should be fun. Not to be misused or ill-maintained. I think everyone agrees that these seats, gazebos and many other aspects within the KLCC make it better*." (R3-SB)

The presence of other pedestrians sitting in the urban spaces in the KLCC development enhances the quality of life, as compare to case study 1 where the absence of street furniture means that pedestrians do not stay outdoors. Respondents reported struggling to find seats in the pedestrian environment in Case Study 1. One of the respondent's describes a personal experience:

> *"There is no place to sit down except at the bus stops. If there is, it is in Kota Raya and Pasar Seni area but usually it is people waiting for the bus that are sitting there. So, we usually don't have place to sit down."* (R10-SA)

Another concern raised by the employees across both case studies is the issue of street lighting. Street lighting is a key organizing streetscape element that defines the night time visual environment in urban settings. This is certainly the case with the street lighting in Site B; however, street lights in Site A were said to lack power (dim) (refer to Chapter 5, 6 and synthesis in section 7.2.3 under sub-theme 'route quality').

8.5.6.1 Walking Conditions

Walking conditions in Site B are favourable to the pedestrian in that there are very few disruptions in the pavement which connects Suria KLCC to the surrounding area. The pavement surface has a subtle change in level that allows pedestrians to walk comfortably, unlike Site A where pavement materials sometimes slip out of place and the sudden changes in kerb levels could cause pedestrians to trip and fall. The changes in level in the pedestrian environment cited in the surroundings of Case study 1 as well as Case study 2 were a major concern for women who use high heel to walk to work, and the handicapped. In addition the findings show that the pavement capacity was not adequate to accommodate the large volume of people walking on it at any given time, thus causing overcrowding.

Cross walks are meant aid the pedestrians while walking in the movement space in the city. Cross walks in KL however, tend to be confusing to pedestrians crossing the car traffic environment. In some cases, the pedestrian crossings, that is, both the zebra crossing and the green man were altogether absent. In a particular case, the green man light had been vandalised and not replaced in Case Study 1 (refer to Chapter 5). On the other hand, in Case Study 2 there is no need for either green man or zebra crossing because of the careful planning of urban design elements in the area. Furthermore there is a clear demarcation between pedestrian traffic and vehicular traffic in Case Study 2 that induces confidence in the employees (refer to Chapter 6).

Generally, the obstacles along the pathways of the site surrounding KLCC and the site of Case Study 1 reflect the entire situation within the city centre, and in KL as whole.

8.5.6.2 Aesthetic elements and greenery

Another significant part of route quality is the aesthetic elements in the pedestrian environment. The reason aesthetic elements and greenery were combined for this discussion is that the employees understood greenery as part and parcel of aesthetic elements that can be appreciated as hardscape and softscape. As can be seen in Case Study 2, the employees responded well to hardscape such as sculptures, water fountains, ponds, wading pools, etc. and hoped to see more forms of art displayed in the area and other parts of KL in the future. The general response was best reflected by two who said:

"*Most of the time it's okay, it's within the park, so of course you will feel its green, fresh and you feel love*" (R2-SB).

"*Yes, I like to walk through here where it is green. There are many things to see, there are water features and trees*" (R9-SB).

Greenery refers to the softscape of the site in the form of vegetative shrubs, deciduous trees, flowers, etc. The respondents appreciate the vegetation as living elements that give life to the environment. As pedestrians walk they enjoy scenery that comprises a proper balance between soft and hardscapes (refer to Chapter 6).

In contrast to Case Study 2, Case Study 1 represents an imbalance between softscape and hardscape where the hardscape is the dominant features in Site A. As noted in Chapter 5, the buildings seem to have been constructed to fill the site with hard elements and, as an afterthought, the pavement are cut open to allow the planting of smaller trees which were perceived to have aesthetic values. The employees who walk in this site, however, have no positive feeling towards the so called 'greenery' in the area.

8.5.6.3 Way finding

The findings revealed that all respondents in this study indicated that way finders are significant in any pedestrian environment, because pedestrians are not always familiar with the site. In Case Study 2, way finders are accurately placed and have an interesting

design that allows pedestrian to spot and read them with ease. It increases the legibility of the case study area and reduces the time taken to find destinations. The majority of the respondents in this site conveyed their satisfaction with the way finders in their walking routes.

On the other hand, Site A in Case study 2 is filled with unclear and randomly placed signage around the site which does nothing to aid accessibility and way finding for the pedestrians in the area. The respondents find other means to familiarise themselves with the site by engaging all their senses while walking. Some reported making sense of the route network between the transit station and the office. Others reported identifying landmarks in the form of people, stalls and billboards. This shows that they completely do not pay attention to the signage that exists in the environment of Case Study 1 (refer to Chapter 5 and synthesis 7.2.3 under sub-theme 'route quality').

8.6 Analytical Category 4: Stakeholder Involvement in the Pedestrian Environment

Analytical category 4 is mainly aimed at sorting out research question (RQ) 4, that is, how to encourage the employee to opt for walking as part of transportation to workplace. However the author found that the answer has a layered synthesis which reflects on other research questions (RQ1, RQ2 and RQ3) as well. The following discussions are based on the user's 'wish' gathered during the interviews and participant observation (refer to section 7.2.4 in Chapter 7).

8.6.1 Role of stakeholders from the pedestrian's perspective

At the initial level, when the employees were asked who they thought the stakeholders were and what can be done by these stakeholders to improve the pedestrian environment, their answers were directed towards the law enforcers and the local authorities.

The employees understood the relationship between themselves as pedestrians, motorists and the built environment, but were unable to see the relationship between themselves and other stakeholders. They failed to see themselves as stakeholders who also have a hand in improving the pedestrian environment.

Their ability to see the larger picture is limited by their understanding of travel behaviour from home to their workplace as an individual action. They are under the impression that their travelling behaviour limits them to the role of user and that therefore, they have fulfilled their role in the pedestrian environment by using it. This is why, when they were asked about stakeholders during the interviews, they identified stakeholders other than themselves. The stakeholders whom the employees held most responsible were the authorities, including law enforcers (police), local authorities and, indirectly, the federal government. The employees criticised the local authorities for not providing sufficient pedestrian facilities and maintaining the existing ones, the law enforcers for not implementing or enforcing policies involving pedestrians, and the federal government for not being able to achieve world class city status by the stipulated date (2020) because they do not deal with problems appropriately on the civilian level.

8.6.2 Necessary improvements from the employees' perspective

In the course of this research, the most significant idea contributed by the employees is that they felt that it is essential for the authorities to include them (the pedestrians) in the decision making process. They felt that, as the main users of the movement space, they understand what the pedestrian environment lacks. They believed that if they continue to be marginalised in terms of input into the planning, any facilities put in place or ideas implemented by the authorities will give rise to unsatisfactory solutions, similar to the elevated pedestrian bridges (section 3.5 in Chapter 3) which in the view of the pedestrians are uncomfortable and inefficient.

Among the suggestions made by the employees during the course of the interviews and participant observation were improvements to pedestrian facilities such as zebra crossings, wider and continuous walkways, connected routes, less obstruction along the walkways, safety, more efficient enforcers on the sites and less construction encroaching into the walkways. Furthermore, the employees felt that the federal government should not develop the city at the surface level by focusing on the hotspots only (section 5.6.5

and 6.6.5). They believed that there should an even distribution of resources in developing a good quality pedestrian environment for the city as whole. The above argument relates to the theoretical proposition no 6, and is confirmed by such statements as:

An integrated approach that involves various disciplines is needed to envision and advocate for a quality pedestrian environment that encourages walking in the city (Pikora, 2003, Ewing, 2006, Aytur, 2007; Lee & Moudon, 2006, PQN, 2010; Litman, 2011; Lapintie, 2007; Kitamura et al., 1997; Handy et al., 2002)

It is essential to point out all stakeholders must be involved in the making and maintenance of a good quality pedestrian environment in the city (refer to Chapter 2). Stakeholders include the employees as pedestrians as well as all other pedestrians, the public sector (municipality of an area, urban planners, designers, public health professionals, transportation division, etc.) and the private sector (employers, retailers, land developers, etc.). All these stakeholders are directly and/or indirectly involved in urban improvement in the city centre.

The continued marginalisation of the pedestrians from the planning process causes a lack of a well-rounded understanding on the part of the pedestrian about the relationship between the stakeholders and the pedestrian environment. It becomes clear, through this research, that the employees appear to be unaware of themselves as stakeholders. This issue was cited by a majority of the employees, as discussed in the findings of Chapter 5 and 6. This marginalisation has meant that people treat the environment as they please, without feeling that they hold a stake in it. In order to correct the travel behaviour of employees, there needs to be a collective decision taken by all stakeholders to include pedestrians in the planning process.

This research finding is in congruence with Heath et al's five barriers (2006) which identifies the lack of effective communication between professional groups including urban planners, public health professionals and architects in the implementation of urban

design policies and practices that can facilitate physical activity, as one of the major barriers in changing behavioural norms related to lifestyles and physical activity among pedestrians.
If the current phenomenon in KL persists, it will eventually become an abandoned city as discussed in Chapters 2 and 3.

8.7 Proposed framework

In fulfilment of the research aim, this section proposes a framework and a list of recommendations for the improvement of the pedestrian environment to encourage employees to walk to work as part of their transportation mode in the city centre of Kuala Lumpur. The focus of this framework is to provide an understanding of the pedestrian environment through a holistic approach in advocating walking to work.

The framework emerges from the initial conceptual framework of chapters 2 and 3 and from data collected for Chapters 5 and 6. Refinement of the framework then arises from the replication logic established after cross-case analysis.
Several problems related to a lack of quality in the pedestrian environment have been identified. These include: inefficient public transportation; excessive use of the automobile for travel to workplace; negative attitudes towards walking; and a lack of integration among relevant authorities for the improvement of the pedestrian environment in KL city centre. Hence, this research has focused on examining a set of themes that give insight into the perception the employees have towards walking as a possible transportation mode. The study also looks into the influencing factors that affect employees' perceptions of walking.

Adopting the method of triangulation, this research observed and analysed the situation in the existing pedestrian environment. The research also adopted a case study approach to the problem of the units of analysis (the employee as the user and the pedestrian environment while travelling to work) and proposed a framework based on the two units of analysis. The framework emerges from the interviews, participant observation and

literature review, and is also supported by the theoretical propositions in chapter 2 (Figure 3.3, 3.4 and 3.5) and the conceptual framework in chapters 3 and 6 (Figure 5.3).

The social ecological perspective highlights the importance of the "behavioural setting" or the "physical and social context in which behaviour occurs" (refer to section 2.7). According to this view, certain settings support or discourage physical activity, including walking (Sallis et al., 1998). The framework proposed for this research uses this social ecological approach to provide a theoretical framework around which the various circles of influence on walking behaviour can be incorporated as illustrated in the framework below (see Figure 8.7).

Within this framework, the relationship of interdependence and dependence between the two units of analysis (the users and pedestrian environment) and among various related elements such as mixed mode of transportation, physical features in the pedestrian environment and stakeholders' involvement, all work together to make walking to work achievable. This framework demonstrates a holistic understanding of incorporating walking as part of the transportation mode to the workplace. There are a number of factors and features in each major category which capture a great deal about the walking environment, giving an in-depth and micro-level picture of employees commuting in the Kuala Lumpur context.

The framework is intended to encourage the urban working population in Kuala Lumpur to change their current mind-set towards walking by effectively deploying data from the analytical categories to enhance the walking experience. Further explanations on the framework are as follows.

1. The employees as the users are most likely to walk more when they understand the benefits of walking to their quality of life from health, economy, social and environmental perspectives.
2. The employees as the commuters are most likely to reduce car dependency, and to support commuting using mixed transportation modes in the city, when they truly understand the advantages of combining walking with other mixed transportation modes to commute to their workplace.
3. Improvement in the quality of physical features to support walking in the pedestrian environment will encourage people to take up walking as part of transportation to

the workplace; however this will need the involvement of various stakeholders from different areas.

These categories, factors and features have been explained in detail in section 8.3, 8.4, 8.5 and 8.6, Chapters 5, 6 and 7 respectively.

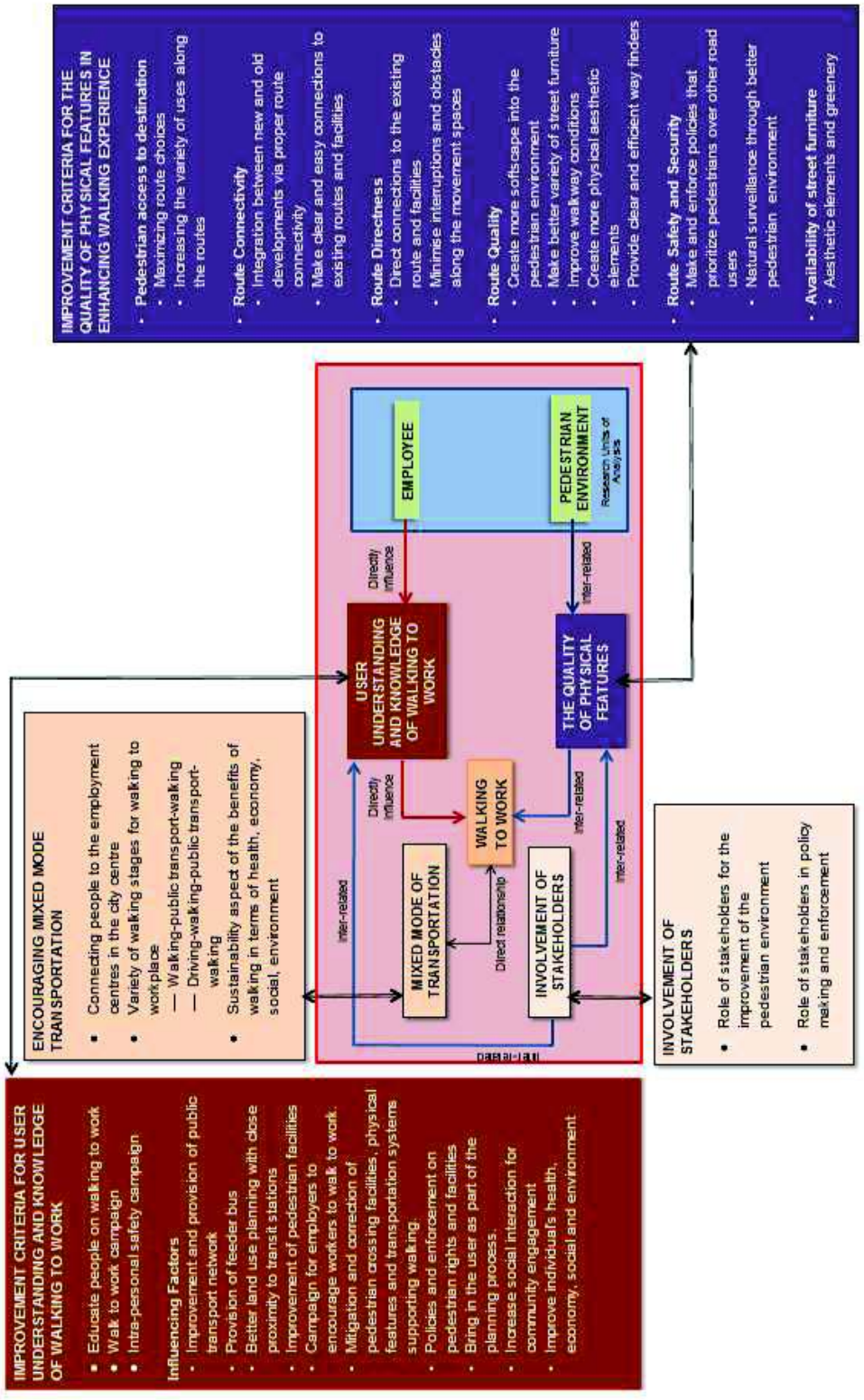


Figure 8. 7 A theoretical framework for holistic understanding of employee walking to work.

8.8 Summary and link

This chapter has narrated a richly detailed story that takes into account and respects a particular context and that connects respondents, events, processes, activities, and experience of walking to larger phenomena. The chapter portrays a holistic view in understanding the issues of employees commuting to work and incorporating walking as part of their transportation to the workplace in Kuala Lumpur. The research emphasises the employees' perceptions of walking as part of their transportation mode to workplace, the factors that may influence them into incorporating walking as part of modes of transportation to workplace, the physical features that support walking in the pedestrian environment, and their dream environment for a positive walking experience while walking to the workplace.

Extensive cross-case analysis from Case Study 1 and Case Study 2 was carried out in the previous chapter, synthesising each theme and its subthemes in answering four research questions generated for this research. The synthesis then led to a comprehensive discussion and explanation building in an analytical thematic form, based on the layered synthesis derived from the findings in the cross-case analysis combined with the literature review, research and practices. The author discovered four (4) analytical themes which combine the individual units of analysis (the users and the pedestrian environment) to show that walking to workplace occurs as an integrated whole. Each analytical theme was linked to the two units of analysis (users and pedestrian environment) and theoretical proposition and discussed in the context of the research questions All major dimensions of this research that were discussed in Chapter 1, Chapter 2, Chapter 3, Chapter 5, Chapter 6 and the cross case analysis are taken into account.

The chapter ends with a discussion on the proposed framework that clearly individualises the two units of analysis and defines their relationship with the analytical categories, and contains the research aim, problem statement and research objectives. Plans for the future urban environment can be modelled on the holistic understanding displayed in the framework put forward here, for the enhancement of the walking experience for walking to work in the pedestrian environment of Kuala Lumpur city centre.

CHAPTER 9. CONCLUSIONS AND RECOMMENDATIONS

9.1 Introduction

This research set out to explore employees' perceptions of including walking as part of transportation to work, as an alternative to car dependency within the context of Kuala Lumpur city. The study has identified the issues of long hours commuting between employment centres and residential areas, high dependence on privately owned vehicles, and severe traffic congestion into the city centre, all of which have implications for deterioration in public health and active community, high spending on fuel, and environmental degradation. The study also examined the employees' understanding of walking to work, the way they perceive walking as part of their transportation mode to work, the factors that influence them to incorporate walking as part of transportation mode, the quality of the pedestrian environment supporting their walking activity, and their views on how to enhance their walking experience while walking to work.

Having satisfactorily achieved the main aim of this research as stated in Chapter 1, which is to develop a framework for the enhancement of employees' walking experience in the context of Kuala Lumpur, and also having successfully resolved all the research questions in Chapters 1, 5 and 6, this final chapter draws attention to the main research findings, synthesis of the objectives of the study, the contributions of this research to the current body of knowledge regarding employees' perceptions of walking as part of mixed mode of transportation, and the pedestrian environment that supports walking to work.
The chapter also points to directions for future research for interested researchers in related fields who are considering similar studies by highlighting the limitations of the current research. The chapter concludes by identifying and highlighting the conclusions of the whole research, in a concise form.

9.2 Main Findings

The main empirical findings are chapter-specific (Chapters 5 and 6) and were summarised in Chapter 7 through the cross-case analysis. The findings are then adjusted to form four

analytical categories to relate the minor details of the factors in and features of the case studies, to the larger context of walking to work. This research has developed a theoretical framework that puts forward a holistic view of the pedestrian experience, based on the employees' understanding and knowledge of walking to work.

The theoretical framework in Chapter 8 has drawn a strong relationship between the two units of analysis (users and the pedestrian environment); only by looking at this interrelationship will it be possible to make walking to work achievable in the context of Kuala Lumpur. Apart from users and the pedestrian environment, mixed mode of transportation and stakeholders' involvement in improving the quality of the physical features in the pedestrian environment are equally important. This research presents the main findings with respect to the above component as follows:

The employee as user

For Kuala Lumpur city to become a walkable city for everyone, it is important that the focus must be the users, that is, the pedestrians. The first major finding of this research is that the majority of the respondents indicate that walking as part of transportation to work has a strong association with reducing car dependencies when commuting to the workplace in the city centre. A conclusion to be drawn from this finding, which also answers research question one, is, firstly, that it reflects the user's reaction towards the actual reality that surrounds them. The key factor is that users need to change their negative perceptions of walking through increased knowledge and better understanding of the situation, in order to choose a sustainable way to travel to and around the city centre. Education about walking as part of commuting for utilitarian purposes should be disseminated to the general population using campaigns, public lectures, awareness programmes, etc.

Secondly, although understanding on the part of the pedestrians is a key factor in improving the pedestrian environment, various factors influence the pedestrians' understanding of walking to work. Influencing aspects such as the psychosocial state of mind of the user will have an impact on their willingness to walk in the pedestrian environment. Their state of mind can, for example, allow them to feel empowered while walking because they made the conscious decision to do so. When they walk willingly,

they begin to understand and profit from the benefits of walking to their physical and mental health, their financial situation and their sensitivity to the environment; all of this helps create a stronger sense of engagement and social interaction in the community.

Thirdly, safety and security are basic needs which determine if people feel encouraged to walk in the pedestrian environment (refer to synthesis 7.2-5 sub-theme 'safety and security factors' for Case Study 1 and Case Study 2). Since the pedestrians walk in the built environment, they are vulnerable to dangers and insecurities that include the fear of crime, vehicular traffic, harassment and actual crime. A conclusion that can be drawn from this finding is that the users need for improved physical facilities related to safety and security such as better crossing facilities, improved route design, adequate lighting, etc. This answers research question two in which safety and security is one of the factors that influences the employee to incorporate walking to work.

Finally, external factors such as weather conditions, policies and enforcement, and a vision towards a world class city were all cited by the majority of respondents as issues to be addressed in the pedestrian environment. The elements mentioned above are classed as external factors because the users have little control over them. However, something can be done to mitigate the issues in relation to the pedestrian environment. A conclusion to be drawn from this finding is that the users need to understand themselves as stakeholders in order to come to a consensus with other stakeholders on the policies and enforcement strategies on pedestrian rights for active walking in the city centre. In addition to the above, Powell et al. (2006) suggest that policy makers should seek to improve facilities and provide better access for a wide range of socio-demographic groups.

The quality of the pedestrian environment

The second major finding is that the pedestrian environment has a strong link with the user walking to work. Based on chapters 5, 6 and 7, different walking stages have been identified; walking, which should mostly occur in the first and last miles of travel to the workplace, forms a significant part of the mode chain of commuting to work. As the users walk within the pedestrian environment, their minds and bodies are engaged because their senses are alert and aware of the elements surrounding them. A conclusion that can be drawn from this finding is that there is a need for a good quality pedestrian

environment which provides several route choices, good route connectivity, adequate accessibility and various land uses, all of which will allow the pedestrians to enjoy the scenery and greenery without being exposed to accidents or harm.

The walkability of the city centre is dependent on how well the connections such as sidewalks, pathways, underground and elevated walkways, etc. work together with other urban design elements to encourage people to walk. The physical features related to pedestrian facilities connect all types of pedestrian movement and is crucial in supporting walking to work and to the success of walkable cities as has been discussed in the literature review in Chapter 2. Certain physical features have been identified in Chapters 5 and 6 as five criteria that need to be refined in the current pedestrian environment around Kuala Lumpur city. The five criteria are as follows:

i) Ease of pedestrian access from the final transit to the office in the city centre is very much dependent on the route choices that have been offered in the pedestrian environment. The majority of the respondents in Case Study 2 are satisfied with the movement choices available to them; they have a variety of options on how to make their journey by walking and using public transport, as explained in Chapter 6. In Case Study 1 and other areas in KL city centre, however, the majority of the respondents feel marginalised when they walk in the pedestrian environment as they have very limited route choices. A conclusion that can be drawn from these findings is that it is necessary to improve this first criterion in order to provide the maximum choices, along with a variety of uses along the movement spaces, to encourage people to use public transport.

ii) The next criterion is route connectivity which Gehl (2004) understands as creating a sense of place within the site and linking the site with the surrounding areas using existing routes to have better integration of new and old. For further discussion, refer to route directness below.

iii) The idea of route directness as a principle of creating a better pedestrian environment for walking to work overlaps with the previous criterion of route connectivity. However, it is more specific to creating a more convenient and

comfortable place to walk. The majority of the respondents referred to the amount of time it takes for them to cross, the ease (or otherwise) of crossings, etc. (as emerged from the findings in Chapters 5 and 6). Within the site in Case Study 2, it is observed that the pedestrians are able to ambulate easily within the movement spaces as compared to the areas in the surrounding site of Case Study 2, which appears to be similar to Case Study 1, where the large number of interruptions and obstacles along the route make ambulation difficult. A conclusion to be drawn is that making direct connections to the existing route and facilities is essential to minimise interruptions and obstacles along the movement spaces.

iv) Route quality is about the functional performance of the pedestrian facilities which contributes to the character of the urban spaces. The physical features that enhance route quality are walking conditions, greenery, aesthetic elements, street furniture, way-finders, etc. The sample of respondents indicated that within the site of Case Study 2, the pedestrian environment is sufficiently equipped with all the above mentioned features, making the spaces more enjoyable compared to the surrounding site of Case Study 2 and within the site of Case Study 1. The conclusion that can be drawn from these findings is that the features in Site B in Case Study 2 represent an exemplary planning design which should be followed by other places like Case Study 1 in Kuala Lumpur city.

v) When discussing route safety and security, the majority of the respondents cited fear of traffic, crime, harassment and fear of falling by tripping over uneven pavement surfaces. With regard to the findings from Case Study 1 and 2, among others criteria, safety and security are the crucial factors that determine the pedestrian's engagement with walking to work. In Case Study 2, the pedestrians have few worries while walking within the site. In comparison to Case Study 1, Case Study 2 is almost ideal because the pedestrians in Site A (Case Study 1) feel less confident while walking in the surrounding sites. A conclusion that can be drawn from this is that there is a need to improve the surveillance and enforcement levels in the area in order to ensure all the rights of the pedestrian

are protected. In addition, the design of building and spaces layout will help to control the flow and density of traffic into the city centre. Signs and add-on traffic calming features, which are under-utilised in Kuala Lumpur, are essential as measures to create awareness among pedestrians and traffic users.

The mixed mode of transportation

The vision of turning Kuala Lumpur into a World Class city by 2020 should encompass activities on the street level especially with regard to pedestrians and the built environment. According to Frank and Kavage (2009), land use patterns and transportation investments should allow people of all ages and abilities to maintain a basic level of independence, mobility and physical activity. A major defect of land use planning in Kuala Lumpur, however, is that it has reached the point where the only option pedestrian have is to embark on long distance trips on a daily basis. In order to remedy this situation, this research suggests mixed-mode transportation in the form of walking and public transport usage as the answer.

The majority of the employees highlighted that in their experience mixed-mode transportation and walking to work are interrelated. Many of them experienced walking to the transit station and using public transport, either bus or rail network as discussed in the sections on travel modes to work and stages and characteristic of walking to workplace in Chapters 5, 6, 7 and 8. Mixed-mode transportation could not only solve the problem of car dependency in the city, but also supports walking as the first and last stage of the mode chain of travelling to work (refer to synthesis 7.1.1 sub-theme ‘walking stages in travelling to workplace, CS1 and CS2; category 1, 2 and 3’). A conclusion that can be drawn from this finding is that mixed mode of transportation is a factor that makes walking feasible and enjoyable, thus the need to promote walking combined with mixed mode of transportation, as well as synchronisation of land uses with various modes of transportation in order to minimise the distance to be travelled, .

The Role of Stakeholders

All the factors mentioned above assist in improving the quality of life in a sustainable manner because it encourages the employees to choose walking as a part of transportation mode to workplace, which scholars have identified as sustainable transportation for the future. It is important for the various disciplines (stakeholders) to remember that they should not lose sight of the fact that the entire population can benefit from any intervention that makes it easier to be physically active as part of everyday life. A conclusion that can be drawn from this finding is that campaigns from all parties need to be carried out not only to increase pedestrian understanding but also improve their perception. Without the cooperation of government authorities, however, policies cannot be passed to improve the current pedestrian environment. A further and related conclusion that can be drawn is that good governance is needed not only in changing and adapting current development practices to include walkability, but also in terms of policies on pedestrian rights and designing mechanisms to facilitate and plan physical improvement in relation to the pedestrian environment. All stakeholders need to play a role in order to achieve sustainable travel to workplace.

9.3 Achievement of the research aim and objectives

This research raised five research objectives (refer Section 1.3 in Chapter 1) with the formulation of four research question (refer Section 1.4 in Chapter 1). The first research question is related to the employee's perception of walking as part of their transportation mode to the workplace. The second looks at the factors that influence the employees to incorporate walking as part of transportation to workplace in the existing pedestrian environment in the city centre. The third is about the main physical features in the pedestrian environment that encourage the employees to walk to work. Finally, the fourth question is about how walking to workplace could further be encouraged.

Data was collected via face-to-face semi-structured interview, participant observation and literature reviews. Two employment companies (Office A and Office B) in two case study areas (Case Study 1 and Case Study 2) within the city centre of Kuala Lumpur were

investigated for this research. The objectives of this research are listed in Section 1.3 in Chapter 1. The accomplishment of the research objectives will be further expanded on in the following sections:

Objective 1:

To review available literature to gain an understanding of the meaning of walking to work for the employees, in particular the definition, the process, their daily activities, the benefits, the barriers to walking in the pedestrian environment and the physical features that support walking.

To ascertain a clear theoretical framework related to this research, the literature associated with the concepts of walking to the workplace was reviewed. From the literature reviewed, a number of authors offered definitions of walking in general, the pedestrian, walkability and the pedestrian environment. In addition, the author suggested a definition of walking to the workplace in relation to this research (refer to Section 2.2.5 in Chapter 2). The science of walking was discussed (refer to Section 2.3 in Chapter 2), as was the idea that the activity of walking does not take place in isolation within the built environment. There are numerous reasons for the re-emergence of walking as an alternative transport mode for workplace travel and these drivers are identified in this research (refer Section 2.4 in Chapter 2).

From the literature review, it was seen that walking to the workplace has strong associations with sustainability and the employees' quality of life. However with the current design of the built environment, the employees face numerous problems that make commuting to work via walking and public transport difficult and uncomfortable, leading to a narrow, negative perception of walking to the workplace, and an over-dependency on vehicles. This leads to physical inactivity, which is associated with a high risk of health problems such as physical and mental stress. The aesthetic appearance of the pedestrian environment is also declining (refer Section 2.5 in Chapter 2). It is imperative to note that walking plays a big role in people's health, finances, social life and environment, as well as the country's economy. It is therefore essential to make people really understand the benefits of walking (refer to Section 2.6 in Chapter 2). It is also

important to recognise that walking is a multi-sensory experience; therefore, barriers and obstacles which contribute to an uncomfortable and unsafe feeling while walking must be identified and dealt with (refer Section 2.7 in Chapter 2). In addition to barriers to walking, there are other equally important elements worth highlighting, such as accessibility to the workplace, which will determine whether the pedestrians' needs are fulfilled.

From the analysis of the case studies, the physical features that support and encourage walking were identified and were grouped into four sub-categories, namely pedestrian access to destinations; route connectivity, route directness and route quality (refer to Section 5.6 in Chapter 5 and Section 6.6 in Chapter 6). It was concluded from the case studies that a good quality pedestrian environment will have close proximity to transit stations with an average of 10 to 15 minutes walking time to reach the stations, maximum route options with various mixed uses, easy and direct routes to reach office and eating places, and good quality physical features that will encourage people to walk more comfortably while feeling safe.

Objective 2:

Explore the employees' perception of walking as part of their transportation mode to the workplace in the city centre of Kuala Lumpur.

For objective 2, the overview of Kuala Lumpur city development was discussed in Chapter 3. It was noted that Kuala Lumpur was once a walkable city (refer to Section 3.2.2 in Chapter 3); changes to the pedestrian environment happened gradually over time following the city's decentralisation, which involved placing settlements in the new growth area in the fringes while retaining employment in the city centre of KL. This type of planning has had a great impact on employee mobility during the commute to and from the workplace in the city centre. Commuting to work during the AM and PM rush hours has become inefficient due to challenges in reaching the workplace on time, physical and mental stress from being trapped in severe traffic congestion, high influx of privately owned vehicles into the city centre and lack of reliable public transport (refer to Section 3.3). People have shifted from driving, to commute by walking and using public

transportation (mixed-mode transportation). However, even though they have reverted to walking to the workplace, they face difficulties in the pedestrian environment due to poor quality and lack of planning in the pedestrian movement spaces (refer to Section 3.4). Relevant evidence was gathered from face-to-face interviews and participant observation; the author, together with the respondents, traced the selected routes in the two case studies. The author was able to obtain a rich and in-depth understanding of real-life conditions in the existing pedestrian environment in city centre of Kuala Lumpur (refer to Chapter 5 and Chapter 6).

In addition, inquiries about the employees' perceptions of walking as part of transportation revealed a significant travel pattern to work for both case studies. The replication logic from the cross-case synthesis proposes that the employees that walk most and are most positive about walking for health, economic, social and environmental reasons are those who combine walking with public transport to work (refer to the synthesis of implicit understanding of walking to work in Section 7.2.1 in Chapter 7).

Objective 3:

Investigate the factors that influence employees to incorporate walking to the workplace in the existing pedestrian environment in the city centre of Kuala Lumpur.

Under objective 3, the factors that influence employees to walk to work in the existing pedestrian environment are investigated. This includes sub-categories such as driver factors, barrier factors, psychosocial factors, external factors and safety and security factors (refer to Section 5.5 in Chapter 5, Section 6.5 in Chapter 6 and Section 7.2.2 under the 'influencing factors for walking to work' theme in Chapter 7). From case study 1 and case study 2, it was concluded that the main reason for employees to walk and use public transport to travel to work was frustration with the severe traffic congestion and high numbers of SOV on the roads, the availability of public transport network in close proximity to their office and car parking facilities at the nearest transit station, and encouragement from the employer to walk to work. However, users also expressed dissatisfaction with barriers in the pedestrian environment. This confirmed the five issues

discussed in Section 2.5 in Chapter 2 and in Chapter 3, and further justified the importance of this research.

The emerging findings from the cross-case synthesis on the sub theme 'psychosocial factors' has provide evidence that walking to work in the pedestrian environment can have a positive effect on both body and mind; however, this depends on the individual's perceptions and experience. Tuan (1977) supports this point by stating that there is a dynamic relationship between personal, behavioural and environmental factors where a high value is placed on human life experience (refer to Section 7.2-3). Hence, this type of study has its own merit which is suitable for the qualitative approach.

From the cross-case synthesis, it was identified that external factors also influence the employees to incorporate walking to work as part of their travel mode. This factor has been acknowledged by the majority of the respondents and is seen to be replicated across the two case studies, where the employees show concern about related pedestrian policies such as weather, enforcement, stakeholders' involvement and achieving world class city status. These factors are all beyond their control but can be solved through law enforcement and an appropriate design of urban space and policy enforcement. The need for safety and security is also a top priority for the employees while walking to work. As discovered from the case study, fear of crime, harassment, traffic and other dangers is seen as a crucial factor that needs urgent improvement in the pedestrian environment.

Objective 4:

Investigate the physical qualities of the existing pedestrian environment as related to the employees' walking activity in the city centre of Kuala Lumpur.

The physical features that support and encourage walking in the pedestrian environment were investigated to answer research question four (refer to Section 1.3 in Chapter 1). The key findings emerged from in-depth semi-structured interviews and participant observation in two case studies within the city centre of Kuala Lumpur. Context-rich information based on the personal accounts, perceptions and experiences of the employees while walking to work has been elicited and organised into key categorical

themes, namely: pedestrian access to destinations, which is about providing maximum options for route choice, with a variety of uses along the routes; clear route connections to the existing routes and facilities; direct routes free from barriers and interruptions; and quality of routes with urban design facilities such as street furniture, greenery, aesthetic elements, and good walking conditions with quality pavements (refer to Section 5.6 in Chapter 5 and Section 6.6 in Chapter 6). The cross-case synthesis has shown a contrast between Case Study 1 and Case Study 2 in that Case Study 2 is a good quality pedestrian environment that should be repeated throughout Kuala Lumpur, whereas Case Study 1 is a representation of the generally poor quality of the current pedestrian environment in the city.

Objective 5:

Develop a framework to advocate walking to work in the city centre of Kuala Lumpur.

The findings from Research Questions one, two, three, and four were adjusted to form four analytical categories that then takes those findings to another level of exploration and discussion as discussed in Section 8.7 in chapter 8. The theoretical framework developed here uses a social ecological approach to explain the specific findings in chapter 5 and 6 and extrapolate them into a larger context in the context of Kuala Lumpur. The employees as users and pedestrians are seen as the main focus in this framework. The framework is intended to inform the urban working population in Kuala Lumpur on the advantages of incorporating walking as part of transportation to work, and to enhance the walking experience among the employees.

9.4 Contribution to the Study

This research focused on a holistic understanding of what will make employees make walking part of transportation to their workplace. This research is intended to extend the existing body of knowledge, and also to benefit practitioners in the relevant fields, as will be discussed in the following sections.

9.4.1 Contribution to the Body of Knowledge

In general, the findings of this research are in tandem with the findings from the literature review, as discussed in previous sections of this chapter. This increases the validity and reliability of the results. The novelty of this research is derived from, firstly, taking into account the employees' views on how they construct the meaning of walking to work, and whether they perceive walking in the pedestrian environment as benefiting them; and secondly, systematically exploring these views whilst comparing the findings with the propositions deduced from the existing literature.

This research has identified that commuting daily to the employment centre in the city centre appears to impose a great challenge to employees in Kuala Lumpur. The research also found that this is caused by unsustainable travel behaviour, such as making driving a habit and contributing to the high volume of cars entering the city. Previous researchers have recognised travel behaviour and related issues as being complex and needing attention; however, research that focuses on how the employees construct the meaning of incorporating walking to work and how walking could be beneficial to them has not sufficiently been explored.

Previously, this type research has been carried out in isolation among the various relevant disciplines, but little cross-disciplinary research has been done. Multi-disciplinary research could bridge the research gap between employees' walking to work, and the large range of influencing factors. Among the factors influencing the response to walking to work are: psychological reaction towards walking to work, driving factors that influence them to open up their mind set to accept walking to workplace, external factors such as whether condition, policy, etc.

This is the only research that has tabulated different walking stages that occur during and between the AM and PM rush hours, and has looked at what characterises these various stages. The study has revealed that both the state of body and mind and the condition of the pedestrian environment differ depending on the type of walking being done and the time it occurs, for example walking from transit station to the office during the AM rush hour, walking from office to the transit station during the PM rush hour, walking from

office to break places during the afternoon break and walking from break places back to the office during the afternoon break. The results corroborate Lee and Moudon's (2006) suggestion that different types of walking are subject to specific physical features that are more contextualised (refer to Section 7.2.1 under-sub theme 'the stages and characteristics of walking to work' in Chapter 7).

The research objectives have been meticulously explored and all research questions satisfactorily resolved. One of the contributions of this research has been to broaden the understanding of the role of the employees as stakeholders in the pedestrian environment, together with government agencies and the private sector. This study has provided an insight into the user's understanding and knowledge of their physical activity (walking), which is significantly related to the condition of the pedestrian environment. By analysing an individual's implicit understanding of and knowledge about walking to work, as has been done in Chapters 5, 6 and 7, the potential is created to change people's perceptions of alternative transport such as walking combined with public transport. In addition to this, the employees' eagerness to state their opinions about the parties involved in creating a better pedestrian environment is an indication of their willingness to be one of the stakeholders and also points to their potential to change their driving habits and reduce car dependency.

Four analytical categories have emerged from these findings, derived from the replication logic based on the initial themes assigned for each research question during the data reduction process. To make sure the iterative process is used throughout the various stages of research, the author has adapted the consistency chart method. This method reflects and links the four analytical categories to the research questions, theoretical propositions and the units of analysis (refer to section 8.2 in chapter 8). The iterative process increases the validity and reliability of the research findings, hence leading to the development of the **'Walking to Work Framework'** for the pedestrian environment in the city centre of Kuala Lumpur.

9.4.2 Contribution to the Practitioner

This study aims to provide an answer to the actual problems faced by the employees commuting to their workplace during the AM and PM rush hours in the Kuala Lumpur city context (refer to Chapter 3). Apart from this, the employees who opted to incorporate walking as part of a mixed mode of transportation face difficulties as the pedestrian environment is unfriendly to them. Therefore, this study also seeks to suggest possibilities for improvement of the pedestrian environment. This research has brought together the real issues of transportation, land use and urban design planning in relation to walking to work. The benefits of the **'Walking to Work Framework'** proposed in this research to the relevant practitioners and stakeholders are seen in several areas as listed below:

i) The framework has taken a holistic view in understanding the interrelationship and connections between all factors involved, in order to find a way to encourage the employees to incorporate walking as part of transportation to work. The data from each category could be treated as a foundation and studied individually by the practitioners for a better solution.

ii) Analysis of factors which encourage employees to walk, such as physical features in the pedestrian environment that support walking, the advantages of mixed modes of transportation in reducing car dependency, and the disadvantages of long hours spent commuting, provides an overview in guiding the authorities, traffic engineers and other practitioners to tackle problems and issues related to walking to work.

iii) The framework has laid out possible areas for improvements to the pedestrian environment, based on the user's needs in enhancing their experience while walking to work in Kuala Lumpur.

9.5 Recommendations

This research has generated some interesting findings. The findings of the research have a number of implications and the author recommends that further studies be conducted in developing a larger database of information to gain more comprehensive understanding of people commuting to work. The recommendations are as follows:

i) To undertake similar research and to replicate similar units of analysis in other contexts or settings, for example, commuting from home to transit stations which were not discussed in detail here due to the scope of the research. For this research, the two units of analysis were measured qualitatively using semi-structured interviews and participant observation for the journey from the final transit to the workplace. For future research, a quantitative approach using questionnaires as a data collection technique could be adopted to get more extensive data in a wider perspective.

ii) Good quality pedestrian environments are mainly concentrated in the hotspots of the city and is not properly incorporated or distributed in other parts of the city for the use of all pedestrians, especially those that reside in the city centre. Quality pedestrian facilities should be available in all parts of the city to create a good pedestrian network in order to encourage walking in general in the pedestrian environment throughout the city.

iii) It should be realised that improvement of the pedestrian environment is not a single party affair, but rather that relevant action needs to be taken by various entities in order to achieve a holistic approach to advocate walking to work. Therefore, it is crucial to identify the stakeholders involved in the improvement and maintenance of a good quality pedestrian environment.

iv) The framework developed in this research is expected to be used to assist government agencies, employers and designers in creating a built environment that facilitates walking. However, this framework has not been tested on live projects. As such, it would be recommended to test and apply this framework to a small area in the city centre to further establish its validity and application.

9.6 Implication of Policy Drawn from the Framework

The reoccurring aspects of pedestrian friendly communities are the high priority on policy-making and long and short term planning methods that support non-motorised transportation. It is not impossible for pedestrians, cyclists and motorists to travel safely

in the same movement spaces which are achievable through a comprehensive transportation plan.

The framework of this research is involved in a holistic understanding of employees walking to work. It is intended to inform the policy makers of the type of policies and the process of implementation however; the framework requires further testing by inviting professionals from relevant disciplines such as transport planners, urban designers, employers, policy makers, health doctors, economists, lawyers, etc. to narrow the research framework down through policy, programme, initiatives, project, intervention and finally tactic. It should be kept in mind that values should primarily be directed by values and not purely evidence found in the research. Here the role of the evidence is to test the 'factual assumption' on which value choices are (usually) based (Young and Sanders, 2003). Other factors to be considered in policy making in incorporating walking to work are public opinion, cost and legal constraint (Young and Sanders, 2003).

A set of possible policy and implications are discussed below.

- There should be adequate campaigning and advocating of incorporating walking to work together with public transportation as a mode of travel on a daily basis.

  The implications are:

  - By campaigning on a holistic perspective, the awareness level of the general public on walking to work daily will increase.
  - All stakeholders will understand and play their roles in the achievement of a pedestrian friendly environment.

- The need to situate transit stations within close proximity to housing developments, the improvement of feeder bus systems between housing development to the nearest transit station and increasing the number of car parking facilities near the transit stations.

  The implications are:

  - It provides a faster, economical, healthy, and more efficient travel to the workplace.

—Convenient and safer pedestrian facilities will ensure all citizens have access to a viable mode of transportation.

- Proper integration of walking with public transportation network such as bus and trains.

  The implications are:

  —There is a variety of travel mode options to commute to work which may lessen the dependency on private vehicles.

  —It is more economical alternative to travel as opposed to fuel and car maintenance.

- Making the environment between home and transit station and that between transit station and the working area safer for walking and ensuring that it is well designed.

  The implications are:

  —Good quality physical features in the environment will have a positive change on user perceptions that encourage them to walk.

- Significantly increasing the taxing on cars purchased in Malaysia, enforcing the reduction of speed limits in areas of high capacity particularly in housing areas and urban centres; making large detours for car while providing more direct routes for pedestrians and public transport to access the destinations in the city.

  The implications are:

  —This will significantly discourage the purchasing of private vehicles.

  —There will be more sensitivity and cautiousness towards other road users by the reduction in speed limits.

  —There is better integration and safety for pedestrians in the same movement space as motor vehicles.

  —Longer car routes in the city centre will discourage driving and significantly reduce traffic congestion in the city centre.

- To put non-motorised transport modes on the employer's agenda by highlighting its health and economic benefits to both employers and employees.

The implications are:

- It saves both employers and employees expenditure on expensive car parking space.
- It reduces the health care cost and absentees and increases employees' productivity and shift away from sedentary lifestyle.

- The need to increase awareness of the long term health implication of walking on a daily basis.

  The implications are:

  - It is a path to a better quality of life by active living, longevity and improved mental awareness reducing likelihood of high risk mortality diseases such as obesity, diabetes and hypertension.

9.7 Limitations of the Research

There are a number of limitations in this research, such as:

i) Due to time constraints, and as there is a need to carry out an in-depth investigation in order to obtain the data and an in-depth understanding of the employees' perception and experiences, only two case studies within the city centre have been chosen. Furthermore, the elicited qualitative data is rich and thick therefore organising the data, generating categories, identifying patterns and themes and coding the data is time consuming.

ii) Qualitative research undertaken in this study is about discovery and seeking to uncover important insights regarding the employees' perceptions and experiences of walking to work in the pedestrian environment. The literature review elicited limited information concerning the above subject matter in the Kuala Lumpur context. Most of the literature available has little or no reference to the user/pedestrian's perception or pedestrian traffic environment.

iii) The inability to test the framework proposed by the author is also a limitation. The main reason for this inability is that usually changes of travel behaviour and improvements to the pedestrian environment take a long time to complete, and is therefore beyond the scope of the allocated duration for the research.

9.8 Final reflections on the Research

This chapter concluded the main findings by summarising the overall research process through five main stages: a thorough literature reviews, development of research methodology and design, main data collection (case study), explanation of the case study findings and writing up.

The main achievements of the research are discussed in this chapter. This research explored the challenges that people encountered in understanding the relationship between daily commuting to workplace and the practice of walking in the built environment, and then developed a framework that can propose alternatives to current commuting activity. The evidence from the key findings lends itself to the argument that a combination of walking and mixed mode of transportation will help create healthier, more active, and more livable communities in the context of Kuala Lumpur city. As such, it is necessary that users understand the benefits of walking to their body and mind, to create a positive mind set toward walking to work. In addition, the factors that influence people to incorporate walking as part of transportation to work and the improvement to the quality of the pedestrian environment will not only enhance the walking experience and therefore needs to be considered by the users and others stakeholders in making commuting become beneficial to all.

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APPENDIX A

Modes profiles summarize the performance of various transportation modes (Litman, 2011)

Mode	Availability	Speed	Density	Loads	Costs	Potential Users			Limitations	Appropriate Uses
	Portion of locations and times served	typical speeds	space requirements	ability to carry baggage	user costs	Non-Drivers	Poor	Handicapped		
Walking	Wide (nearly universal)	2-5 mph	High	Small	Low	Yes	Yes	Varies	Requires physical ability. Limited distance and carrying capacity. Sometimes difficult or unsafe	Short trips by physically able people.
Wheelchair	Limited (requires suitable facilities)	2-5 mph	Medium	Small	Med.	Yes	Yes	Yes	Requires suitable sidewalk or path. Limited distance and carrying capacity	Short urban trips by people with specific physical disabilities
Bicycle	Wide (feasible on most roads and some paths)	5-15 mph	Medium	Small to medium	Med.	Yes	Yes	Varies	Requires bicycle and physical ability. Limited distance and carrying capacity	Short to medium length trips by physically able people on suitable routes
Taxi	Moderate (in most urban areas)	20-60 mph	Low	Medium	High	Yes	Limited	Yes	High costs and limited availability	Infrequent trips, short and medium distance trips
Fixed Route Transit	Limited (major urban areas)	20-40 mph	High	Small	Med.	Yes	Yes	Yes	Limited availability. Sometimes difficult to use	Short to medium distance trips along busy corridors
Paratransit	Limited	10-30 mph	Medium	Small	High	Yes	Yes	Yes	High cost and limited service	Travel for disabled people
Auto driver	Wide (nearly universal)	20-60 mph	Low	Medium to large	High	No	Limited	Varies	Requires driving ability and automobile. Large space requirements. High costs.	Travel by people who can drive and afford an automobile
Ridesharing (auto passenger)	Limited (requires motorist matching services)	20-60 mph	High	Medium	Low	Yes	Yes	Yes	Requires cooperative motorist. Consumes driver's time if a special trip (chauffeuring)	Trips that the driver would take anyway (ridesharing). Occasional special trips (chauffeuring).
Carsharing (vehicle rentals)	Limited (requires nearby services)	20-60 mph	Low	Medium to large	Med.	No	Limited	Varies	Requires convenient and affordable vehicle rentals services	Occasional use by drivers who don't own an automobile
Motorcycle	Wide (nearly universal)	20-60 mph	Medium	Medium	High	No	Limited	No	Requires riding ability and motorcycle. High fixed costs	Travel by people who can ride and afford a motorcycle
Telecommute	Wide (nearly universal)	NA	NA	NA	Med.	Yes	Varies	Varies	Requires equipment and skill	Alternative to some types of trips.

APPENDIX B

THE SCHOOL OF BUILT ENVIRONMENT, THE UNIVERSITY OF SALFORD

CASE STUDY BRIEF

EXPLORING THE EMPLOYEE WALKING EXPERIENCE IN THE PEDESTRIAN ENVIRONMENT OF CENTRAL BUSINESS DISTRICT

1.0 Introduction

A PhD research project titled "An Exploration of the Employee Perception of Walking: Enhancing the Walking Experience in Kuala Lumpur" which is part of the PhD program of The School of Built Environment; University of Salford is currently being carried out.

This research explores the employee's perception on walking as part of transportation to the workplace. It is also to find out the factors and the quality of the pedestrian environment through their walking experiences on the routes they take from the arrival points whether car parks, transit stations, or bus stops to the workplace; and the routes from the workplace to activity centre during lunch break. In order to investigate this, the researcher adopts the case study approach in order to obtain an in-depth understanding of the real life phenomenon.

The study is currently in the data collection phase. Interviews and participant observations have been adopted as the data collection technique for this research. Potential respondents, who are the employees working in the city centre of Kuala Lumpur have been identified as who performed commuting to work. , have been identified and the format in which the interviews will be conducted will be using semi-structured interview questions.

The context will be in Central Business District of Kuala Lumpur as she is a capital city of Malaysia and has no exception on the pedestrian environment issues experienced in internationally (Barter, 2004 and Kenworthy, 2003, 2004, Jusoh et al 2009 and; Mohamad and Kiggundu,2007). This research is in line with Malaysian government vision to transform Kuala Lumpur as a 'world class' city by the year 2020 (CHKL, 2008). The city appears to have a great opportunity in developing the urban spaces that is friendly to the pedestrian for the city's successes (Kuala Lumpur Draft, 2008).

We would like to invite you to participate and share your walking experiences and views on the pedestrian environment that would encourage and discourage the employees to walk to work conducted by Mastura Adam from the School of Built Environment, The University of Salford.

2.0 Research Background

Human walking is the process by which people move themselves from one geographic position to another and this is referred to as locomotion. In the act of walking, all the body functions and structure are working together. Transportation researches also recommend that walking can be part of transportation to commute to utilitarian destinations (Handy, 1996). Although, public health has recommended that walking is to gain health protective benefits however not many are willing to take up this moderate physical activity as part of their habit (British Heart Foundation, 2001; Department of Health, 2004). The evidences shown that people driving more and walk less. It is also appear that people are too dependence on car even though for less than half a mile (Steg and Gifford, 2005). The implication from this habit was that high carbon foot print, traffic congestions, sedentary lifestyle of being in active, obesity and health deterioration.

In contrary, people who want to walk mainly for utilitarian are discouraged and encountered many challenges in the built environment due to many aspects that is needed to be explored further (Shay E. et al., 2003). Therefore the aim of this research is to examine how the employees understand traveling to work, how they perceive walking as part of transportation to work and is their walking environment supporting them to walk comfortably, enjoyably and safely.

This aim will be achieved via the following objectives;

1. To develop an understanding using the available literature on the definition and meaning of walking to work, the health and transportation issues, and the benefits of and barriers to walking in the existing pedestrian environment.
2. To explore how the employees perceive walking as part of their transportation mode, during their daily commute to the workplace in the city centre of Kuala Lumpur.
3. To investigate the factors that influence employees to incorporate walking to the workplace in the existing pedestrian environment in the city centre of Kuala Lumpur.
4. To investigate the quality of the physical features of the existing pedestrian environment, as they relate to the employees' walking activity in the city centre of Kuala Lumpur.

3.0 What is expected from the Study?

As the data collection technique used is interviews, the outcomes from these interviews are to explore the followings:

1. An depth understanding on meaning of walking in a real life phenomena from the employees perspective;
2. The real factors or aspect that may influence the employees to practice walking
3. The positive and negative feelings towards walking as part of transportation to work and the perception to walking in their pedestrian environment.
4. The quality of the selected routes and physical elements in the built environment that would encourage more employees to walking to work;

4.0 Your Commitment

If you agree to continue with the study, we will be conducting an interviews on the above points (refer to 3.0). Each interview will last approximately 40 minutes to an hour in order to attain highly personalised data on the subject under study.
The interviewer would like the participants to check the validity of the transcript prepared by the researchers

5.0 Ethical Issues

All respondents are assured that their identity will be kept anonymous and that all information provided will be used for the sole purpose of this research. All ethical issues will be in accordance with the University of Salford's policy and procedures on 'Integrity and Self Regulation in Research' which requires ethical approval from the University Research Governance and Ethics Sub-Committee before any data collection or fieldwork.

6.0 Researcher Information

Mastura Adam
PhD Researcher
The School of Built Environment
The University of Salford
Salford, Greater Manchester
United Kingdom

Professor Marcus Ormerod
Centre Director
SURFACE Inclusive Design Centre
The University of Salford
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United Kingdom

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School of the Built Environment

CONSENT FORM

I herby volunteer to participate in the doctorate dissertation research conducted by Mastura Adam and Professor Marcus Ormerod (supervisor) from The School of Built Environment, The University of Salford. I have fully understood the aims and objectives of the research and my contributions to the research.

I have agreed to participate in a study that is being conducted by Mastura Adam and Professor Marcus Ormerod (supervisor) who is currently carrying out doctoral research study into Pedestrian Environment in the city centre of Kuala Lumpur at the University of Salford, School of the Built Environment.

I understand that the purpose of this study is to explore how the employees understand traveling to work, how they perceive walking as part of transportation to work and is their walking environment supporting them to walk comfortably, enjoyably and safely in the employment centre of Kuala Lumpur city. These experiences and perceptions will be utilised to develop a framework for walking to work in Kuala Lumpur city.
My participation in the study mainly involves interview/s and informal discussion with Mastura Adam, I understand that research contribution shall be discussed with me and that my consent is required.

I give approval for audio recording of interviews for the sole purpose of ensuring the accuracy of response. All data will be securely kept until the completion of the research.

I understand that all confidential information will be respected. All interviewee's will be anonymous in any analysis, evaluation or discussions in the report/thesis production. Any numeric coding which could be linked to the interviewees will be recoded so as to remove any such traces. I may withdraw at any time, without prejudice and without giving a reason. If I withdraw, all data that have already collected by Mastura Adam will be void from her data bank.

I have read the above information and have understood them clearly. The purpose of the study has been explained to me and I agree to participate.

Participant name :_____

Signature : _____
Date : _____

Investigator's name : _____

Signature :_____
Date : _____

APPENDIX D

OFFICE A/ OFFICE B AND CASE STUDY 1/ CASE STUDY 2	INTERVIEW INSTRUMENTS
INFORMATION REQUIRED	**QUESTIONS**
1. General Background of the respondent that inclu • The travel pattern that they used to go to work	**Q1.0 SECTION A** i) Could you please tell me in general about yourself for example; • What is your occupation? • Where do you stay? ii) How long have you been with this company? iii) What time do you usually start and finish work? iv) Which mode of travel do you use occasionally to travel to and from work?
2. Perception of walking as a means of transportation for that includes: • The understanding on walking to work • The understanding the benefits of walking for health, social, environment and economy.	**Q 2.0 SECTION B** Any journey to work destination constitutes a departure (starting) and arrival (terminating) points. i) Can you tell where your arrival point is in the morning? Why do you choose that point? ii) Do you walk everyday from the arrival points to your office? How long does it take to get to your office? iii) Do you use the same point after office hours to go home? iv) Where you normally had your lunch? If it is outside your office building, can you tell me where it is? v) In your opinion, does walking from the arrival points to the office is considered as 'walking for necessary purposes'? Why do think so? vi) How about looking for food and other stuff during break, do you describe that as 'walking for necessary purposes' or 'walking for socialising'?

Travel mode	To Work	From Work
Car Driver		
Car Passenger (Driver at same location)		
Park and Ride		
Motorbike		
Monorail/LRT		
Bus		
Train/ Commuter		
Taxi		
Walk		
Cycle		
Other		

	Walking is a viable means of transportation for everyone for short distance journey. Walking also has many benefits to health, social, environmental and economy. i) Based on your everyday walking experience, would you strongly agree that walking could be part of an alternatives transport for short distance journey? ii) Do you value your everyday walking to work has any benefits to your health, social, environmental and economy? iii) Why do you feel this way?
3. The routes quality and physical features in the pedestrian environment that may encourage and support walking.	**Q3.0 SECTION C** Good quality of the external physical built environment would invite people to get around on foot to their destination in the city. i) How familiar are you with the routes in surrounding areas? ii) Can you tell about the routes connections – Do good pedestrian routes connect the places where you want to go? iii) Are routes direct, and are crossings easy to use? Do you have to wait more than 10 seconds to cross roads? iv) Are routes that you take attractive, well lit and safe, and is there variety along the street? v) What is the quality and width of the footway? vi) How easy is it to find and follow a route? Are there surfaces treatments and signs to guide pedestrians? vii) Why do you feel this way?
4. The positive and negative feelings towards walking to work in the pedestrian environment	**Q4.0 SECTION D** People are attracted to, or repelled, by certain opportunities to walk in their pedestrian environment. Walking movement is facilitated by the accessibility and the quality of the pedestrian environment experienced by the user. i) As far as you are concerned, what are the most important elements that you need in the pedestrian environment? ii) Why do you feel this way? iii) Does a good facility give a value added to your walking experience? iv) Can you tell what obstruction have you encountered along the routes?

	5.0 SECTION E A pedestrian environment that is pleasant, safety and functional will encourage more purposive walking in the Central Business District. i) Do you think your existing pedestrian environment has provides a pleasant feelings to you? ii) Why do you feel that way? iii) Do you feel that you are safe from traffic, accident and crime? iv) How strongly do you feel about this – agree strongly, fairly agree or not at all strongly? v) What make you feel enjoy while walking? vi) Do you want the feeling of enjoyment that you have experienced so far to be available throughout the city of KL? vii) Would you like your ideas to be heard by the designers and planner who design and make it into reality? viii) In your personal view, how could we achieve these ideas?

PARTICIPANT OBSERVATION CHECKLIST

Route Quality and Route Connectivity	Description	Remarks
• Difficult terrains (e.g., steep or cross slopes, uneven and unstable surfaces); • Obstacles within the path (e.g., lamp posts, benches, railings etc.); • Travel path without rest or shelter; • Over and under passes with stairs and steep ramps; • Sidewalks design that exposed the user to potential hazards • Environmental designs that require unusual movements or coordination (e.g., placement of pedestrian signal devices in a location that cannot be accessed by all pedestrians) ; • Limited sight lines; • Complex paths of travel • Ambiguous or unclear signs or signals • Unclear or missing information about the appropriate pedestrian path of travel		

Route choice	Description	Remarks
• Variety of routes from transit to the office • Walkways indoor and outdoor • Underground walkways • Sidewalks • Covered walkways		
Physical activities in the outdoor		
• Walking to work in the AM • Walking after working hour • Walking during lunch break • others		
Characteristic of Walking		
• AM • PM • Lunch break		
Other uses/facilities along the walkways		
• Parks • Seatings • Water features • others		

APPENDIX E

(Date)

Dear (Last Name),

You are invited to participate in a doctorate dissertation research conducted by Mastura Adam and Professor Marcus Ormerod (supervisor) from The School of Built Environment, The University of Salford. The objectives of this study are:

1. To develop an understanding using the available literature on the definition and meaning of walking to work, the health and transportation issues, and the benefits of and barriers to walking in the existing pedestrian environment.
2. To explore how the employees perceive walking as part of their transportation mode, during their daily commute to the workplace in the city centre of Kuala Lumpur.
3. To investigate the factors that influence employees to incorporate walking to the workplace in the existing pedestrian environment in the city centre of Kuala Lumpur.
4. To investigate the quality of the physical features of the existing pedestrian environment, as they relate to the employees' walking activity in the city centre of Kuala Lumpur.

You will be invited to participate in a semi-structured interview on your walking experiences from the arrival points to the workplace; the routes from the workplace to activity centre during their lunch break and the issue related to commuting to workplace.

The amount of time required for your participation will be 40-60 minutes. There are no known risks associated with this research. However, your participation is crucial for the success of this research effort. As an expression of the researcher gratitude for your participation, you will be provided a summary of the study's findings.

Please be assured that your response will be held in strictest confidence. Under no circumstances will any result specific to your organisation or yourself be made available to any individual or organisation. Your participation in this research study is completely voluntary. You may withdraw your consent to participate at any time.

If you have any questions or concerns about this study, please feel free to contact the undersigned at 07825127326 or email at M.Adam@pgr.salford.ac.uk or masturaadam@yahoo.co.uk. If you have any questions or concerns about your right as a research participant, please contact the University of Salford's Research Governance and Ethics Committee at +44 016 1295 2654

Thank you

Yours faithfully

Mastura Adam
The School of Built Environment
The University of Salford
Salford, Greater Manchester

APPENDIX F

Academic Audit and Governance Committee

Research Ethics Panel (REP)

MEMORANDUM

To	Mastura Adam
cc:	Prof M Ormerod, Prof M Kagioglou
From	Jayne Hunter, Contracts Administrator
Date	1st April 2011

Subject: **Approval of your Project by REP**

Project Title: **Exploring the Employee Walking Experience in the Pedestrian Environment of Central Business District**

REP Reference: **REP10/152**

Following your responses to the Panel's queries, based on the information you provided, I can confirm that they have no objections on ethical grounds to your project.

If there are any changes to the project and/or its methodology, please inform the Panel as soon as possible.

Regards,

Jayne Hunter
Contracts Administrator

For enquiries please contact
Jayne Hunter
Contracts Administrator
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Enterprise Division
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APPENDIX G

10th International PostgraduateGraduate Research Conference (IPGRC)
14TH -15TH September 2011

UNDERSTANDING THE PEDESTRIAN ENVIRONMENTAL FACTORS THAT INFLUENCE WALKING TO WORK

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Abstract:

Walking to work is found to be one of the subset of walking for transportation and utilitarian category with the purpose to meet the basic needs of everyday life activity that is travelling to work. Known as a moderate intensity physical activity, walking is recommended as a feasible mode of transportation that could be incorporated for workplace travel in the public health, transportation, urban design and planning research. People who want to walk for utilitarian, particularly for the purpose of walking to workplaces, however, are discouraged from doing so and encounter many challenges in the external built environment. People have to deals with a multidimensional aspect in this complex phenomenon that is created in a real life situation, involving the perception of walking, the expectation while walking and finally the decision to walk as part of transportation modes.
Hence, the aim of this paper is to identify and understand the factors that may influence people walking to work based on the employees walking experience while walking to and from work in the employments area in the city hub. Through deep and in depth understanding from people's experience has underpinned this research into a qualitative paradigm that made eligible to adopt a case study research approach and selecting city centre of Kuala Lumpur as the case study area. It is hoped through all this research processes; the conceptual framework for the pedestrian environment quality for walking to work will be consolidated.

Keywords: Employees' walking experience (life experience), walking to work, pedestrian environment quality and case study research approach.

1 Introduction

Human walking is the process by which people move themselves from one geographic position to another and is commonly referred to as locomotion. Locomotion includes starting, stopping, changes in speed, alterations in direction, and modifications for changes in slope (Inman et al., 2006). Whittle (2007) describe it as a basic pattern of human walking activities that involves a rhythmic displacement of human body parts in a constant forward progression. In the act of walking, all of body functions and structure are working together and what make human walking unique can be classified under the three main gait characteristics; (1) human walk erect on two legs, (2) at the moment of contact with the ground, the leg is almost fully extended, and (3) the foot strikes the ground initially with the heel (Capaday, 2002). Adding on to its uniqueness, these

walking cycles in motion occur in a uniform progression in a straight line that is related from one to another in a systematic fashion (Whittle, 2007 and Inman, 2006). As Rose (2006) observes, from her analysis of *Energetic of Walking,* people naturally walk in a manner that conserve energy and selects their walking speed accordingly in order to minimize the energy expended per distance walked. The normal walking pattern however increases the energy expenditure and limits the ambulation if there is any deviation (Rose, 2006), barriers and obstacles (Gehl, 2004) on the ground surfaces. Walking has become an important subject in the field of public health, transportation and urban planning because it is believed to have a potential to be a feasible travel mode (Rose et al, 2006; Lee and Moudon, 2006) and can be part of sustainable transportation for the future (Litman, 2011, Frank, 2008). Walking to work is considered as one of the subset of walking for transportation (Lee and Moudon, 2006, Shay, 2003) that can be included in people's daily lives activity. Similar terms used for walking for transport are walking for necessity (Gehl, 1987, 2004) and purposive walking to destination (Wunderlich 2008; Shay, 2003; Lee and Moudon, 2006).

Public health literature has recognised that integrating walking to work destinations in a daily routine (Darker, 2007; Brockman and Fox, 2011),) may fulfil the public health recommendation of walking for 30 minutes a day (for at least 5 days/week). This should combat the problem of inactivity among urban employees due to the sedentary nature of jobs and work tasks, obesity and mortality diseases such as heart diseases, type 2 diabetes and high blood pressure (Pronk and Kottke, 2009). Researchers in this field have also examined the environmental determinants that may influence different purposes of physical activity mainly walking (Pikora, 2003, Corti and Donovan, 2002, Shay, 2003). For example, Lee and Moudon's (2006) research on the correlation between walking for transport and recreation found that the physical environmental contributed significantly to the different probability of walking. The Pedestrian Reviews System (PERS) by Transportation for London (TRL, 2006) on the other hand highlights the importance of noting that different types of users have their own needs in the pedestrian environment (TRL, 2008; Methorst et al., 2010). The transportation and urban planning literature reports on the correlation between the physical built environment and physical activity. Litman, (2011); CABE, Handy for example, examine the impact of land use on: walking conditions, urban design features and transportation infrastructure conditions.

In general, literature in these fields recommends that walking ought to be included as part of transportation modes in the travel plan to destinations (Lee & Moudon, 2006). It is believed that including walking as alternative transportation could help solve many urban problems. For example, it could help reduced: 1) the growing numbers of private vehicles entering the city especially during peak hours, 2) car dependencies among urban adult even though for journeys less than 1 mile (Brockman and Fox, 2011; Shay et al, 2003), and 3) intensifying traffic congestions in the city which lead to degrading of the environment due to high influx of CO^2 emission and noise pollution. This chaotic scenario happens when the motorized vehicles overpower the movement in spaces that are meant to be shared with the non-motorised travel in the city centre (Pharoah, 2008).

Nevertheless, walking has massive benefits to the quality of life (Owen, 2004) which are not only limited to health and the environment. According to Frank, et al. (2010a), it

gives high advantage to personal economy. CABE (2004) noted that it increases greater interaction with the surrounding community where people will enjoy the benefits of walking when they willingly want to walk and their environment allows them to walk. Researchers suggests the main reason that would encourage people to get around on foot, is not because they have to but because they will feel like they are missing out if they don't walk.

This paper presents the early findings of the pedestrian environmental factors that influence walking to and from work for cities in a developing country with a particular focus on Kuala Lumpur. The context of the research is discussed first (2.0) followed by the definition of terms that make up the unit of analysis for this research: walking, walkability and pedestrian environment (3.0). The paper also discusses on theories and knowledge on walking for transport based on the surrounded issues in five key areas in developing the conceptual framework (4.0). The research methodology that underpinned the research is explained in 5.0 carried by the initial findings and discussion in 6.0.

2 Research Context

This research is based on a multi-disciplinary approach which seeks to understand the walking, walkability and pedestrian environment. The choice of a multi-disciplinary approach was influenced by the: 1) need to ensure all the correlates of walking for transportation particularly walking to work are considered comprehensively, 2) fact that the walking activity does not take place in isolation as (Trew and Everett, 2007) as can be seen from the explanation under the pedestrian environment definitions below. The selection of the physical environment factors for walking to work is based on a comprehensive review of the existing literature and theoretical frameworks in the fields of public health, transportation planning, urban design and planning. As part of ongoing PhD research, an extensive review of literature has been conducted on the links between the physical activities particularly walking with the physical built environment. The core areas of concern are: the environmental attributes (Pikora et al., 2003, Corti, 1998) for different types of walking; barriers to walking (TfL, 2008, 2004), initiatives and measures (Methorst et al., 2010) that may influence purposive and utilitarian (e.g walking to work) Most research and exemplar gathered are from the international perspective within developed cities in the UK, Europe, Australia and USA. These cities have experienced a pace of change far more rapid in comparison to any other time in recent history (Couch et al., 2003).

However, there appears to be in sufficient knowledge about the specific environmental conditions (Lee & Moudon, 2006) that are associated with walking to work among the adult employees who work in the employment area in the city hub of developing cities. It seeks to answer two research questions: 1) how does the quality of the built environment influence the experience of walking to and from work? 2) Why is it important that those experiences are recognised? In realising this, there are several criteria set as a boundary to this research. The criteria, which are multidimensional in nature, are designed in a way that should help address the complex relationship between the built environment and how people travel to work and. They are discussed detail in section 5.1. The next section discusses the unit of analysis (walking, walkability and

pedestrian environment) with a view to establishing a working definition for walking to work.

3 Understanding the meaning of walking, walkability and Pedestrian Environment

People travel from one place to another with purpose and plan their trips with the consideration of many aspects to the built environment including accessibility to transit stops, presence and connectivity of walk paths (Southward, 2007; Pikora, 2003), land-use mix (Southworth, 2007), street network density such as average length of links and number of intersections per unit area (Bhat and Guo, 2007), block sizes, and proportion of street frontage with buildings, transport modes, time and cost (Frank, 2010), destinations, trip distance and trip frequency. In view of these aspects, Gehl (2004) concludes that walking is an integral element of a majority of trips made in the outdoor environment. The meaning of walking, walkability and pedestrian environment has notable differences. They are discussed below.

Walking is:

- Defined by Owen et al. (2004) as the main form of transportation for humans without a vehicle.
- Known as non-motorised transport and human powered modes of travel worth in terms of value and benefits to the health and the environmental sustainability (Litman, 2011; Frank, 2010; Darker, 2007; Gehl, 2004; Shay, 2003; Handy 2010, 1996).
- A feasible transport mode (Rose, 2006; Lee and Moudon, 2006), a functional mode of transport that is the most common form of adult lifestyle physical activity (Darker, 2007).
- A person travelling from place to place by foot or by using other mobility aids in a short distance journey (TfL, 2006)

Walkability:

- "….is the extent to which the built environment supports and encourages walking by providing for pedestrian comfort and safety, connecting people with varied destinations within a reasonable amount of time and effort, and offering visual interest in journeys throughout the network' (Southward, 2007 p248).
- has a close relationship with the built environment that associates with people movement through its spaces such as streets, sidewalks and lanes (Jane Jacob, 1969; Gehl, 1996 and Whtye, 2000) in accessing to thier destinations (Litman, 2011; Frank, 2010; Lee and Moudon, 2006).
- is '...the ability for one to move around on foot in a given space', (Transport Research for London (TrL), 2006).
- is "...the quality of walking conditions, including factors such as the existence of walking facilities and the degree of walking safety, comfort, and convenience" (Litman, 2003)

Pedestrian environment definition has a combination meaning of the above components. It involves the act of people walking and the built environment conditions as describe below:

- The pedestrians are relying on the urban environment and infrastructure that are designed to meet their travel needs. The needs are being able to travel safely, conveniently, directly and comfortably (http://www.toronto.ca/transportation/walking).
- It constitutes the movement space facilitated by the accessibility and the quality of the pedestrian environment experienced by the user on foot (Talen, 2002; Clifton and Handy, 2001; Handy, 1996).
- The walking movement is usually performed on streets sidewalks or pavement, footpaths, routes, alley, boulevard, etc. Since the term pedestrian is applied to anyone in the public realm not using a vehicle (TRL,2006), it also encompasses non-transport activities such as walking from the starting point and terminate the walks at another destination, window shopping, standing and talking, sitting and watching (Gehl, 2004; Pharoah, T., 2008).

- Urban design scholars agree that a lively and convivial pedestrian environment depends on how attractive the places are to people (Bentley et al., 1985). Researchers have argued that Kevin Lynch's urban design elements such as paths, landmark, edges, districts and nodes (Kevin Lynch, 1960) are needed in order to guide people movement in the city. For example, people move through the city from one districts to another using paths as a connector. Each district has its own special landmarks and memorable features like squares that give its own identity. These elements are believed to furnish pedestrian experiences while walking.

The meaning of walking to work for this study is: Trips taken to and from workplace destinations for both the purposes of walking for transportation and utility. Walking links people on foot to other modes of transportation that serve as connections to many destinations such as to and from home to transit; transit to destinations; parking lot to offices and offices to eating places.

4 The Development of the Conceptual Framework on Walking to Work

This section discusses on the issues of walking for transportation in the existing pedestrian environment in order to elicit a theoretical proposition (Yin, 2009)for the development of the main aim of the research. A theoretical proposition provides a sufficient blueprint for the study as noted by Sutton and Staw (1995) cited from Yin (2009) as " a [hypothetical] story about the why acts, events, structure, and thoughts occurs"; and offers a strong guidance in determining what data to collect and the strategies for analysing the data (Yin, 2009). Trew and Everett (2007) suggest human walking has scientifically revealed a complex and seemingly infinite of embodied practices which involve or are controlled by a wide range of internal and external factors. Further to that, in order to understand how the systems of the body interact to produce finely controlled and purposeful movement within the built environment, it is necessary to know how human movement is initiated, performed, controlled and interact and should be seen in multi-dimensional standpoints as shown in diagram 1 below.

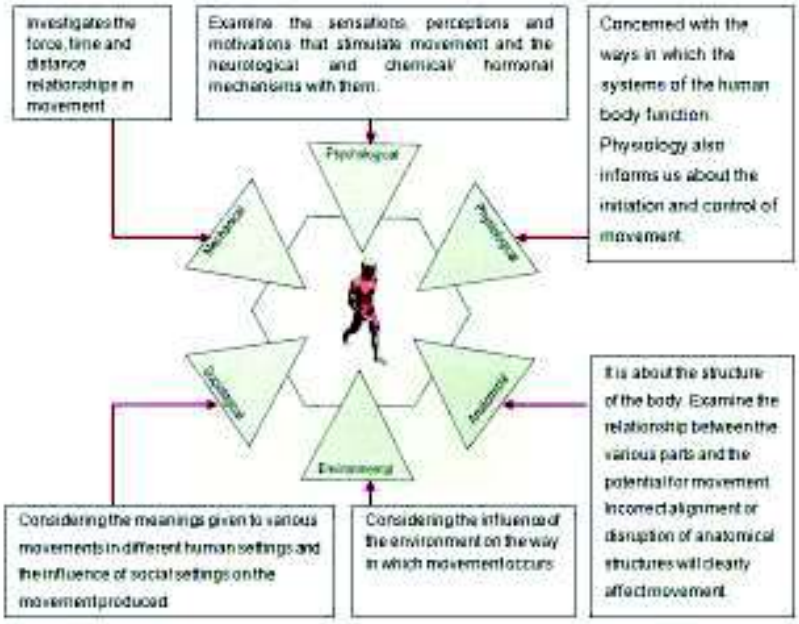

Diagram 1: Each approach is valid in its own right but it needs a collaborative contribution from all other approaches (Trew and Everette, 2007, Lee and Moudon, 2006).

The reason of looking into multi-dimensional approaches from the act of walking in built environment is to obtain a holistic understanding of how the human body moves, why the component parts work as they do in the external physical built environment (Trew and Everette, 2007; Rose, 2006) and how it would make people gain its benefit (Owen, 2004). The health behaviour model namely social ecological approaches (Owen et al., 2004; Sallis and Owen, 2002) helps to understand multiple influences on walking behaviour (Corti, 1998; Ewing,) in the external built environment. It places emphasis on the dynamic relationship between personal, behavioural, and environment factors which provide a theoretical basis for this research that give high consideration on human life experience (Tuan, 1977). However, according to Lee and Moudon (2006), this model does not provide sufficient guidance towards conceptualizing physical environment attributes. Lee and Moudon (2006) contend that there are numerous physical environmental factors that are relevant to different types of walking and subject to complex interactions. These, they further contend, require specific conceptual frameworks that are more contextualized. In line with this thinking, the author proposes the framework below.

4.1 Theoretical propositions for walking to work

The author has identified theories and knowledge from a broad literature searches addressing the following: principle of human walking, walking psychology, walking for transport, active transportation, non motorised transport, walkability, walking to work, workplace travel, walking benefits and environmental attributes to physical activity. The theoretical proposition is based on the findings from the extensive review of literature on the diverse fields of: **Public Health including physiologists and bio mechanists, Urban design and planning, Transportation planning and Phenomenology and sociology.** This has been done from broad to specific issues which are then categorised under several key areas that are closely related to the aim of the studies. The issues specific to each field are explained (see diagram 2).

Diagram 2: The significant research issues within the key areas related to walking for transport (Author, 2010).

Key Area	Related Issues	Authors
Health	1. Sedentary work involving long hour sitting, inactive living, diversified lifestyle, car dependencies, mental stress at work leads to obesity epidemic and other mortality diseases however not many people realise the benefit of walking to their quality of life. 2. Current patterns of transport, which are dominated by motorized road transport, have substantial adverse impacts on health	Frumkin.H, 2002, Pikora, Darker, 2007, Frank, 2003 Brockman and Fox, 2011, WHO, 1999, 2000
Human Behavior	1. Human desire on greater freedom of movement in urban spaces however the pedestrian are often marginalised. 2. Negative perception to walking for transport hindered people to utilise their physical ability and participating their walking for workplace travel. 3. People respond behaviourally and perceptually to detailed design at the scale of streets and corridors, shops and doorways however the quality of the existing pedestrian need is unsatisfying.	Zacharias, 2001, Gehl, 1996 Jane Jacob, 1961, Whyte, 2000, FHWA, Lee & Moudon, 2006 Methorst, 2010;Zacharias, 2001; Handy, 1996;
Physical Built	1. In direct and unpleasant walking in accessing land uses	Mackett, 2000, Pharoah T.,

Environmental	and transit has given a withdrawal factors for walking to work. 2. Urban sprawl leading to increased numbers of car ownership thus increased traffic congestion, air and noise pollution 3. Imbalance investment in roads building vs public transport and pedestrian facilities.	2008 Anable, 2005, Steg, 2005 Jane Jacob Barter, 2003
Transportation	1. As city evolve and population growth, transportation issues such as poor level of services including insufficiency and ineffectiveness of public transport are still unsolved at par with the rapid growth. 2. Limited choice of transportation modes and pedestrian facilities that make people highly depending on car travel even though for short trip ie less than 1.6 km (1 miles) 3. Car dominating the urban spaces gives negative impact on liveability, environmental quality, and both vehicular and pedestrian circulation network. 4. Walking to destinations is low when automobiles are available in households.	Kenworthy & Barter, 2000 Mackett, 2000, Anable, 2005 (Coogan et al., 2007)
Urban Design	1. Unregulated pedestrian policies have made uneven distribution of people and activities in public urban spaces. 2. Pedestrians are moved onto sidewalks and indoors while the motor vehicles dominating urban spaces. 3. Poor urban design element cause to ineffectiveness pedestrian infrastructures and facilities in urban spaces ie. discontinued sidewalks, repetitive obstacles, poor drainage systems	Zacharias,2001; Gehl, 2004; Litman, 2003; Litman, 2011; Tolley, Jane Jacob, 1961 Whyte,2000

A consolidation of the diverse aspects of issues within each key area resulted in a sound theoretical proposition ready for the implementation in the data collection phase. A conceptual framework of the physical environmental factors that influence walking to work is yet to be developed. The propositions are as below:

Public Health including physiology and bio mechanics: *Walking is a viable means of transportation for everyone due to self-selected walking speed in order to minimize the energy expended per distance walked* (Kaufman and Sutherland's, 2006; Rose et al., 2006). *The barriers along the sidewalk increase a person's effort in order to avoid those barriers* (Inman, 2006). *Psychological, social and environmental factors were all significant contributors to explaining walking to work* (Giles and Corti, 2002).

Urban design and planning: *A good quality pedestrian environment would invite people to get around on foot to their destinations in the city* (Litman, 2011; Gehl, 2001; Low,2003; Sealens, 2003, Southward,2005; and Ewing, 2006). *This means that walking movements are facilitated by the accessibility and the quality of the pedestrian environment experienced by the user* (Talen, 2002; Clifton and Handy, 2001; Barton, 1998; Handy, 1996).

In creating a quality walking environment, pedestrian environment that is*; 1) pleasant and comfort means people will enjoy the benefits of walking when they willingly want to walk and their environment allows them to walk* (Gehl, 2008; TfL, 2008) *, 2)safe* (Pikora et al, 2003) *and 3) functional means that a pedestrian requires a level of detail and planning for more efficient walking* (Barnett, 2006) *will encourage more walking to*

work in the city (Pikora et al, 2003; Gehl, 2004)*., The urban design quality plays an important role in removing the barriers that hinder walking activity in the city* (CABE, 2008; Gehl, 2004; Barton, 1998).

Transportation planning: *Improved walking conditions tend to enhance accessibility opportunities, encourage more walking to work, increase transit travel, and reduce automobile travel* (Litman, 2011, 'Non Motorized Transport Planning', VTPI, 2008, Lee & Moudon, 2006). *Values, beliefs, attitudes and characteristics of the built environment are related to travel behaviour in walking for transportation* (Kitamura et al., 1997; Handy et al., 2005). *The vision for the pedestrian friendly environment in the city needs stable policies that are hostile to cars and friendly to pedestrians* (Gehl 2001, 2004, Frank, 2008).

Phenomenologist and sociologist: *The external, physical environment provides a strong relationship with sensory expression and social interaction derived from everyday walking practices, which nurtures a sense of belonging, familiarity, emotional attachment and thoughts to the area which is being walked* (Gehl, 2001, Tuan,1997; Wunderlich, 2008). *People are attracted to, or repelled by, certain opportunities to walk in their pedestrian environment* (Brown et. al., 2007). *Human behaviour is very much affected by the way they perceive walking in the external physical environment, their expectation while walking and finally their decision to incorporate walking as part of transportation modes for their work travel* (Methorst, 2010).

5 Research Methodology

The methodology examines the reasoning and rationale behind the research design adopted to realising the objectives of this study. The research has utilised a range of research technique including interviews and participant observations that are analysed within a case study research methodology (Yin, 2009; Gray, 2009) that is informed by a constructivist/interpretivist theoretical perspective and a subjective epistemology, which together come within an overarching qualitative paradigm (Gray, 2009; Miles and Huberman, 1994).

5.1 Unit of analysis Investigating the issue of walking to work and theorising about new approaches to improve the pedestrian environment for workplace travel, involves a close look at the main pedestrian character and the physical built environmental factors that influence their walking experience to and from workplace during peak hours in the city centre. Both of these components are undertaken as *unit of analysis* for this *exploratory research* (Yin, 2009) within the developing city context of Kuala Lumpur Metropolitan City. In supporting the selection of unit of analysis and research approach, Gray (2009) and Seamon (2010) has suggested that human interaction with the world is meditated through the process of meaning- making and interpretation of the phenomenon based on the people's experiences. This study seeks to establish a better understanding of the meaning behind the walking to work phenomenon. The walk trips experiences are explored based on time, context (Gray, 2009), trips and walk stages (Transport for London, 2011).

i) walk trips to and from office to home during morning and evening rush hours; and walk trips to and from office to activity centres during lunch break;

ii) walking as a connector to other modes of transportation that is access to and from office to transit or parking facilities based on the empirical evidence of walking distance that an adult can and do walk which is within the short distance journey range from 500m (Scheiner, 2010) to 1 km/0.6 mile (Lee and Moudon, 2007).

iii) Two contrasting site areas; 1) Kuala Lumpur City Centre (KLCC) – 21th century development with a well planned pedestrian environment and established public transportation and circulation; and 2) Old Town of Kuala Lumpur - a prominent employment area starting from 1900 during the colonial period with mixed of old and new development in an ad hoc planning. It would give the opportunity for the researcher to make a comparative analysis on the employees' walking experience for walking to and from work

5.2 Sampling, data collection and analysis

Sampling. Non-probability sampling is adopted in this research. Participants' selection is based on the purpose and objectives of the study. This is called *purposive sampling* where the participants are adult employees, within Kuala Lumpur Metropolitan, who depend on walking for transportation. The journey starts from home and terminates at work in the city centre. To start with, the researcher compiles a short list of sample units from various sources. Each of these respondents are contacted and invited to participate and to recommend names of other potential respondents among the employees who work for the same company and willing to share their walking experience. This referrals technique is called *snowball samplig* (Gray, 2009).

Data Collection. In the nature of qualitative approach, the data collection needs to be deep and rich in order to give an understanding full of meaning. In depth interview technique via semi structured interviews is adopted for data collection. This technique is a more appropriate and adequate method of inquiry for the study that has a complex phenomenon focusing on people's feelings and meanings about the topic under investigation (Gray, 2009). A total of 19 participants across the two site areas in the city centre of Kuala Lumpur Metropolitan namely Pudu and KLCC have been interviewed. The respondents were asked on the value of their everyday walking activity including their views on the impact of walking on their health conditions, surrounding environment, personal economy and social interaction.

Data Analysis. According to Miles and Huberman (1994) human activity is seen as "text"- as a collection of symbols expressing layers of meaning through a process called transcribing- transforming audio into text. Soft data from the interview transcript are analysed through a series of process to capture the essential quality of what was found in the text (Smith and Osborn, 2007) and identifying the evidence that addresses the research question (Yin, 2009). Each text or soft data are then interpreted through a coding and categorising processes into a more concrete version with the aid of Nvivo 9 software. This process help the researcher to induce the influential factors through the exploration of personal experience and perception; discovering positive and negative feelings about their existing pedestrian environment and recognising the potential ideas from the subject of one's inquiries.

6 Initial Findings and Discussion

At this stage of research, the findings are based on the thematic induced from the data analysis of eight (8) respondents which is four (4) respondents from each case study area. They are discussed below:

i) Walking to work

There are about four categories of travel modes experienced by the employees who walk to and from workplace in the city centre of Kuala Lumpur Metropolitan. The walking stages are identified as a connector to the transit station from home and from the arrival point at the transit station in the city to the office as shown in the diagram 2. In all categories three walking stages are identified as: 1) walking from home to transit, 2) walking in indoor environment within the interchange and 3) walking from the arrival point at the transit station or from the nearest car parking in the city centre to the office. However due the time constraint in the research, the quality of the existing pedestrian environment for walking from home to transit and walking in indoor environment within the interchange has been left for further exploration and investigation.

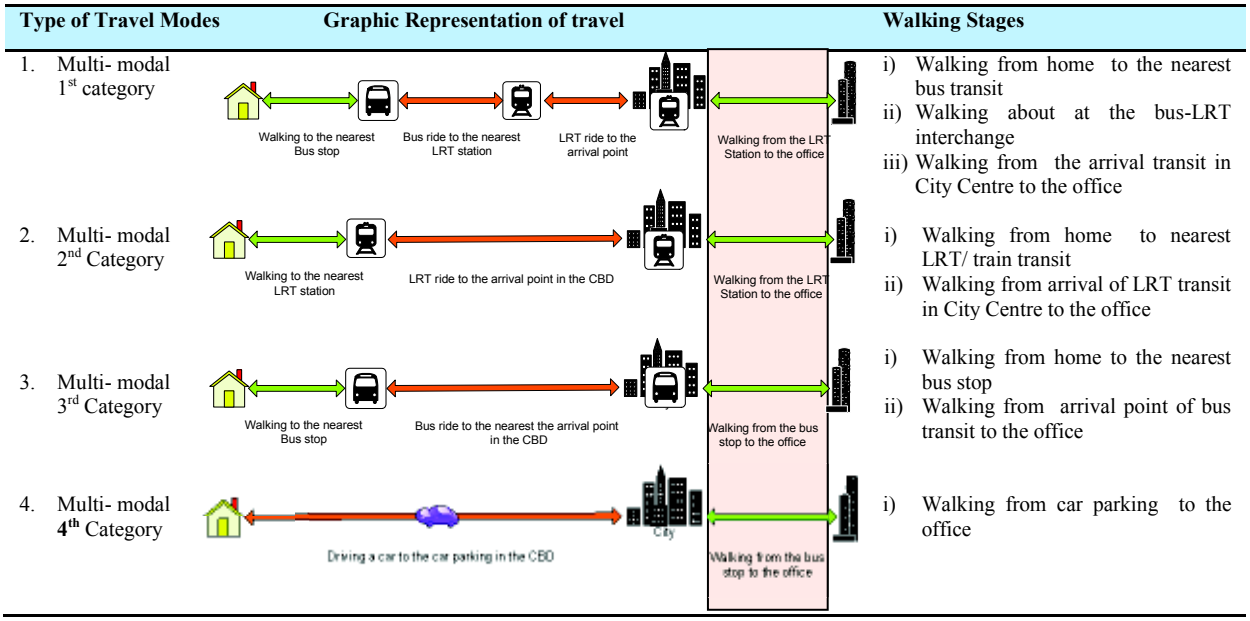

Diagram 3: Walking stage in the multi modal for workplace travel in the Kuala Lumpur Metropolitan City (Author, 2011)

ii) Purposive walking to and from work place

The analysis showed that there are about four types of walking segments by purpose which take place in routine activity of an adult employee within the selected walking stage. The walking segments have a strong relationship with: 1) time *travel* during morning and evening rush hour; and 2) *walking stages* from point A to B. The four walking segments are:1) walking from the arrival point to workplace (am),

2) walking from workplace to the departure point (pm),
3) walking from workplace to break places (afternoon) and
4) walking from break places to workplace (afternoon).

From this point, the meaning of walking to work in the daily walk trip for an employee would be precise if walking from workplace to break places (afternoon) and walking from break places to workplace (afternoon) are included in the earlier definition. Each of these walking segments has its own characteristics and the pedestrian environment (PE) conditions and needs as shown in diagram 4:

Walking segments	Time travel	Walking characteristics	PE condition and needs
1.Walking from the arrival point to workplace	Am rush hour	Fast walking pace, fear of fall for ladies, body and mind are rushed by time,	straight forward and direct routes, transit choices that closer to the workplaces, efficient public transport services, safety and security along the routes, minimal obstacle on the sidewalks, efficient pedestrian infra and facilities
2. Walking from workplace to the departure point	Pm rush hour	Walk leisurely at slow pace, body and mind are more relax with time, having more time to observe the surrounding atmosphere	Safety and security along the routes, looking for more mixture of uses along the routes such as cafe, retail outlets, art works, and attractiveness and details of sidewalks and routes design, street furniture and lighting
3.Walking from workplace to break places	Afternoon break	Fast walking pace, best time to rejuvenating and refreshing mind and body, socializing time, accompanied walking with working colleagues	Looking for more mixture of uses along the routes such as cafe, food places and retail outlets, focused destination to win the time travel
4.Walking from break places to workplace	Afternoon break	Fast walking pace, accompanied walking with working colleagues	straight forward and direct routes, safety and security along the routes, minimal obstacle on the sidewalks, efficient pedestrian infra and facilities

Diagram 4: The result of each walking segments in relation to walking characteristics and the need of the pedestrian environment for walking to work (Author, 2011)

iii) Factors that influence walking to work

Walking to work has been recognised to have been influenced by several factors categorised as internal, external and physical environment factors.

The internal factors are influenced by:

a) *The individual choice of transportation modes for workplace travel* including incorporating walking as part of the transportation mode. The choice of modes of transport depends on residential location, availability of the nearest public transport network to residential, car ownership and socio economy status of an individual;

b) *The walking perception:* for example rejuvenation, enjoyment, refreshment, relaxation, comfort, socializing, safety and security that is fear of crime, traffic and harassment from strangers, attitudes that developed their positive and negative belief on walking to work; and

c) *Understanding and knowledge on the value of walking:* for example to physical health, the surrounding environment, personal economy and social interaction. The decision to drive to work or to incorporate walking with other forms of transportation depends on the individual's depth of understanding and knowledge of the benefits of walking. The results has clarified that the walking behaviour is influenced by individual belief and attitudes on walking to work.

The pedestrian environment factors are influenced by:

a) *Accessibility to destinations* (see four walking stages described above)

b) *Barriers to walking* (e.g. obstacles and insufficiencies in the physical infrastructure and facilities such as parking facilities, surface conditions, street lighting, crossing facilities, signages, park and greenery and art work).

c) *Opportunities* in the existing transportation, pedestrian network to the workplaces and ageing population.

The external factors are influence by *government policy* and *weather* attributes.

7 Conclusion and Further Research

The paper has explored the walking experience of adult employees who work in the city centre. It also highlighted the issues to support the research basing from the diverse fields of Public Health including physiologists and bio mechanists, Urban design and planning, Transportation planning and Phenomenology and sociology. The existing theories and knowledge about walking for transport are consolidated in a set of theoretical proposition in which these initial ideas are going to be developed into a conceptual framework for the pedestrian environmental quality for walking to work. The next stages of the research is to absolute the data analysis and induce the emerging possibilities revealed during the course of the research and/or potential for expansion based on the scope and limitation of the research set earlier.

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