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THE UNIVERSITY OF HONG KONG

USER-FRIENDLINESS OF THE UNIVERSITY OF HONG KONG FOR WHEELCHAIR-BOUND PERSONS

A DISSERTATION SUBMITTED TO

FACULTY OF ARCHITECTURE

IN CANDIDACY FOR

THE DEGREE OF

BACHELOR OF SCIENCE IN SURVEYING

DEPARTMENT OF REAL ESTATE AND CONSTRUCTION

BY

WONG CHEUK KEI

APRIL 2008

CONTENTS

DECLARATION

I declare that this dissertation represents my own work, except where due acknowledgement in made, and that it has not been previously included in a thesis, dissertation or report submitted to this University or to any other institution for a degree, diploma or other qualification.

Signed: _____

Name: _____

Date: _____

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ABSTRACT

"We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights that among these are Life, Liberty and the pursuit of Happiness"

The Declaration of Independence of the United States

Equal Opportunities have long been the ideal for all human beings. Hong Kong being the Asian metropolis of the world is endeavored in protecting the rights of all her citizens. Systems of anti-discrimination of sex, disability and family status is set up under the efforts of Equal Opportunities Commission for the sake of securing a favorable environment for everyone.

However, the discrimination against disability is a more complicated issue than the other groups since it requires not only intangible means such as education or legislation to achieve equal opportunities. Instead, the disabled person indeed aspire to more tangible means like tailor-made facilities or other specified devices for them to live normal lives as others, enjoying the same pleasure as others, getting access to the world as others. Wheelchair-bound

people being a dominant group of population of disabled in Hong Kong have long been neglected for their rights to achieve these rights. Tons of obstacles are found in the public society that make their everyday lives seem to be an endless hurdle race that torture their mentality in exploring the world.

A barrier free environment has long been an ideal for wheelchair-bound people. Legislations do help alleviating the present condition. However, in reality, they indeed are still struggling in getting to most of the places as compared to ordinary people where they can just easily get accessed. This account for the failure in governing the amount and quality of the facilities provided. Not to mention, those given facilities usually are not designed from the point of view of wheelchair-bound people. Instead, most of them are just merely provided for the sake of fulfilling the legislative requirement. This reveals a desperate necessity in assisting the wheelchair-bound people to really better their life rather than tricks to entertain the government.

Benefits of a user-friendly environment to everyone, especially to the disabled people have been widely documented in literature. A significant portion of the entire population, not only people with disability, is handicapped due to the physical barriers in the society. Therefore, a user-friendly environment with

barrier free actually helps not only people with a disability, but also a wide variety of people such as children, the elderly, pregnant woman, parents with prams and the injured.

This dissertation is to investigate the user-friendliness of the main campus in the University of Hong Kong mainly by the personal trial of using a wheelchair inside the main campus. One point to note is that the aim of the personal trial is not to test the total compliance of the University of Hong Kong to the statutory requirements prescribed in the regulatory framework, but to determine the problems or difficulties for wheelchair-bound people when they get access and travel around the main campus, and the overall user-friendliness of the University of Hong Kong for wheelchair-bound people.

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Chapter 1 Introduction

1.1 Background

Hong Kong is a city of tower blocks. Owing to the topography, flat land is limited in the region. In the past few decades, the rapid increase in population and high land price forced the buildings skywards. The user friendliness of the environment, in terms of accessibility and barrier free, becomes a major problem for people with a disability. While the majority of people enjoy freedom of access, the rights and opportunities of disadvantaged groups are often ignored.

The United Nations (1997) notes that – “The built environment throughout much of Asia and the Pacific has been designed without consideration for the special needs of people with disabilities. Physical obstacles and social barriers prevent citizens with disabilities from participating in community and national life.”

Also, as stated in the Hong Kong Government (1995), the White Paper on “Equal Opportunities and Full Participation: A Better Tomorrow for All”, mobility is a right, not a privilege. And the objectives of government policies in respect of access and built environment are to ensure the development of a

“barrier-free” physical environment, which permits access to all buildings and facilities for all people with disabilities to enhance their mobility at will in society and to facilities their full participation and integration into the community.

It is particularly true in Hong Kong where the high land cost is a deterrent to providing adequate access and facilities for person with a disability. The introduction of Disability Discrimination Ordinance (DDO) (Cap. 487) in 1995, subsequently implemented on 20 September 1996, no doubt reflects the continuous quest by persons with disabilities for equality in Hong Kong. Although Hong Kong has a long history of rehabilitation services, in the early years they were mainly provided by non-governmental organizations with relatively little co-ordination by the government. Since the establishment of Equal Opportunities Commission (EOC) in 1996, the involvement of the government starts to be more proactive and willing to undertake more important jobs in this field until now.

Under DDO, the provisions of the “Access to Premises” & “Building Approval” (section 25 & 84 of DDO) relating to all accessibility in building design, are named as one of the responsibilities of EOC. EOC is therefore the first statutory body established for dealing with the accessibility in light of the

anti-discrimination, which is a totally new perspective in Hong Kong. Both DDO and EOC are in effort to secure a favorable environment for every one.

Wheelchair-bound people being a dominant group of population of disabled in Hong Kong have long been neglected for their rights to enjoy equal opportunities to have the same pleasure as others and get access to the world as others. Tons of obstacles are found in the public society that make their everyday lives seem to be an endless hurdle race that torture their mentality in exploring the world.

A user-friendly with barrier free environment has long been an ideal for wheelchair-bound people. Legislations do help alleviating the present condition. However, in reality, they indeed are still struggling in getting to most of the places as compared to ordinary people where they can just easily get accessed. This account for the failure in governing the amount and quality of the facilities provided. Not to mention, those given facilities usually are not designed from the point of view of wheelchair-bound people. Instead, most of them are just merely provided for the sake of fulfilling the legislative requirement. This reveals a desperate necessity in assisting the wheelchair-bound people to really better their life rather than tricks to entertain

the government.

Having claimed the basic principles of equal opportunities and full participation, the legislation, policy and planning framework of the government still fails to secure a user-friendly environment for all sectors of the community. In this research relating to the user-friendliness of the main campus of the University of Hong Kong, wheelchair-bound persons are chosen as the study target group because they are major victims of physical inaccessibility. It is found that they are bound to stay at home, without work or schooling (Lung, 1998). They never enjoy the same rights as the able-bodied (Cheng, 2005). The physical barriers can dictate which school they can attend, which job they can get, which supermarket or restaurant they can go in, which clinic or library they can visit, which park they can go or even which public toilet they can use (Choi, 2003). In other words, every aspect of their daily lives is restricted.

On the other hand, a significant portion of the population, not only people with a disability, is handicapped in some ways due to the physical barriers in the built environment. Therefore, a user-friendly environment actually helps not only people with a disability, but also children, the elderly, pregnant women, parents with prams and the injured (Cheng, 2005).

In this research, the present regulatory framework in promoting a user-friendly environment, the level of user-friendliness in the University of Hong Kong for wheelchair-bound people and the problems for wheelchair-bound people from the environment are studied.

1.2 Aim

The primary aim of this research is to determine the user-friendliness of the main campus in the University of Hong Kong for wheelchair-bound persons. It also aims to understand special facilities for the wheelchair-bound person as an essential accompaniment to increase the user-friendliness of the university campus as well as an enhancement for better quality of their life in Hong Kong.

1.3 Objectives

This dissertation endeavors to carry out a comprehensive analysis to achieve the following objectives:

1. To study the present regulatory framework in Hong Kong on the user-friendliness, in terms of accessibility and barrier free, for wheelchair-bound persons

2. To evaluate the adequacy of regulatory framework in setting out design requirements for ensuring a user-friendly built environment for wheelchair-bound persons in Hong Kong
3. To examine the problems that wheelchair-bound persons face when they access and move around main campus in the University of Hong Kong

1.4 Methodology

To fulfill the objectives of the research, data are collected via literature review, comparative analysis and personal trial.

(a) Literature Review

By critically reviewing literatures and theories, understanding towards the basic issues of disability as well as to develop a knowledge foundation to know and understand about the aspects of user-friendly environment. It also consists of an extensive literature review on the definition and changing concept of the disability, types of barrier for wheelchair-bound persons in the society, and the disability models, etc. Reviewing literatures from some experts of disability like Imrie and Gleeson are done in order to have some basic concepts on the topic.

(b) Comparative Analysis

Comparative analysis is adopted to evaluate the adequacy of the regulatory framework in setting out the design requirements for ensuring a user-friendly environment, in terms of accessibility and barrier free, in Hong Kong.

Since Hong Kong is not yet a leading country in the provision of regulatory framework for ensuring a user-friendly environment, by comparing to those leading countries in the world like the United States, and the neighboring countries like Singapore, the adequacy of the regulatory frameworks can be determined. The rationales for adopting the method of comparative analysis are further elaborated in section 9.2.2.

(c) Personal Trial

A personal trial of using a wheelchair in the main campus of the University of Hong Kong is conducted by the author of this dissertation. A practical investigation around the main campus and a number of set of journey from place to place are carried out in the position of being a wheelchair-bound person, in this way, the actual difficulties or problems for the wheelchair-bound persons to travel around the main campus can be found.

1.5 Outline Content of the Dissertation

This dissertation is mainly divided into 3 parts as follows:

Part I:	Introduction	(Chapter 1)
Part II:	Literature Review	(Chapter 2, 3, 4, 5, 6, 7 & 8)
Part III:	The Research	(Chapter 9, 10, 11 & 12)

Part I: Introduction

Chapter 1 – Introduction

Chapter 1 is the introduction of the research. Structure of the dissertation is described. The background, aim, objectives, methodology of the research are also stated out in this chapter.

Part II: Literature Review

Chapter 2 - Overview of the Physically Disabled People in Hong Kong

Chapter 2 is an overview of the physically disabled people in Hong Kong. It describes the demographics, socio-economic, and residential characteristics of physically disabled people in Hong Kong. Also, their relative position with

that of entire population in Hong Kong can be understood by the comparison with another one. The number of wheelchair-bound students in each university in Hong Kong is approximately calculated by using the statistic of the physically disabled people at 2001 by the Census and Statistics Departments of Hong Kong.

Chapter 3 – Basic Issues of Disability

Chapter 3 reviews literature on the basic issues of disability. In order to have a better understanding of the terms, concept as well as definition of impairment, disability and handicap are distinctively studied. In addition, the types of barrier for wheelchair-bound people and the disability models are described. Through this way, a knowledge foundation to know and understand about the aspects of user-friendly environment can be developed.

Chapter 4 – Political Philosophy for User-friendly Environment

This chapter introduces a widely accepted political philosophy for helping the needy. Under the principle of the theory, a user-friendly environment is supported to be created for everyone, especially for the disabled people.

Chapter 5 – Arguments against User-friendly Environment

There are counter arguments against the establishment of user-friendly environment. To set up an objective platform for a comprehensive understanding of this particular issue of user-friendliness campus, the major arguments against the provisions of a user-friendly environment are discussed in this chapter.

Chapter 6 – Political Approaches for Disability Legislations

Political approaches for disability legislations are reviewed in this chapter, in order to have more understanding on the regulatory framework for persons with disabilities.

Chapter 7 – “Ableist City”

A new idea of “ableist city” is introduced with literatures back-up by the thesis of Cheng (2005). Moreover, the causes of making an “ableist city” and the impacts of “ableist city” on disabled people are also discussed.

Chapter 8 – Definition of Accessibility

Literatures on the definition of accessibility and accessibility measurement are reviewed under this chapter, so as to create a basis for determining the level of user-friendliness of main campus of the University of Hong Kong. Also, the ways for the measurement of accessibility are set for the personal trial of using a wheelchair in main campus at the end.

Part III: The Research

Chapter 9 – Research Design

Chapter 9 illustrates the rationale of the research design. The grounds behind each research method used and the reason why using those methods are explained.

Chapter 10 – Comparative Analysis

This chapter firstly selects the comparable countries for comparative analysis. The overview of the regulatory framework for ensuring user-friendly built environment, in terms of accessibility and barrier free, in Hong Kong as well as the comparable countries is followed. Then, the basis for the comparative

analysis is set. Next, the comparative findings, analysis and discussion on the result of comparison among Hong Kong and comparable countries are given. At the end, a conclusion of the comparative analysis is made.

Chapter 11 – Personal Trial

The problems that wheelchair-bound persons face when they access and travel around main campus in the University of Hong Kong are mainly examined by the personal trial of using a wheelchair. Empirical findings through the trials in a number of set of journey inside main campus, analysis and discussion are afterwards given. The personal trial is concluded at the end of this chapter.

Chapter 12 – Conclusion

Chapter 12 discussed whether the results and findings fulfill the three research objectives with a conclusion. Limitation of the research and recommendations for further research are also given.

Chapter 2 Overview of the Physically Disabled People in Hong Kong

This chapter provides an overview of the physically disabled population in Hong Kong. Compared with some corresponding figures of the entire Hong Kong population, it helps to highlight the relative magnitude of those figures related to the disabled population. The comparisons between the total population and the disabled population help to understand the relative position of the physically disabled people, with that of the entire population, in Hong Kong. In the first section, it starts with some basic facts of the physically disabled population, such as the number of physically disabled people and the causes of their physical disability. The remaining sections deal with, in turn, three major characteristics – demographics, socio-economic, and residential – of the physically disabled population.

2.1 Physically Disabled Population

Disabled people constitute only a small group among Hong Kong's entire population. In 2000, there were 269,500 disabled people of various disability types, and the prevalence rate was about 4% (Census and Statistics Department, 2001). Among the different types of disability, physically disability

exceeded others as the most prevalent form of disability (see table 1). The prevalent rate of physical disability alone was 1.5%, representing that there were 15 physically disabled persons out of every 1,000 Hong Kong residents. The common types of physical disability included “restriction in limb movement owing to feeling of weakness”, “paraplegia and quadriplegia” and “restriction in limb movement owing to bone broken” (see table 2). Most of those sufferers required either wheelchairs or other specialized tools like crutches and cane to facilitate their movement (see table 3). Therefore, the total number of disabled people as a whole and that of physically disabled people by itself are insignificant. One point is that their physical differences from able-bodied people demand a realization that the bodily conditions of Hong Kong citizens are quite diverse.

Table 1: Disabled People by Type of Disability

Type of disability	Number of persons	As % of total Hong Kong population
Restriction in body movement	103,500	1.50
Difficulty in seeing	73,900	1.10
Difficulty in hearing	69,700	1.00
Difficulty with speech	50,500	0.70
Mental illness	18,500	0.30
Autism	3,000	0.05
All disabled people[a]	**269,500**	**4.00**
[a] A person might have more than one type of disability and hence the overall number of persons with disabilities is smaller than the sum of all the number of persons with various types of disability		

(Source: Census and Statistics Department, 2001)

Table 2: Physically Disabled People by Major Cause of Physical Disability

Major cause of physical disability	As % of all physically disabled persons
Restriction in limb movement owing to feeling of weakness	35.7
Paraplegia and quadriplegia	14.0
Restriction in limb movement owing to bone broken	12.3
Restriction in limb movement owing to stroke	7.2
Loss of hand/foot/finger/toe	4.3
Spasm	2.7
Loss of whole arm/leg	2.5
Others	21.9
Total	**100.0**

(Source: Census and Statistics Department, 2001)

Table 3: Physically Disabled People Required a Wheelchair or Other Specialized Aids/tools to Move/walk around

	Number of Persons	As % of All Physically Disabled People
Wheelchair	20,100	19.4
Other Specialized Aids/tools	33,300	32.1
Total	53,400	51.5

(Source: Census and Statistics Department, 2001)

2.2 Demographic Characteristics

The vast majority of physically disabled people were middle-aged or the elderly. Their gender composition, however, shows no significant difference from that of the overall Hong Kong population. More than half of the physically disabled people were 60 years of age or over (see table 4). Together with the middle-aged group, elderly physically disabled people constituted nearly 90% of all physically disabled people. This was significantly different from the age structure of the general population (see table 4). On the other hand, in term of gender structure, there is a small difference, in terms of proportion, between physically disabled people and the total population. The proportion of female physically disabled people was slightly higher than that of male physically disabled people (see table 5). In brief, the majority of physically disabled people were middle-aged and the elderly, and women exceeded men in this

social sub-group.

Table 4: Physically Disabled People by Age, and the Corresponding Figure of the Total Hong Kong Population

Age group	As % of all physically disabled people	As % of total Hong Kong population
<15	1.7	17.2
15-29	3.1	20.7
30-39	5.9	19.2
40-49	12.0	17.8
50-59	12.3	10.0
≥60	65.1	15.0
Total	**100.0**	**100.0**

(Source: Census and Statistic Department, 2001)

Table 5: Physically Disabled People by Gender, and the Corresponding Figure of the Total Hong Kong Population

	As % of all physically disabled people	As % of total Hong Kong population
Male	43.7	48.6
Female	56.3	51.4
Total	**100.0**	**100.0**

(Source: Census and Statistic Department, 2001)

2.3 Socio-economic Characteristics

The socio-economic characteristics of physically disabled people are noticeably different from that of the overall population. Firstly, the majority of physically disabled people had low educational attainment. Around 75% of them received only primary education or less. This proportion was significantly

higher than that of Hong Kong's population in general (see table 6). In addition, the proportion of physically disabled people who had received secondary and tertiary education was significantly lower than that of the general population (see table 6). Therefore, in spite of a high literacy rate (93.5% in 2002) in Hong Kong (CIA, 2005), the physically disabled people are mostly situated at the lower half of the social spectrum.

Table 6: Physically Disabled People by Educational Attainment, and the Corresponding Figure of the Entire Hong Kong Population

	Number of Persons	**As % of All Physically Disabled People**	**As % of Total Hong Kong Population**
No Schooling/Kindergarten	80,200	37.0	13.0
Primary	107,900	37.8	26.9
Secondary/Matriculation	68,300	21.1	45.4
Tertiary or Above	13,100	4.2	14.7
Total	**269,500**	**100.0**	**100.0**

(Source: Census and Statistic Department, 2001)

Secondly, even though some physically disabled people were employed, they were over-represented in those low-skilled occupations. Among the 17,500 physically disabled persons participating in the labour force, around 15,300 were employed in the sector of elementary occupations (Census and Statistics Department, 2001). The unemployment rate of physically disabled people was around 12.5%, which was significantly higher than the unemployment rate of

4-5% in the total population. Among the employed physically disabled people, most were hired in low-skilled occupations. Among others, unskilled "elementary occupations" was the most common job of employed physically disabled people (see table 7). Conversely, physically disabled people were under-represented in those high-skilled occupations (i.e., "Managers and administrators, and professionals and associate professionals") in comparison with that of the overall population (see table 7).

Table 7: Employed Physically Disabled People by Occupation, and the Corresponding Figure of the Total Hong Kong Population

	As % of all employed physically disabled people	**As % of total employed population**
Managers and administrators, and professionals and associate professionals	12.9	29.5
Clerks	14.6	18.3
Service workers and shop sales workers	15.1	14.4
Craft and related workers	12.8	10.4
Plant and machine operators and assemblers	11.4	8.4
Elementary occupations	33.0	18.7
Others	0.3	0.3
Total	**100.0**	**100.0**

(Source: Census and Statistic Department, 2001)

This unbalanced occupational structure contributes to an over-representation of the employed physically disabled people in low-income groups. More than a third of the employed physically disabled people earned less than $7,000 a month, and this figure was higher than that of the entire population (see table 8). In the highest income group (i.e., $20,000 and above), the number of physically disabled people was significantly smaller than that of the entire population (see table 8). In sum, the economic status of physically disabled people was much inferior to that of the entire population.

Table 8: Physically Disabled People by Average Monthly Income, and the Corresponding Figure of the Total Hong Kong Population

	As % of all physically disabled people	As % of total population
<$4,000	13.6	8.9
$4,000-$6,999	20.8	13.7
$7,000-$9,999	17.2	20.5
$10,000-$14,999	26.3	23.9
$15,000-$19,999	10.8	11.0
≥$20,000	11.2	22.0
Total	**100.0**	**100.0**

(Source: Census and Statistic Department, 2001)

2.4 Residential Characteristics

Although there was no evidence showing any spatial segregation or concentration of physically disabled people, most of them are living in public housing estates. Similar to the residential pattern of the entire Hong Kong residents, half of the physically disabled people are living in the New Territories (see table 9). Slightly over a third of physically disabled people live on Kowloon Peninsula, which was also similar to the corresponding figure for the entire population (see table 9). Hong Kong Island, which contains some of the oldest housing, has the least number of physically disabled residents, while it is also the least populous area in Hong Kong in general (see table 9). In brief, the geographical distribution of physically disabled people does not differ significantly from that of the overall population.

Table 9: Physically Disabled People by Area of Residence, and the Corresponding Figure of the Total Hong Kong Population

	As % of all physically disabled people	As % of total population
Hong Kong Island	16.6	19.6
Kowloon East	22.4	21.2
Kowloon West	10.2	9.2
New Territories East	22.6	23.8
New Territories West	28.1	26.2
Total	**100.0**	**100.0**

(Source: Census and Statistic Department, 2001)

Table 10: Physically Disabled People by Type of Housing, and the Corresponding Figure of the Total Population of the SAR

	As % of all physically disabled people	As % of total population
Public rental/public temporary housing	47.2	35.1
Private housing	29.2	46.0
Subsidized sale flats[a]	11.4	17.5
Other permanent housing[b]	12.2	1.4
Total	**100.0**	**100.0**

[a] Includes flats built under the Home Ownership Scheme, Middle Income Housing Scheme and Private Sector Participation Scheme, and flats sold under the Tenants Purchase Scheme of the Hong Kong Housing Authority, and flats built under the Flat for Sale Scheme and Sandwich Class Housing Scheme of the Hong Kong Housing Society

[b] Includes quarters in hotels, hostels, dormitories and non-residential buildings. In this case, it is more likely to be long-stay care hospitals and rehabilitation centres

(Source: Census and Statistic Department, 2001)

Even though there was no geographical segregation or concentration of physically disabled people in particular neighbourhoods, the physically disabled people were over-represented in public housing estates (see table 10). The proportion of physically disabled people living in private housing units

was noticeably smaller than that of the entire population (see table 10).

2.5 Calculation of Wheelchair-bound Students in each University in Hong Kong

Making use of the statistic of physically disabled people, the number of wheelchair-bound students in each university in Hong Kong can be approximately calculated. It can be calculated as follows:

[Total number of wheelchair-bound people X percentage of university age (approximately 10%) X percentage of wheelchair-bound people with tertiary or above education attainment / number of university in Hong Kong]

= 20, 100 X 10% X 4.2% / 8

= approximately 11 wheelchair-bound students per university

2.6 Summary

In sum, physically disabled people, in terms of number, are a minority group in Hong Kong. Most of them are middle-aged or the elderly, and had received relatively low level of education. Among the employable physically disabled people, the majority were employed in low-skilled occupations with relatively lower wages. Some physically disabled people were also employed in

high-skilled occupations but, as a proportion of the total number of disabled people, it was significantly lower than that for the entire population. In addition, although there was no evidence to suggest that physically disabled people were residentially segregated from the larger population, most of them were living in public housing estates. In brief, they were one of the disadvantaged groups in the society.

From the calculation making use of the statistic of the physically disabled people in 2001, the number of wheelchair-bound students in each university is approximately eleven.

Chapter 3 Basic Issues of Disability

Steinfeld & Danford (1999) point out that all research methodology starts with theory. Therefore, literature review is vital and important in the research since it presents a set of important issues underlying the formation of the research objectives and research approach. This chapter focuses on reviewing basic issues of disability and more practical information about people with disability and user-friendly environment. For example, the definitions of impairment, disability and handicap, types of barrier for the wheelchair-bound people and the disability models. These theories lead us to develop a knowledge foundation to know and understand about the aspects of user-friendly environment. It also helps to guide the research approach and interpret the findings.

3.1 Definition of Impairment, Disability and Handicap

Although the terms impairment, disability and handicap are sometimes used interchangeably, their underlying meanings are different. International Classification of Impairments, Disabilities and Handicaps (ICIDH) which is introduced by the World Health Organization (WHO) in 1980 and Thomas (1982) also define these terms as:

Impairment

It means any loss or abnormality of the psychological, physiological or anatomical structure or function. Impairments may be permanent or temporary and occur from birth or at any time throughout lifespan. The term impairment is defined objectively.

Disability

Disability refers to the impact of impairment upon the performance of activities commonly regarded as the elements of everyday living such as walking, bathing and getting in and out of bed. This term is also defined objectively. A person with only one leg is disabled as such an impairment hinders his/her mobility and ability to carry out domestic routines etc.

Handicap

Handicap is defined as a disadvantage, due to impairment and disability, for an individual in that it limits or prevents the fulfillment of a role that is normal (depending on age, sex, social and cultural factors) for that individual. Handicap is defined subjectively. It is a value-judgment applied by others, even by the impaired-disabled persons themselves, to an impaired-disabled person on the basis of failure to perform customary social roles. For example, the

mobility of a person with physical impairment may be hindered owing to functional incapacity.

It is important to know that the presence of impairment does not necessarily imply disability and neither does disability imply handicap. It is because two persons with similar functional limitations may face objectively similar activity restrictions, but one person may retain his/her conventional social roles while the other person, owing to different personal or community resources, may consider himself/herself or be considered as a handicapped person. For example, if there is no ramp provided in the entrance, a wheelchair user is handicapped. But if a gentle ramp is provided, the wheelchair user is able to gain access to the building himself without difficulty. He is not handicapped even though he has a disability. However, if the wheelchair user has impairment in his upper limbs as well, he is handicapped in spite of the gentle ramp available.

Obviously, the term handicap carries a labeling and stigmatized meaning to the persons with impairments and this meaning is caused socially. According to Oliver (1983), impairment is an individual limitation while disability is a socially imposed restriction. When all people in the society are locomotorily impaired,

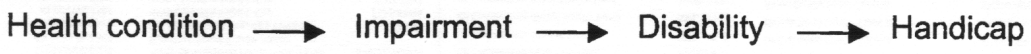
then wheelchair users are not regarded as disabled as the whole society is designed to fit their needs. In other words, the limitations and difficulties imposed on the disabled people are due to the physical and social environments rather than the disabilities themselves.

3.2 Concept of Impairment, Disability and Handicap

Under the classification of World Health Organization (WHO), the terms “impairment”, “disability” and “handicap” are covered under the umbrella term “disablement”. The traditional concept as well as the new concept of these terms is reviewed in the following sections.

3.2.1 Traditional Concept

Traditional concept is that impairment, disability and handicap are in a cause and effect process. That means, impairment, which may result from some kinds of disease or illness, cause disability in which people experience a limitation on his/her activities, and disability in turn leads to limitations in social participation or “handicap” (Bickenbach *et al*., 1999; International Social Security Association, 1981; Steinfield & Danford, 1999). The following shows the traditional concept of the disablement process.



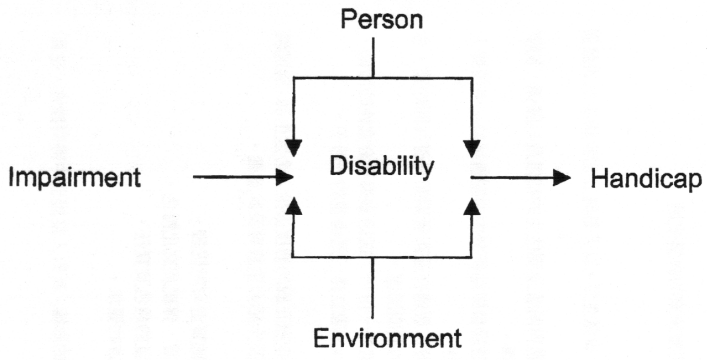
(Source: Steinfeld & Danfold, 1999)

This one-way process of diseases to impairment to disability to handicap suggests that people are inconvenienced because of their disability alone, and that handicap is caused by impairments and disabilities. The sole attribution of handicap to the medical or functional state of the individual has received much criticism and the traditional concept is regarded as an oversimplification (Chamie, 1995; Steinfeld & Danford, 1999). Health conditions do not necessarily result in impairment, but they can result in functional limitations, such as pregnancy. Moreover, it is suggested in many literatures (Bickenbach *et al*., 1999; Council on Tall Buildings and Urban Habitat, 1992; Steinfeld & Danford, 1999; Ustun, 2001) that not everyone with a disability is handicapped. A disability becomes a handicap mainly because the external factors such as environment hinder the individual to perform the task. Yet, although the role of environment in the creation of disabilities and handicap is noted, the traditional view has not explicitly included the environmental factor and so this essential component of the disablement process is neglected.

In the context of physical access, the role of a barrier-filled environment should be identified as the major element contributing to handicap, which is the underlying concept of the social model which is described later. This raises the new conception of the disablement process.

3.2.2 New Concept

The recognition of the role of environment in the disablement process brings a new conception to describe the disablement process. From the new perspective, environment is conceptualized as a mediating factor in both functional ability and social participation. The following shows the new conception of the disablement process.



(Source: Steinfeld & Danfold, 1999)

Under this new concept, it is acknowledged that instead of the impairment and disability, the physical barrier in the society is the main reason leading to handicap, which is the inability of the physical environment to allow all persons,

but not limited to persons with disabilities only, to make full use of the facilities (Council on Tall Buildings and Urban Habitat, 1992). This means that disabled people may not be handicapped and are able to have an independent life if a user-friendly environment is present. It also leads to realize that all people are actually under risk of being ‘handicapped’ because no one can control all aspects of the environments encounter. This is the idea of universalism, which is the long run approach for user-friendly built environment. In regard to the role and extent of the influence caused by a user-friendly environment, it is therefore crucial to ensure to have a user-friendly environment, which can be effectively done by legislations through modifying the design requirements.

3.3 Type of Barriers

A “barrier” is thing that prevents or controls progress or movement and has both a literal form as in a fence or railing, and a figurative form, as in a restriction to membership in a club (Bednar, 1977). Freund (2001) argues that wheelchair users have less room for maneuver as they make their way in their society. Barriers are encountered by them in a physical and social environment, including public transport and building design, which are created by (and for) people without a disability.

Bednar (1977) asserts that there are two kinds of barriers, one is related to the built environment, that is literal (physical), and the other is related to figurative (attitudinal) barriers.

3.3.1 Physical Barriers

Physical barriers can be defined as those elements in the built environment that deter access to the buildings and public transportation, and make these provisions non-negotiable to people with disability. The most efficient method to address physical barriers is to remove them by way of clear regulations. According to Li (1993), the problems associated with mobility for handicapped involve modes of public transport as well as the “chain of transport links”. Thus, other physical barriers can be defined as the lack of pedestrian circulation, dropped curbs at crossings, ramps for footbridges and subways.

3.3.2 Attitudinal Barriers

Attitudinal barriers are more abstract in nature. They are constructed by society. Bednar (1977) argued that people should remove not just the physical barriers in the public transport and built environment, but also the attitudinal barriers in the minds of people. Bednar’s argument is related to people’s conceptual and attitude changes. As culture and attitudes have long been

implanted in people's minds, it does take times for their minds to change.

To remove attitudinal barrier is important and is the long-term solution. Only if people understand more about the needs of those with a disability and change their attitude towards them, the design of physical environment will start to change and voluntarily cater more for people with a disability, not only by complying with building regulations. Under the enforcement of legislation and promotion of Equal Opportunities Commission, efforts have been made to change people's attitude towards those with disability by promoting that they have the same human rights as the "able-bodied" and it is just to provide them with equal opportunities. Despite their physical or sensory disability, people with disability are treated as the "able-bodied".

3.4 Disability Models

Disability models are the basis in the conceptions of disability in social science theories (Imrie, 1996a). There is no universal accepted view about disability. Also, there is no agreed definition in literature on how the disabled people interact with the society. The interpretation of a word or a symbol is able to affect the attitude and behaviour of people. Thus, the definition of disability is

important in determining the role, status, action and policies of people with a disability. Indeed, one may see disability in a completely different view from the others. The difference in views results in different models of disability and the conflicts basically arise from differing views: to adapt and to be adapted.

Different models have been developed under the different and changing views over disability. There are two major models regarding “disability”, and the meanings of “disability” under these two approaches are very different. The models are, namely, the medical model and social model. The two different interpretations have great influence on disability policies, including provisions on user friendly environment (Choi, 2003; Lau, 2001). In recent years, a bio-psychosocial model, a combination of the medical model and social model, was introduced by the World Health Organization (WHO).

3.4.1 Positivistic Paradigm and the Biomedical Approach (Medical Model)

Positivistic disability geography is initially raised from the medical model of disability. In early usage, the meaning of disability refers to “any restriction or lack of ability (resulting from impairment) to perform an activity in the manner or within the range considered normal for human being” (Oliver, 1990). In other

words, disability is an impairment-induced individual and medical problem. Disability is biologically determined or, as Oliver (1990) has termed, a “personal tragedy”. In this sense, access and movement difficulties encountered by the disabled in the built environment are largely caused by their bodily “defects” but not imposed by the environments (Imrie, 1996b).

According to this medical model, it sees disability is viewed as a personal problem and medical care is the main solution. Disability is defined as an observable deviation from biomedical norms of structure or function that directly results from a disease, trauma or other health condition. It attributes the problems encountered to the person with a disability himself and his disability is the cause of problems (Bickenbach *et al*., 1999). Under this interpretation, it sees disabled people as “the problem” and the responsibility is on them to adjust themselves both physically and psychologically to the mainstream society, which is designed for the able-bodied majority, in order to solve their problems and difficulties (Barnes, 1992). For example, a person with physical disability should try his best to walk with crutches rather than using a wheelchair as he can adapt to the physical environment more with crutches. Disabled people’s lives become attempts to correct such problems, fitting into an immutable society designed for able-bodied people while

counteracting stereotypes of disability (Kaufman-Scarborough, 2001).

However, social factors are divorced in the medical model. It conceives “the problem” entirely within the individual and focused all efforts on “fixing” the individual (Sinacore-Guinn, 1995). In other words, the medical model ignores an important consideration – it is the environment that imposes these limitations. Actually, limitations could be improved by changing the environment without changing the disabled people themselves (Oliver, 1983).

3.4.2 Interpretative Paradigm and the Socio-political Approach (Social Model)

It is a comprehensive model proposed by Stubbin & Albee (1984). The re-conceptualization of the notion of disability has facilitated the emergence of the interpretative paradigm in disability geographies. Social scientists and disabled people have long criticized the individualist conception of disability. As a social scientist proclaimed:

> *“Throughout history, discriminatory practices against the sick and disabled have varied from country to country and from century to century; they have ranged from complete rejection and ostracism to semideification and the according of special privileges and honours”*

(Safilios-Rothschild, 1970; Hall, 1994)

In other words, disability is conceived as a spatiotemporally specific issue, rather than a biologically determined one. The momentous leap from the medical model of disability to a social one was accomplished by a British disability group that re-conceptualized the notion of disability as:

> *"The disadvantage or restriction of activity caused by a contemporary social organization which takes no or little account of people who have physical impairments and thus excludes them from the mainstream of social activities" (Union of People with Impairments Against Segregation, 1976; Hall, 1994)*

In other words, disability is not simply an attribute of a person, but a complex collection of conditions, many of which are created by the social environment. Rather, literal and figurative barriers "disable" people with impairments so that they are unable to fully participate in society. Thus, social change is required to integrate people with disability into the society (Butler & Bowlby, 1997).

The socialization of disability leads to the emergence of interpretative disability geography. The notion shift of disability has refreshed the sub-discipline that

regards disability as a social, not an individual, problem (Hahn, 1988).

According to the socio-political approach, access and movement problems of disabled people stem from the failure of a structured social environment to adjust to the needs and aspirations of citizens with a disability, rather than from the inability of people with a disability to adapt to the demands of a society (Butler & Bowlby, 1997; Hahn, 1986). The focus has, therefore, shifted from medical care to social change such as the disabling built environment and its production within a wider socio-political context (Gleeson, 2001; Hahn, 1986; Imrie, 1996a).

With the interpretative paradigm, the management of disability requires social action, and it is the collective responsibility of society at large to make environment modifications necessary for the full participation of people with a disability in all areas of social life. As the change is on the society, disability becomes a political issue and a matter of human rights.

3.4.3 Embodied Paradigm and the Bio-sociological Approach (Bio-psychosocial Model)

The recent attempt to resolve the conflicting views between the medical and social models of disability has led to a new understanding of disability. It is

argued that the medical and the social models of disability are both unable to capture the totality of disability. Butler & Bowlby (1997) have criticized the social model of disability for:

> *"go[ing] to the extreme of denying that an individual's embodiment, including their impairment, has any effect on their abilities and behaviour [and this notion helps]…paint a picture to which many disabled people cannot relate"*

From an experiential vantage point, a disabled academic concurred:

> *"So how is that, suddenly to me, for all its strengths and relevance, the social model doesn't seem to be water-tight anymore? It is with trepidation that criticizes it. However, when personal experience no longer matches current explanations, that it is time to question afresh" (Crow, 1996)*

In this connection, there has been an attempt to refine the notion of disability. According to this emerging model, disability is the interaction of the disabling society and impaired bodies (Butler & Bowlby, 1997; Imrie, 2004). In this sense, access and movement difficulties experienced by disabled people are never

merely:

> *"an ergonomic problem in the sense of mechanistic, a-social, subject-less ergonomics, but…is a problem of people's embodied relationship to physical artifacts and environments" (Freund, 2001)*

This notional refinement of disability is still in a state of flux. Different theories and concepts are borrowed from various disciplines to substantiate this new intellectual attempt.

Such paradigmatic advancement has led to the formation of the bio-psychosocial model. The bio-psychosocial model is a synthesis of the medical and social model of disability, rather than a mere adoption of one of the models, and is proposed by the World Health Organization (WHO) in ICIDH-2: International Classification of Functioning and Disability[1] in 1997. This entails that disability is not caused solely by either the person himself or the environment. It conceptualizes disablement as an interaction between intrinsic features of the individual and that person's social and physical environment (Bickenbach *et al*., 1999).

[1] ICIDH-2 is a revision of the International Classification of Impairments, Disabilities and Handicaps (ICIDH), which was published in 1980 by the World Health Organization (WHO)

Informed by the thesis of society-body interactions, the bio-sociological approach aims at facilitating a fuller understanding of the experience of disabled people. Using the bio-psychosocial model, user-friendly environment is required as it is categorized in individual's participation. Without barrier free access, people with a disability can hardly participate in ordinary community activities like working, shopping, traveling or even living. They are hindered from going out and hence integrating into the community. In this sense, the social part of the bio-psychosocial model is adopted and accessibility is a part of human rights.

Implications of the Models

The three models described above give rise to different views about disability. Among these, the medical model was developed with a long history but many people especially the disabled criticize the victim-blaming nature of the model. Moreover, it fails to address the social issues involved.

Impaired people do have some physical differences from the able-bodied. But the difficulties encountered by them should not be attributed solely to their physical condition. Humphrey (1994) criticizes that the social model avoids the mentioning of place, medication or ill-health and it is constructed for healthy

quadriplegics. On another hand, under the prevailing model – social model draws attention to barriers in the society; social barriers are stressed rather than the personal restrictions of impairment as emphasized in the medical model. Professional and policy makers questioned the social model about its experimental validity and explanatory reliability. Also, literatures supporting the medical model criticize the social model for the ignorance of an individual's body in defining disability. Even the disabled people themselves criticize the explanatory power of the social model to reflect the real experience of disabled people (Oliver, 1996).

Based on those models mentioned above, some other disability models are created. Smart (2001) describes a model as human-made representations of experiences and phenomena, but it is incomplete and subject to error. Both medical and social model have their advantages and disadvantages. Models are only ways to help us understand the world better and we must not assume that models can do everything (Oliver, 1996). Those models give an insight to politicians and professionals on disability policy. No single model alone is enough for disability policy and legislation formation. The concept of disability involves the ideas from those models, and is even more complicated. Therefore, we should not simply reject other models.

Chapter 4 Political Philosophy Theory Supporting User-friendly Environment

Disability created actually is a political issue. The widely accepted political philosophy for helping the needy is theory of justice by Rawls (1971).

4.1 Rawls's Theory of Justice: Justice as Fairness

"Justice as Fairness" is a major theory in the Theory of Justice. The guiding ideas under this theory are the "principles of justice". They provide a way of assigning the rights and duties in the basic intuitions of society and they define the appropriate distribution of the benefits and burdens of social co-operation. In the Theory of Justice, Rawls (1971) claims the principle of justice are chosen behind a "veil of ignorance", where individuals are unaware of their position in the distribution of natural assets and liabilities. This ensures that no one is advantaged or disadvantaged in the choice of principles by the outcome of natural chance or the contingency of social circumstances. There are two principles of justice as shown below:

1st Principle

Each person is to have an equal right to the most extensive total

system of equal basic liberty compatible with a similar system of liberty for all.

2nd Principle

Social and economic inequalities are to be arranged so that they are both:

i. to the greatest benefit of the least advantaged, consistent with the just savings principle, and

ii. attached to positions and offices open to all under conditions of fair equality of opportunity

The reasoning leading to the two principles of justice stated above is that the general conception of justice as fairness requires that all primary social goods should be distributed equally unless an unequal distribution would be to everyone's advantage. As suggested by Rawls, primary goods are those things which a rational individual wants or need to enable to lead a worthwhile life, whatever its content, which in broad categories, are sense of worth, rights and liberties, etc.

4.2 Implications on User-friendly Environment

Adopting Rawls's Theory of Justice, it is just and rational to provide a user-friendly built environment as everyone does have chance to turn out to be people with a disability behind the 'veil of ignorance'. According to Lau (2001), it is universally accepted that accessibility is a basic human right, which referring to the theory is a primary good that should be equally distributed to all people. Oppositely, without accessibility, many rights and opportunities of people with disability are likely to be exploited. For example, they are hindered from enjoying rights for education, employment, social activities, etc. if the physical environment is inaccessible. Also, from a political perspective, the theory suggests that the right should be guaranteed in laws. An evaluation of the user-friendly environment regulatory framework to provide a standard design is thus needed to see whether the principle of justice under Rawls's theory can really be realized under the current laws and legislations in Hong Kong nowadays.

Chapter 5 Arguments against User-friendly Environment

It has been discussed about the necessity of providing a user-friendly environment under the Rawls's Theory of Justice. However, Lau (2001) has raised three arguments against the user-friendly environment. They are the small number of beneficiaries, economic factor and lowering the self-esteem of people with a disability.

5.1 Small Number of Beneficiaries

In order to provide the necessary facilities for the people with a disability, it increases the project sums and the additional special facilities sometimes may cause inconvenience to the majority of able-bodied. It is argued that the number of people with a disability contributes only a small proportion of the population and therefore, it is not worthwhile to provide special cares and facilities for a few. Also, it is unjust to make use of expense of the others.

However, this argument is obviously invalid. It is because the user-friendly environment provides convenient access for both people with or without a disability. In another word, user-friendly environment is beneficial to the general public.

5.2 Economic Factor

No matter what, profit is the most concerning thing for the developers in a construction project. In order to maximize the profit, developers are reluctant to spend an amount of money for a few potential users to do the additional facilities. However, there are evidences suggesting that the additional cost necessary for user-friendly environment is relatively small. Most estimates are about 1% of the total cost only (Council on Tall Buildings and Urban Habitat, 1992). That means both public and private should be able to meet the additional costs with little or no apparent hardship. Therefore, it is not unworthy to provide a user-friendly environment from the point of profit created.

5.3 Lowering Self-esteem of People with a Disability

People with a disability are discriminated and defined as a special but weaker person. This lowers his/her self-esteem as he/she is treated as an incapable man (Seaton, 1997). This is the dilemma of the issue of creating a user-friendly environment, and also on the provisions of disability legislation or policies (Lau, 2001).

When there is no legislation to protect the rights of the people with a disability,

they are always discriminated by the society, hence, they can not enjoy their own civil rights and equal opportunities due to social and historical factors. However, when legislation presents, people with a disability are considered as the weak that need special care and protection.

One way to solve the problem is to remind the people that the reason why the rights of one group need to be protected by legislation is entirely because rights of that group are often exploited in the reality. People with a disability would properly suffer more discrimination if the society is without disability legislation. They feel more unfair and helpless in their life. Thus, their self-esteem would be impaired to a greater extent.

Chapter 6 Political Philosophy for Disability Legislations

After exploring disability models and the justice to assist disable people, this section reviews political approaches for disability legislations in order to have more understanding on the regulatory framework for persons with disabilities. These political approaches are underpinnings of the regulatory framework on user-friendly environment and the concept of these approaches underlies the rationale in enacting the legislations to protect the rights of people with a disability. The differences in political approaches can explain contrasting policies in different countries. There are three major political approaches that are widely applied to the subject area of this research (Imrie, 1996a; 1996b; Lau, 2001; SAHRC, 2002), the implications of each approach are explored in the following sections.

6.1 Neo-liberalism and Market Force Approach

Under this approach, regulatory provisions are written with the pursuit of utilitarian ideals (Imrie, 1996a; 1996b). An example of this approach is the United Kingdom. A statement by the Minster for Local Government, David Curry, in 1993 reinforced the centrality of costs and market utility in that,

"whilst committed to creating an environment more accessible to people with disabilities we must ensure that any additional costs do not bear unreasonably heavy on those who provide and use buildings or on the community which ultimately pays the price for goods and service."

From the statement, a dominant view focuses on the efficacy of the market and market utility, where meeting with the needs of persons with disabilities is identified with forms of market provisions, which is different to regarding the demands of them as a human right.

Applying to the aspect of built environment, the underlying utilitarian view supports the idea that the provision of access facilities should only occur if a market demand or opportunity could be expressed to persons with disabilities. In other words, it is not necessary for developers to provide additional facilities for persons with disabilities if little or no demand exists (Imrie, 1996a). Under the market force approach, the issue of accessibility is in a low priority. The level of user-friendliness of the built environment is entirely decided by the developers and architects.

6.2 Minority Group Analysis and Civil Rights Approach

Under this approach, people with disability are living under the “disabling images” in the society. They are regarded as a group of social minority which has been discriminated against in all areas of life due to social attitudes of neglect and prejudice about their ability and needs. For example, persons with disability are often denied the full enjoyment of their civil rights (Bickenbach *et al*., 1999). Therefore, they have to seek out their basic human rights and fight against discrimination in order to correct the injustices towards them in the society.

With the minority group analysis and civil rights approach, accessibility is viewed as an issue of human right, but not a utilitarian issue like the neo-liberalism and market force approach. Therefore, provisions on user-friendly environment have to be enacted undoubtedly.

On the other hand, the use of law is highlighted as a means to protect human rights. Supports for this approach prefer legal solutions as a political tool. Hahn (1987) says persons of disabilities need human rights protection guaranteed in laws. He also believes that “the laws stand the best change of guaranteeing the basic individual rights of disabled people”. Thus, regulatory framework for

having user-friendly built environment is necessary to ensure the rights of persons with disability to travel around themselves with any difficulties. Therefore, the provisions of design standards present in the framework greatly represent the level of user-friendliness of the environment.

The minority group analysis and civil rights approach is the prevailing tool on provisions for people with a disability in the modern society (Lau, 2001; Ng, 2003). It is a proven success that forms a basic political platform for the issues or problems of persons with disability.

6.3 Universal Approach

The concept of universalism only emerged a few years ago. It is raised by Zola (1989), in which he says that the universal approach is a long-run strategy with universal policies that recognize the entire population is “at risk” in suffering illnesses and disability. Instead of providing special needs for the people with a disability in the minority group analysis and civil rights approach, all people have needs that vary in roughly predictable way on life span.

Also, the universal approach emphasizes that an aging population increases the proportion of people with a disability or illness. Thus, disability provisions

and policies should be not only for the minority group, but a policy for all, including the able-bodied (Steinfeld & Danford, 1999).

Based on the universal approach, universal built design and environment promotes user-friendliness on a broader scale than the other two approaches, which focus on specific group instead of the whole population, in the above. In another words, universal design is accessible for all people, no matter with or without impairment. With universal approach, it can increase the user-friendliness of the built environment and enhance opportunity for the integration and participation of people with disabilities in society (Steinfeld & Danford, 1999).

Comparatively, universal approach is more desirable than civil rights approach in the issues of disability. However, universal concept of disability is still new to the public. Therefore, the civil rights approach is the most prevailing one in the aspects of disability legislation at this moment (Lau, 2001; Ng, 2003).

Chapter 7 “Ableist City”

7.1 “Ableist City”: An Exclusionary Built Environment

“Ableist city” represents the built environment is produced on the assumption that city users are able-bodied (Cheng, 2005). This idea has a long historical root. Many urban researchers have tried to elaborate on the idea of the “ableist city” in many ways. As Chouinard (1997) noted, the “ableist city”:

> *“refers to lived environments which incorporate and perpetuate physical and social barriers to the participation of disabled persons in everyday life, including the lack of automatic doors and ramps in public buildings, the absence of hearing people with sign language skill at community events such as political candidates’ debates, the ‘print barrier’ that faces the visually impaired when, for instance, important reading materials are not provided in braille, insurance programs which make no provision for partial disability, job descriptions and evaluation criteria based on able-bodied standards of performance, and subtle and not-so-subtle reactions to disabled people that challenge their right to be and, in particular, to be in able-bodied, spaces”*

Also, the “ableist city” is designed and produced on a bodily assumption that each user is:

> *“[an] ideal person – that person of perfect physical health, dimensions, and mobility and the mythical ideal of the human species fostered by consumer product advertising and fashion journals. This ideal human is frozen in time, never to grow old, to be ill, to be blind, or to be deaf” (Ast, 1977)*

The “ableist city” is largely invisible to able-bodied people (Hahn, 1986; Mattews & Vujakovic, 1995). For example, a step less than an inch is more or less the same to the able-bodied. However, it definitely can be a significant barrier for wheelchair-bound users (Templer & Jones, 1977). However, the “ableist city” could also be considered problematic by some ordinary people.

In general speaking, the “ableist city” is problematic for disabled people whose bodily condition is far from that of the ordinary person. As Hahn (1986) noted, the “ableist city” is:

> *“basically designed for the average human being, plus or minus half a standard deviation. From the perspective of a bell-shaped curve,*

persons with many types of disability that place them in the tails of the distribution are effectively isolated by their environment'.

Therefore, many access and movement challenges for disabled people long exist in the "ableist city" (Darcy, 2003; Gleeson, 1999; Imrie, 1996a; West, 1986). For analytical purposes, Gleeson (1997) classified the "ableist city" into three aspects:

(1) Physical barriers hinder the movement of disabled people, including broken surfaces on thoroughfares (streets, guttering, paving);
(2) Building architecture which excludes the entry of anyone unable to use stairs and hand-opened doors, and;
(3) Public transport modes which assume that passengers have a common level of ambulance

In another word, these three aspects refer to the outdoor, indoor and circulation spaces of the city respectively (Cheng, 2005). Firstly, for the outdoor space of the city has largely been neglected in academic research (Palfreyman, 1991). But many empirical evidences have long suggested that outdoor space is not particularly barrier-free (Matthews & Vujakovic, 1995; Templer & Jones, 1977). For example, high kerbs, steep gradients without

resting place, uneven and narrow pavements, difficult cambers on pavements, deep gutters along roadside, and raised manhole covers. All of the above are some of the barriers for disabled people in outdoor environment (Matthews & Vujakovic, 1995; Templer & Jones, 1977). Empirical evidences also suggest that the pedestrian green time is insufficient for disabled people's completely crossing a road (Ast, 1977; Templer & Jones, 1977). Therefore, as a wheelchair-bound person, he/she experiences countless barriers in the path to his/her destination (Hahn, 1986).

Secondly, for the indoor space of the city is undoubtedly problematic for disabled people. Many obstacles such as a flight of steps, no internal lifts, too narrow doorways, that are unable wheelchair-bound people to get access or refuse them to make use of the buildings (Imrie & Kumar, 1998). In brief, both public and private buildings are full of barriers (Gleeson, 1999; Imrie, 1996a; Imrie & Hall, 2001b; Imrie & Kumar, 1998).

Unlike the first two aspects mentioned, circulation space is the most frequently studied. It is found that most of the public transport facilities are largely inaccessible for disabled people (Darcy, 2003; Hine & Mitchell, 2001). For instance, only 1% of privately operated buses in New South Wales are

wheelchair-accessible (Darcy, 2003). Also, the path to go to the transport facilities or stations is not always barrier free. For example, it is difficult for the disabled people to get access to the train as there are steps in the one-way path to the train (Hine & Mitchell, 2001). Exaggeratedly, a considerable portion of the “ableist city” is an “unexplored territory” for the disabled people (Hahn, 1986).

In another view, the “ableist city” is also equally problematic for the able-bodied in the society. The “ableist city” is produced with a “mythical ideal of the human species” in mind. In reality, apart from disabled people, many able-bodied people are not within the pool of such mythical bodily ideal so, as disabled people, they are also challenged by the non-user-friendly environment (Cheng, 2005). For example, pregnant mothers, children, babies, old people, those encumbered by baby-buggies, luggage, and shopping, those temporally disabled by illness or accident, and those with restrictive conditions such as heart problems and blood pressure (Hellman, 1977; Greed, 1996). In Templer & Jones (1977) further explained:

> *“many of the elements of the pedestrian system not only give trouble to many of the subgroups, but to ‘normal’ pedestrians as*

well. Brick paved surfaces and cobblestones become slippery and irregular with age, street furniture and equipment are located without consideration for pedestrian flow, sidewalks are often too narrow, traffic signals give too short an interval for pedestrians, and so forth"

In sum, the "ableist city" is an area primarily designed for "physically perfect people" that is different from many people in terms of body condition (Cheng, 2005).

In many countries, the "ableist city" is developing in the direction of barrier-free, in another word, user-friendly. Starting from the last decade, many countries have become more accessible (Imrie & Kumar, 1998). However, it is still far away from an ideal goal of user-friendly. Even though in the countries with a long history of disability provision development (such as the United Kingdom, the United States and Australia), they are now in a state of mix of accessible and inaccessible areas (Darcy, 2003). For example, disabled people in the UK are only able to use the railway system through:

"a system of ingress and egress from trains that consistently left people with mobility disability stranded on stations or carriages

waiting for ramps or for staff to escort them through the labyrinth of access tunnels" (Darcy, 2003)

A mix of accessible and inaccessible areas definitely increases the accessibility of that area in a certain extent. However, it also gives a feeling of "half measure" to people:

"a good inclusive design will send positive message to disabled people, messages which tell them: 'you are important'; 'we want you here'; and 'welcome'…if the way that disabled people are expected to get into a building is round the back, past the bins and through the kitchens, what does that message communicate? How will it make disabled people feel?" (Napolitano, 1995)

In addition, mindless improvement on the built environment is another expression of the half-measure approach. For example, ramps are installed, but it is too steep for wheelchair-bound users (Imrie & Kumar, 1998). Therefore, even though improvements or alternations are made in the purpose of increasing the user-friendliness of the environment, for wheelchair-bound users, the "ableist city" is just "a vast desert containing a few oases" (Hahn, 1986).

In social model, the “ableist city” is a social problem, rather than merely a design fault (Cheng, 2005). The “ableist city” greatly excludes the disabled people out of the society. Such spatial exclusion of disabled people must not be due to a design problem (Gleeson, 1997), but properly be an infringement to the freedom, equal opportunity and human rights (Cousins, 1998; Leach, 1989; Room, 1995; Hahn, 1986).

7.2 The Causes of Making a “Ableist City”

Apart from the conventional economic aspects (i.e. exploitation), discrimination rooted in social (i.e. marginalization), cultural (i.e. cultural imperialism), and institutional (i.e. powerlessness) practices are also captured (Merrifield & Swyngedouw, 1996; Room, 1995). In Young (1990), it notes that these fives aspects do not operate simultaneously in the same strength, rather a few of them being more or less significant. This section examines two aspects of social injustice that lay down deeply in the practices of built environment production, leading to formation of the “ableist city” (non-user-friendly environment): powerlessness and cultural imperialism.

7.2.1 Powerlessness of Disabled People

Elitism is common in the practice of built environment production, which has led professionals to consider public participation or involvement unnecessary (Cheng, 2005). In the mind of architects, the general public, as Ludwig Mies van der Rohe[2] claimed, do not possess the "capacity" (Prak, 1984) or, as Walter Adolph Gropius[2] perceived, are "intellectually undeveloped" (Knox, 1987) to appreciate their architectural works, unless, as Le Corbusier[2] suggested, they are "reeducated" (Knox, 1987). Such elitist, technocratic discourse long exists in the field of construction (Giddens, 1991; Howe & Kaufman, 1981; Imrie, 1996a; 2000). Because of those feelings towards public participation or involvement, many construction professionals consider disabled people technically unable to participate in the process of built environment production (Hall & Imrie, 1999). Although elitism has long been criticized by the construction professional, the public including both able-bodied people and disabled people are still being excluded from participating in the process of built environment production (Ast, 1977; Imrie & Hall, 2001a; West, 1986). The exclusion of the public in the process of built environment production deserves particular attention (Cheng, 2005).

[2] Ludwig Mies van der Rohe, Walter Adolph Gropius and Le Corbusier are widely deemed as the three great architects in the 20th century

In Cheng (2005), one of the reasons making an “ableist city” for disabled people is that only a limited number of built environment professionals who are themselves disabled. As a result, the able-bodied professionals can well understand the access and movement needs of able-bodied people. Conversely, they can hardly understand the needs of disabled people.

In addition, the professionals rarely consult disabled people about their needs of access and movement (Hall & Imrie, 1999). In specific, the participation of disabled people in private construction projects is kept to a minimal level (Gleeson, 1997; Imrie & Hall, 2001b). Unbelievably, some of the professionals even think involvement of disabled people is “a waste of time” (Imrie, 2000). On the other side, in the public construction production, non-participatory practices of disabled people are also evident, for example, town planning (Imrie & Kumar, 1998; Matthews & Vujakovic, 1995) and urban regeneration (Edwards, 2001).

Through the long criticism of non-participatory practice, a certain level of participations channel to built environment production in various forms has been opened to disabled people recently (Cheng, 2005). This change at least makes the disabled people can express their opinions (Imrie & Hall, 2001a;

Scotch, 1988). However, it is still doubtful about the effectiveness of such a channel, since the expressed opinions of the disabled people may be easily ignored by the professionals (Hall & Imrie, 1999; Imrie & Hall, 2001a).

Moreover, the disabled people seldom receive support to comprehend the technical issues and documents involved (Imrie, 1997). Due to all disadvantages and unsupportive force for the disabled people, participation of disabled people in the built environment production is considered simply as "public relations exercises" (Imrie & Hall, 2001a). All of their expressed opinions are just an "afterthought" (Imrie & Hall, 2001a). Overall, the effectiveness of their participation is very limited and hence it can say that they are almost powerless in the production of built environment (Cheng, 2005).

7.2.2 Cultural Imperialism of Able-bodiedness

The society is produced on the assumption that an able-bodied condition being the norm of the human body (Cheng, 2005). Under this bodily assumption, a belief that an impaired body is abnormal or deviant is constructed (Paterson & Hughes, 1999). In the practice of built environment production, it is very insufficient and inconsiderable that the expected users are the able-bodied portion of the entire population only (Cheng, 2005).

Cultural imperialism of able-bodiedness has led to a privileged position of able-bodied people in the production of the built environment (Cheng, 2005). As Posmopoulous (1973) notes, the production of the built environment is based on:

> *"a fictitious model of the human being – exclusively for a man (not a woman) in the prime of life, and at the peak of his physical fitness. Statistically speaking, only a small minority of the population can fall into this category, even among the fit"*

In other words, under the influence of an unrealistic bodily assumption on the users, the construction professionals believe that users can move free around society (Imrie, 2000; Matthews & Vujakovic, 1995). Therefore, the society is built with a satisfaction of the access and movement needs of the able-bodied in practice (Imrie, 2000; Imrie & Wells, 1992).

Consequently, the needs of the disabled people are marginalized or even totally ignored (Imrie, 2003). The cultural imperialism of able-bodiedness has often rendered disabled people as non-users of the built environment. For example, a ramp is built for allowing the women with pushchairs to go into the building, instead of specifically designed for the disabled. Obviously, the

access and movement needs of disabled people have been overlooked in the built environment production (Imrie, 2003; Imrie & Hall, 2001a; Matthews & Vujakovic, 1995).

Moreover, the cultural imperialism of able-bodiedness is a widespread belief incorporated in the practices of different groups of built environment professionals (Cheng, 2005). In all indoor and outdoor environment, and circulation spaces production, due to the bodily assumption, able-bodied people are the only expected users (Hine & Mitchell, 2001). Hence, architects' construction designs fail to concern a variety of bodily conditions of users (Imrie, 2000; 2003). Therefore, the needs of disabled people are largely invisible in the environment production (Imrie, 2000). Under this realistic practice, it leads to the formation of the society that satisfies the needs of all able-bodied people and exclusion of disabled people as non-users of the built environment (Cheng, 2005).

Since the late 1990s, built environment professionals have increasingly recognized the existence of disabled people and the disabled people are starting to be regarded as "half-users" of the built environment, instead of non-users (Huw, 1992; Imrie, 2000). However, the cultural imperialism of

able-bodiedness is still dominating (Huw, 1992; Imrie, 2000).

According to Cheng (2005), the dominating role of cultural imperialism of able-bodiedness is evident in three different ways. Firstly, the concern of the built environment professionals for the needs of access and movement of the disabled is still not “all-rounded” (Imrie, 1996a). In real, the built environment professionals often only consider the needs of those physically disabled people or, even worse, wheelchair-bound person, instead of all types of disability (Barnes, 1991; Hall & Imrie, 1998; 1999; Imrie, 1997; Imrie & Hall, 2001a; Oliver, 1990). As an architect says,

> *“we generally design for wheelchair-users as a standard requirement for all building types. Other disabilities are only considered if the building is required for additional specific disabilities” (Hall & Imrie, 1999)*

Secondly, many built environment professionals in practice have overlooked the access and movement necessity for disabled people. The design provisions for disabled people are either a “side issue” (Imrie, 1997) or “the last thing” (Imrie & Hall, 2001a) among all considerations, instead of one of the essential things. At worst, as a planning officer claims,

"we're too busy getting on with the normal workload to be bothered with additional tasks (i.e., the consideration of the access and movement needs of disabled people)" (Imrie & Wells, 1993)

Thirdly, in most cases, the provisions for disabled people are poorly interlinked (Cheng, 2005). According to West (1986), the major cause for this problem is that the built environment professionals commonly apply a single set of standards to ease for all needs of access and movement of all disabled people (West, 1986). For example, the built environment is only "accessible" for those wheelchair-bound users, but it is still problematic for some of the other disabled people. In other words, some portions of the built environment is accessible for the disabled, however, the built environment as a whole is still full of barriers (West, 1986).

7.3 Impacts of "Ableist City" on Disabled People

The built environment is produced on the assumption that all users are able-bodied as mentioned in the previous section (Cheng, 2005). The environment is designed and produced on a bodily assumption that each user is an "ideal" person (Ast, 1977).

Due to the assumption made on the environment production, eventually the level of user-friendliness on existing environment, especially on the old areas, is surely low. The non-user-friendly environment in an “ableist city” reinforces the social injustices of marginalization and powerlessness to disabled people (Barnes, 1991; Butler & Bowlby, 1997; Gleeson, 1997; Hahn, 1986; Kitchin, 1998; Scotch, 1989; Tudor, 1979). In another word, the ableist city helps reinforce the socially marginalized, economically disadvantageous, and politically disenfranchised positions of disabled people in society (Cheng, 2005).

7.3.1 Marginalization

The non-user-friendly environment in an “ableist city” helps reinforce the socially marginalized position of disabled people (Cheng, 2005). Access and freedom of movement is one of the vital issues for disabled people to have a meaningful social life. In a non-user-friendly environment with insurmountable barriers in terms of physical and attitudinal, the disabled people are unlikely able to enjoy a proper social life. Then, this has significant social implications for disabled people. For example, firstly, the access and movement of the disabled are confined by the non-user-friendly environment (Hahn, 1986).

Secondly, the disabled people are impeded from fully participating in social life (Chouinard, 1997; Imrie & Wells, 1993; Kitchin, 1998; Oliver, 1990). Finally, the disabled are forced to withdraw the social life and stay at home (Hahn, 1986; Imrie, 2000; Imrie & Kumar, 1998). A “prison syndrome” is the best way to characterize the social life of disabled people (Barnes, 1991). As Hahn (1986) proclaims:

> *“The arrangement of the built environment in most communities constitutes an even more comprehensive and rigid means of discouraging contact between disabled and non-disabled groups than policies of apartheid enacted by racist governments. Disabled residents of Los Angeles and other metropolitan areas are virtually precluded from mingling with the non-disabled in public assemblies, commercial facilities, and schools, as well as in most places of entertainment, recreation, or amusement”*

In other words, disabled people are also socially marginalized from social life in different ways (Cheng, 2005). For instance, in many developed countries, disabled children are still excluded from mainstream schools largely due to the inaccessible design of schools (Barnes, 1991; Chouinard, 1997). Also, the

disabled people are excluded from most of the places of entertainment, recreation and amusement (Gilderbloom & Rosentraub, 1990; Kitchin, 1998; Oliver, 1990). In sum, the “ableist city” helps marginalize disabled people in the social world (Cheng, 2005).

7.3.2 Distributive Outcome

Marginalization further brings disabled people distributive outcomes. The significant access and movement challenges for the disabled people not only marginalize disabled people in the mainstream but also exclude them from the workplace (Cheng, 2005). The non-user-friendly environment impedes disabled people from traveling to workplaces. Then, the employers put it as an excuse to refuse employing the disabled people (Imrie & Kumar, 1998). Therefore, the non-user-friendly built environment is powerful in excluding disabled people from the employment market (Gilderbloom & Rosentraub, 1990; Kitchin, 1998; Oliver, 1990; 1996). As a result, disabled people are totally removed from the job market because of access and movement problems brought by the non-user-friendly environment (Barnes, 1991; Gleeson, 2001). Hence, the unemployment rate of disabled people keeps high in developed countries (Barnes, 1991; Hall, 1994; Imrie & Wells, 1993; Oliver, 1990). As a result, the disabled people are always in a relatively deprived

position in the society (Chouinard, 1997; Gleeson, 1997). In sum, the “ableist city” is constitutive of the economic marginalization of disabled people in society (Cheng, 2005).

7.3.3 Powerlessness

The “ableist city” is also constitutive of the powerless position of disabled people in society (Cheng, 2005). The materialization of civil and political rights is achievable only if disabled people are able to move freely all around the society. Conversely, sites of protest, inaccessible voting stations, and venues for holding public participation seriously undermine their civil rights. It is found that the voting right of many disabled people is deprived in the 1997 British general election, since 75% of polling stations are inaccessible (Imrie & Kumar, 1998). It is also found that the disabled people are blocked by a flight of steps in front of a city hall from lodging a complaint (Hahn, 1986). These examples show that the powerless position of disabled people in society has been remained and reinforced if non-user-friendly built environment is still present (Cheng, 2005).

Chapter 8 Accessibility

8.1 Definition of Accessibility

Ney (2001) has pointed out that the idea of accessibility is vague and, thereby, always opens to interpretation. There is no clear definition of accessibility. Culliane (1998) also says "Accessibility is difficult to define".

As Giuliano (1996) says, "Human activities and environment are dependent. The basic concept underlying the relationship between human activities and environment is accessibility. In a broadest context, accessibility refers to the ease of movement between places". Daly (1975) has defined it as "the ease with which people can reach distant but necessary services", while Mitchell & Town (1976) define it as "the ability of people to reach destinations at which they can carry out a given activity". These definitions imply that accessibility requires a physical movement by the person to get access to the services.

Hall & Banister (1995) put it in words that, at a very general level, accessibility refers to "the ease with which people can travel to and from a particular location". Hall & Banister (1995) also point out that, in general, accessibility is a characteristic of a location, an object, or a service. Work, shops, medical care, legal aid, and leisure facilities are things that can be more or less

accessible. However, early studies tended to emphasize accessibility among places, but more recent attention has switched to a concern with personal accessibility. In regard to Lo (2002), personal accessibility is concerned with the ease with which people can use a range of facilities, as part of which travel may have an important part to play. Personal accessibility describes how easily a person, or a group of people, can reach places. This may be distinguished from place accessibility, which describes how easily certain places can be reached.

8.2 Accessibility Measurement

Jones (1981) has summarized that when measuring accessibility, it is necessary to be clear about the type of person, the modes available to him, his location and the type of activity for which the calculation is being made. Also, Cullinane (1998) mentions that accessibility measures vary in their design, scope, and accuracy. Some focus more on accessibility to a certain facility while others focus more on the people.

Accessibility inside a university campus for wheelchair-bound people can be measured in terms of how far the wheelchair-bound people travel to reach their

destination (i.e. a lecture room, an academic building or a laboratory) or how long the wheelchair-bound people take to get there. At the same time, the distance travelled and the time required for wheelchair-bound people is compared to that for ambulant people. For some wheelchair-bound people, the time taken is the most influential factor; for others may be the power that is the most influential factor. Regarding the concept of accessibility, two dominant units of measurement are identified. They are journey distance and journey time.

8.2.1 Journey Distance

Mayer (1983) and Powell (1995) mention that studies have often determined that physical proximity is an important factor in accessibility and utilization of campus resources. Meade & Earickson (2000) also point out that closeness to a particular facility such as a lecture room or laboratory is one of the main reasons for using that resource.

Meade & Earickson (2000) also say there are many ways to measure distance. Map distance from a wheelchair-bound person's origin to his/her destination is commonly used. When distances are short, map distances coincide with physical distance. Comparatively, other distance measures such as path

distance may be more meaningful in certain situations because it takes into account the actual route taken from origin to destination. In this research, path distance is considered to be more appropriate since it represent the actual route for the wheelchair-bound persons to get to the destination. Moreover, the path distance is compared to the walking distance of an ordinary person. By the comparison, the difference of user-friendliness for wheelchair-bound people and non-disabled people in the built environment can be determined very easily.

8.2.2 Journey Time

In Hong Kong, time is comparatively valuable and, therefore, more important than distance. The time that is required for wheelchair-bound people to make a journey to the destination seems to be the most realistic measure of its accessibility. According to Zakaria (1981), journey time involves one or more of the following elements: time for route-finding, waiting time and travelling time by mechanized modes.

The time for a wheelchair-bound person completing the whole journey from its origin to destination within the main campus is considered as the journey time. Besides travelling in wheelchair time, the waiting time for lift service must to be

taken into account. In addition, the travelling time to access the lift and the campus facility should also be considered. It is because students may have to float in between the classes to different buildings.

8.2.3 Number of Accessible Route and Quality of Access

According to Church & Marston (2003), although the standards-based approach in terms of journey distance and journey time to measure accessibility has been valuable, it lacks the sensitivity that other measures of accessibility might provide. Since the standard is to ensure that one accessible route for the wheelchair-bound people has been provided, little attention has been devoted to the number of accessible route and quality of access provided. Further, providing a second access route to a building is not given any value, by virtue that a first access route meets the standard. Therefore, it is relevant to include the number of accessible route and the quality of each access route provided in the investigation so that the user-friendliness of the university campus can be determined in advanced.

The United Nations (1995) states that no part of the built environment should be designed in a manner which excludes certain groups of people by virtue of their disability. Therefore, it should be possible for everyone:

i. to reach all place of the built environment;

ii. to enter all places within the built environment; and

iii. to make use of all facilities within the built environment

In other words, the built environment is required to be accessible, reachable, usable, safe and workable for all people (Lung, 1998).

Although the regulatory framework on the provision of setting a user-friendly environment for the wheelchair-bound people in terms of accessibility and barrier free vary from country to country, the principles governing provision for the disabled people are actually similar. According to ICTABT (1983), the following design requirements governing user-friendly environment can facilitate the access and movement of the wheelchair-bound people. They are divided into 4 areas:

(a) Outside and Around Buildings

1. Pedestrian routes in open spaces or between buildings should be free from obstructions, and pathways should be wide enough for wheelchair users.
2. Protruding elements should be avoided.
3. Surfaces should be slip-resistant.

4. Where there are changes in level, shallow ramps should be provided instead of steps and stairways which are clearly marked, and provided with handrails.

5. Street furniture, mailbox, bollards, gully gratings and signposts need careful sitting as they can be hazardous.

6. Amenities such as lavatories and telephones should be clearly signposted and usable.

7. Manholes, drains and gratings should generally be placed outside the pedestrian pathway.

(b) Entrance to Buildings

8. An entrance to a building should be easy to distinguish and should preferably be under cover.

9. The access should be level and the door easy to open and wide enough to permit entry of a wheelchair.

10. Where there are changes in level, ramps should be provided as well as steps and these should be clearly marked.

11. Accessible doors should be so designed as to permit operation by one person in a single motion with little effort; Revolving doors and frameless glass doors can be hazardous.

12. Accessible entrances should be clearly identified using the international symbol of accessibility including alternate locations of accessible entrances.

(c) Inside the Building

13. Inside the building, floor surfaces should be slip-resistant. Where there are changes in level, ramps should be provided as well as steps and these should be clearly marked.

14. Where a building is multi-storey, at least one lift with controls that are reachable from a seated position should serve all main circulation areas which provide facilities. It should be large enough to accommodate a wheelchair and one other person.

(d) Visual, Audible and Tactile Aids

15. A building is easier to use when signposting is legible, well illuminated and where lettering and numerals are embossed or raised. Names and numerals on doors should be at eye level.

16. Contrasting colours, distinguishing routes, together with changes in floor texture where they are hazards, avoid the wheelchair-bound users getting hurt.

All the above characteristics of the built environment would be served as the criteria of the personal trial of using a wheelchair inside the main campus in Chapter 11.

Chapter 9 Research Design

In Chapter 1, the methodology used to achieve the objectives of the research is briefly outlined, namely, literature review, comparative analysis and personal trial. This chapter is going to further describe the research design for the study. Methods used in the research are explained.

9.1 Methodology

9.1.1 Literature Review and Background of the Research

Firstly, to develop a better understanding on the background information, relevant research projects and statistics in related to disability or especially physically disabled people are reviewed, and the overview of the physically disabled people in Hong Kong are also studied. Secondly, in order to help gaining an insight about the research topic, the definition of disability, types of barrier for wheelchair-bound people and disability models are studied.

Comprehensive review of literatures is presented in Chapter 2 to 8 to provide background information and insights concerning previous studies and related issues.

9.1.2 Comparative Analysis

9.1.2.1 Objective

This method aims to achieve one of the objectives, to derive the adequacy of the regulatory framework of Hong Kong in setting out the design requirements for a user-friendly environment, by comparing the corresponding provisions of relevant regulation framework with some other countries upon the criteria set for comparison to derive the adequacy.

9.1.2.2 Reasons for Adopting Comparative Analysis

The use of comparative analysis is actually a very common means to make evaluation to the laws and policies (Leichter, 1979; Yeo, 1998). The concept of adequacy is just a relative sense (Theodoulou, 2002). That means, in order to evaluate one's adequacy in the provisions of policy and law depends on the other's corresponding policies or laws, which represents to the norm of adequacy (Yeo, 1998). In other words, the existing policies or laws can be said as adequate once it reaches the norm, even though it may not reach a preferable standard in its own country or some other countries (Ng, 2003). Thus, to apply it to evaluate the adequacy of the regulatory framework of Hong Kong in setting out the design requirements for a user-friendly environment, what other countries have done on this issue must take into consideration.

In Council on Tall Buildings and Urban Habitat (1992), an international equivalent standard on treating the issues related to the disabled people is important. Comparative analysis can be used to evaluate the adequacy of the regulatory framework of Hong Kong in setting out the design requirements for a user-friendly environment with the corresponding provisions in other leading countries. Thus, any lagging behind the international standard can be easily identified, eventually each country can improve their own regulatory framework on the related aspects (Ng, 2003). In particular, Hong Kong, as an international city, should always retain itself in an international standard. This way of improvement by comparative analysis has actually been adopted by Canada to revise the design requirements of life safety for the disabled people (Council on Tall Buildings and Urban Habitat, 1992).

9.1.2.3 Advantages of Comparative Analysis

According to Leichter (1979), Theodoulou (2002) and Yeo (1998), the advantages of comparative analysis are shown as follows:

i) Through assessing one's situation against another, one's own situation can be better understood, which includes the constraints and possible options that might be available.

ii) By the comparison process, each one can learn from the experiences of others. A richer range of solution can obtain to expand the policy options.

9.1.2.4 Procedures of the Comparative Analysis

i) To select comparable countries for the comparative analysis (*section 10.1*)

ii) To study the regulatory framework of Hong Kong and each comparable countries in setting out the design requirements for a user-friendly environment (*section 10.2*)

iii) To identify the subject for comparison among all the instruments in the regulatory framework, and set criteria for the comparative analysis (*section 10.3*)

iv) To derive the adequacy of the regulatory framework of Hong Kong in setting out the design requirements for a user-friendly environment based on each criterion of the comparative analysis (*section 10.4*)

v) To draw a conclusion on the comparative analysis in respect of adequacy of the regulatory framework of Hong Kong in setting out the design requirements for a user-friendly environment (*section 10.5*)

9.1.3 Personal Trial

One of the principles proposed by Stone & Priestley (1996) for able-bodied researchers to carry out disability research is to surrender objectivity. Apply to this research, it means the belief for the research should specifically focus on the wheelchair-bound people's needs and interest.

In order to experience the difficulties that the wheelchair-bound people would suffer when travelling around main campus of the University of Hong Kong, personal trial of using a wheelchair to finish a number of set of journey is carried out. Thus, the overall user-friendliness of the University of Hong Kong for wheelchair-bound people can also be determined from the personal trial.

Before the personal trial is carried out, the number of accessible route for the wheelchair-bound people to reach the destination inside main campus in each journey are counted. As a result, the more the number of accessible route provided for the wheelchair-bound persons to reach the same destination, the higher is the level of user-friendliness of the University of Hong Kong for the wheelchair-bound persons.

Moreover, in the personal trial, journey time used and journey distance travelled by the author of this dissertation using a wheelchair are measured.

The measured wheelchair time and distance are compared with the time and distance that an ordinary person required in the way of normal walking in corresponding set of journey respectively. Apart from comparisons of the measured time and distance, the facilitating signage for wheelchair-bound people to avoid repeated route-finding is also observed throughout the personal trial.

Also, the quality of each accessible route is determined by the observation during the journey. According to ICTABT (1983), the observation is based on 4 areas that are set in Chapter 8. They are as follows:

(a) Outside and Around Buildings

1. Pedestrian routes in open spaces or between buildings should be free from obstructions, and pathways should be wide enough for wheelchair users.
2. Protruding elements should be avoided.
3. Surfaces should be slip-resistant.
4. Where there are changes in level, shallow ramps should be provided instead of steps and stairways which are clearly marked, and provided with handrails.

5. Street furniture, mailbox, bollards, gully gratings and signposts need careful sitting as they can be hazardous.

6. Amenities such as lavatories and telephones should be clearly signposted and usable.

7. Manholes, drains and gratings should generally be placed outside the pedestrian pathway.

(b) Entrance to Buildings

8. An entrance to a building should be easy to distinguish and should preferably be under cover.

9. The access should be level and the door easy to open and wide enough to permit entry of a wheelchair.

10. Where there are changes in level, ramps should be provided as well as steps and these should be clearly marked.

11. Accessible doors should be so designed as to permit operation by one person in a single motion with little effort; Revolving doors and frameless glass doors can be hazardous.

12. Accessible entrances should be clearly identified using the international symbol of accessibility including alternate locations of accessible entrances.

(c) Inside the Building

13. Inside the building, floor surfaces should be slip-resistant. Where there are changes in level, ramps should be provided as well as steps and these should be clearly marked.

14. Where a building is multi-storey, at least one lift with controls that are reachable from a seated position should serve all main circulation areas which provide facilities. It should be large enough to accommodate a wheelchair and one other person.

(d) Visual, Audible and Tactile Aids

15. Maps and information panels, which is legible, well illuminated and where lettering and numerals are embossed or raised, at building entrances, along roads, and on public buildings should be placed and viewed from a seated position.

16. Contrasting colours, distinguishing routes, together with changes in floor texture where they are hazards, avoid the wheelchair-bound users getting hurt.

One point to note is that the aim of this personal trial is not to test the total compliance of the University of Hong Kong to the statutory requirements

prescribed in the regulatory framework, but to determine the overall user-friendliness of the University of Hong Kong for wheelchair-bound people.

In more details, due to limitation of research time and resources, it is impossible to use the academic buildings, complexes or amenities centres in the main campus as a base for measurement. Considerable effort and a lot of time are required to finish such scale of personal trial. Also, it is reasonable to assume that an international university would provide close accommodation with designated facilities for wheelchair-bound students.

To solve the problem, it is decided to reverse the procedure. Rather than using the academic buildings or amenities centres as the base for measurement, Simon K.Y. Lee Hall (one of the in-campus residential halls) is used instead. Apart from the reasons of possibility, and limited time and resources, as being one of the residents in the Simon K.Y. Lee Hall now, it is more convenient for arrangement of the personal trial. Therefore, in the personal trial, the starting point for all journey is G/F of Simon K.Y. Lee Hall.

On the other hand, for the destination in each set of journey, it is selected base on the rationale that all wheelchair-bound students have equal opportunities to enter every academic building, complex, amenities centre or library inside the

main campus for attending lecture or tutorial class, borrowing reference books, having a meal, enjoying medical and banking services, and shopping in a supermarket. Therefore, in the personal trial, starting from Simon K.Y. Lee Hall, the destination selected in each set of journey would satisfy particular needs of the wheelchair-bound students. Taking this into consideration, eight parts including twenty seven components inside campus are selected to be the possible destinations in the personal trial, namely, West Part, North Part, Hui & James Part, Run Run Shaw Podium Part, East Part, Swire & Tang Part, K.K. Leung Part and Sun Yat-Sen Place Part. In more details, the selected buildings, complexes or amenities centres are all listed as below.

(a) West Part

1. Chow Yei Ching Building
2. Composite Building
3. Haking Wong Building

(b) North Part

4. Graduate House

5. Robert Black College

6. University Drive No.2

7. University Lodge

(c) Hui & James Part

8. Hui Oi Chow Science Building

9. James Hsioung Lee Science Building

(d) Run Run Shaw Podium Part

10. HSBC

11. Rayson Huang Theatre

12. Run Run Shaw Building

13. Runme Shaw Building

(e) East Part

14. Chong Yuet Ming Amenities Centre

15. Chong Yuet Ming Chemistry Building

16. Chong Yuet Ming Physics Building

17. Eliot Hall

18. Meng Wah Complex

(f) Swire & Tang Part

19. Swire Hall

20. Tang Chi Ngong Building

(g) K.K. Leung Part

21. K.K. Leung Building

(h) Sun Yat-Sen Place Part

22. Hung Hing Ying Building

23. Kadoorie Biological Sciences Building

24. Knowles Building

25. Library Building

26. Main Building

27. Pao Siu Loong Building

Chapter 10 Comparative Analysis

10.1 Selection of Comparable Countries

Before carrying out the comparative analysis to evaluate the adequacy of the regulatory framework in setting out design requirements for a user-friendly built environment, first of all, target countries have to be selected for the comparison purpose. In this chapter, the selection considerations are described and the target countries for comparison with Hong Kong are confirmed.

10.1.1 Selection Process

Comparative analysis used in the research necessarily involves a sampling or selection procedure (Leichter, 1979). In this research, a number of countries have to be chosen to serve as comparison purpose in determining the adequacy of regulatory framework. There are two considerations in the selection procedure as shown below.

The first consideration is solely due to practical reason. As the time and resources for this research is limited, the number of countries that could be studied is restricted. Therefore, in this research, only three countries are

chosen for the comparative analysis.

According to the Michailskis (1997), when comparison is made between countries, one typical problem is whether they are genuinely comparable and the results are not influential by their specific cultural differences. In order to tackle this problem, the “principle of similarity” is applied. The rationale of the principle is that the countries with similar features are chosen to act as control. In this way, it can minimize the differences in either cultural or social structure (Hyman, 1972).

In general, under the “principle of similarity”, choosing countries with a common or similar socio-economic context, and holding this variable constant, the relative comparability can be ensured (Leichter, 1979; Michailakis, 1997). Applying it to this research, only developed countries can be chosen in the selection procedure for the comparative analysis in this research. This gives the selected countries a similar context to accommodate either cultural or social differences among them (Leichter, 1979). The selection of developed countries as the comparison target is based on the idea that the more developed the country is, the more sophisticated legislations in promoting user-friendly environment in the countries (Council on Tall Buildings and Urban

Habitat, 1992).

The second consideration in the selection process is whether the developed countries have an established regulatory framework on creating user-friendly environment. If no such framework exists, it is impossible to carry out the comparative analysis. Therefore, only developed countries with established regulatory framework on creating user-friendly environment are desirable to be one of the comparable countries in the analysis.

Having considered these, three countries, namely Singapore, the United Kingdom and the United States are selected for the purpose of comparative analysis in the research. In sum, they have several characteristics in common.

i. All of them are developed countries, which is indicated by the Human Development Index (HDI)[3]
ii. All of them have a long-established and sophisticated regulatory framework on promoting user-friendly built environment
iii. All of them are countries that support human rights, which signifies non-discrimination and, hence, an intention for building a user-friendly environment

[3] HDI is an indicator developed by the United Nations (UN) for measuring the development status of a country/state. For the latest version of HDI of each country

In specific, the United Kingdom and the United States are selected for comparing with Hong Kong as they are two of the most leading countries in the provision of user-friendly environment, and they have the most progression sets of regulatory framework governing a user-friendly built environment in terms of accessibility and barrier-free in the world (SAHRC, 2002). Especially for the United States, it has the most comprehensive legislations to make buildings readily accessible for persons with disabilities in the world (Goldsmith, 1997). The design standards in the aspect of accessibility in the United States are worthwhile examining to serve as a role model for Hong Kong.

For the United Kingdom, it is one of the most leading countries for creating a user-friendly environment (SAHRC, 2002). Also, as Hong Kong was a crown colony of the United Kingdom from 1842 until the transfer of its sovereignty to the People's Republic of China in 1997, it is relevant to make a comparison in the provision of regulatory framework for promoting user-friendly environment between Hong Kong and the United Kingdom (Goldsmith, 1997).

On the other hand, Singapore is included as the only one Asian country in the comparative analysis. It has the most similar socio-economic context to Hong Kong than other chosen comparable countries. In fact, Singapore is similar to

Hong Kong in many ways and its set of regulations is revised and improved periodically to meet comparable standard of leading developed countries (Building and Construction Authority, 2002; Council on Tall Buildings and Urban Habitat, 1992).

By studying other developed countries, it is believed that an international design standard in creating user-friendly environment can be established (Ng, 2003). Eventually, the most important is that one of the research objectives – the evaluation of adequacy of regulatory framework in setting out design requirements for user-friendly built environment in Hong Kong, can be achieved through the comparative analysis.

10.2 Overview of the Regulatory Framework on User-friendly Environment

After the comparable countries are selected in the previous section for the evaluation purpose, an overview of the major regulatory framework on user-friendly environment for each of the comparable countries is carried out first. It is essential that it provides the knowledge foundation for the subsequent comparative analysis.

10.2.1 HONG KONG

The legislative framework governing user-friendly environment in terms of accessibility and barrier free access in Hong Kong promote equal opportunities and full participation in the life of the community. According to Choi (2003), the Hong Kong government has referred to the United Nations' approach on the disability legislation, which emphasizes three areas:

i) The establishment and safeguarding of human rights;

ii) Measures to permit full participation by people with a disability; and

iii) Measures to provide for equalization of opportunities for people with a disability in social life

In the provision of legislations, it consists of two main parts, namely, Building (Planning) Regulations (B(P)R) and Disability Discrimination Ordinance (DDO). They are further described as below.

10.2.1.1 Building (Planning) Regulations (Cap. 123)

The Building (Planning) Regulations (Cap. 123 sub Leg. F), which is a subsidiary legislation made under section 38 of the Buildings Ordinance (Cap. 123), is the most significant ordinance governing accessibility for persons with a disability (Ng, 2003). To ensure that adequate barrier free facilities are

provided at the design stage of a building, obligatory requirements are specified in section 72 of the B(P)R ("B(P)R 72") (Lau, 2001). B(P)R 72 was first enacted in 1984 and it has been the sole legislation requiring design for people with disability until the enactment of DDO in 1995. B(P)R 72 is highlighted as shown below:

(1) Subject to paragraphs (3) and (4) and notwithstanding any other provisions (other than the provisions under this regulation) in these regulations, where a building is one to which persons with a disability have, or may reasonably be expected to have, access, that building shall be designed to the satisfaction of the Building Authority in such a manner as will facilitate the access to, and use of, that building and its facilities by persons with a disability.

(2) A building shall be deemed to be designed in accordance with paragraph (1) if its design complies with the requirements set out in Part I of the Third Schedule.

(3) The provisions of this regulation shall apply to the categories of buildings specified in the first column of Part II of the Third Schedule only to the extent specified in the second column

thereof.

(4) The provisions of this regulation shall not apply to –

(a) buildings of 13m or less in height above ground level which are used, or intended to be used, for occupation by a single family; or

(b) temporary buildings or contractor's sheds referred to in Part VII

(Section 72 of B(P)R)

Apart from the above provision in B(P)R 72 and the Third Schedule of B(P)R 72, in order to better illustrate the design requirements stated in B(P)R 72, Design Manual: Barrier Free Access 1997 is issued by the Building Authority. In the Manual, not only the obligatory design requirements of B(P)R 72, background information, recommendation of design requirements with detailed figures are also included (Lau, 2001).

10.2.1.2 Design Manual: Barrier Free Access 1997

This Manual aims to set out standard design requirements for providing proper access to and appropriate facilities in a building especially for persons with a disability and even for the general public (Ng, 2003). Also, it is made with the

belief that people with disabilities should enjoy the same rights as any others – the rights to medical services, education, housing, employment, transport and leisure activities which encourage their social integration or reintegration (UNHCHR, 1975).

In addition, the Manual is a non-statutory set of guidelines giving technical information to apply B(P)R 72. There are two types of design requirements in the Design Manual 1997, namely obligatory and recommended design requirements. It means that not all design requirements are compulsory. For the obligatory design requirements, they are set out with incorporation with the Third Schedule of B(P)R. Therefore, most of the obligatory design requirements stipulated in this Manual should be complied with (Ng, 2003).

Conceptual Improvements of Design Manual 1997 from Design Manual 1984

Design Manual 1997 is the latest version and it made improvements from the Design Manual 1984 with a conceptual improvement. In Lau (2001), it notes that the universal concept of barrier free design is a correct philosophy behind barrier free provisions. Therefore, the conceptual change is that the Design Manual 1997 is no longer emphasized that the design is especially for people with a disability. On the contrary, it mentions:

"the barrier free design requirements included in this Manual will help considerably towards greater independence of not only persons with a disability, but also the elderly, pregnant women, and indeed a broad spectrum of the community"

(Design Manual: Barrier Free Access 1997)

10.2.1.3 Disability Discrimination Ordinance (Cap. 487)

Disability Discrimination Ordinance (Ch. 487) was enacted in August 1995, and it becomes the core of legislation regarding disability matters (Lau, 2001). DDO is an ordinance to:

i) render unlawful discrimination against persons on the ground of their or their associates' disability in respect of their employment, accommodation, education, access to partnerships, membership of trade unions and clubs, access to premises, educational establishments, sporting activities and the provision of goods, services and facilities;

ii) make provision against harassment and vilification of persons with disability and their associates;

iii) extend the jurisdiction of the Equal Opportunities Commission to include discrimination against persons on the ground of their or their associates' disability, and for connected purposes

Discrimination can be direct or indirect under DDO. Direct discrimination occurs when, on the ground of disability, a person with a disability is treated less favourably than another person without disability in a similar circumstance. On the other hand, indirect discrimination occurs when a condition or requirement is applied to everyone, but in practice affects people with a disability more adversely, is to their detriment, and such condition or requirement cannot be justified (EOC, 1998).

In the case of building accessibility, indirect discrimination commonly happens rather than direct discrimination as developers and designers normally seldom make the buildings with an intention to make them inaccessible for people with disability or unable them to use them (Lau, 2001).

The relevant provisions governing accessibility under DDO are shown below. In the section 25(1), it is unlawful for a person to discriminate against another person with a disability –

i. *by refusing to allow that other person access to, or the use of, any premises that the public or a section of the public is entitled or allowed to enter or use (whether for payment or not);*

ii. *in the terms or conditions on which the first-mentioned person is prepared to allow that other person access to, or the use of, any such premises;*

iii. *in relation to the provision of means of access to such premises;*

iv. *by refusing to allow that other person the use of any facilities in such premises that the public or a section of the public is entitled or allowed to use (whether for payment or not);*

v. *in the terms or conditions on which the first-mentioned person is prepared to allow that other person the use of any such facilities; or*

vi. *by requiring the other person to leave such premises or cease to use such facilities.*

(Section 25(1) of DDO)

However, exemptions are provided for the circumstances under section 25(2) of DDO. It is not regarded as discrimination if:

i. *the premises are so designed or constructed as to be inaccessible to a person with a disability; and*

ii. *any alteration to the premises to provide such access would impose unjustifiable hardship on the first-mentioned person who*

would have to provide that access

(Section 25(2) of DDO)

Another relevant provision in DDO for barrier free access is found at section 84 – "Building Approvals", which aims to guarantee accessibility to buildings through the building plan approval process. The section applies to any new building works or for the alternations or additions to an existing building.

10.2.1.4 Equal Opportunities Commission (EOC)

The Equal Opportunities Commission (EOC) is a statutory body set up in 1996 to implement three laws, which includes DDO. The functions and powers of EOC in relation to disability are provided under section 62 of DDO.

Functions and Powers of EOC:

i) work towards the elimination of discrimination;

ii) promote equality of opportunity between persons with a disability and persons without a disability;

iii) work towards the elimination of harassment and vilification;

iv) in the case of any act alleged to be unlawful by virtue of this Ordinance, encourage persons who are concerned with the matter to which the act relates to effect a settlement of the

matter by conciliation, whether under section 80 or otherwise;

v) *keep under review the working of this Ordinance and, when it is so required by the Governor or otherwise thinks it necessary draw up and submit to the Governor proposals for amending this Ordinance; and*

vi) *perform such other functions as are imposed on it under this Ordinance or any other enactment*

(Section 62 of DDO)

In regard to barrier free access to buildings, under section 80 of DDO, a person can lodge with EOC a complaint in writing if the individual believes that he/she has been discriminated in relation to access to premises or the provision of facilities. EOC is required to conduct an investigation into the complaint and try to settle the matter in question by conciliation. In addition, EOC has empowered by DDO to conduct investigation into purported discrimination act and require the related parties to furnish relevant information. Although EOC has statutory power to conduct investigation and conciliation, conciliation itself is an entirely voluntary process and the parties are free to decide whether to conciliate. However, if conciliation is not successful or the matter under complaint cannot be conciliated for whatever reasons, the

complainant may apply to EOC for assistance of litigation.

10.2.2 SINGAPORE

Different from Hong Kong, in Singapore, Building Control Regulations (BCR) is the only regulatory framework governing barrier free access to and within buildings. There is no disability discrimination law serving as another tier to protect the rights of persons with disabilities for access. Details of BCR are given below.

10.2.2.1 Building Control Regulations (Cap. 29)

Similar to Building (Planning) Regulation in Hong Kong, the Building Control Regulations (Cap.29, regulation 5) was made under the Building Control Act (BCA), which is the first legislation enacted by the Parliament of Singapore requiring buildings to be subjected to building control (Building and Construction Authority, 2003). Provisions about barrier free access are provided in Regulation 36 of BCR. In short, where a proposed building is one to which disabled persons have or may be reasonably expected to have access, that building shall be built to the satisfaction of the Building Authority in such a manner as facilitates access to and use of that building and its facilities by disabled persons. Also, all building works should be designed in

accordance with the Code on Barrier-Free Accessibility in Buildings.

10.2.2.2 Code on Barrier-Free Accessibility in Buildings 2002

This Code is first published in 1990 and it is now in its 3rd edition. It is originally intended for wheelchair users and is written primarily with their needs in mind. Through the years it is found that people with other forms of physical infirmities or limitations but who is not wheelchair-bound such as those with visual impairment, the aged and elderly, and families with young children should also not be unnecessarily disadvantaged by the built environment. They should also be able to access buildings, make use of their facilities and participate in activities as an integral part of the community just like any other person (Building and Construction Authority, 2002).

The aim of the Code is to set out the fundamental design and construction requirements and guidelines for making buildings accessible to persons with disabilities (Building and Construction Authority, 2002). Detailed technical designs are set out, with mandatory and non-mandatory requirements. It forms an important reference for submission of application for building plans approval, as regarded by the Building and Construction Authority (Ng, 2003).

On the other hand, as Regulation 36 of BCR makes reference to this Code for

compliance, all building works must comply with the building requirements set in the Code. Otherwise, a breach of the BCR would be result.

10.2.3 United Kingdom

Similar to Hong Kong, the provisions of regulatory framework governing barrier free access to buildings in the United Kingdom consists of two main parts, namely Building Regulation 2000 and Disability Discrimination Act 1995 (DDA). Details are shown below:

10.2.3.1 Building Regulations 2000

The current Building Regulations 2000 (SI 2000 No.2531) comes into force on 1 January 2001. It replaces the Building Regulations 1991 and consolidates all subsequent revisions to those regulations (WBC, 2008). The main purpose of the Regulations is to ensure the health and safety of people in or about buildings. They are also concerned with energy conservation and with making buildings more convenient and accessible for all people, including those with disabilities. A common way for achieving is to set standards for buildings to be accessible and hazard-free wherever possible. The Regulations, themselves, consists of only twenty seven pages with six parts and three schedules (WBC, 2008). In specific, Part M (Access and Facilities for Disabled People) of

Schedule 1 to the Regulations is responsible for satisfying the access and movement needs of the disabled people. In section 4 of the Regulations, with title of “Requirements Relating to Building Works”, it states that all building works should follow the requirements of Part M of Schedule 1.

(i) Building works shall be carried out so that –

(a) it complies with the applicable requirements contained in Schedule 1; and

(b) in complying with any such requirement there is no failure to comply with any other such requirement

(ii) Building work shall be carried out so that, after it has been completed –

(a) any building which is extended or to which a material alteration is made; or

(b) any building in, or in connection with, which a controlled service or fitting is provided, extended or materially altered; or

(c) any controlled service or fitting,

complies with the applicable requirements of Schedule 1 or, where it did not comply with any such requirement, is not more

unsatisfactory in relation to that requirement than before the work was carried out.

(Section 4 of Building Regulations 2000)

10.2.3.2 Approved Document M: Access to and Use of Buildings (2004)

This document is one of a series that has been approved and issued by the Secretary of State for the purpose of providing practical guidance with respect to requirements of Schedule 1 and Regulation 7 of the Building Regulations 2000. It is now in its 2004 edition. This Approved Document is intended to provide guidance for some of the more common building situations. However, there may well be alternative ways of achieving compliance with the requirements. Thus, there is no obligation to adopt any particular solution contained in an Approved Document if the developers or designers prefer to meet the relevant requirement in some other way, although meeting the provisions in the Approved Document are deemed to satisfy the Part M requirements (NBS, 2006).

10.2.3.3 Disability Discrimination Act 1995 (c. 50)

The Disability Discrimination Act 1995 (DDA) is a UK parliamentary act of 1995, which makes it unlawful to discriminate against people in respect of their

disabilities in connection with employment, the provision of goods, facilities and services or the disposal or management of premises, education and transport (OPSI, 1995). It is a civil rights law. The Equality and Human Rights Commission also provides support for the Act (Ng, 2003).

DDA contains duties to make reasonable adjustments to physical features of premises in certain circumstances. However, it is not a requirement for satisfying these duties to make those adjustments (OPSI, 1995). In specific, section 6 and 21 of DDA concern the accessibility of the buildings. Prior to section 21, section 19 and 20 give example of services to which section 21 can apply, such as “access to and use of any place which members of the public are permitted to enter” and defines discrimination for Part III purposes respectively. Some parts of the sections 6 and 21 are given below:

Duty of employer to make adjustments

6 (1) Where any physical feature of premises occupied by the employer, place the disabled person concerned at a substantial disadvantage in comparison with persons who are not disabled, it is the duty of the employer to take such steps as it is reasonable, in all the circumstances of the

case, for him to have to take in order to prevent the arrangements or feature having that effect.

Duty of providers of services to make adjustments

21 (2) Where a physical feature (for example, one arising from the design or construction of a building or the approach or access to premises) makes it impossible or unreasonably difficult for disabled persons to make use of such a service, it is the duty of the provider of that service to take such steps as it is reasonable, in all the circumstances of the case, for him to have to take in order to –

(a) remove the feature;

(b) alter it so that it no longer has that effect;

(c) provide a reasonable means of avoiding the feature; or

(d) provide a reasonable alternative method of making the service in question available to disabled persons

(Disability Discrimination Act 1995)

For the disabled people, they can claim discrimination caused by the

inaccessibility of the buildings if they cannot get access to the buildings or premises. The building owners are necessary to rectify the problems under the provision of DDA, if not, the case would take into the court (Ng, 2003).

10.2.4 The United States

In the United States, the federal government has been actively involved with developing a user-friendly environment. The United States has the most sophisticated laws and regulations governing built environment in terms of accessibility and barrier free among the other comparable countries (SAHRC, 2002; Ng, 2003). In the history of development of a user-friendly environment, the Architectural Barrier Act, which is also the first federal law, has first been passed in 1968. It is followed by the Rehabilitation Act of 1973, the Fair Housing Act of 1988, and finally the Americans with Disabilities Act (ADA) of 1990. All of them are governing the environment production with the aim of creating a user-friendly environment.

Among the numerous of laws and regulations governing the built environment in other countries, ADA is the most significant and representative regulatory framework addressing the physical accessibility issue (SAHRC, 2002; Ng, 2003). Goldsmith (1997) notes that ADA is the landmark law for persons with

disabilities.

10.2.4.1 Americans with Disabilities Act (ADA)

Americans with Disabilities Act, signed by President Bush on July 26, 1990, is landmark legislation to extend civil rights protection to people with disabilities. ADA prohibits discrimination on the basis of disability in employment, State and local government services, public transportation, public accommodations, commercial facilities, and telecommunications (ATBCB, 1996). It affords similar protections against discrimination to Americans with disabilities as the Civil Rights Act of 1964, which made discrimination based on race, religion, sex, national origin, and other characteristics illegal. In NCD (1986), it comments that ADA is an integration of the other "existing limited patchwork of protections for disabled people".

ADA is more significant compared to the discrimination laws in other countries (Ng, 2003). In practice, ADA prevails over all the other laws and regulations unless the requirements are more stringent than that in ADA (ATBCB, 1996). In addition, according to Sweet's Group (1999), as a civil rights law, ADA is unique in that architecture plays a central role. For people with disability, true equality and participation cannot always be achieved simply through a change

of policies, practices, and actions. For some, integration and independence requires accessibility in the built environment (UNHCHR, 1975). This fact alone places design and building professional in a unique position to positively affect the lives of the people with disabilities, their family member, friends, and coworkers (Butler and Bowlby, 1997; Imrie, 2003).

In ADA, for buildings and facilities constructed or altered by, on behalf of, or for the use of State and local governments, where accessibility can be economically and conveniently incorporated into design and construction, ADA contains a minimum standard which must be met. These standards are called Americans with Disabilities Act Accessibility Guidelines, or ADAAG. Failure to design, construct, or alter a building or facility according to design standards promulgated under ADA constitutes an act of discrimination.

10.2.4.2 Americans with Disabilities Act Accessibility Guidelines (ADAAG)

ADAAD is written by a federal agency called the United States Architectural and Transportation Barriers Compliance Board, known more commonly as the Access Board. In developing the accessibility guidelines, the Access Board works closely with people and organizations from the design and building

industries, disability community, state and local governments, and private sector to develop guidelines that are clear, consistent, and fair (Sweet's Group, 1999). In sum, ADAAG contains scoping and technical requirements for accessibility to sites, facilities, buildings, and elements by individuals with disabilities by individuals with disabilities under ADA. These scoping and technical requirements are to be applied during the design, construction, and alteration of buildings and facilities covered by titles II and III of ADA to the extent required by regulations issued by Federal agencies, including the Department of Justice and the Department of Transportation, under ADA. Therefore, if complying with all requirements of ADAAG, it is deemed to satisfying the accessibility requirements of ADA.

ADAAG is enforced by the United States Department of Justice through a complaint process. In addition, section 308(a)(1) of ADA permits a private suit by an individual who has reasonable grounds to believe that he or she is "about to be" subjected to discrimination because a facility that is being newly constructed or altered does not comply with ADAAG. In such cases, an individual may apply for an injunction or other order to halt construction.

It is important to note that because ADAAG is contained within civil rights

legislation, it is not enforced like a building code. ADAAG compliance is not overseen by a local building code official, and there is no ADA “certification” by any kind of access inspector. Building professionals should be wary of anyone who claims a design or product is “ADA certified”. There simply is no such thing (Sweet’s Group, 1999).

10.3 Basis for Comparative Analysis

In section 10.2, the regulatory framework in setting a user-friendly environment in terms of accessibility and barrier free of Hong Kong and the comparable countries are reviewed. However, only the major regulations, laws or codes of practice are briefly described as a foundation background for comparison. As one of the objectives in this research is to evaluate the adequacy of the legislative framework of Hong Kong in setting out the design standards for a user-friendly environment, before the comparative analysis is carried out, the basis for comparative analysis is identified by examining the regulatory framework of all the comparable countries and also criteria are set afterward for the comparative analysis.

10.3.1 Subject for Comparison

In order to have a reliable evaluation in comparative analysis, the most important thing is to determine the most comparable items for the analysis (Leichter, 1979). In another word, the subject for comparison is the best to have equal footings (Ng, 2003). Applying to this research, as mentioned in section 10.1, for the selection for the comparable countries, all of them are developed countries, that means they are all already of equal footing in the level of state development. On the other hand, for the underlying regulations or laws in all comparable countries, those objective and nature are the same for setting out the design standards for a user-friendly environment. In the view of equal footings, the building regulations should not be taken together with the disability discrimination law for comparison due to the differences in the aim and nature as well (Ng, 2003).

In addition, as mentioned in the introductory paragraph, the objective is to evaluate the adequacy of the legislative framework of Hong Kong in setting out the design standards for a user-friendly environment. Therefore, the relevant items contributing to the design standards for a user-friendly built environment with the same footings should be taken as the subject for comparison.

Findings in Section 10.2

In section 10.2, the regulatory framework of Hong Kong and the comparative countries for setting a user-friendly environment is found to have some common characteristics. In sum, countries can set up a user-friendly environment through regulatory framework by the means of, in general term, building regulation, disability discrimination law/ordinance, code of practice and manual which they all generally provide the technical design requirements in order to comply with the respective regulation or law. The major legislative framework for each of the comparable countries is shown in table 11 for easy reference.

Country	Laws	Codes/Guidelines
Hong Kong	i) Building (Planning) Regulations ii) Disability Discrimination Ordinance	Design Manual: Barrier Free Access 1997
Singapore	Building Control Regulation	Code on Barrier-Free Accessibility in Buildings 2002
United Kingdom	i) Building Regulations 2000 ii) Disability Discrimination Act 1995	Approved Document M: Access and Facilities for Disabled People
United States	Americans with Discrimination Act of 1990	Americans with Disabilities Act Accessibility Guidelines (1998)

Table 11: Legislative Framework of Hong Kong & the Comparable Countries

Decision

Among the disability discrimination law, the building regulation and the code, it is the best to choose the code as the subject for comparison in the comparative analysis. The reasons are as follows:

Regarding the disability discrimination law, it is found that Singapore does not promote a user-friendly environment by means of disability discrimination law like other comparable countries, due to the reason of unequal footing of the subject, disability discrimination law is not an appropriate subject for the comparative analysis.

Yet, Singapore has established such disability discrimination law, the disability discrimination law also is not an appropriate subject for the purpose of comparison. The reason is that the law only stipulates the obligation to provide a user-friendly built environment in terms of accessibility and barrier free, so as to promote equal opportunity for everyone, but not provide any design standards in order to create a barrier free society (Ng, 2003). Thus, the research objective of evaluate the adequacy of regulatory framework in setting out the design standards for a user-friendly environment then has no means to be achieved. Therefore, the disability discrimination law is not an appropriate

subject for comparative analysis.

For the building regulations, compared to the disability discrimination law, the building regulation is in the aim of prevention rather than a remedial one (Ng, 2003). For example, in the Building (Planning) Regulations of Hong Kong, accessibility is one of the vital factors to consider getting the approval when submitting the plans. Also, the building regulations provide design standards or requirements for developers or designers to comply with in all building works or alternations to prevent discrimination.

In the view of equal footing, building regulation also is not regarded as the most appropriate subject for comparative analysis. As the United States does not have a specific federal building regulation as those in other comparable countries. Therefore, the principle of equal footing is not satisfied again.

The technical requirements in practice and details of how to create a user-friendly built environment or barrier free society are guaranteed through the regulations with supplement by the code of practice and manual (grouped as “Code”), which demonstrates how to comply with the regulations by following the design requirements prescribed in the Code (Ng, 2003). Although the Approved Document M: Access and Facilities for Disabled People of the

United Kingdom is not obligatory in nature, it in fact acts as an important guidance to fulfill the requirement of its own building regulations in promoting user-friendly environment.

Since the Code is the only common element for Hong Kong and all comparative countries, and it is the most representative one that laid down the design standards for promoting user-friendly environment. In the view of the research objective and principle of equal footing, the Code is regarded as the most appropriate subject for comparative analysis.

The following table gives a quick reference to the corresponding codes of Hong Kong and each comparable country that undergo comparative analysis later.

Country	Codes for Comparative Analysis
Hong Kong	Design Manual: Barrier Free Access 1997
Singapore	Code on Barrier-Free Accessibility in Buildings 2002
United Kingdom	Approved Document M: Access and Facilities for Disabled People
The United States	Americans with Disability Act Accessibility Guidelines

Table 12: The Code in Hong Kong and all Comparable Countries

In order to determine whether the regulatory framework in Hong Kong in setting design standards for promoting user-friendly environment, the design standards or requirements prescribed in the Code is an important determining

factor.

10.3.2 Criteria for Comparison

After the Code is chosen as the subject for comparative analysis, the criteria for comparison should then be set by follow. One point to aware is that the comparative analysis is carried out based on technical requirements and design standards of the Code, but not from the view of a legal or political perspective (Ng, 2003). First of all, a norm on the regulatory framework to set out design standards or requirements in promoting a user-friendly built environment is formed from the overview of those regulatory frameworks of all comparable countries. Then, the adequacy of the design standards or requirements in ensuring barrier free society can be determined by the comparison process based on the norm.

The criteria for comparison of the research are classified into general criteria and specific criteria. The general criteria are kinds of broad indicators (Ng, 2003). They are components that are influential to the practical outcome of accessibility and the actual embodiment of barrier free access, which are put forward by many literatures (Council on Tall Buildings and Urban Habitat, 1992; Building Regulation Division, Office of the Deputy Prime Minister, 2002;

SAHRC, 2002; Steinfeld & Danford, 1997). For the specific criteria, they are used to measure the requirement of the two major components of a user-friendly built environment, with examinations on those requirements on individual design features (Ng, 2003). The criteria list as below:

General Criteria:

i) Scope of application of the Code

ii) Coverage of users

iii) Comprehensiveness of design requirements

Specific Criteria:

i) Requirements on initial access

ii) Requirements on internal circulation

10.4 Comparative Analysis: Determining the Adequacy

After all the preparations for comparative analysis, including selection of comparable countries, overview of the regulatory framework promoting user-friendly environment, selection of subject for comparison and comparison criteria, are finished in previous sections, the comparative analysis, with aim to achieve the research objective to evaluate the adequacy of the regulatory

framework in setting out the design requirements to promote user-friendly environment, is carried out in this section.

The Code on Barrier-Free Accessibility in Buildings 2002 of Singapore, the Approved Document M: Access and Facilities for Disabled People of the United Kingdom and the Americans with Disability Act Accessibility Guidelines (ADAAG) of the United States are selected as the subject for comparison with the Design Manual: Barrier Free Access 1997 of Hong Kong. They are compared with each other based on the criteria set in section 10.3. The comparative analysis consists of two parts. The first part is based on the general criteria and the second part is based on the specific criteria.

10.4.1 Comparison Based on General Criteria

For general criteria, they are:

i) Scope of application of the Code

ii) Coverage of users

iii) Comprehensiveness of design requirements

Each criterion in the Code of Hong Kong and all comparable countries is compared and discussed in the following sections.

10.4.1.1 Scope of Application of the Code

The scope of application of the Code is one of the important criteria to determine the adequacy of the regulatory framework in setting out design requirements to ensure barrier free society. Since the Code if only subject to apply to buildings in a minimal circumstance, the Code surely cannot effectively help to promote or ensure a user-friendly built environment in practice. Therefore, whether the regulatory framework for promoting user-friendly environment in the society is adequate, it can be determined by the scope of application of the Code indirectly. For comparison, the scope of application of respective Code is summarized in the table below.

Findings and Implications

Name of the Code	Major Requirements in the Code
Design Manual: Barrier Free Access 1997 (Hong Kong)	- Applies to a new buildings or any alternations or additions to an existing building (*section 1.6 & 3.2*) Exemptions: Buildings of 13m or less in height which are used, or intended to be used for occupation by a single family; or temporary buildings or contractor's shed
Code on Barrier-Free Accessibility in Buildings (Singapore)	- Applies to a new building; or repairs, alternations or additions to an existing building that are major and substantial upon writing from the Commissioner of Building Control (*section 2.3*)
Approved Document M: Access and Facilities for Disabled People (United Kingdom)	- Applies to a new building or building that has been substantially demolished to leave only external walls or extensions to buildings other than dwellings. Material alternations are NOT governed under the Code but require that the level of provision after alternation should not be any worse (*section 0.1-0.6*)
Americans with Disabilities Act Accessibility Guidelines (United States)	- Applies to all areas of newly designed or newly constructed buildings and facilities and altered portions of existing buildings and facilities generally - Temporary structures, e.g. "temporary safe pedestrian passageways around a construction site", "temporary classroom", are NOT EXEMPTED (*section 1 & 4.1*)

Table 13: Summary of the Scope of Application of the Code in Hong Kong and the Comparable Countries

From the scope of application of the respective Code shown in table 13, if look at Hong Kong alone, it is found that the Code is stipulated to apply to new buildings works or, any alternations or additions to existing buildings. In other words, new buildings, as well as existing buildings if there are any alternations or additions to be commenced, are both governed by the design standards or requirements set in the Code. In the view of existing buildings, the Code is

definitely inadequate for excluding those existing buildings if there are no alternations or additions to be commenced, as existing buildings also account for a significant portion of buildings that the disabled people may get access to (Ng, 2003).

However, when compared to the Code in other comparable countries, it is found that the scope of application of the Design Manual: Barrier Free Access 1997 of Hong Kong is generally consistent with that of the comparable countries. In the aspect of exemption of temporary structures, the provisions about the design requirements or standards in the Design Manual: Barrier Free Access 1997 of Hong Kong has much limitation on the scope of application than ADAAG of the United States. But this is an exceptional case as the temporary structures are only not exempted in ADAAG of the United States. Therefore, the inclusion of temporary structure is not one of the characteristics for the norm of comparison among the comparable countries.

Back to the exemption of existing buildings if there are no alternations or additions to be commenced, according to Ng (2003), an explanation for this exemption is due to the possibly high costs. The building owners of those existing buildings are likely to oppose the idea if the Code is to require them to

renovate the buildings and surroundings, in order to create a user-friendly environment with barrier free access. Also, a lot of great difficulties have to be overcome to renovate all the existing buildings. For instance, the possible constraints of the site and the substantial amount of necessary resources.

In this point of view, the current scope of application is reasonable and given that most of the comparable countries have adopted similar standard. Therefore, it is adequate for the regulatory framework of Hong Kong in promoting user-friendly environment with barrier free access in the aspect of scope of application of the Code.

10.4.1.2 Coverage of Users

The coverage of the Code, in terms of its requirements and specifications that address the needs of the potential users, is another criterion to determine the adequacy of the regulatory framework in setting out design requirements to ensure barrier free society. In other words, the number of people who benefit from the Code is an indicator of the adequacy of the design standards to ensure a user-friendly built environment (Council on Tall Buildings and Urban Habitat, 1992; Ng, 2003). The adequacy of the regulatory framework of Hong Kong in promoting user-friendly environment is determined by the factor of

coverage of users as below.

Findings and Implications

It is found that the disabled people are categorized into groups in both Singapore and the United Kingdom. Table 14 shows the categorization of the disabled people into groups in these two countries.

Country	Categorization
Singapore	i) ambulant disabled; ii) wheelchair-bound; iii) hearing impairment or deafness; or iv) visual impairment or blindness
United Kingdom	i) an impairment which limits their ability to walk (ambulant disabled) or which requires them to use a wheelchair for mobility (wheelchair users) ii) impaired hearing or sight

Table 14: Summary of the Categorization of Disabled Users in Singapore & the United Kingdom

The aim of categorizing the disabled people into specific groups is to ensure most of the fundamental design requirements or standards prescribed in the Code address the needs of these groups of users (Council on Tall Buildings and Urban Habitat, 1992). In contrast, there is no categorization of the disabled people into groups in the United States. However, it is found that the design requirements or standards in ADAAG of the United States have also put emphasis on the “persons using a wheelchair”, “persons with visual impairments”, and “persons with hearing impairments” respectively. This

shows that all the Code is ensured that they can cater for the needs of all disabled people with the help of categorization into groups.

For Hong Kong, the type of categorization of the disabled people into groups in Hong Kong is shown in section 2.2 of the Design Manual: Barrier Free Access 1997.

> *The types of disabilities for which the Manual caters are –*
>
> *(a) Locomotory disabilities (wheelchair users and ambulant disabled);*
>
> *(b) Sensory disabilities which include*
>
> *i) Visual impairment*
>
> *ii) Low vision*
>
> *iii) Totally blind, and*
>
> *iv) Hearing impairment*
>
> *(Design Manual: Barrier Free Access 1997)*

Look through the Code in Hong Kong and all comparable countries, they all have similar type of categorization of disabled people into groups, with common meaning but in different wordings. The coverage of users in the Code can be generalized in four different groups, namely wheelchair-bound users,

the ambulant disabled, the visual impaired and the hearing impaired. The design requirements or standards prescribed in the Code can address the needs of these four disability groups respectively and effectively. For example, for wheelchair-bound users, corridors or other accesses is required to have certain clear width for them to pass readily; for the ambulant disabled, steps and staircase are provided for them to facilitate their movement.

Comparatively, the Code on Barrier-Free Accessibility in Buildings of Singapore has a relatively wider coverage of users. It not only covers those four categorized disability groups, but also includes the elderly and parents with children. The necessity to cover the whole population in the application of the Code is shown in the preface of the Code on Barrier-Free Accessibility in Buildings of Singapore.

> *…[they] should also not be necessarily disadvantaged by the built environment. They should also be able to access buildings, make use of their facilities and participate in activities as an integral part of the community just like any other person.*
>
> *(Code on Barrier-Free Accessibility in Buildings 2002)*

Another necessity for a wider coverage of users in the Code is that everyone is "at risk" for certain kind of illness or disability (Zola, 1989). Also, environment is another source of barriers that sometimes may hinder people's daily activities (Bickenbach *et al*., 1999; Council on Tall Buildings and Urban Habitat, 1992; Steinfeld & Danford, 1999; Ustun, 2001). Therefore, instead of confining the coverage of the Code to involve only the four disability groups, the wider the coverage of the users, the more prevalence is the user-friendly built environment.

For Hong Kong, the coverage of the Design Manual: Barrier Free Access 1997 is not that wide like the Code on Barrier-Free Accessibility in Buildings of Singapore. However, similar concept to cover not only the disabled people is shown in both the foreword (Chapter 1, section 1.3) and introduction chapter (Chapter 2, section 2.1) of the Design Manual: Barrier Free Access 1997 as below:

> *The "barrier-free" design requirements included in this Manual will help considerably towards greater independence of not only persons with a disability, but also the elderly, pregnant women, and indeed a broad spectrum of the community.* *(section 1.3)*

This Design Manual aims to set out design requirements for providing access and appropriate facilities in a building for persons with disabilities and other sector of the population, who do at times requires the same provision as persons with a disability. (section 2.1)

(Design Manual: Barrier Free Access 1997)

In the view of coverage of users, Hong Kong is better than both the United Kingdom and the United States, as their design requirements prescribed in the Code do not expressly state to cover the entire population. However, Hong Kong is lagging behind Singapore.

10.4.1.3 Comprehensiveness of Design Requirements

The comprehensiveness of the design requirements prescribed in the Code is the last general criterion to determine the adequacy of the regulatory framework in setting out design requirements to ensure barrier free society. in order to assess comprehensiveness of the design requirements, the coverage of accessible items in the built environment, in terms of typical features and facilities, that the disabled people are able to use like the ordinary people and enjoy equal opportunities through those usages, is able to act as an indicator

for the assessment. According to Council on Tall Buildings and Urban Habitat (1992), for the Code with comprehensive design requirements, it means the Code has taken account of most of the typical features or facilities that the disabled people normally make use of or need in their daily activities.

Findings and Implications

The accessible items, in terms of typical features and facilities in the built environment, covered by the corresponding Code of Hong Kong and all comparable countries are reviewed and listed in the table as shown below.

Hong Kong	Singapore	United Kingdom	United States
- Access - Ramps - Dropper kerbs - Steps & staircases - Handrails - Corridors, lobbies, paths - Doors Toilet & W.C. cubicles - Signs - Lift - Car parking space - Public service counter - Induction loop system - *Switches & controls* - *Illumination* - *Telephones* - *Escalators* *[italic: non-mandatory requirements only]*	- Access - Slope ramps - Kerb ramps - Staircase - Handrails - Accessible routes, corridors, paths - Doors - Sanitary provisions - Signs - Lift - Passenger alighting & boarding point - Service counter - Floor surfaces - Gratings - Walls - Seating space - Drinking foundtain - Illumination - Public telephone - Control & operating mechanisms (e.g. switches) - Eating outlets - Taxi stands - Vehicle parking lots	- Access - Ramps - Dropped kerbs - Steps & staircase - Handrails - Corridors, lobbies, passageways - Doors - Sanitary provisions Signs - Passenger lifts - Wheelchair stairlifts - Platform lifts - Aids to communicate - Switches & socket outlets - Changing facilities - Restaurant & bars - Hotel & motel bedrooms - Audience or spectator seating	- Access - Ramps - Curb ramps - Stairs - Handrails - Corridors, lobbies, paths - Doors - Sanitary provisions - Signs - Platform lifts - Elevators - Car parking spaces - Parking & passenger loading zones - Ground & floor surface - Windows - Seating tables - Drinking fountains - Telephones - Control & operating mechanism - Automatic teller machines (ATMs) - Assembly area - Dressing & fitting rooms - Restaurants & cafeterias - Medical care facilities - Business & mercantile - Libraries - Transient lodging Transportation facilities

Table 15: An Overview of the Accessible Items Covered by the Code in Hong Kong and All Comparable Countries

In table 15, in terms of number of the accessible items covered in the Code, there are seventeen items (including 13 mandatory items and 4 non-mandatory items) covered in the Design Manual: Barrier Free Access 1997 of Hong Kong. Among all comparable countries, the coverage of the design requirements in the Design Manual: Barrier Free Access 1997 of Hong Kong is the smallest one. In other words, the comprehensiveness of the design requirements of the Code in Hong Kong is in a lower level compared to the comparable countries.

Furthermore, when look through the accessible items covered by the Code of Hong Kong and the comparable countries, it is found that the items covered by the Design Manual: Barrier Free Access 1997 of Hong Kong are not as broad as the Code in the comparable countries. In fact, those excluded accessible items, in the Design Manual: Barrier Free Access 1997 of Hong Kong, are quite usual for disabled people to make use of or get access to. For example, floor surfaces, seating space and drinking fountain. In specific, the design requirement for telephones is included in the Code of Singapore, the United Kingdom and the United States, while it is still a non-mandatory requirement in the Design Manual: Barrier Free Access 1997 of Hong Kong. In the concept of everyone (including the disabled people) enjoying equal opportunities, the

design requirements covered by the Code should cover as many as possible, including those areas or aspects where the disabled people would properly make use of or get access to.

Ideally, the most comprehensive Code should prescribe design requirements covered all items in the built environment. With such ideal Code, not only are the disabled people able to experience barrier free access in all environment aspects, they are more likely to integrate into the barrier free society (UNHCHR, 1975).

In the view of comprehensiveness of design requirements, from the comparative findings, design requirements prescribed in the Design Manual: Barrier Free Access 1997 of Hong Kong covers the least accessible items in the built environment, therefore, the Code in Hong Kong is not as comprehensive as the comparable countries.

10.4.2 Comparisons Based on Specific Criteria

The following section is the second part of the comparative analysis. The determination of the adequacy of the regulatory framework in setting out design requirements to promote a user-friendly environment is based not only on the design standards of general criteria, but also that of the specific criteria.

According to the Council on Tall Buildings and Urban Habitat (1992), in order to create a barrier free society, initial access and internal circulation are the key components of the specific criteria. Thus, the design requirements prescribed in the Code related to these two key components are the determinants for whether the environment is user-friendly for disabled people. The result of this part would make the determination of the adequacy becomes more comprehensive and reliable.

10.4.2.1 Design Requirements on Initial Access

Initial access is the primary concern of barrier free access (SAHRC, 2002). Whether the disabled people can make use of the facilities or get access to the buildings can be obviously shown in the aspect of initial access. Without proper design requirements prescribed in the Code concerning about the initial access, the disabled people are probably hindered by the barriers, such as steps or unqualified slope, to get access to those buildings. This exclusion of the disabled people from the society would become more serious in a non-user friendly environment (Union of People with Impairments Against Segregation, 1976; Hall, 1994). Therefore, initial access is one of the important criteria in specific for determining the adequacy.

Findings and Implications

From the comparison between Hong Kong and the comparable countries, it is found that the initial access requirement in the Design Manual: Barrier Free Access 1997 of Hong Kong is similar to the norm of the comparable countries. The detailed comparison on the requirements on certain features concerning about the initial access is shown in the following table.

Requirement	Hong Kong	Singapore	United Kingdom	United States
Ground & Floor Surface	**NIL**	- **stable, firm, level & slip-resistant** - not have any projections, drop or unexpected variation in level - colour & tone contrast with walls - gratings spacing max. 12mm wide	**NIL**	- **stable, firm, & slip-resistant** - gratings spacing max. 13mm wide
Ramps	Shall be a ramp at changes in level - **min. width 1050mm** - max. gradient 1:12 - **handrails on both sides** - landing at top & bottom of every ramp: 1500mm min. x 1500mm min. - tactiles at head & foot of ramp	Shall be a ramp at changes in level - **min. width 1200mm** - max. gradient according to change in vertical rise (max. 1:12) - **handrails on both sides** - landing at top & bottom of every ramp: 1500mm min. x 1200mm min. - **slip-resistant surface** - shall be designed so that water would not accumulated on surface of ramp	Shall have a ramp if gradient of change in level greater than 1:20 - **min. width 1200mm** - gradient max. 1:15 if flight not longer than 10m; 1:12 max. if flight not longer than 0.5m - **handrails on both sides** - landing at top & bottom of every ramp: 1500mm min. x 1200mm min. - **slip-resistant surface**	Shall have a ramp if slope of route greater than 1:20 - **min. width 915mm** - max. gradient 1:12 - **handrails on both sides** - landing at top & bottom of every ramp: min. 1525mm clear - **slip-resistant surface** - shall be designed so that water would not accumulated on surface of ramp

Accessible Route	- **clear width 1050mm min.** - no projections beyond 90mm from the surface of any walls if they are below 2m above the finished floor level	- **clear width 1200mm min.** - walls to be i) corners without sharp edges ii) wall finishes to be smooth - no projections beyond 100mm into pedestrian areas from wall surface - for long paths, resting areas required at frequent intervals not exceed 30m	Either a level approach, ramped approach or a stepped approach (ramped and stepped approach refer to 'ramp' & 'stairs' respectively) FOR Level approach - **clear width 1200mm min.** - gradient max. 1:20 (otherwise, ramp requirement should be followed) - tactiles required at crossings - windows/doors open outwards should not cause obstruction on the path	- **clear width 915mm** except at doors, but if route less than 1525mm clear width, passing space of 1525mm x 1525mm shall be provide at reasonable intervals not exceeding 61m - gradient max. 1:20 (otherwise, ramp requirement should be followed) - no projections beyond 100mm into the route from wall surface

Stairs	- **risers max. 175mm** - tactiles at top & bottom end of staircase - non-slip nosing in contrasting colour - treads & walls in contrasting colours - **handrails on at least one side** - raised directional signs on handrails	- **uniform risers max. 150mm** - tactiles at top, bottom & intermediate landings - non-slip nosing between 50mm & 65mm width with permanent contrasting colour - **continuous handrails on both sides of flight** - illumination of min 120 lux	- **uniform risers max. 150mm** - tactiles on top landing - all steps nosings distinguishable through contrasting brightness - **continuous handrails on both sides of flight**	- uniform risers - **continuous handrails on both sides of flight** - outdoor stairs designed so that water would not accumulate on the surface

Parking Space	Requires at least one & to be accessible to entrance only, NO details provided	- located nearest to an accessible entrance - no. of accessible parking lots required according to total no. of lots - dimensions of 4800mm x 3600mm - have a firm, level surface without aeration slab - the path leading to the entrance shall be level or have a kerb ramp as required - signage provision	Requires accessible route to principle entrance only, NO details provided	- located at the shortest accessible route from parking space to entrance of building - no. of accessible parking lots required according to total no. of lots - at least 2440 mm wide - access aisles adjacent space shall be 1525mm wide min - parking space & access aisles shall be leveled with surface slopes not exceed 1:50 (2%) - signage provision
Passenger Loading Zones/Alighting & Boarding Point	**NIL**	- Have an access aisle at least 1500mm wide x 4500mm long - have a kerb ramp if there is a kerb between the access aisle & vehicle pull-up space	**NIL**	- Have an access aisle at least 1525mm wide x 6100mm long adjacent & parallel to vehicle pull-up space - have a curb ramp if there is a curb between the access aisle & vehicle pull-up space

Table 16 Comparison of Design Features on Initial Access in the Code of Hong Kong and the Comparable Countries

In table 16, it is found that the design requirements prescribed in the Design Manual: Barrier Free Access 1997 of Hong Kong has not addressed two of the six design features, namely “ground and floor surface” and “passenger loading zones/alighting and boarding point”, while all comparable countries do cover those features. According to SAHRC (2002), it is pointed that the design requirements of these two features are originally not included in the Approved Document M: Access and Facilities for Disabled People of United Kingdom. Through revision and amendment on the Approved Document M: Access and Facilities for Disabled People of United Kingdom, it has newly incorporated these two design features into the list of design requirements items. The move of the United Kingdom reveals it is a standard in the developed countries to cover these items for initial access (Ng, 2003).

The incomprehensiveness of design requirements in the Design Manual: Barrier Free Access 1997 of Hong Kong is further evidenced in the aspect of requirements on initial access. Specifically in the area of initial access, due to the incomprehensive design requirements, the Design Manual: Barrier Free Access 1997 of Hong Kong only prescribes that a ramp and an accessible entrance should be provided for the access of the disabled people. However, it does not concern about the surface materials, if the surface is not stable, firm,

and level & slip resistant, it would probably be a big difficulty for the disabled people to get access or make use of the facilities and buildings.

Moreover, for the minimum width of the ramp and accessible route prescribed in the Design Manual: Barrier Free Access 1997 of Hong Kong, they are narrower than that in the Code of the comparative countries. In another words, the Code of Hong Kong is not compatible with the norm of the comparable countries. Although the facilities are designated for being used by the disabled people, they are eventually one of the barriers hindering their movement.

Apart from the incomprehensiveness of the design requirements on specific features for initial access, comparatively, the specifications prescribed in the Code of the comparative countries are in more detail, considerable and with more restrictions. Take “stairs” as an example, handrails are required to be installed on both sides of the stairs in all the comparable countries. However, in the Design Manual: Barrier Free Access 1997 of Hong Kong, it is required to be installed on at least one side only. In addition, it is also a mandatory requirement, which means it is not compulsory. The comparison among other design features is highlighted in table 16. One of the unique requirements on the stair in the Design Manual: Barrier Free Access 1997 of Hong Kong is that

raised directional sign is required to put on the handrails of stairs for facilitating the movement of people with visual impairments. This shows the design requirements prescribed in the Design Manual: Barrier Free Access 1997 of Hong Kong is aimed to help facilitating the life of people with different type of disability, or even for the entire population, as everyone is “at risk” for certain kind of illness or disability (Zola, 1989).

In the view of design requirements prescribed in the Code on initial access, the Design Manual: Barrier Free Access 1997 of Hong Kong is not compatible with the Code of the comparable countries. Firstly, the coverage of the Code in Hong Kong is not wide and detailed enough as the Code in the comparable countries, in addition, two of the six common design features for the initial access are excluded in the Design Manual: Barrier Free Access 1997 of Hong Kong. Secondly, due to the incomprehensive design requirements, it makes the standard of the Code in Hong Kong lags behind the norm of the comparable countries.

10.4.2.2 Design Requirements on Internal Circulation

Apart from the initial access, internal circulation, which concerns on the ease of movement within buildings, is another specific criterion to determine the

adequacy of the regulatory framework in setting out design requirements to promote a user-friendly environment. According to Council on Tall Buildings and Urban Habitat (1992), it is necessary to provide a good internal circulation for disabled people so that they can move freely around the building themselves, even without the help from others. Therefore, the design requirements on internal circulation are a relevant criterion to determine the adequacy of the regulatory framework to promote a user-friendly environment, particularly true for the multi-storey buildings in Hong Kong (Ng, 2003).

Findings and Implications

Among Hong Kong and all comparable countries, all their Code concern about internal circulation in terms of horizontal circulation and vertical circulation. For horizontal circulation, the design requirements focus on provisions on corridors & passageways as well as doors. For vertical circulation, the design requirements focus on the features of lifts. Since the Code in Hong Kong and all comparable countries address the design requirements on internal circulation in the same features, therefore, the coverage for internal circulation in the Code of Hong Kong is compatible with the norm of the comparable countries. The only method to compare the design requirements on internal circulation is to make the comparison among the specifications of design

features relevant to internal circulation prescribed in the corresponding Code. The comparison of specifications of design features in respect to internal circulation in the Code of Hong Kong and all comparable countries is shown in the following table.

Requirement	Hong Kong	Singapore	United Kingdom	United States
Corridors & Passageways	- **clear width 1050mm min.** - no projections beyond 90mm from the surface of any walls if they are below 2m above the finished floor level	- **clear width 1200mm min.** - walls to be i) corners without sharp edges ii) wall finished to be smooth - no projections beyond 100mm into pedestrian areas from wall surface - min. clear headroom shall be 2000mm	- **clear width 1200mm min.**	- **clear width 915mm** except at doors, but if route less than 1525mm clear width, passing space of 1525mm x 1525mm shall be provided at reasonable intervals not exceeding 61m - no projections beyond 100mm into the route from wall surface - min. clear headroom shall be 2030mm

Doors	- **clear width 750mm** - unobstructed area adjacent to door handle 3800mm min. in width - door opening foce max. 22N - door handle between 950mm - 1050mm above floor level	- **clear width 900mm** - unobstructed area adjacent to door handle 300mm min. in width on push side & 600mm min. on pull side - door opening force max 22N - door handle i) between 900mm - 1100mm above floor level ii) push-pull mechanism do not require grasping iii) should contrast with colour of door	- **clear width min. 750mm** - unobstructed area adjacent to door handle 380mm min. in width	- **clear width min 815mm** - unobstructed area adjacent to door handle 305mm min. in width on push side & 455mm min. on pull side - door opening force max. 22N - door handle i) max. 1220mm above the floor level ii) easy to grasp with one hand, does not require tight grasping to operate

Lift	- at least one lift to every floor i) lift car: - min. internal dimensions 1200mm x 1100mm wide - **min. clear door width 750mm** ii) lift doors: - detection device required iii) lift buttons: - braille & tactile markings - emergency alarm push button in tactile bell shape & at 900 - 1020mm above floor of car	- at least one lift from entrance serving all levels for vertical circulation i) lift car: - min. internal dimensions 1400mm x 1200mm wide - **min. clear doors width 950mm** ii) lift door: - shall be controlled by a photo-eye/infra-red detection/sensing device - audible signal for alerting passengers iii) life buttons: - braille & tactile markings	- a lift to serve storey above or below principle entrance i) lift car: - min. internal dimensions 1400mm x 1100mm wide - **min. clear door width 800mm** ii) lift door: - re-activating device by photo-eye/infra-red; - audible signal for alerting passengers iii) lift buttons: - tactile indications	- at least one lift to every floor i) lift car: - min. internal dimensions 1730m x 1291mm - **min. clear door width 915mm** ii) lift door: - automatic; - reopening device; - audible signal for alerting passengers iii) lift buttons: - braille, tactile & visual control indicator iv) illumination - level 53.8 lux min. v) floor surface controlled

Table 17: Comparison of Design Features on Internal Circulation in the Code of Hong Kong and the Comparable Countries

For the wheelchair-bound users, they are the group that is the most sensitive to the width of corridors and doors (Ng, 2003). It is worth noting that insufficient width would be a great barrier for them to pass through. According to Working Group on Community Occupational Therapy (1999), in general, a wheelchair-bound user need a minimum 915mm clear width for passageway and 760mm clear opening width for doorway. Referring back to table 17, it is found that, in the Design Manual: Barrier Free Access 1997 of Hong Kong, the minimum requirement of the clear width 750mm on both doors and lift doors is not insufficient to facilitate good internal circulation of the wheelchair-bound persons.

On the other hand, for the passageway width, the design standard in the Design Manual: Barrier Free Access 1997 of Hong Kong can only allow a single wheelchair to pass through, while the Code of all comparable countries can allow a wheelchair and one ambulatory person to pass through at the same time. Therefore, specifically in the clear width of doors and corridors & passageway requirement, the design standard in the Design Manual: Barrier Free Access 1997 of Hong Kong is definitely lower than that in all comparable countries.

In the view of design requirements on internal circulation, the Design Manual: Barrier Free Access 1997 of Hong Kong and the Code in all comparable countries mainly cover three features, namely, corridors & passageway, doors and lift, with different scales. In comparison, the design requirements in the Code of Hong Kong are in a lower standard than the norm of the comparable countries. In the standard lagging behind the norm of the comparable countries, the design requirements for internal circulation may be insufficient to address all needs of the disabled people in Hong Kong, especially for wheelchair-bound users.

10.5 Conclusion

Comparative analysis is carried out based on five criteria (3 general criteria and 2 specific criteria) to determine the adequacy of the design requirements prescribed in the Design Manual: Barrier Free Access 1997 of Hong Kong to promote a user-friendly environment.

For general criteria, it is adequate for the regulatory framework of Hong Kong in promoting user-friendly environment with barrier free access in respect of the scope of application and coverage of users in the Design Manual: Barrier

Free Access 1997 of Hong Kong, and even better than some of the comparable countries. On the other hand, as the design requirements prescribed in the Design Manual: Barrier Free Access 1997 of Hong Kong covers the least accessible items in the built environment compared to the Code in comparable countries, therefore, the Design Manual: Barrier Free Access 1997 of Hong Kong is not as comprehensive as the Code in comparable countries. This implies the range of facilities that persons with disabilities can access without barriers may be less than those in the comparable countries.

Apart from the general criteria, for specific criteria, the design requirements prescribed in the Design Manual: Barrier Free Access 1997 of Hong Kong for initial access is not compatible with the Code of the comparable countries due to reasons of less detailed and incomprehensive. Hence, some common features for disabled people are overlooked and barriers for disabled people are still present in the society. Beside, in the aspect of internal circulation, the design requirements in the Design Manual: Barrier Free Access 1997 of Hong Kong are in the standard lagging behind the norm of the comparable countries, thus, the design requirements may be insufficient to address all needs of the disabled people in Hong Kong, especially for wheelchair-bound users.

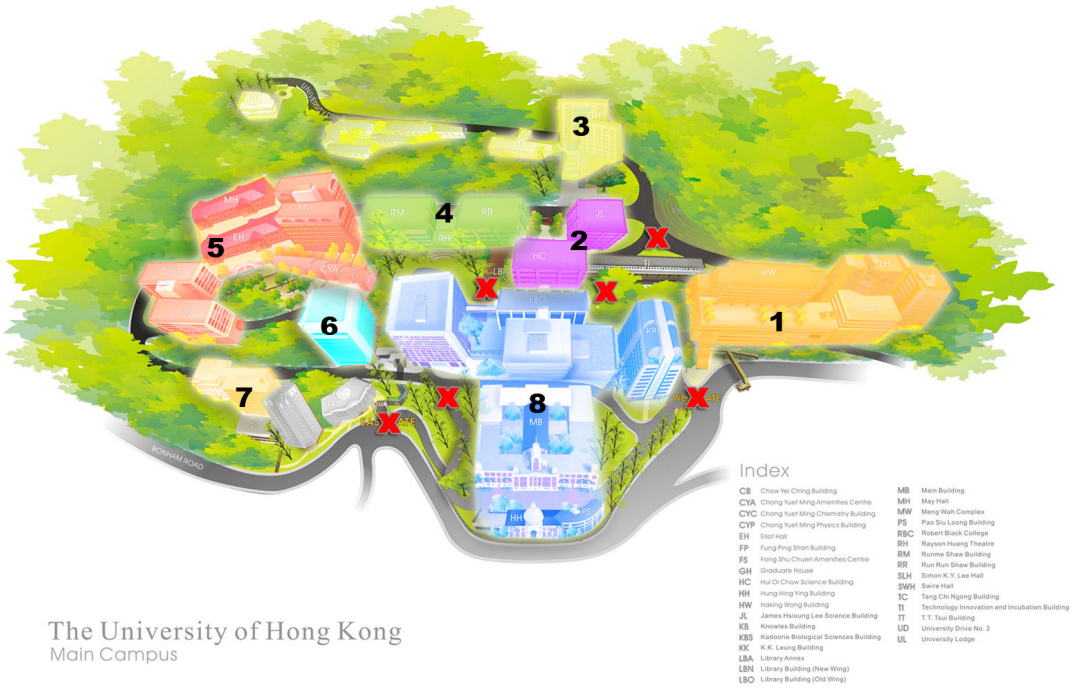
Finally, from the result of comparative analysis based on both general criteria and specific criteria, it is found that the design requirements prescribed in the Design Manual: Barrier Free Access 1997 of Hong Kong to promote a user-friendly environment are not as good as the Code of the comparable countries. The determination of adequacy of the regulatory framework of Hong Kong in setting out design requirements to ensure a user-friendly environment with barrier free access can be drawn from the result of the comparative analysis.

Chapter 11 – Personal Trial

11.1 Number of Accessible Route

The user-friendliness of the University of Hong Kong can be indicated by the number of accessible route provided for wheelchair-bound persons. The higher the number of the accessible route provided for them to reach a particular destination implies more choices of route are available for choosing, thus, the higher is the level of user-friendliness of the main campus. In each set of journey originates at Simon K.Y. Lee Hall, all possible accessible routes are identified accordingly.

The eight parts comprise twenty seven components inside main campus are selected to be the possible destinations in the personal trial. They are identified by different colours and numbers shown in the picture as below. In addition, the red crosses in the picture represents that those particular paths are not suitable for the wheelchair-bound persons to travel on due to physical barriers such as staircases or over-steep ramps, and these constraints are further elaborated later on.



Pic. 1: Main Campus of the University of Hong Kong

1. West Part
2. North Part
3. Hui & James Part
4. Run Run Shaw Podium Part
5. East Part
6. K.K. Leung Part
7. Swire & Tang Part
8. Sun Yat-Sen Place Part

The number of accessible route and the corresponding journeys are summarized in the following table.

	No. of Accessible Route	Journey(s):
West Part		
Chow Yei Ching Building (CB)	1	Lift of the Simon K.Y. Lee Hall → UG1 of COB → Corridor between CB & COB → CB
Composite Building (COB)	1	Lift of the Simon K.Y. Lee Hall → COB
Haking Wong Building (HW)	1	Simon K.Y. Lee Hall → HW
North Part		
Graduate House (GH)	0	
Robert Black College (RBC)	0	
University Drive No.2 (UD)	0	
University Lodge (UL)	0	
Hui & James Part		
Hui Oi Chow Science Building (HC)	2	i. Simon K.Y. Lee Hall → HW → Time Corridor → LG/F of HC ii. Simon K.Y. Lee Hall → Corridor on 5/F of HW → HC
James Hsioung Lee Science Building (JL)	2	i. Simon K.Y. Lee Hall → HW → Time Corridor → LG/F of HC → G/F of HC by Lift → JL ii. Simon K.Y. Lee Hall → Corridor on 5/F of HW → JL

Run Run Shaw Podium Part		
HSBC	1	Simon K.Y. Lee Hall → HC → Run Run Shaw Podium → HSBC
Rayson Huang Theatre (RH)	0	
Run Run Shaw Building (RR)	2	i. Simon K.Y. Lee Hall → HC → Run Run Shaw Podium → RR ii. Simon K.Y. Lee Hall → HC → Ramp besides JL → RR
Runme Shaw Building (RM)	2	i. Simon K.Y. Lee Hall → HC → Run Run Shaw Podium → RM ii. Simon K.Y. Lee Hall → HC → Ramp besides JL → RM
East Part		
Chong Yuet Ming Amenities Centre (CYA)	1	Simon K.Y. Lee Hall → RM → CYA
Chong Yuet Ming Chemistry Building (CYC)	2	i. Simon K.Y. Lee Hall → RM → CYA → 4/F of CYA by Lift → LG1/F of CYP ii. Simon K.Y. Lee Hall → RM → Service Lift of MW → 5/F of CYA → CYC
Chong Yuet Ming Physics Building (CYP)	2	i. Simon K.Y. Lee Hall → RM → CYA → 4/F of CYA by Lift → LG1/F of CYP ii. Simon K.Y. Lee Hall → RM → Service Lift of MW → 5/F of CYA → CYP
Eliot Hall (EH)	0	
Meng Wah Complex (MW)	1	Simon K.Y. Lee Hall → RM → Service Lift of MW → 5/F of CYA → MW

K.K. Leung Part		
K.K. Leung Building (KK)	1	Simon K.Y. Lee Hall → RM → CYA → G/F of CYA by Lift → KK

Swire & Tang Part		
Swire Hall (SWH)	1	Simon K.Y. Lee Hall → KK → LG2 of KK → SWH
Tang Chi Ngong Building (TC)	1	Simon K.Y. Lee Hall → KK → LG2 of KK → TC
Sun Yat-Sen Place Part		
Hung Hing Ying Building (HH)	0	
Kadoorie Biological Sciences Building (KBS)	0	
Knowles Building (KB)	1	Simon K.Y. Lee Hall → KK → KB
Library Building (LB)	1	Simon K.Y. Lee Hall → KK → MB
Main Building (MB)	0	
Pao Siu Loong Building (PS)	0	

Table 18: Number of Accessible Route and the Corresponding Journeys

11.1.1 West Part

(a) Composite Building (COB)

There is only one accessible route for wheelchair-bound people to go to COB from Simon K.Y. Lee Hall. One of the lift in Simon K.Y. Lee Hall is designed to incorporate wheelchair-bound people which is accessible at G/F lobby of the hall and can arrive at every floors of COB.

Pic. 2: Lift Serving Every Floor of COB on G/F of Simon K.Y. Lee Hall

(b) Chow Yei Ching Building (CB)

Following the way from Simon K.Y. Lee Hall to COB, the wheelchair-bound persons can go further to the lift lobby of CB via the corridor between COB and CB. Therefore, there is also one accessible route available in total as well.

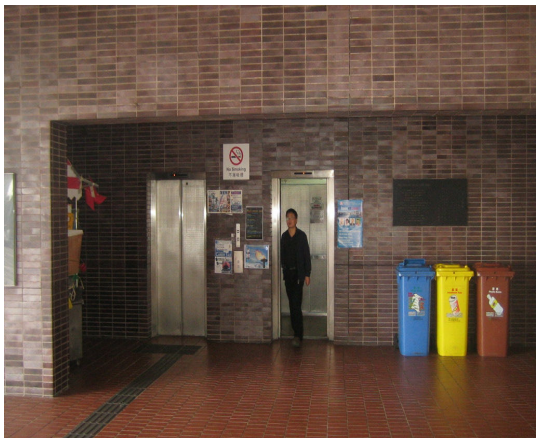
Pic. 3: Corridor from COB to CB

Pic. 4: Lifts to All Floors of CB

(c) Haking Wong Building (HW)

The HW is located beside Simon K.Y. Lee Hall. The wheelchair-bound people can get access to HW through the most direct but is also the only accessible route on the ground level from the Hall.

Pic. 5: Haking Wong Building Podium



Pic. 6: Lift to All Floors of HW

11.1.2 North Part

Through on-site observation, it is found that wheelchair-bound people are unable to get access to any components located in the North Part since the only way links up with the North Part is a flight of steps in front of the Graduate House and a ramp which is too steep and not safe for wheelchair-bound persons to travel on (see red cross at pic. 1). As the result, the North Part is then not qualified as the area for personal trial due to the wholly void of possible accessible routes.

Pic. 7: Staircase to Graduate House

Pic. 8: Slope to North Part

11.1.3 Hui & James Part

(a) Hui Oi Chow Science Building (HC)

Following the way from Simon K.Y. Lee Hall to HW, the wheelchair-bound people can go further to HC by 2 accessible routes. The first one is through the "Time Corridor" to reach the LG1/F of HC where lifts serving to every floors of HC are then provided, whereas the latter one is to go through the alternative corridor on 5/F of HW which linked up with the 1/F of HC.

Pic. 9: Time Corridor

Pic. 10: Corridor on 5/F of HW to HC

(b) James Hsioung Lee Science Building (JL)

The public entrance of JL, which is opposite to 1/F entrance of HC, is right there after passing the corridor on 5/F of HW, thus the wheelchair-bound persons can arrive at the destination simply via the latter route abovementioned, lifts serving to all floors of JL are provided.

Since the entrance of the two buildings are located side by side, it is reasonable to take Hui Oi Chow Science Building as the representative for the measurement of journey distance and time later on in Hui & James Part.

11.1.4 Run Run Shaw Podium Part

(a) Runme Shaw Building (RM)

Pic. 11: Run Run Shaw Podium

Following the way from Simon K.Y. Lee Hall to HC, 2 accessible routes are provided for wheelchair-bound people to get access to G/F of RM. The first one is that they can go straight through the Run Run Shaw Podium to reach RM. The second one is to go up to 1/F of RR through the ramp beside JL. Then, using the lifts on G/F, which are able to reach every floors of RM.

Pic. 12: Ramp besides JL

(b) Rayson Huang Theatre (RH)

Pic. 13: Step at the Entrance of RH

It is found that wheelchair-bound people are unable to get access to RH as there is just a step in front of the entrance of RH. Thus, no accessible route is provided for wheelchair-bound people to get to RH. Therefore, Rayson Huang Theatre is out of the area of the personal trial.

(c) HSBC & Run Run Shaw Building (RR)

HSBC and RR are located beside RH, and the wheelchair-bound people can reach both of them in the same way as RH. In addition, they can also get access to RR in the same way by using the JL's ramp. Therefore HSBC and RR are both skipped in the measurement of journey distance and time in the Run Run Shaw Podium Part for personal trial. As the result, only Runme Shaw Building is used as reference in the Run Run Shaw Podium Part.

Pic. 14: HSBS

Pic. 15: Run Run Shaw Building

11.1.5 East Part

(a) Chong Yuet Ming Amenities Centre (CYA)

Following the way from the Simon K.Y. Lee Hall to RH, it is found that there is only 1 accessible route provided for wheelchair-bound persons to get access to CYA. Ramp is located outside the entrance of CYA at the end of the Run Run Shaw Podium.

Pic. 16: Ramp at the Entrance of CYA

(b) Chong Yuet Ming Physics Building (CYP)

For CYP, two accessible routes are available. The former one is to take the lifts to go up to 4/F of CYA and then travel along the pedestrians path outside the canteen to LG1/F of CYP/CYC, and there are lifts getting to every floors of CYP. The latter one is to take the service lifts of Meng Wah Complex to get to 5/F of CYA, and afterwards travel a short distance towards CYP.

Pic. 17: Lift to 4/F of CYA

Pic. 18: Service Lift of Meng Wah Complex

(c) Chong Yuet Ming Chemistry Building (CYC) & Meng Wah Complex (MW)

CYC is just located beside CYP; hence it can be arrived in the same way as CYP. On the other hand, MW is located nearby CYP, and the wheelchair-bound people can also get access to MW by using the service lift of MW. Therefore, CYP is taking as the reference for counting journey distance and time for East Part.

Pic. 19: Meng Wah Complex

(d) Eliot Hall (EH)

Although a ramp is provided to get access to the entrance of EH, the wheelchair-bound persons are still unable to enter the building since a thick curb is present at its entrance. As no accessible route is available, EH is not to be selected as destination for personal trial.

Pic. 20: Ramp outside EH

Pic. 21: A Thick Curb at the Entrance Door of EH

11.1.6 K.K. Leung Part

K.K. Leung Building (KK)

Following the way from Simon K.Y. Lee Hall to CYA, the wheelchair-bound persons can first reach G/F of CYA by lifts. Then, they can travel directly towards KK through a ramp. In total, only 1 accessible route is provided for wheelchair-bound persons from Simon K.Y. Lee Hall to KK.

Pic. 22 & 23: Ramp from CYA to KK

11.1.7 Swire & Tang Part

(a) Swire Hall (SWH)

The wheelchair-bound people can get access to SWH by first arrive at LG2/F of KK and then travel a short distance of ramp towards SWH. Therefore, only one accessible route is provided for wheelchair-bound people from Simon K.Y. Lee Hall to SWH.


Pic. 24 & 25: Ramp outside KK & SWH

(b) Tang Chi Ngong Building (TC)

Similar to the case of James Hsioung Lee Science Building, TC is not included in the Swire & Tang Part for personal trial stemmed from the high proximity to the accessible route of SWH.

11.1.8 Sun Yat-Sen Place Part

(a) Knowles Building (KB) & Library Building (LB)

Following the way from Simon K.Y. Lee Hall to KK, the wheelchair-bound people can go straight forwards to the KB & LB with the help of ramps. It is found that only one accessible route is provided for them. As both KB and LB are located at the side of the Sun Yat-Sen Place, due to sake of simplicity, it is better to take the Sun Yat-Sen Place, the centre between KB and LB, instead of taking two buildings separately in the measurement for journey distance and time of the personal trial.

Pic. 26: Ramp from KK to KB

Actually, for the ordinary students, they have two more alternative routes get access from Simon K.Y. Lee Hall to the Sun Yat-Sen Place. The first route is in the way of Simon K.Y. Lee Hall → Time Corridor → Starbucks → Sun Yat-Sen Place while the second route is in the way of Simon K.Y. Lee Hall → G/F of Hui Oi Chow Science Building → Sun Yat-Sen Steps → Sun Yat-Sen Place (see red cross in the pic. 1). However, wheelchair-bound students are unable to go to Sun Yat-Sen Place in the same way due to the present of staircases in between. The only method for them is to bypass around the main campus before reaching the Sun Yat-Sen Place.

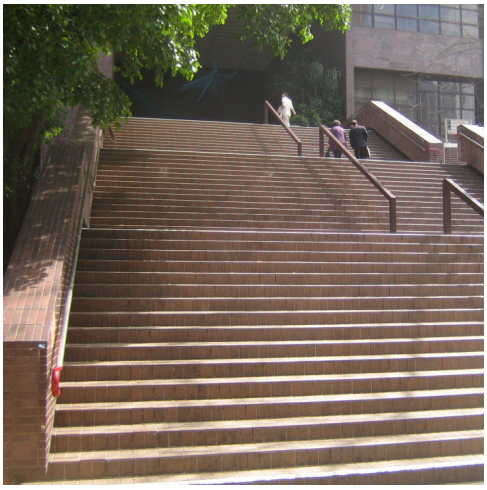
Pic. 27: Staircase from "Time Corridor" to Starbucks

Pic. 28: Sun Yat-Sen Steps

(b) Main Building (MB), Kadoorie Biological Sciences Building (KBS), Hung Hing Ying Building (HH) & Pao Siu Loong Building (PS)

Through on-site detailed observation, it is found that the wheelchair-bound people are unable to get access from Simon K.Y. Lee Hall to HH, KBS, MB & PS. Although elevator is provided beside the Library Building, stairs or too steep ramps present in the only path to those buildings hinder the wheelchair-bound people to get access. Therefore, no accessible route is provided to get access to those buildings from Simon K.Y. Lee Hall.

Similar to the case of going to the Sun Yat-Sen Place, due to the present of staircases or ramps which are too steep and unsafe for wheelchair-bound students to use, wheelchair-bound people are unable to go the HH, KBS, MB & PS through the west gate and the LG2/F of Knowles Building (see red cross at pic. 1).



Pic. 29: Staircase at the West Gate

Pic. 30: Slopes on LG2/F of KB

11.2 Measurement of Journey Distance

The distance travel to a particular destination in each set of journey starting from Simon K.Y. Lee Hall is very important since it has a significant impact on the user-friendliness of the University of Hong Kong for wheelchair-bound persons. The level of user-friendliness decreases with increasing journey distance (Lo, 2002). It is also agreed that journey distance is a suitable unit for measuring accessibility in Chapter 8. In addition, road distance is measured instead of map distance for a more accurate comparison.

In table 19, there are two types of distance starting from Simon K.Y. Lee Hall to the corresponding destination in each set of journey, namely, walking distance and wheelchair distance. The walking distance represents how far have to travel to the destination on foot while the wheelchair distance represents how

far have to travel to finish the journeys by using a wheelchair. Both types of distance are the road distance. In other words, they represent the actual route which one need to travel on foot and by a wheelchair respectively. For walking distance, it is measured by the number of steps in the whole journey. For wheelchair distance, it is measured by the number of turns of the wheel in each set of journey. At the end, both of them would be converted back in the same unit using metre. In addition, vertical distance travelled by elevator in the journey is excluded in both journey distance measurements. The difference in distance travelled to the same destination from the same starting point out of different route(s), between ordinary people and wheelchair-bound people can be compared easily. The result of a number of set of journey in term of journey distance is shown in the following table:

From Simon K.Y. Lee Hall To	Walking Distance (m)	Wheelchair Distance (m)
Chong Yuet Ming Amenities Centre (CYA)	324.0	329.9
Chong Yuet Ming Physics Building (CYP)	433.9	419.1
Chow Yei Ching Building (CB)	72.6	66.9
Composite Building (COB)	28.3	22.5
Haking Wong Building (HW)	61.7	61.7
Hui Oi Chow Science Building (HC)	184.5	184.5
K.K. Leung Building (KK)	320.7	421.1
Meng Wah Complex (MW)	438.2	398.6
Runme Shaw Building (RM)	284.1	284.1
Sun Yat-Sen Place (SP)	230.8	507.9
Swire Hall (SWH)	383.1	500.1

Table 19: Walking Distance & Wheelchair Distance in Each Set of Journey

From the results, the wheelchair distance is most likely longer than the walking distance. Except in the buildings of CYP, CB, COB and MW, the wheelchair distance to those buildings is shorter than the walking distance, since vertical movement by an elevator in the journey is excluded in the measurement of wheelchair distance, while the ordinary person is going upwards by a flight of staircase and that distance is counted in the measurement of walking distance. Whereas for some of the journeys, the wheelchair distance is the same as the walking distance since both parties go to that destination by the same way of route. To conclude, it is usually wheelchair-bound people have to travel a longer distance than the ordinary people to the same destination inside main campus from the same starting point.

The difference between walking distance and wheelchair distance in the buildings of KK, SP and SWH is more than 100m. The major reason for such big difference is that the route for wheelchair-bound people to reach those destinations from Simon K.Y. Lee Hall is not as direct as an ordinary person. For example, in order to reach the buildings surrounding the Sun Yat-Sen Place, the wheelchair-bound people have to bypass almost the whole main campus one time (route: Simon K.Y. Lee Hall → Haking Wong Building → Hui Oi Chow Science Building → Chong Yuet Ming Amenities Centre → K.K.

Leung Building → Knowles Building/Library Building/Sun Yat-Sen Place), instead of the direct and the fastest route for an ordinary person (route: Simon K.Y. Lee Hall → "Time Corridor" → Bookstore → Knowles Building/Library Building/Sun Yat-Sen Place).

In the view of journey distance, the level of user-friendliness of the University of Hong Kong for wheelchair-bound persons is still insufficient. Although at least one accessible route is provided for wheelchair-bound people to get access to the destinations, those accessible routes are in a type of bypassing around rather than a direct one.

11.3 Measurement of Journey Time

On the other hand, the user-friendliness of the University of Hong Kong is derived in term of journey time. That means how long ordinary people or wheelchair-bound people to get to the destination. According to the definition of accessibility discussed in Chapter 8, journey time consists of not only travelling time by using a wheelchair or just walking, but also the time for route-finding and waiting time for lift service which contribute a significant portion of the whole journey time.

In the table 20, similar to the information of the table of journey distance, there are two types of time required to travel from Simon K.Y. Lee Hall to the corresponding destinations, namely, walking time and wheelchair time. The walking time represents the time required for ordinary people to reach the destination on foot while the wheelchair time represents the time required for wheelchair users to finish the journeys. In terms of time counted, the difference in time required reaching the same destination from the same starting point, out of different route(s), between the two parties can be figured out easily. The results of journey time are shown as follows.

From Simon K.Y. Lee Hall To	Walking Time	Wheelchair Time
Chong Yuet Ming Amenities Centre (CYA)	4 min 45 sec	8 min 32 sec
Chong Yuet Ming Physics Building (CYP)	6 min 22 sec	11 min 50 sec
Chow Yei Ching Building (CB)	1 min 10 sec	3 min 05 sec
Composite Building (COB)	30 sec	2 min 30 sec
Haking Wong Building (HW)	56 sec	1 min 28 sec
Hui Oi Chow Science Building (HC)	3 min 44 sec	6 min 36 sec
K.K. Leung Building (KK)	5 min 05 sec	12 min 49 sec
Meng Wah Complex (MW)	6 min 04 sec	11 min 04 sec
Runme Shaw Building (RM)	4 min 09 sec	7 min 59 sec
Sun Yat-Sen Place (SP)	3 min 20 sec	15 min 13 sec
Swire Hall (SWH)	6 min 06 sec	14 min 11 sec

Table 20: Walking Time & Wheelchair Time in Each Set of Journey

From the results, it is found that wheelchair time always is almost the double time of the walking time. The greatest difference between walking time and wheelchair time is the journey from Simon K.Y. Lee Hall to Sun Yat-Sen Place.

The wheelchair time is five times more than the walking time. It is mainly because there is no direct accessible route provided for wheelchair-bound persons from either “Time corridor” or Hui Oi Chow Science Building to Sun Yat-Sen Place. The only route for them to get to SP is bypassing almost the whole main campus one time (route: Simon K.Y. Lee Hall → Haking Wong Building → Hui Oi Chow Science Building → Chong Yuet Ming Amenities Centre → K.K. Leung Building → Sun Yat-Sen Place).

If the wheelchair-bound students generally need double time comparing to the ordinary students in order to reach the destination in the main campus, insufficient time for transition between successive lessons would be a possible problem for them, since normally 5 minutes time lapse is provided.

In the view of journey time, the main campus of the University of Hong Kong is not a user-friendly built environment for wheelchair-bound people. Since barriers such as steps, staircase and too steep ramp are present in the most direct accessible route provided for the ordinary students to most of the destinations in the main campus, the wheelchair-bound students are hindered by those barriers. As the result, they have to bypass some buildings before reaching the destinations. This makes their travelling time required almost

double to the time for the ordinary students who can go to the destinations in the most direct way through those “barriers” in the point of view of wheelchair-bound students.

11.4 Quality of Access

The standard is to ensure that at least one accessible route for wheelchair-bound people has been provided; however, little attention has been paid to the quality of access provided especially if an alternative path to the destination is provided for wheelchair-bound people (Church & Marston, 2003). Apart from the number of accessible route, actual quality of each accessible route also account for the user-friendliness of the University of Hong Kong. For wheelchair-bound people, the quality of each accessible route is much more important than the number of accessible route. It is because even minor barriers such as a step along the alternative routes are enough to impede the wheelchair students from using it. For example, a step located at the entrance of Rayson Huang Theatre. The quality of each possible accessible route to the destination is assessed based on the criteria set in Chapter 9 by observation throughout the personal trial. In the context of assessment about the quality of each possible accessible route to a destination (i.e. academic building,

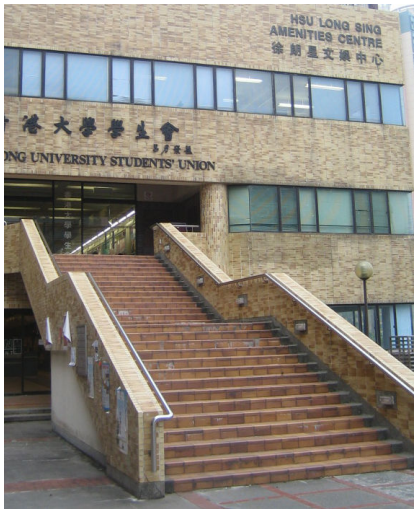
complex or amenities centre inside the main campus), one may understand the existing problems or difficulties that the wheelchair-bound persons would suffer and how a good design features can facilitate the journey of wheelchair-bound people.

11.4.1 West Part

(a) Composite Building (COB)

[Route: Simon K.Y. Lee Hall → Composite Building]

Undoubtedly, wheelchair-bound students are unable to make use of the staircases outside COB and outside the canteen to get access to the UG1/F of COB. Although one of the lifts of Simon K.Y. Lee Hall can get access to every floors of COB, there is no signage indicating the present of that lift to the wheelchair-bound people, as a first-comer to the University of Hong Kong, it is impossible for them to know this. Thus, wheelchair-bound people are unable to get access to COB.



Pic. 31 & 32: Staircases to G/F to UG1/F of COB

However, being a resident of Simon K.Y. Lee Hall, it is common to know this way to COB. So, the personal trial still goes on. In the view of quality, actually this accessible route is designated for wheelchair-bound people. Firstly, a ramp with handrails on both sides is provided for wheelchair-bound people to get from the hall entrance to the lift lobby easily. Secondly, a lowered control panel is installed on one side of the lift that enables the wheelchair-bound people to select which floor they would like to go. In the whole journey, the wheelchair-bound people can go to COB independently and easily. In addition, the surface of floor is slip-resistant. It would be safe for wheelchair-bound people to travel all the time. Therefore, the quality of this route from Simon K.Y. Lee Hall to COB is acceptable for wheelchair-bound people.

Pic. 33: Ramp with Two-side Handrails

Pic. 34: Lift with Lowered Control Panel

(b) Chow Yei Ching Building (CB)

[Route: Simon K.Y. Lee Hall → UG1/F of Composite Building → Corridor → Chow Yei Ching Building]

After reaching UG1/F of COB from Simon K.Y. Lee Hall, the direction to CB is clearly directed by the signage on the corridor between CB and COB. Also, a lift marked by a wheelchair-bound symbol is provided to stop at every floor of CB. Thus, the wheelchair-bound people can get access to CB easily. In addition, the corridor to CB is wide enough for one wheelchair and an ordinary to pass through at the same time. Therefore, the quality of this accessible route from Simon K.Y. Lee Hall to CB is acceptable for wheelchair-bound people.

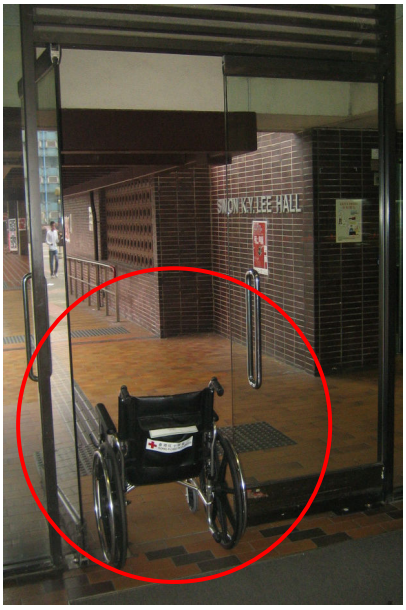
Pic. 35: Wide Corridor to CB

Pic. 36: Lift Designated for Wheelchair-bound Persons

(c) Haking Wong Building (HW)

[Route: Simon K.Y. Lee Hall → Haking Wong Building]

The wheelchair-bound people can get access to HW in a simply straight way on ground level from Simon K.Y. Lee Hall. They can go to the Haking Wong Podium through an accessible door with a sufficient width. Also, a ramp is provided just next to a few steps outside the door. This type of design can effectively ease the confusion of the wheelchair-bound time and reduce their route-finding time.



Pic. 37: An Accessible Door with a Sufficient

Pic. 38: Ramp beside the Steps

Also, there are two lifts designated for wheelchair-bound people to go upwards and downwards respectively with a clear signage and lowered control panel for the use of wheelchair-bound people.

Pic. 39: Lift to G/F – 8/F of HW

Pic. 40: Lift to G/F – LG2/F

However, the surface of the Haking Wong Podium is not slip-resistant. If the floor surface gets wet especially in rainy day, the wheelchair-bound people are difficult to control their movement and slipping is most likely to occur.

Pic. 41: Floor Surface of HW

11.4.2 Hui & James Part

Hui Oi Chow Science Building (HC)

[Route 1: Simon K.Y. Lee Hall → Haking Wong Podium → "Time Corridor" → LG/F of Hui Oi Chow Science Building]

The most obvious problem for wheelchair-bound people in this accessible route is that the floor surface of both Haking Wong Podium and "Time Corridor" is in the same type of non slip-resistant. Slipping is likely to occur when the floor is wet.

Pic. 42: Floor Surface of "Time Corridor"

On the other hand, a ramp is provided with two-side handrails instead of steps or stairways on the way from Haking Wong Podium to “Time Corridor”. It is very helpful for the movement of wheelchair-bound people. Also, “Time Corridor” is wide enough for a wheelchair and a person passing through at the same time, although the left hand side of the corridor is occupied by a row of lockers. However, it is a bit difficult for them to travel in the “Time Corridor” during rush hours.

Pic. 43: Ramp from Haking Wong Podium to “Time Corridor”

Pic. 44: “Time Corridor”

For the signage, it is found that there is no official signage for wheelchair-bound people on the wall of HC. All of them are merely a paper with various logos or arrows guiding direction which are fastened on the board. Some of them are even too small and not clear enough to be viewed from a seated position. This would make the wheelchair-bound people difficult to find their way to the destination, hence route-finding time increases.

Pic. 45: Signage in HC

[Route 2: Simon K.Y. Lee Hall → Corridor on 5/F of Haking Wong Building → Hui Oi Chow Science Building]

The wheelchair-bound people can also go to HC by using the corridor on 5/F of Haking Wong Building. A short ramp with two-side handrails is provided for facilitating the movement of wheelchair-bound people to get to the lift lobby. Afterwards, legible and well illuminated signage for the direction of exit and lecture rooms are put on the wall. It prevents the wheelchair-bound people from getting lost in the campus. Also, the slip-resistant floor surface avoids them from slipping.

Pic. 46: Corridor on 5/F of HW

Pic. 47: Clear and Legible Signage

Since the entry to G/F of HC is secured, a reachable card reader is installed so that the wheelchair-bound students can use their own student card to pass the security check independently.

Also, an international symbol of wheelchair-bound people is put at the entrance to indicate that this entrance is accessible for wheelchair-bound people. Thus, this would effectively reduce the wheelchair-bound people's route-finding time or entrance-finding time.

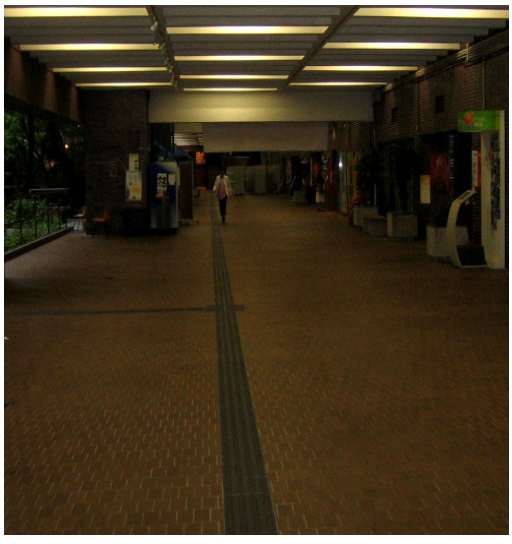
Pic. 48: Door with Reachable Card Reader

11.4.3 Run Run Shaw Part

(a) Runme Shaw Building (RM) & Run Run Shaw Building (RR)

[Route 1: Simon K.Y. Lee Hall → Hui Oi Chow Science Building → Run Run Shaw Podium → Runme Shaw Building / Run Run Shaw Building]

Since the path from HC to Run Run Shaw Podium is on the same ground level, the wheelchair-bound people can easily go straight forwards to RM/RR with assistance of a short ramp in front of the entrances. Also, the area of Run Run Shaw Podium is under-covered, so there would not be any problems in raining day. A telephone designated for wheelchair-bound people is clearly signposted and usable at the side of Run Run Shaw Podium. A legible and clear signage for the use of wheelchair-bound people is also put beside the telephone as well as at the entrance of the buildings for easy observation.



Pic. 49: Straight Way in Run Run Shaw Podium

Pic. 50: Telephone Designated for Wheelchair-bound People

Pic. 51: Run Run Shaw Building

Pic. 52: Runme Shaw Building

[Route 2: Simon K.Y. Lee Hall → Hui Oi Chow Science Building → Ramp besides James Hsioung Lee Science Building → Runme Shaw Building / Run Run Shaw Building]

The wheelchair-bound people can also reach the 1/G of RM/RR by using the ramp beside JL. Although landings are provided in between the ramp, the ramp is still too long and steep for wheelchair-bound people to use.

Pic. 53: Ramp beside JL

(b) Rayson Huang Theatre (RH)

Although there is no accessible route provided for wheelchair-bound people to reach RH, in order to notice them a change in floor level, a sharp yellow line is painted at the curb right in front of the entrance.

Pic. 54: A Sharp Yellow Line at the Step

11.4.4 East Part

(a) Chong Yuet Ming Amenities Centre (CYA)

[Route: Simon K.Y. Lee Hall → Run Run Shaw Podium → Chong Yuet Ming Amenities Centre]

A ramp is provided jut next to the steps to the entrance of CYA and at the end of Run Run Shaw Podium. It is easy for wheelchair-bound people to get access to CYA from Run Run Shaw Podium.

Pic. 55: Ramp to CYA

(b) Meng Wah Complex (MW)

[Route: Simon K.Y. Lee Hall → Run Run Shaw Podium → Service Lift of Meng Wah Complex → 5/F of Chong Yuet Ming Amenities Centre → Meng Wah Complex]

The only route for wheelchair-bound people from Simon K.Y. Lee Hall to MW is by using the service lift of MW. Since the service lift is next to the refuse room, the hygiene around the service lift is rather bad where the floor is often dirty and smelly. Furthermore, the floor condition of the service lift and the lift lobby is usually wet. Some raised manholes are placed along the path to the service lift. It would be potentially hazardous to wheelchair-bound people.

Pic. 56: Surrounding around Service Lift

Pic. 57: Condition inside Service Lift

In addition, the waiting time for that lift is unusually long whereas there is actually no signage directing wheelchair-bound people the way to go up MW. In general, the wheelchair-bound people would use the lifts of CYA. However,

the lifts of CYA can only reach up to 4/F of CYA. Therefore, this makes the route-finding time becomes longer.

Pic. 58: Ramp with Two-side Handrails

After reaching MW, a number of ramps with two-side handrails are provided for helping the wheelchair-bound persons to have easy movement towards lecture rooms.

(c) Chong Yuet Ming Physics Building (CYP) & Chong Yuet Ming Chemistry Building (CYC)

[Route 1: Simon K.Y. Lee Hall → Run Run Shaw Podium → Service Lift of Meng Wah Complex → 5/F of Chong Yuet Ming Amenities Centre → CYP / CYC] ***(The SAME as above)***

[Route 2: Simon K.Y. Lee Hall → Run Run Shaw Podium → 4/F of Chong Yuet Ming Amenities Centre → LG1/F of CYP / CYC]

By using lift to go up to 4/F of CYA, a pedestrian path is provided with two facilitating ramps along the canteen connecting to LG1/F of CYP/CYC. Therefore, the wheelchair-bound people are able to get access to every floor of CYP/CYC.


Pic. 59 & 60: Ramps outside Canteen to CYP/CYC

Similar to the case of service lift of Meng Wah Complex, there is no signage indicating the direction towards CYP/CYC after reaching 4/F of CYA. The wheelchair-bound students would probably face a situation that they know generally where the destination is, however, they do not know the exact way to get there. Also, similar to the case of the ramp outside JL, the ramp to CYP/CYC along the canteen is too long and not flat enough for the use of wheelchair-bound people.

(d) Eliot Hall (EH)

Pic. 61: Ramp with Two-side Handrails Leading towards EH

Pic. 62: Entrance of EH

For the wheelchair-bound persons, they are unable to get to EH since a thick curb is found in front of the entrance of EH, even though a ramp with two-side handrails is installed leading them towards the EH. During the time when the personal trial is carrying out, the area outside the building is under construction which hardens the journey for wheelchair-bound persons. The path to EH is difficult for a wheelchair to pass though. The embarrassing situation happens again as they can see the entrance, but they cannot get inside without the help from others.

11.4.5 K.K. Leung Part

K.K. Leung Building (KK)

[Route: Simon K.Y. Lee Hall → Run Run Shaw Podium → Chong Yuet Ming Amenities Centre → K.K. Leung Building]

The wheelchair-bound people can further go to KK from CYA. However, it does not have any signage or information indicating the wheelchair-bound people the direction to KK again. Also, the symbol for wheelchair-bound mounted on the lift surface is rough and inconspicuous. There is no way the wheelchair-bound people can realize the lift is linked up with the way to KK. Assume this assessable route via the lift abovementioned is still known to them by other means, they can finally reach KK through the two successive ramps provided. Along the path to KK, it is indeed difficult for wheelchair-bound people to travel along the first ramp stemmed from the protruding elements such as columns which are found at sides of the ramp. Apart from that, the width of the second ramp is insufficient for an easy turning of a wheelchair. Thus, the movement of wheelchair-bound persons is hindered and delayed all the way down, not to mention the additional caution required for safety.

Pic. 63: Lift in CYA

Pic. 64: Lift Button with Symbol of Wheelchair-bound People

Pic. 65: Protruding Elements along Ramp to KK

Pic. 66: Ramp to KK

It is to be mentioned that the one and the only one automatic door inside campus is installed at the main entrance of KK. It would be very helpful and convenient for wheelchair-bound people to get access to KK. Beside the main entrance, there is a water fountain provided for public. However, it provides only one spout at the height suitable for public. Therefore, the wheelchair-bound people can only use a container to collect the water first

instead of drinking directly.

Pic. 67: Automatic Door at KK

Pic. 68: Water Fountain

11.4.6 Swire & Tang Part

Swire Hall (SWH) & Tang Chi Ngong Building (TC)

[Route: Simon K.Y. Lee Hall → K.K. Leung Building → Swire Hall / TC]

It is found that the path from KK to SWH/TC is comparatively good among other sets of journey in the personal trial. There are sufficient signages directing the wheelchair-bound people to SWH. Also, every ramp designated for wheelchair-bound people along the route is just next to the staircase. This can effectively save their route-finding time when the wheelchair-bound people are travelling similar path as the non-disabled people do. Similar to the water fountain at KK, only one water spout at high level is provided for public at there.

Pic. 69: Ramp at Entrance of KK

Pic. 70: Ramp at Entrance of SWH

Pic. 71: Water Fountain at SWH

Pic. 72: Clear Signage at SWH

The major problem to go to TC is that the quality of ramp provided is not up to standard. For example, a temporary ramp, which is made of metal plate, is attached to the curb along the way from SWH to TC. Besides, the gradient of the ramp at the entrance of TC is not reasonable for wheelchair-bound people to go up. Therefore, extra assistance from other people is required for them to get to TC.

Pic. 73: Temporary Ramp from SWH to TC

Pic. 74: Too Steep Ramp at Entrance of TC

11.4.7 Sun Yat-Sen Place Part

(a) Knowles Building (KB) & Library Building (LB)

[Route: Simon K.Y. Lee Hall → K.K. Leung Building → Knowles Building / Library Building]

For wheelchair-bound people, either can they get access to Sun Yat-Sen Place from “Time Corridor” or Sun Yat-Sen Steps, since both paths are hindered by staircase or steps.

Pic. 75: Staircase at “Time Corridor”

Pic. 76: Sun Yat-Sen Steps

The only accessible route for them is to take a rather by-passing, long and time-consuming path which almost goes one complete cycle around the main campus. This is also the cause for such big difference in journey distance and time between wheelchair-bound people and non-disabled people.

Along the path from KK to KB/LB, it is quite easy for the movement of wheelchair-bound people as a fairly gentle ramp of low gradient with two-side handrails is provided. In addition, ramp is design to be placed next to the staircases, thus it would be very convenient for and noticeable to the wheelchair-bound people. In addition, a telephone which is reachable and clearly signposted is provided for wheelchair-bound people.

Pic. 77: Ramp from KK to KB

Pic. 78: Telephone Designated for Wheelchair-bound People

However, the finishing of the ramp surface is not made use of slip-resistant material. It imposes danger to wheelchair-bound people especially in rainy day, as they may collides with the wall at the end of the ramp, if they cannot control

their wheelchair well.

For getting access to both KB and LB, there is legible and sufficiently large signage for the use of wheelchair-bound people signposted near the entrance of the buildings. By signposting those signage at the entrance, it is convenient for wheelchair-bound people to know that the buildings is accessible for them and the location of entries can be easily found.

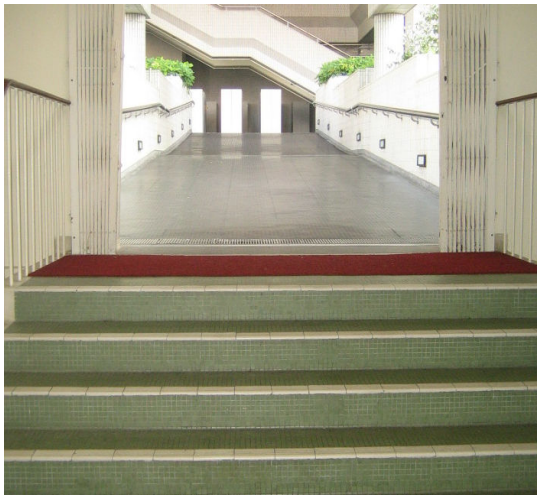
Pic. 79 & 80: Symbol for the Use of Wheelchair-bound People at the Entrance of KB & LB

In order to go down to the library extension, a lift designated for wheelchair-bound people is provided beside the entrance of LB. In the lift, the control panel is lowered and reachable from a seated position. Therefore, the wheelchair-bound people can travel by themselves.

Pic. 81: Lift besides LB

The most ridiculous thing does occur along the path from library extension to MB. Firstly, a ramp with two-side handrails and signage for the use of wheelchair-bound people toward the theatre is provided at the bridge from library extension to MB. However, never can the wheelchair-bound people arrive at the MB via this bridge since a flight of steps is situated at the end of ramp.

Pic. 82: Bridge from Library Extension to MB



Pic. 83: Steps at the End of Ramp

(b) Main Building (MB), Kadoorie Biological Sciences Building (KBS), Hung Hing Ying Building (HH) & Pao Siu Loong Building (PS)

Another ridiculous thing happens when the wheelchair-bound people try to get access to Main Building from the lift lobby of LG2/F of Knowles Building. Although a ramp is provided for wheelchair-bound people to get out of the lobby, the exit is connected to a steep slope where the entrance of a car park

is. It is insecure for them to travel safely downwards. In another words, it would be like a “death end” for wheelchair-bound persons.

Pic. 84: Slope down to the Area of MB and to KBS

11.4.8 Around the Main Campus

It is found that campus map display panels and directional guides are usually put near to the lifts and at the entrances of the buildings. In this way, visitors can check where they are and the path to a particular building, complex or amenities centre when they are first come to the main campus of the University of Hong Kong and there is a campus zoning system, which is shown by color, indicating the relationship of geographic location among buildings. These effectively reduce their route-finding time and prevent them from getting lost inside the main campus. In addition, they are legible, well illuminated and where lettering and numerals are sufficiently big, and can be viewed from a seated position.

Pic. 85 - 87: Map Display Panels & Directional Guides around Main Campus

11.4.9 Beyond Criteria

It is also found that a car-parking space designated for the use of wheelchair-bound people is provided in every building, complex or amenities centre. This is entirely due to the reason of legislative requirement. Hence, the directional guides or signage along the way from the car-parking space to the entrance of that building is comparatively comprehensive and sufficient. Also, the car-parking space is usually very close to the entrance.

Pic. 88: Car-parking Space Designated for Wheelchair-bound Persons to JL

Pic. 89: Car-parking Space Designated for Wheelchair-bound Persons to RR/RM

The components inside the main campus indeed are fragmented. The connections between buildings, complexes or amenities centres are poorly planned and even the accessible routes are not equipped well for wheelchair bound people. The easiest way for wheelchair-bound people to get access to an individual building in campus is by dropping off at the car-parking space of that building. However, it is rather inconvenient and impossible for them to always get access to buildings from the particular car park and not to mention for those who do not process a car. To alleviate this problem, the wheelchair-bound people have to be accompanied and assisted by others or else they can merely keep traveling around with their own cars.

11.5 Conclusion

In conclusion, the main campus of the University of Hong Kong seems to burden the wheelchair-bound people. First of all, there is insufficient signage for wheelchair-bound people, which implies failure in indicating the direction to the wheelchair-bound people as well as the routes of approaching the entrance of a specific academic building. They usually face a situation that they know generally where the destination is, however, they do not know the exact way to get there. Hence, this would greatly increase their route-finding or entrance-finding time.

Secondly, some facilities are aimed to provide assistance to wheelchair-bound people so as to let them travel around the main campus much easier. However, the facilities sometimes are actually helpless to them, since they are unsafe for wheelchair-bound people to use. For instance, a too steep ramp is provided for them to accommodate the change of floor level. Even more frustrating is that physical barriers such as thick curbs or staircases are irrationally found at the entrance of the buildings or along the accessible route. As the result, the wheelchair-bound people are indeed unable to get access to the destination by themselves.

Thirdly, the wheelchair bound persons sometimes need to go to a nearby building through a long bypassing journey rather than a straight forward one. As the result, the wheelchair-bound students have to inevitably go through a long distance every day and spend lots of their precious time on travel.

The most serious problem found in the personal trial is that the wheelchair-bound people are unable to get access to the Main Building, Kadoorie Biological Sciences Building, Hung Hing Ying Building, Pao Siu Loong Building and the North Part in the main campus from Simon K.Y. Lee Hall without the help from others. It is because the only route to these buildings is at a steep slope. Neither any site formation to flatten the topography nor any remedial measures to assist the wheelchair bound people in circulation is carried out.

All of the above challenges give concrete evidence on the infeasible planning of the main campus of the University of Hong Kong for wheelchair-bound people.

It is also discovered that the components in the main campus are fragmented. The buildings are situated in a way that the car park route ridiculously becomes the best barrier free way for wheelchair-bound people to get access

to an individual building in campus. That accounts for the poor connection among buildings, complexes or amenities centers. Moreover, car ownership should not be a must for wheelchair bound people to cruise among buildings.

By the investigation and observation from the personal trial in the main campus, it proved that there is still much room for improvement upon the built environment in the main campus. Therefore, the main campus of the University of Hong Kong should not deserve to be entitled as an entirely user-friendly place for wheelchair-bound persons.

Chapter 12 Conclusion

12.1 Overall Conclusion

The objectives of this research as stated in Chapter 1 are as follows:

1. To study the present regulatory framework in Hong Kong on the user-friendliness, in terms of accessibility and barrier free, for wheelchair-bound persons
2. To evaluate the adequacy of regulatory framework in setting out design requirements for ensuring a user-friendly built environment for wheelchair-bound persons in Hong Kong
3. To examine the problems that wheelchair-bound persons face when they access and move around main campus in the University of Hong Kong

Objective 1 is achieved by reviewing the current legislative framework governing user-friendly environment in terms of accessibility and barrier free access in Hong Kong before the comparative analysis is carried out in section 10.2.1. It is found that there are four major components for ensuring a user-friendly built environment, namely, Building (Planning) Regulations (B(P)R), Design Manual: Barrier Free Access 1997, Disability Discrimination Ordinance (DDO) and Equal Opportunities Commission (EOC). All of them are

in the purpose of providing equal opportunities for everyone (including people with a disability):

i. to reach all place of the built environment;

ii. to enter all places within the built environment; and

iii. to make use of all facilities within the built environment

Also, people with disabilities should enjoy the same rights as any others – the rights to medical services, education, housing, employment, transport and leisure activities which encourage their social integration or reintegration (UNHCHR, 1975).

Objective 2 is achieved by the method of comparative analysis. In the method, Singapore, the United Kingdom and the United States are selected as comparable countries. Apart from the overview of the present regulatory framework of Hong Kong, the regulatory framework in setting out design requirements for user-friendly built environment in all comparable countries are also reviewed, so that it can identify the instruments that set out the design requirements as the subject for comparison afterwards.

The comparison in regulatory framework between Hong Kong and the comparable countries is based on five criteria (3 general criteria and 2 specific

criteria). For the general criteria, in respect of the scope of application and coverage of users, the Design Manual: Barrier Free Access 1997 of Hong Kong is adequate to promote a user-friendly environment with barrier free access, even better than some of the comparable countries. However, in respect of comprehensiveness of design requirements, as it covers the least accessible items in the built environment compared to the Code in comparable countries, therefore, the regulatory framework of Hong Kong is not as comprehensive as the Code in comparable countries. This difference implies the range of facilities that persons with disabilities can access without barriers may be less than those in the comparable countries.

For the specific criteria, in the aspect of initial access, the Design Manual: Barrier Free Access 1997 of Hong Kong is not compatible with the Code of the comparable countries due to reason of less detailed and incomprehensive. Moreover, some common features for disabled people are overlooked and make barriers for the disabled people are still present in the society. Beside, in the aspect of internal circulation, the design requirements in the Design Manual: Barrier Free Access 1997 of Hong Kong are lagging behind the norm of the comparable countries, therefore, it is insufficient to address all needs of the disabled people in Hong Kong, especially for wheelchair-bound users.

The result shows that current regulatory framework in setting out design requirements for user-friendly environment through the Design Manual: Barrier Free Access 1997 is relatively inadequate compared with the general standard of all comparable countries.

Objective 3 is achieved by the personal trial of using a wheelchair inside main campus in the University of Hong Kong. In the personal trial, a number of set of journey starting from Simon K.Y. Lee Hall to a particular destination of academic building, complex or amenities centre are finished by using a wheelchair. By counting the number of accessible route provided for wheelchair-bound people, measurement of journey distance and time with comparison to the results by finishing the same journey on foot, and the observation about the quality of each accessible route throughout the trial.

The results show that there are three general problems in the built environment of the main campus for wheelchair-bound people. Firstly, there is insufficient signage for wheelchair-bound people, which implies failure in indicating the direction to the wheelchair-bound people as well as the routes of approaching the entrance of a specific academic building. This would greatly increase their route-finding or entrance-finding time.

Secondly, some facilities sometimes are actually helpless to wheelchair-bound people, although those facilities are aimed to provide assistance to wheelchair-bound people so as to let them travel around the main campus much easier, because they are unsafe for wheelchair-bound people to use.

Thirdly, the wheelchair bound persons sometimes need to go to a nearby building through a long bypassing journey rather than a straight forward one. As the result, the wheelchair-bound students have to inevitably go through a long distance and spend more times in order to reach the destination.

The most serious problem found in the personal trial is that the wheelchair-bound people are unable to get access to the Main Building, Kadoorie Biological Sciences Building, Hung Hing Ying Building, Pao Siu Loong Building and the North Part in the main campus from Simon K.Y. Lee Hall without the help from others. It is because the only route to these buildings is at a steep slope. Neither any site formation to flatten the topography nor any remedial measures to assist the wheelchair bound people in circulation is carried out.

It is also discovered that the components in the main campus are fragmented. The buildings are situated in a way that the car park route ridiculously

becomes the best barrier free way for wheelchair-bound people to get access to an individual building in campus. This shows that the connections between buildings, complexes or amenities centres are poorly planned and even the accessible routes are not equipped well for wheelchair bound people.

By the investigation and observation in the personal trial, it proved that there is still much room for improvement upon the built environment in the main campus, so that to achieve the goal of being a user-friendly university campus for wheelchair-bound students. Therefore, the main campus of the University of Hong Kong still is not an entirely user-friendly place for wheelchair-bound persons.

12.2 Limitations

Due to the constraints in time and data resources, several limitations to the research have to be noticed.

12.2.1 Small Size of Comparable Countries

Small size of comparable countries selected for the comparison purpose in the comparative analysis is considered as a limitation to the research. In the

analysis, only three countries are involved. It would probably reduce the reliability of the comparison result and the implication of the analysis. Hence, the conclusion about adequacy of regulatory framework in Hong Kong for user-friendly environment would not be representative and comprehensive.

12.2.2 Imperfect Comparability

It is a universal problem when a comparison is made between countries. As every country does have its own background and culture, although the "principle of similarity" can be applied to minimize the difference between countries, the differences among them may also render the comparison not having perfect equal footing on the comparison subject. Thus, it also reduces the reliability of the comparison result.

12.2.3 Assumption on the Personal Trial

In the personal trial, it is assumed that a wheelchair-bound student is able to access to every floor of the academic buildings, complexes or amenities centres if at least one accessible lift serving to all floors of the buildings is provided for wheelchair-bound persons. However, under this assumption, the user-friendliness of the University of Hong Kong for wheelchair-bound person is not entirely determined. Although the wheelchair-bound student is able to

get onto one floor of a building, they would still have chance to suffer problems or difficulties due to the present of physical barriers on that floor, such as insufficient width of the corridors and passageways or even no ramps are installed instead of steps in front of the lecture rooms. As a result, this assumption reduces the reliability of the result of personal trial of using a wheelchair.

12.3 Recommendation for Further Research

There are recommendations for further research given in light of the limitations above.

Firstly, some more leading countries in the provision of creating a user-friendly environment should be taken into comparison with Hong Kong as well as employing more criteria in the comparison. In this way, the comparison can be made in a more all-rounded way, thus, the reliability of result of the comparative analysis can be increased.

In order to rectify the result of personal trial of using a wheelchair, a journey with more detailed investigation to a particular floor or room of every academic building, complex or amenities centre should be carried out. This type of

journey can definitely discover the unknown problems or difficulties for wheelchair-bound students when they travel inside a particular place. Hence, the user-friendliness of the University of Hong Kong for wheelchair-bound persons can be determined in an entire view.

Besides, in addition to the present scope of the research, further research could extend the scope outside the main campus of the University of Hong Kong. In my brief observation through the personal trial, it is found that it would be a big problem for wheelchair-bound people to get access from outside to the University of Hong Kong if there is no private vehicles to pick them outside to the main campus, since staircases and too steep ramp are the only way for wheelchair-bound people to get access from both east gate and west gate. In another word, they are unable to enter the University of Hong Kong without the help of vehicles or people. Therefore, the transportation from outside to main campus of the University of Hong Kong is a good area to explore for further research.

Also, the University of Hong Kong is planning to build a major extension, the Centennial Campus, immediately to the west of the existing main campus. Since a new MTR West Island Line, a number of academic buildings,

recreational facilities and other modern amenities will be constructed in the Centennial Campus, and it is scheduled to be completed in 2011/2012, therefore, the connection between the main campus and the Centennial Campus would be an interesting and meaningful research topic in the future.

References

ARCHITECTURAL AND TRANSPORTATION BARRIERS COMPLIANCE BOARD (ATBCB), (1996). *Americans with Disabilities Act Accessibility Guidelines: Checklist for Buildings and Facilities*. Los Angeles.

AST, G.D. (1977). Moline Illinois: Planning a Barrier-Free Environment for the Elderly and Handicapped. *Barrier-Free Environments*, 106 – 131.

BANISTER, D. AND HALL, P. (1995). Summary and Conclusions, In D. Banister (Ed). *Transport and Urban Development*. E&FN Spon. London. 278-287.

BARNES, C. (1991). *Disabled People in Britain and Discrimination: A Case for Anti-discrimination Legislation*. London: Hurst & Co.

BARNES, C. (1992). Qualitative Research: Valuable or Irrelevant?, *Disability, Handicap & Society*, 7(2), 115 – 124.

BEDNAR, M.J. (1977). Barrier-free Environments, *Community Development Series*, 33, 278.

BICKENBACH, J.E. AND CHATTERJI, S. AND BADLEY, E.M. (1999). Models of Disablement, Universalism and the International Classification of Impairments, Disabilities and Handicaps. *Social Science and Medicine*, 48(9), 1173 – 1187.

BUILDING AND CONSTRUCTION AUTHORITY, (2002). *Code on Barrier-free Accessibility in Buildings*. Singapore: Building and Construction Authority.

BUILDING AND CONSTRUCTION AUTHORITY, (2003). *Building Control Regulations* [online]. Singapore. Building and Construction Authority. Available from: http://www.bca.gov.sg/Publications/BuildingControlAct/building_control_act.html [Accessed 10th March 2008].

BUILDING REGULATIONS DIVISION, OFFICE OF THE DEPUTY PRIME MINISTER, (2002). *Consultation on Proposals for Amending Part M Access to and Use of Buildings*. United Kingdom: ODPM.

BUTLER, R. AND BOWLBY, S. (1997). Bodies and Spaces: An Exploration of Disabled People's Experiences of Public Space. *Environment and Planning D: Society and Space*, 15, 411 – 433.

CENSUS AND STATISTICS DEPARTMENT, (2001). *Social Data Collected via the General Household Survey: Special Topics Report No.28*. Census and Statistics Department. HKSAR.

CENTRAL INTELLIGENCE AGENCY (CIA), (2005). *The World Fact Book – Hong Kong* [online]. United States. CIA. Available from: https://www.cia.gov/library/publications/the-world-factbook/geos/hk.html#Geo [Accessed 1st March 2008].

CHAMIE, M. (1995). What does Morbidity have to Do with Disability?. *Disability and Rehabilitation*, 17, 323 – 327.

CHENG, C.Y. (2005). *The Ableist City Unveiled: Disabled People, Social Injustice and Urban Space in Hong Kong*. Thesis (MSc). The University of Hong Kong.

CHOI, T.M. (2003). *Accessibility of Wheelchair Users in the Built Environment – A Study in Private Shopping Centers*. Dissertation (BSc). The University of Hong Kong.

CHOUINARD, V. (1997). Making Space for Disabling Difference: Challenging Ableist Geographies. *Environment and Planning D: Society and Space*, 15, 379 – 387.

CHURCH, L. AND MARSTON, R. (2003). Measuring Accessibility for People with a Disability. *Geographical Analysis*, 35(1), 83 – 96.

COUNCIL ON TALL BUILDINGS AND URBAN HABITAT, (1992). *Building Design for Handicapped and Aged Persons*. New York: McGraw-Hill Inc.

COUSINS, C. (1998). Social Exclusion in Europe: Paradigms of Social Disadvantage in Germany, Spain, Sweden and the United Kingdom. *Policy and Politics*, 26(2), 127 – 146.

CROW, L. (1996). Including All of our Lives: Renewing the Social Model of Disability. *Encounters with Strangers: Feminism and Disability*. London: Women's Press.

CULLINANE, S. (1998). Mobility and Accessibility. *Rural Transport Policy*, 61.

DALY, A. (1975). Measuring Accessibility in a Rural Context. *Rural Transport Semina*, Polytechnic of Central London, 3.

DARCY, S. (2003). The Politics of Disability and Access: the Sydney 2000 Games Experience. *Disability and Society*, 18(6), 737 – 757.

DIMITRIS MICHAILSKIS, (1997). *Government Action on Disability Policy: A Global Survey*. Sweden: Liber Publishing House.

EDWARDS, C. (2001). Inclusion in Regeneration: A Place for Disabled People?. *Urban Studies*, 38(2), 267 – 286.

EQUAL AND OPPORTUNITIES COMMISSION (EOC), (1998). *The Disability Discrimination Ordinance and I* [online]. Hong Kong. EOC. Available from: http://www.eoc.org.hk/EOC/GraphicsFolder/showcontent.aspx?itemid=5299 [Accessed 14th March 2008].

FREUND, P. (2001). Bodies, Disability and Spaces: the Social Model and DISABLING SPATIAL ORGANIZATIONS. *Disability and Society*, 16(5), 689 – 706.

GIDDENS, A. (1991). *Modernity and Self Identity: Self and Security in the Late Modern Age*. Cambridge: Polity Press.

GILDERBLOOM, J.I. AND ROSENTRAUB, M.S. (1990). Creating the Accessible City: Proposals for Providing Housing and Transportation for Low Income, Elderly, and Disabled People. *American Journal of Economics and Sociology*, 49, 241 – 282.

GIULIANO, G. (1996). *Land Use Impacts of Transportation Investments*. University of Southern California.

GLEESON, B. (1997). The Regulation of Environmental Accessibility in New Zealand. *International Planning Studies*, 2(3), 367 – 390.

GLEESON, B. (1999). *Geographies and Disability.* London: Routledge.

GLEESON, B. (2001). Disability and the Open City. *Urban Studies*, 38(2), 251 – 265.

GOLDSMITH, S. (1997). *Designing for the Disabled: The New Paradigm*. Oxford: Architectural Press.

GREED, C.H. (1996). Planning for Women and Other Disenabled Groups, with Reference to the Provision of Public Toilets in Britain. *Environment and Planning A*, 28, 573 – 588.

HAHN, H. (1986). Disability and the Urban Environment: A Perspective on Los Angeles. *Environment and Planning D: Society and Space*, 4, 273 – 288.

HAHN, H. (1988). The Politics of Physical Differences: Disability and Discrimination. *Journal of Social Issues*, 44(11), 39 – 47.

HAHN. H. (1987). Civil Rights for Disabled Americans: the Foundations of a Political Agenda, *In*: Gartner, A. AND Joe, T. (eds.), *Images of the Disabled/Disabled Images*. New York: Praeger.

HALL, E.C. (1994). *Researching Disability in Geography*. Working Paper 28. School of Geography. University of Manchester.

HALL, P. AND IMRIE, R. (1998). Responding to Disabled People's Needs in the Built Environment: A Survey of Chartered Surveyor's Attitudes and Practices in the UK. *Chartered Surveyor's Monthly*, 42- 43.

HALL, P. AND IMRIE, R. (1999). Architectural Practices and Disabling Design in the Built Environment. *Environment and Planning B: Planning and Design*, 26, 409 – 425.

HELLMAN, L. (1977). Handicapped Architecture. *Built Environment*, 3(3), 216 – 221.

HINE, J. AND MITCHELL, F. (2001). Better for Everyone? Travel Experience and Transport Exclusion. *Urban Studies*, 38(2), 319 – 332.

HONG KONG GOVERNMENT, Health and Welfare Branch (1995). *White Paper on a Rehabilitation: Equal Opportunities and Full Participation: A Better Tomorrow for All*. Hong Kong: Government Printer.

HOWE, E. AND KAUFMAN, J. (1981). The Values of Contemporary American Planners. *Journal of the American Planning Association*, 47, 266 – 278.

HUMPHREY, R. (1994). Thoughts on Disability Arts. *DAM*, 4(1).

HUW, T. (1992). Disability, Politics and the Built Environment. *Planning Practice and Research*, 7(1), 22 – 26.

HYMAN, H.H. (1972). *Secondary Analysis of Sample Surveys: Principles, Procedures, and Potentialities*. New York: John Wiley.

IMRIE, R. (1996a). *Disability of and the City: An International Perspective*, London: Paul Chapman.

IMRIE, R. (1996b). Ableist Geographies, Disablist Spaces: Towards a Reconstruction of Goddedge's Geography and the Disabled. *Transactions of the Institute of British Geographers*, 21, 397 – 403.

IMRIE, R. (1997). Challenging Disabled Access in the Built Environment: An Evaluation of Evidence from the United Kingdom. *Town Planning Review*, 68(4), 423 – 447.

IMRIE, R. (2000). Disability and Discourses of Mobility and Movement. *Environment and Planning A*, 32, 1641 – 1656.

IMRIE, R. (2003). Architects, Conceptions of the Human Body. *Environment and Planning D: Society and Space*, 21, 47 – 65

IMRIE, R. (2004). Demystifying Disability: A Review of the International Classification of Functioning, Disability and Health. *Sociology of Health and Illness*, 26(3), 1 – 19.

IMRIE, R. AND HALL, P. (2001a) An Exploration of Disability and the Development Process. *Urban Studies*, 38(2), 333 - 350.

IMRIE, R. AND HALL, P. (2001b) *Inclusive Design: Designing and Developing Accessible Environments*. London: E.F. & K Spon.

IMRIE, R. AND KUMAR, M. (1998). Focusing on Disability and Access in the Built Environment. *Disability and Society*, 13(3), 357 – 374.

IMRIE, R. AND WELLS, P. (1992). Creating a Barrier-free Environment. *Town and Country Planning*, 278 – 279.

INTERNATIONAL AND SOCIAL SECURITY ASSOCIATION, (1981). *Social Security and Disability: Issues in Policy Research*. Geneva: ISSA Publications.

INTERNATIONAL COMMISSION ON TECHNICAL AIDS BUILDINGS AND TRANSPORTATION (ICTABT), (1983). *Guidelines for Improving Access for Disabled People*. London: RADAR.

JONES, S.R. (1981). Accessibility Measures: A Literature Review. Crowthorne Berkshore: *Transport and Road Research Laboratory Report 967*, 22.

KAUFMAN-SCARBOROUGH, C. (2001). Sharing the Experience of Mobility-Disabled Consumers. *Journal of Contemporary Ethnography*, 30(4), 430 – 464.

KITCHIN, R. (1998). ”Out of Place”, “Knowing one’s Place”: Space, Power and the Exclusion of Disabled People. *Disability and Society*, 13(3), 343 – 356.

KNOX, P.L. (1987). The Social Production of the Built Environment: Architects, Architecture and the Post-modern City. *Progress in Human Geography*, 11 354 – 378.

LAU, W.Y. (2001). *The Effectiveness of Barrier Free Access in Hong Kong*. Dissertation (BSc). The University of Hong Kong.

LEACH, B. (1989). Disabled People and the Implementation of Local Authority Equal Opportunities Policies. *Public Administration*, 67, 65 – 77.

LEICHTER, H.M. (1979). *A Comparative Approach to Policy Analysis: Health Care Policy in Four Nations*. USA: Cambridge University Press.

LI, S.F. (1993). *Planning for Equities in Hong Kong: How Planning can Improve the Lives of the Physically Disabled?*. Thesis (MSc). The University of Hong Kong.

LO, T.K. (2002). *A Study of the Transport Needs of Patients for Medical Services, with Emphasis on the Accessibility of the Prince of Wales Hospital to Patients*. Dissertation (MSc). The University of Hong Kong.

LUNG, Y.C. (1998). *Landuse Planning for an Accessible Transport System and Built Environment for the Wheelchair Bound in Hong Kong*. Dissertation (MSc). The University of Hong Kong.

MATTHEWS, M.H. AND VUJAKOVIC, P. (1995). Private Worlds and Public Spaces: Mapping the Environmental Value of Wheelchair users. *Environment and Planning A*, 27, 1069 – 1083.

MAYER, ID. (1983). The Distance Behavior of Hospital Patients: A Disaggregated Analysis. *Social Science and Medicine*, 17,819 – 827.

MEADE, M.S. AND EARICKSON, R.J. (2000), Accessibility, Utilization, and Health Services Planning. *The Guilford Press*, 383.

MERRIFIELD, A. AND SWYNGEDOUW, E. (1996). Social Justice and the Urban Experience. *The Urbanization of Injustice*. 1 – 17.

MITCHELL, C. AND TOWN, S. (1976). *Accessibility of Various Social Groups to Differing Activities*. Crowthorne. Berks: Transport and Road Research Laboratory.

NAPOLITANO, S. (1995). Mobility Impairment. *Beyond Disability: Towards an Enabling Environment*, 30 – 35.

NATIONAL COUNCIL ON DISABILITY (NCD), (1986). *Toward Independence: An Assessment of Federal Laws and Programs Affecting Persons with Disabilities*. New York.

NBS, (2006). *Approved Document M – Access to and Use of Buildings*, Norwich.

NG, W.S. (2003). *Adequacy of the Regulatory Framework of Hong Kong in Setting Out Design Requirements to Ensure Barrier Free Access*. Dissertation (BSc). The University of Hong Kong.

OFFICE OF PUBLIC SECTOR INFORMATION (OPSI), (1995). *Disability Discrimination Act 1995* [online]. United Kingdom. OPSI. Available from: http://www.opsi.gov.uk/acts/acts1995/ukpga_19950050_en_1#Legislation-Preamble [Accessed 12th March 2008].

OFFICE OF THE UNITED NATIONS HIGH COMMISSIONER FOR HUMAN RIGHTS (UNHCHR), (1975). *United Nations Declaration on Rights of Disabled Persons* [online]. Geneva. UNHCHR. Available from: http://www.unhchr.ch/html/menu3/b/72.htm [Accessed 10th March 2008].

OLIVER, M. (1983). *Social work with Disabled People*. London: Macmillan Education Ltd.

OLIVER, M. (1990). *The Politics of Disablement*. London: Macmillan Education Ltd.

OLIVER, M. (1996), *Understanding Disability: From Theory to Practice*. Malaysia: Macmillan.

PATERSON, K. AND HUGHES, B. (1999). Disability Studies and Phenomenology: the Carnal Politics of Everyday Life. *Disability and Society*, 14(5), 597 – 610.

POSMOPOULOS, P. (1973). Disabled People in Disabling Settlements. *Models of Service for the Multi-handicapped Adult*, 14 – 26.

POWELL, M. (1995). On the Outside Looking in: Medical Geography, Medical Geographers and Access to Health Care. *Health and Place*, 1, 41 – 50.

PRAK, N.L. (1984). *Architects: The Noted and the Ignored*. Chichester: John Wiley.

RAWLS, J. (1971), *A Theory of Justice*, Oxford: Oxford University Press.

ROOM, G. (1995). Poverty in Europe: Competing Paradigms of Analysis. *Policy and Politics*, 23, 103 – 113.

SAFILIOS-ROTHSCHILD, C. (1970). *The Sociology and Social Psychology of Disability and Rehabilitation*. New York: Random House.

SAHRC, (2002), *Towards a Barrier-free Society: A Report on Accessibility and Built Environments*. South Africa: SAHRC.

SCOTCH, R.K. (1988). Disability as the Basis for a Social Movement: Advocacy and the Politics of Definition. *Journal of Social Issues*, 44(1), 159 – 172.

SCOTCH, R.K. (1989). Politics and Policy in the History of the Disability Rights Movement. *Milbank Quarterly*, 67(52), 380 – 400.

SEATON, M. (1997), Building for ADA, *NFPA Journal*, 91(6), 40 – 45.

SINACORE-GUINN, A.L. (1995). The Diagnostic Window: Culture and Gender-sensitive Diagnosis and Training. *Counselor Education and Supervision*, 35, 18 – 32.

SMART, J. (2001). *Disability, Society and the Individual*. United States: Aspen.

STEINFELD, E. AND DANFORD, G.S. (1999). *Enabling Environments: Measuring the Impact of Environment on Disability and Rehabilitation*. New York: Kluwer Academic.

STEINFELD, E. AND DANFORD, G.S. (eds.) (1999). *Enabling Environments: Measuring the Impact of Environment on Disability and Rehabilitation*. New York: Kluwer Academic.

STEVEN, N. (2001). Understanding Accessibility in Liana Giorgi and Ronald J.Pohoryles (Ed). *Transport Policy and Research: What Future*, 149.

STONE AND PRIESTLEY, (1996). Parasites, Pawns and Partners: Disability Research and the Role of Non-disabled Researchers. *British Journal of Sociology*. 47(4).

STUBBIN, J. AND ALBEE, G.W. (1984). Ideologies of Clinical and Ecological Models. *Rehabilitation Literature*, 30, 10 – 25.

SWEET'S GROUP, (1999). *Sweet's Accessible Building Products Catalog File*. New York: Sweet's Group.

TEMPLER, J. AND JONES, M. (1977). Pedestrian Mobility: the Accessible City. *Barrier-Free Environments*, 17 – 43.

THEODOULOU, S.Z. (2002). *Policy and Politics in Six Nations: A Comparative Perspective on Policy Making*. New York: Prentice Hall.

THOMAS, D.J. (1982). *The Experience of Handicap*, London: Methuen.

TUDOR, K. (1979). The Politics of Disability in Italy. *Critical Social Policy*, 9(1), 37 – 55.

UNION OF PEOPLE WITH IMPAIRMENTS AGAINST SEGREGATION, (1976). *Fundamental Principles of Disability*. London: Union of the Physically Impaired Against Segregation.

UNITED NATIONS, (1995). *Promotion of Non-Handicapping Physical Environments for Disabled Persons: Guides*. New York: Economic and Social Commission for Asia and the Pacific.

UNITED NATIONS, (1997). *Legislation on Equal Opportunities and Full Participation in Development for Disabled Persons: Example from the ESCAP Region.* New York: Economic and Social Commission for Asia and the Pacific.

USTUN, T.B. (eds.) (2001). *Disability and Culture: Universalism and Diversity*. Germany: Hogrefe & Huber Publishers.

WAVERLEY BOROUGH COUNCIL (WBC), (2008). *The Building Regulations 2000* [online]. United Kingdom. WBC. Available from: http://www.waverley.gov.uk/buildingcontrol/regulations.asp#regu [Accessed 12th March 2008].

WEST, P.C. (1986). Environment and the Handicapped. *Environments*, 18, 89 – 106.

WORKING GROUP ON COMMUNITY OCCUPATIONAL THERAPY, (1999). *Guide to Environmental Modification – Occupational Therapy in Practice*. Hong Kong. Hong Kong Occupational Therapy Association.

YEO, S. (1998). *Unrestrained Killings and the Law: A Comparative Analysis of the Laws of Provocation and Excessive Self-Defence in India, England and Australia*. Delhi: Oxford University Press.

YOUNG, I.M. (1990). *Justice and the Politics of Difference*, New Jersey: Princeton University Press.

ZAKARIA,T. (1981). *The Application of Accessibility Measures in Gwent: Travel to Hospital and Shops*. Crowthorne: Gwent County Council: Department of the Environment and Department of Transport, Transport and Road Research Laboratory.

ZOLA, I.K. (1989). Toward the Necessary Universalizing of a Disability Policy, *The Milbank Quarterly*, 67, 401 – 420.