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Freedom and Control in Public Space: Quality Everyday Life in the Hong Kong Mass Transit Railway

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Urban rail transit (URT) systems have a history of more than 150 years and have become part of the city system and permeate citizens' everyday lives (EDLs). In a sense, the URT space is a new form of city public space that carries people of different backgrounds. This research takes the Hong Kong MTR public space as a case study and investigates the freedom and control of public space. Based on the theoretical discussions and empirical findings, this study emphasises the importance of balancing freedom and control in constructing a MTR life. This thesis provides a systematic analysis of the MTR space in Hong Kong, which explicates MTR space's nature and informs designers and policymakers with a referential framework for designing the URT systems and public spaces of other cities.

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FREEDOM AND CONTROL IN PUBLIC SPACE: QUALITY EVERYDAY LIFE IN THE HONG KONG MASS TRANSIT RAILWAY

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ZHAO Tianjiao

A thesis submitted in partial fulfilment of the

requirements for the degree of Doctor of Philosophy

August 2014

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_____ (Signed)

ZHAO TIANJIAO (Name of Student)

Abstract

The urban rail transit (URT) system has a history of more than 150 years. Cities have increasingly begun to construct URT systems. URTs have become part of the city system and permeate citizens' everyday lives (EDLs). The URT space is a new form of city public space that carries people of different backgrounds. Different users share the same public space, in which they pursue their own purposes. Different categories of behaviour and interactions happen in the public space. People shape the public space, while the space shapes the citizens' EDLs. Conflicts and cooperation exist together in the URT space.

The Hong Kong MTR is a world famous URT system. It has a history of around 30 years. The Hong Kong MTR's status in the city and in city life has increased every year since its construction. People have recently begun paying more attention to the quality of MTR life. A quality MTR life is not only convenient for citizens, it brings harmony to the whole society.

This study takes the Hong Kong MTR public space as a case study and focuses on freedom and control in the public space. It aims to produce a quality MTR life by answering its research questions: a) What is the role of the MTR life in people's EDLs? b) What do users expect for a quality EDL in the Hong Kong MTR space? c) What are the relationships between freedom, control and a quality MTR life? d) How can we achieve a balance between freedom and control in the MTR public space, regarding citizens' EDLs?

This study uses both qualitative and quantitative methods. Observations are conducted across time and space dimensions. Interviews and questionnaires are conducted with different users to supplement the information acquired from each. Representative cases are selected to form a case study. Systematic research methods are used to successfully identify people's EDLs, confirm the role of the MTR life in citizens' EDLs, define a quality MTR EDL from the needs perspective, construct a model to discover design opportunities, identify how freedom and control exist and work in the public space and promote a method of balancing freedom and control.

Based on its theoretical discussions and empirical findings, this study emphasises that the balance between freedom and control is a primary factor in constructing a quality MTR life. Dealing with freedom and control in a public space involves dealing with human relationships and balancing benefits between different groups. The findings illustrate that the MTR life is part of citizens' EDLs and plays necessary roles in the whole city system. A quality MTR life can be constructed according to the needs pyramid, from the low to the high levels. The balance between freedom and control in a public space can be achieved by recognising and analysing behaviour from the ethical and strategic perspectives.

This thesis provides a systematic analysis of the MTR space in Hong Kong. The nature of the MTR space and the process of its development are explained. References for both designers and policymakers are promoted. The research method used here could also be used in related studies of other city URT systems and public spaces.

Publication Arising from the Thesis

(A) Journal papers

Zhao, T. J., & Siu, K. W. M. (2012). The role of subway in the urban life: Case study in Hong Kong Mass Transit Railway. *Humanities and Social Sciences Review, 1*(4).

Zhao, T. J., & Siu, K. W. M. (2014). Freedom and Control: A state of balance in public space. *Facilities, 32*(11/12), 606-623.

Zhao, T. J., & Siu, K. W. M. (2014). The needs of quality urban rail transit life in an Asian metropolitan city. *Applied Research in Quality of Life,* DOI 10.1007/s11482-014-9345-z

Zhao, T. J., & Siu, K. W. M. (2014). The Boundaries of Public Space: A Case Study of Hong Kong Mass Transit Railway. *International Journal of Design, 8*(2), 1-18.

Siu, K. W. M., & **Zhao, T. J.** (2013). City spaces and human relations in Hong Kong's Mass Transit Railway: From circulation to everyday life. *Journal of Human Behavior in the Social Environment, 23*(5), 675-688.

Siu, K. W. M., & **Zhao, T. J.** (Under review). Discovering subway design opportunities using social network data: The image-need-design opportunity model. *The Design Journal.*

Siu, K. W. M., & **Zhao, T. J.** (Under review). The quality of the urban rail transit experience for young adults in Hong Kong's Mass Transit Railway public space. *China: An International Journal.*

(B) Conference papers

Zhao, T. J., & Siu, K. W. M. (2013). *Quality of the Subway Experience for Older People in Hong Kong's Mass Transit Railway Public Space.* Paper presented at 7th International Conference on Design Principles and Practices. Chiba, Japan: Common Ground.

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August 2014

Contents

List of Abbreviations

EDL	Everyday Life
HK	Hong Kong
MTR	Mass Transit Railway
PolyU	The Hong Kong Polytechnic University
POPS	Private Owned Public Space
QoL	Quality of Life
SNS	Social Networking Service
UCD	User Centred Design
URT	Urban Rail Transit

CHAPTER 1 Introduction

1.1 Introduction

Space is a product (Lefebvre, 2010, p. 26). Lefebvre (2010) said that, 'Man does not live by words alone, all "subjects" are situated in a space in which they must either recognise themselves or lose themselves, a space which they may both enjoy or modify'. Space plays a significant role in society, whether in physical, mental' or social forms. It embodies social relationships, social development, urban politics, administrative systems and public life (Gottdiener, 1985).

Urban space is considered a special unit of space. It is also part of citizens' everyday space, which is simply defined as the space in which everyday life (EDL) is carried out (Siu, 2010, p. 17). The forms of urban public space have become more abundant with increasing urbanisation. New types of public space have developed that respond to citizens' changing public lives. In the past one and a half centuries, a new urban public space has permeated citizens' EDLs, the urban rail transit (URT) public space.

The URT system has a long history of 149 years. The first URT system, the Metropolitan Railway, was constructed in 1863 in London. Since then, 187 URTs have been constructed around the world and that number is still increasing (Metrobits, 2013). The URT system has changed radically from a traffic tool to an underground city (Brooks, 1997). Its function and nature have been enriched and gradually transformed. The relationship between a URT system and its city is vague and intricate. URT life has become a significant element of city life and the URT space has developed into an everyday space for citizens.

The Hong Kong Mass Transit Railway (MTR), which was constructed in 1979, is world-famous for its security, stability and high quality service. It is the most populated public transport system in Hong Kong, carrying 30% of all Hong Kong passengers (Census and Statistics Department, 2011). The Hong Kong MTR system has been an expanding space ever since its construction. It has grown from a 'metro' to a 'metropolis' (Yeung, 2004). The metro is the structural part of the MTR system, whereas the metropolis is the social space produced by urban movement within the metro system. It has also grown from a place to space (Siu & Zhao, 2013). As Portoghesi (Schulz, 2010) stated, a space is a 'system of places' and the structure of a place.

The MTR has developed quickly in the city space and MTR life has become more important for citizens. Policymakers have changed the MTR's focus from quality subway functions to quality subway life (Wu & Berman, n.d.). Constructing a quality MTR life has become a social benefit issue. In March 2012, the Hong Kong MTR launched the Listening, Responding Programme to enhance train service, upgrade station facilities and strengthen passenger communications (MTR, n.d.). It is eager to provide its passengers with a more efficient, pleasant journey.

Different people use the MTR space and different activities take place in the URT space. The structure of the space and the relationships within it make the URT space alive and complete. Winston Churchill stated that we shape our buildings, thereafter they shape us. Yeung (2004) pointed out that, 'we shape our MTR and afterwards our MTR shape[s] us'. The objective of constructing a quality MTR space is the same as constructing a quality MTR EDL.

Space is both the geographical site of an action and the social possibility of engaging in action. Gottdiener (1985) argued that space is a physical location, a piece of real estate and simultaneously an existential freedom and a mental expression. The relationships in, and the physical structure of, the MTR space define it. Freedom and control are the two primary factors of a public space, explaining relationships between people and between people and the space. In 2012, the issue of Chinese mainland visitors eating in Hong Kong's MTR train compartments aroused heated disputes between locals and non-locals. The locals considered the behaviour of the non-locals to be unethical and impolite, whereas the non-locals claimed ignorance of the policy or did not consider it to be reasonable. Many questions have arisen. Should the freedom to behave in this manner be forbidden in public spaces? What kind of behaviour should be encouraged or forbidden? Why do locals and non-locals have different attitudes towards the same policy? What are the deeper implications hidden in these different attitudes? Can we create a good balance between freedom and control in public space? In summary, a key question is how freedom and control can be balanced.

Today, people spend most of their time in public spaces, such as open-areas shopping centres, theme parks and privately owned public spaces, of which the MTR stations are one. Public space plays a significant role in citizens' EDLs, providing convenience and control. Citizens expect the freedom to use space, whereas policymakers and property managers aim to promote security and stabilisation. Freedom and control are thus constantly interacting in a public space. Lynch (1995) claimed that defining the openness of a space is an effective way of examining the freedom and control of the place, instead of its name, physical forms and the functions provided, although all of these affect the openness of the space. Most people would agree that it is impossible and inappropriate to ask for absolute freedom or to endure unreasonable control. Proper amounts of both freedom and control must exist in a public space. As Lynch (1995) claimed,

> Open space, like an open society, must be free and yet controlled. The free use of open space may offend us, endanger us or even threaten the seat of power. Yet that freedom is one of our essential values. We prize the right to speak and act as we wish. When others act more freely, we learn about them, and yet about ourselves. (p. 413)

Freedom and control have different meanings and levels. They should be balanced at both the physical and psychological levels (The Institute of Art and Ideas, 2014). To find a balance between them is to achieve the balance of space, society and diverse benefits.

The Hong Kong MTR public space is the main research area of this study. Both the people and the activities in the space are investigated. The MTR space is different from other public spaces (such as shopping malls, parks, schools and even bus systems) due to its short history, unique location, broad objective users, significant commercial value and its privately owned public space characteristics. This study aims to find a method of constructing a quality MTR life (space) by balancing freedom and control. This balance is both for different individuals and diverse groups of people. An individual's needs for freedom and control should be balanced. An institution or group's authority over freedom and control also need to be balanced. Before pursuing a quality MTR life, the definition of quality MTR life must be confirmed. This study analyses the regulation of the MTR system, searches for potential needs with a systematic research method and develops strategies for constructing a quality MTR life.

The direct way of obtaining users' needs and understanding human relationships in a space is to discover users' daily lives. EDL can illustrate the most common and basic situations in

people's lives in a specific environment (Lefebvre, 1984). The qualitative and quantitative research methods used in this study complement one another. Observing EDL is the most effective and efficient way to determine the reality of users' lives. This study focuses on users' EDLs in the subway from the perspectives of four senses: sight, sound, smell and touch. Qualitative descriptions are recorded through photographs. Interviews and questionnaires are performed to obtain first hand materials. A case study strategy is used.

This thesis presents a general study of urban public space. Arendt (cited in Benhabib, 1992) pointed out that in ancient times, public space was shaped by citizen participation. Gottdiener (1993) also claimed that space was both a material product of social relationships (the concrete) and a manifestation of relationships, a relationship itself (the abstract). This study essentially deals with human relationships and the relationships between people and a space.

1.2 Aims and objectives

The aim of this study is to search for a way of constructing a quality MTR life. By defining what a quality MTR life is, this study aims to understand how freedom and control affect different people's practices in the Hong Kong MTR space. By observing the interactions between people and people, people and space, and people and policy, this study intents to find proper approaches to balance freedom and control in the MTR space and coordinate different classes' (groups') requirements of freedom and control. People will enjoy a quality subway life if a harmonious space can be created.

Based on the overall aims, the detailed research area and objectives are as follows.

- Taking the Hong Kong MTR as a case study, explore the role of the subway in the city and review people's everyday practices in the MTR public space.
- Determine users' potential and substantial needs in the MTR space through observations and interviews.
- Explore the possibility and direction of a quality MTR life from the needs perspective.
- Explore how freedom and control exist in the MTR public space and how to balance the two.
- Generate a reference for policymakers, managers, designers and users to improve the quality of subway life by dealing reasonably with the relationship between freedom and control.

1.3 Hypothesis

The balance between freedom and control is a significant element in improving the quality of MTR EDL.

1.4 Scope and research question

Lefebvre's (2010) triple space concept demonstrated that space is both a medium of social relationships and a material product that can affect social relationships. Space has a complex character and enters social relationships at all levels. The URT public space is a public transportation institution and comprises different groups of people. The human relationships in the public space are part of the space. Carr et al. (1992) believed that the

human dimension had the greatest influence on public space. The value of public space is determined by the human rights that citizens enjoy and their participation in public life.

As human relationships are part of a space, it is necessary to conduct research on the relationships that happen in that space if a quality space is to be constructed. Considering the research aims of this thesis, the relationships between people, the environment and principles must be analysed.

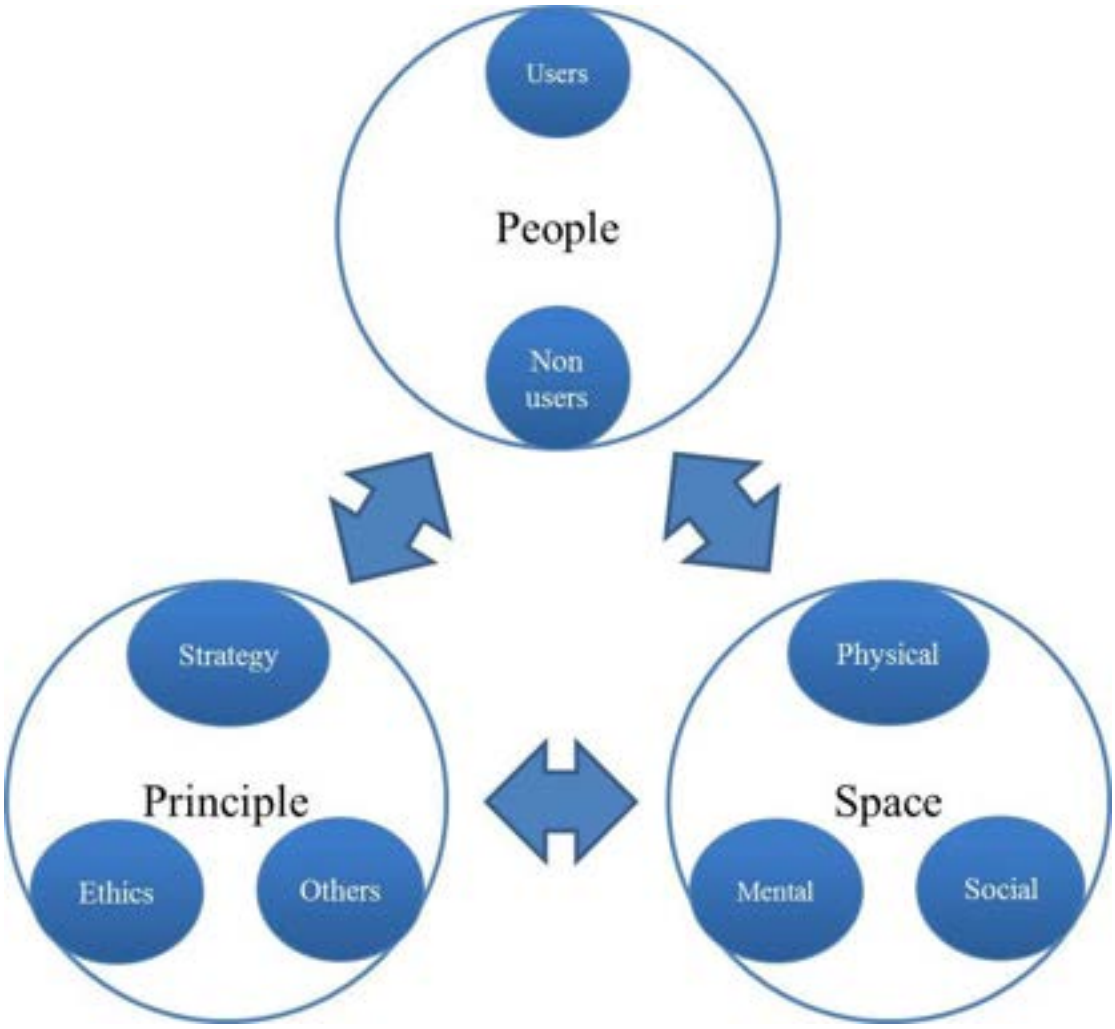


Figure 1-1 Research scope of the study

Figure 1-1 shows the research scope of this study. It focuses on the interactions between each group and the relationships between each group's members. By organising and analysing all of these elements, this study aims for a deep analysis of freedom and control in MTR life. This study explores the following research questions.

- Question 1: What is the role of MTR life in people's EDLs?
- Question 2: What are users' expectations of a good quality EDL in the Hong Kong MTR space?
- Question 3: What are the relationships between freedom, control and quality MTR life?
- Question 4: How can a balance between freedom and control in citizens' EDLs be achieved in the MTR public space?

1.5 Significance and value

Henry Lefebvre was one of the first social theorists to discuss the significance of EDL. EDL is a collection of things and activities that are repetitive and banal (Lefebvre, 1992). The exploration of EDL was a meaningful revolution for society. As Poster said, 'it [is] a measure of the balance between human realisation and its dialectical antitheses and alienation'. (Poster, 1975; as citied in Siu, 2001, p. 20). Lefebvre (1984) pointed out the significance of the study of EDL in *Everyday Life in the Modern World*:

> The study of EDL affords a meeting place for specialised sciences and something more besides; it exposes the possibilities of conflict between the rational and the irrational in our society and our time.

Everyday space is the carrier of EDL and exists in different forms in society. In modern society, the URT system has a shorter history than other urban public space such as streets, squares and parks. In spite of this, the URT public space plays a significant role in people's EDLs and has become a symbol of urbanisation (Lewis, 2012). The study of the URT public space is a relatively new but necessary research topic. The exploration of URT life may help to produce a harmonious, quality space and a rational, peaceful society. Hsia (1994) mentioned in his book on public space that a city is not only a place for living, shopping and to take the children out. It is also a place for extending ethics, cultivating a sense of justice and learning how to communication. Constructing a quality environment is significant, as it may even increase the quality of the citizens.

This study focuses on the factors of freedom and control. In *Open Space: Freedom and Control*, Lynch and Carr (1995) mentioned that an open city must be both free and controlled, as an absolutely free use of open space may lead to social problems. It is obvious that proper controls should be applied to public space to avoid conflicts between individuals or institutions (Siu, 2001). A balance between freedom and control benefits both the user and the policymaker. It may also promote social stability and development. A freedom environment may promote users' satisfaction, comfort and happiness. A properly controlled space may guarantee security and fairness. An overly free public space may not be sufficiently ordered, whereas an overly controlled space may lead to citizens' opposition. Both extreme states may affect citizens' normal lives and the development of society.

By observing social phenomena, this study identifies the conflicts between individuals and groups and searches for approaches that will achieve balance. Space in which freedom and control are balanced is harmonious, secure and healthy. Balance encourages peace, stability

and a happy, high quality EDL. A quality everyday space results in a quality EDL, which in turn leads to a quality society.

1.6 Framework of the study

Figure 1-2 shows the framework of this study. The thesis includes five main parts, the introduction, literature review, research method, findings and discussion and conclusions.

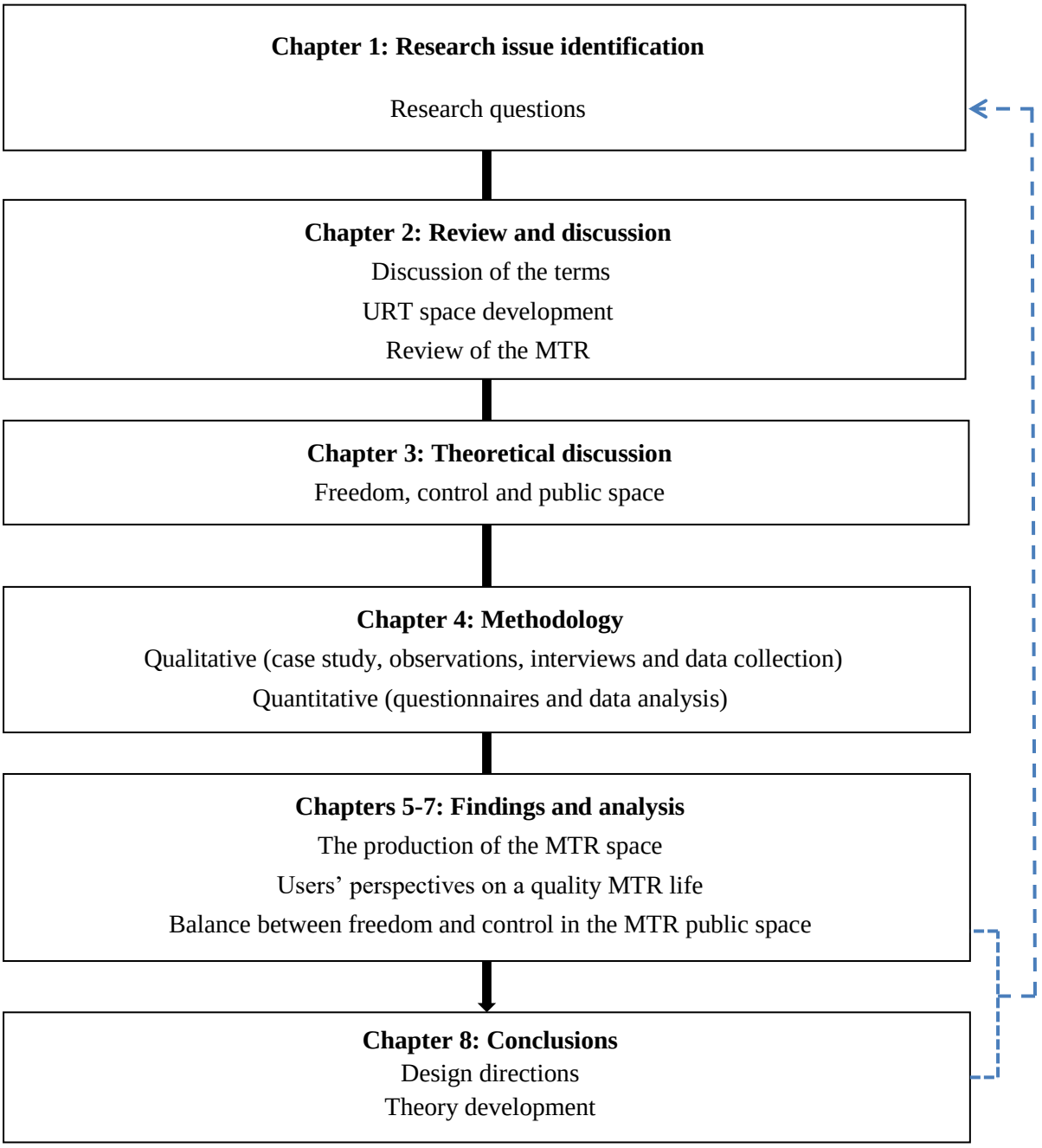


Figure 1-2 The framework of the study

Chapter 1 introduces the study, presenting the research aims, hypothesis and research methods. The research scope and significance are also discussed. This chapter gives the overall structure of the study. It indicates the relationships between the chapters.

Chapters 2 and 3 are literature reviews. Chapter 2 considers the literature from a historical viewpoint and Chapter 3 from a theoretical perspective.

Chapter 2 reviews the definitions of the terms in this research topic to identify the research content and scope. The most recent definitions of public space are presented to clarify its characteristics. EDL and quality of life (QoL) are both defined by reviewing scholars' viewpoints over time and across cultures (Siu, 2005a). A historical and cultural review of the URT space is discussed. This chapter also reviews the development of the URT space and summarises its characteristics. A deep understanding of the URT space is useful for conducting further research about users' behaviour and analysing space phenomena. The development of the Hong Kong MTR is also reviewed.

Chapter 3 discusses the two factors in public space, freedom and control, which are the core concepts of this study. The two terms are defined from different perspectives by reviewing different scholars' viewpoints. Freedom and control in the public space, their relationships with public space, related issues in public space and how they exist in space are discussed and analysed. The chapter focuses on the relationship between freedom and control in the public space. The theoretical discussion of freedom and control is used to achieve an in-depth understanding of the regulations behind the phenomena and the nature of behaviour in further research on the URT space.

Chapter 4 discusses the methodology used in the study. The purpose of this study is to explore the relationships between people, between people and space, and between people and policies. Qualitative methods are mainly used, with some quantitative methods used to complement these methods, producing valid, reliable findings. The qualitative methods used are a case study, structured observations, unstructured observations, direct interviews and questionnaires. These methods complement one another. The data are analysed quantitatively. The combined method overcomes the shortages of each method and thus satisfies the research objectives.

Chapter 5 discusses citizens' EDLs in the MTR public space, analysing how people spend their EDLs, how they interact with other people and how they behave in the MTR public space. The users of the MTR space are divided into groups and the space is divided into levels. This organised information indicates a clear process by which EDL is produced and the role of the MTR life in people's EDLs and city life.

Chapter 6 examines a quality MTR life from the needs perspective. The analysis in Chapter 5 provides the factors that affect the quality of the MTR EDL. Based on the Maslow theory, a three-dimensional comparison between age, gender and background is performed. People's requirements for an MTR life are sequenced and a needs pyramid of quality MTR life is constructed. This study also creatively proposes a method of using big data from social Internet sites in design work. A model for discovering design opportunities in the MTR space is proposed.

Chapter 7 uses the analysis of the MTR needs pyramid to analyse the relationships between quality MTR life, freedom and control. It points out the significance of balancing freedom

and control. This chapter analyses the abstract and concrete forms of freedom and control. It systematically analyses how freedom and control exist in the public space and work on that space. The concrete form of control in public space is boundaries, which are categorised and characterised. Profound design instructions and policy-making methods are proposed using the identified nature of freedom and control in public space.

Chapter 8 concludes the study. It answers each research question mentioned in the first chapter. The limitations of the study and future work are discussed.

CHAPTER 2 Literature review

2.1 Introduction

This chapter discusses the terms related to the topic, the development of URT systems and the history of Hong Kong's MTR system. This literature review provides overall impressions of the research topic, historical development and the URT life.

Public space, EDL, quality life and URT are discussed and used to define the research scope and target. Freedom and control are discussed in Chapter 3.

The historical review of the URT system encompasses the development of the system in different cities, cultures and eras. How the URT life is produced and how its role in cities and in citizens' lives has changed are illustrated. As a new form of urban public space, the character of the URT space is reviewed.

The development of the Hong Kong MTR is reviewed. The MTR's history is divided into three processes, the growth age from 1970 to 1989, the development age from 1990 to 2012 and the golden age from 2010 to the present. The clear historical background and development of the Hong Kong MTR is presented, which can help a better understanding of the MTR life.

2.2 Discussion of the terms

2.2.1 Public space

In the term 'public space', 'public' describes the character, ownership and targeted users of the 'space'(Siu, 2005b). What a space is called strongly influences how it is designed and used. The name of a space defines what it is for and what behaviour is expected and accepted in it (Franck & Paxson, 1989, p. 133). At the beginning of Altman and Zube's *Public Spaces and Places* (1989), the authors defined public as follows:

> The term public connotes the idea that these settings are accessible to everyone – people of a community, state or nation, regardless of age, gender, ethnicity, physical handicap or other characters. In this context, public does not necessarily related to ownership, but rather to use. (p. 1)

In *Public Space* (1994), Hsia used 'for all' to explain the nature of 'public'. This explanation is tracked from traditional Chinese, with 'all' corresponding to the different kinds of people in Altman's definition.

The binary opposite of public is 'private', which has often been used in explanations. Hsia (1994) used non-private to define public. In *Women and Urban Public Space*, Franck and Paxson (1989) found that ownership, access and control could be used to analyse the meanings of public and private. These three elements are of key importance in analysing public spaces.

Different scholars have defined public space from different perspectives. 'Publicness' is one of the standards used to define public space. Franck and Paxson (1989) defined publicness as:

> The concept of "publicness" refers both to the physical attributions of a space and, more important, to its social and behavioural features. …Public space is the common ground where civility and our collective sense of what may be called publicness are developed and expressed. (p. 131)

Publicness is based on face to face interactions between diverse types of people. These valuable interactions should be provided by the public space (Siu, 2010b). The greater the diversity of people and activities allowed to manifest in a space, the greater its publicness (Franck & Paxson, 1989).

Some scholars have defined the public space from the functional perspective. They have considered public space to be a place that allows public gathering, communication and easy interactions (Aubock & Cejka, 1996; Hsia, 1994; Lynch & Carr, 1995). Public spaces not only serve daily needs, but can also be placed together for special occasions (Carr, 1992). A public space is also considered a participatory landscape (Franck & Paxson, 1989). People can be directly involved in a public space through both bodily actions and visual participation. The public realm is publically 'perceived', 'valued' and 'controlled' (Altman, 1989). As Lofland (1984) noted, a public space is both a stage and theatre. It is a place where the tragic, comic and tender aspects of relationships between friends, neighbours, relatives and lovers take place.

Public space has been widely defined by different scholars from different perspectives. In its long history, public space has been defined differently in different periods and places, depending on the culture, policy and economic background. The concept of public space can be traced back to ancient Greece and Rome (Carr, 1992). In Greece, a market and

meeting place called the ‘agora’ emerged with the development of civilisation. Mumford (1961) stressed that the most important function of the agora was daily communication and formal and informal assembly. The public space was also considered a democratic space where citizens could vote on governmental and judicial issues, hold meetings and conduct conversations with others (Carmona, de Magalhães & Hammond, 2008).

The cities of the Roman Empire were centred around the ‘forum’, which combined the functions of the Greek acropolis and agora. The form and function of public space seems to have been far richer in Roman forums than in Greek agoras. After developing into a complete community, the public expressed itself in shrines, temples, council houses and justice halls (Mumford, 1961). The forum, existing in enclosed, semi-closed and open spaces, was used for commerce, religious congregation, political assembly, athletics and informal meetings (Mumford, 1961).

During the medieval period, commercial and other exchange activities occurred in public spaces and a weekly event emerged outside the city wall (Carr, 1992). The market place became a new kind of public space. People gathered in market squares and plazas in enormous numbers. Victories were celebrated with bonfires on piazzas (Girouard, 1985). However, the great plazas of the Renaissance period were carefully planned and designed, and were quite different from the public spaces of the Middle Ages. Some of these plazas were too large and lacked connections to the surrounding city (Carr, 1992).

In Soviet cities, public space was also called ‘free space’, ‘open space’ or ‘social space’, and typically referred to spaces that lacked buildings. Public space was considered a visual symbol of the power of communism (Engel, 2006).

In traditional Chinese culture, public space has always belonged to the state and been managed/controlled by the government. It is a publicly used space for all of the people (Hsia, 1994). Hou (2010) researched Asian cities and found their public spaces to be everyday spaces where citizens participated in a variety of public activities.

The definitions of public space through history are summarised in Table 2-1.

Table 2-1 The definitions of public space in different eras and places.

Time/ Place	Definition
Greek agora	The agora was a place of assembly for citizens to conduct business, engage in trade and discuss political issues. (Rubenstein, 1992) It was also a democratic space in which the Greeks discussed government issues and voted on matters of justice. (Mumford, 1961)
Rome	Different groups of people began to participate in different types of public activities. It was also used as a representation of state power. (Fagan, 2002)
Medieval Europe	Piazzas and city streets constituted the major public space of the Middle Ages. The piazza was not only a public assemble place, but also a symbol of freedom for the city.
Renaissance	Public space in this period was at the disposal of the powerful and influential. In scale, form and design, it followed the requirements of the upper class and the state. (Borsay, 1989)
Soviet square	Public space was owned and controlled by the state, which held absolute power over its use. (Engel, 2006)
East	Public space is a commercial site for trade and business exchange and a recreational venue offering a variety of leisure activities.
Contemporary public space	Public space is everyday space in which citizens participate in a variety of public activities. The definition of public space has become far richer and more complex in modern society. Carmona et al. (2008) claimed that public space can comprise both the natural environment and freely

	accessible artificial building. It can include streets, squares and parks that have residential, commercial or communal functions. However, no matter the function or location of the space, public access is always unrestricted.

These definitions of public space indicate that public space has evolved from a site for EDL to a tool of power and wealth, from a place for people to an important urban space for the public and private sectors (Xing & Siu, 2010). The development of and changes in public space have demonstrated its diverse requirements in different eras. Public space has played different roles in society and people's EDLs. The process is summarised in Figure 2-1.

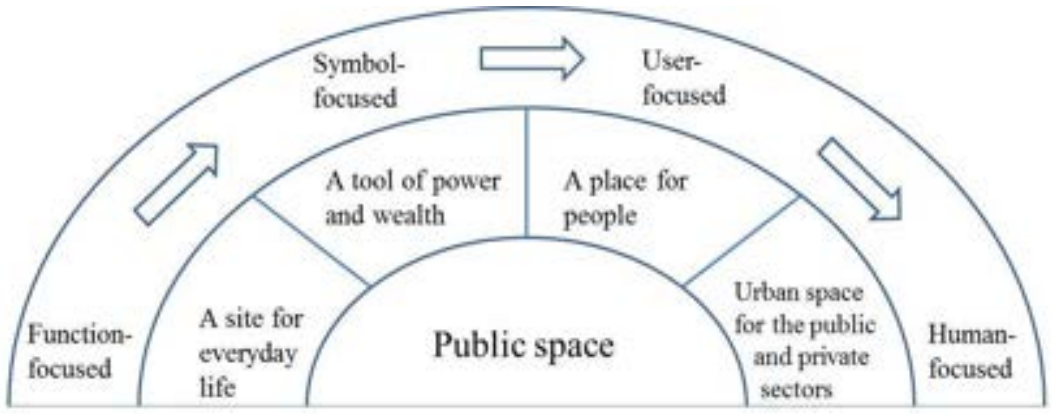


Figure 2-1 The development of public space

Public space has a long history with cities. In summary, in both the ancient world and modern times, public space has provided a physical setting for public activities. It is a reflection of culture, private beliefs, public values and individuals (Berman, 1986). It is a mirror of individuals' behaviour, social processes and often-conflicting public values. Meanwhile, as stated by Siu (2010b),Among all of the spaces being changed under the recent urban development, Public space, such as parks and playgrounds, is one of the

significant urban elements affecting people's (including residents and visitors) quality of life. It is part of people's EDLs.

2.2.2 Everyday life (space)

Currently, EDL is widely researched by scholars in different fields. EDL includes a great scale and people cannot live without EDL. Human history is built on the everyday activities of human beings (Heller, 1984). EDL is the outcome and product of human work and social existence.

From a historical standpoint, one of the first mentions of EDL is found in Plato's criticism of the upside down existence (Gouldner, 1975). He considered EDL to be negative and pointed out that people in the EDL sphere pursue the things that are of less value, such as wealth, fame, ordinary appetites and earthly loves, instead of reflective and rational concerns. Modern Western theory had a critical attitude towards EDL and considered it to be something from which one must detach oneself. However, the artist Euripides promoted the transvaluation of EDL. Euripides stressed that there are more roles for subordinate people who are unworthy or incapable of heroic pursuits. This is a crisis of the heroics culture.

Attitudes towards EDL in the West were then shaped by Christianity. Christianity described the EDL sphere as 'worldly', 'fleshy' and referring to 'appetites'. It considered EDL to be a subordinate realm or a spiritual prelude. EDL was considered 'a waiting room', 'a moral gymnasium' or 'a testing ground' in which men wait and prepare their souls for eternity. Christianity's attitude towards EDL was also negative.

However, the enlightenment brought a new chapter of EDL history. It stressed the significance of EDL and emphasised that happiness can be happen in EDL. The enlightenment also emphasised that the EDL sphere was probably the only sphere of fulfilment. The enlightenment's attitude towards EDL was positive (Gouldner, 1975, pp. 418-419).

From the historical definitions of EDL, it can be found that EDL was the object and the instrument of a struggle. EDL was used by the enlightenment as an instrument to critique the ancient hierarchies of lineage and of the church. Gouldner (1975) showed that EDL was also a tacit critique of politics, as politics is an arena of struggle, competition and conflict between parties and leaders.

Historical descriptions of EDL have moved from negative to positive. In the recent literature, EDL has often been defined from a more objective perspective. According to Inglis' *Culture and Everyday Life* (2005), Gouldner's *Sociology and Everyday Life* (1975) and Heller's *Everyday Life* (1984), EDL has been generally defined as the 'routine life' of the 'ordinary people', the 'small people' and the 'grassroots class'. As Giddens (1990; cited in Inglis, 2005) stated:

> Nothing seems more transparently obvious than our day-to-day activities. All of us spend our days doing things that are so routine and mundane that it hardly seems worth talking about them…We live day-to-day lives in which for most of what we can't give any reason. We wake up, eat food, go to work...These things are part of a tissue of day-to-day social activities, which really isn't explained. (p. 3)

Besides routine, people have also defined EDL as 'repetitive'. In Lüdtke's (1995) *What is the History of Everyday Life and Who are its Practitioners*, repetitiveness was described as an obvious characteristic of EDL. Every thought and action in EDL becomes pragmatic. Shields (1999, p. 69) also stated that EDL is a collection of things and activities that are repetitive and banal. Philosophers and social theorists have ignored EDL to rather focus on great events or institutions.

EDL is so routine that people seldom see the value of it and sometimes ignore it. If people are asked to describe their daily lives, it is hard to find anything interesting and they cannot give reasons for their actions. EDL just happens naturally. If EDL is so banal, why are so many scholars from different fields interested in it?

EDL contains more significance than might be first apparent. Inglis (2005) pointed out in *Culture and Everyday Life* that EDL can tell us about most of the agents and relationships in a society. EDL can enrich sociological knowledge, fleshing out general ideas and theories. EDL is also a reflection of social conflicts. It is the basis of current history. Conflict in EDL generates conflict across society, which promotes social development. Simmel (1950) explained that 'even the most banal externalities of life are expressions of the wider social and culture order' (p. 3).

EDL can strongly affect people. Different people have different sorts of EDLs. The everyday routines and activities that they engage in depend on their social positions (Inglis, 2005). However, EDL has the same meaning for most people. De Certeau (1998) defined EDL:

> EDL is what we are given every day (or what is willed to us), what press[es] us, even oppress[es] us, because there does exist an oppression of the present. Every morning, what we take up again, on awaking, is the weight of life, the difficulty of living or of living in a certain condition, with particular weakness or desire. EDL is what holds us intimately, from the inside. (p. 3)

Everyday space is often defined with everyday life. Lynch (1960) simply defined everyday space as the space in which EDL is carried out. Heller (1984) also mentioned that EDL takes place in its own space and that this space can be named everyday space. In this definition, EDL has a frontier and this frontier is the limit of the effective radius of action and movement. Everyday space is not only open space, such as streets, lanes and small empty spaces between buildings and parks, but is also the space that illustrates EDL.

In summary, EDLs are the lives of ordinary people, concerned with housing and homelessness, clothing and nakedness, eating habits and hunger, people's loves and hates, their quarrels and co-operation, memories, anxieties and hopes for the future (Eley, 1995). However, great social relationships and conflicts can be found in ordinary, routine life. EDL is the reproduction of the person (Heller, 1984) and thus it is meaningful to examine EDL and its space.

2.2.3 Quality of life (space)

It is not easy to define 'quality'. Quality is a general standard or level representing goodness and excellence. The standard changes according to people, time, space and things. It is not easy to strictly define what the standard for quality is as it is a relative rather than an

absolute concept. In the sociology and psychology literature, QoL has been defined from different perspectives and different methods of evaluating QoL have been proposed. QoL can be evaluated according to health status (Bowling, 1997), activities of daily living (Katz et al., 1963), disability (Townsend, 1962), psychological wellbeing, happiness or morale (Andrews, 1986; Andrews & Withey, 1976; Larson, 1978). QoL is also related to the satisfaction of peoples' needs. Sirgy (1986) mentioned that the higher the need satisfaction of the majority of a society, the greater the QoL of that society. Maslow (1943) proposed a hierarchy of needs theory, in which people are only free to pursue higher needs, such as control, autonomy, self-realisation and pleasure, once their fundamental needs are satisfied. Both fundamental and higher needs contribute to good QoL.

Urban space is the area in which EDL happens. Urban environments are places that profoundly affect public life (Carr, 1992). A quality urban space is the foundation of quality life. In *The Good City Form*, Lynch (1984) clearly described what a good city form is and what kind of city space can produce a high quality city life:

> What is good city form? … It is vital (safe, congruent, transparent, legible, unfolding and significant); it is well fitted (a close match of form and behaviour [that] is stable, manipulable and resilient); it is accessible (diverse, equitable and locally manageable); and it is well controlled (congruent, certain, responsible and intermittently loose). And all of these are achieved with justice and internal efficiency. (p. 167)

Lynch's theory about the form of a quality city form uses specific words that correspond to deep, comprehensive meanings of city life and space design.

Vitality: A good environment is a habitat that can maintain the normal and healthy life of an individual and the survival of a species. A healthy environment must give sustenance, safety and consonance (Lynch, 1984). Sustenance means providing adequate sources of the food, water and energy needed to sustain life. These are the basic requirements of normal city life, not just a quality life. Safety means a space with no danger, disease or poisons. It is a physically secure environment. Finally, the environment should be 'consonant' with the basic biological structure of the human being. The space and its facilities should be designed according to people's life rhythms and ergonomics. Vitality is significant for a city and city life. However, it is impossible to produce an absolutely healthy, safe space. The aim is a reasonable level of risk, not the total absence of risk.

Sense: The sense of a settlement is how the place is perceived and identified. This feeling recalls memories and makes links between space and time. As Lynch (1984) said:

> A good place is one which, in some way appropriate to the person and her culture, makes her aware of her community, her past, the web of life and the universe of time and space in which those are contained. (p. 136)

The sense of a place depends on the form of the space and on the observer's culture, temperament, status and experiences. The identity of a place provides the place with a vivid, distinct, unique character. This quality is considered to be a good standard by designers.

Fit: The fit of a settlement is the match between the residents' habits and the spatial environment. A place's fitness can be determined by observing the inhabitants' activities and interviewing them with questionnaires. Fitness can be achieved by changing a place to match people's behaviour and by modifying the people to fit the place. A space that

matches the basic human requirements of warmth, light, dryness, access and body scale can be made fit in a reasonable time. In general, fitness deals with place and actual behaviour or, at most, behaviour that is consciously desired.

Access: An ideal city is described as a centre providing easy access to a variety of goods, services and people. Access has several aspects. The basic aspect is access to people, such as family, friends, workmates and strangers. Communication with others is a basic activity of daily life required for survival in a society. The second aspect is access to human activities such as education, entertainment and religion activities. These activities construct peoples' life and maintain the normal rhythms of society. The final aspect is access to sources. Only when people have access to sufficient food, water, energy and other goods will their lives be full and will the city have vitality.

Control: People have the authority to control the land. Control over a space leads to feelings of satisfaction, pride or submission. Control may become the evaluation of a settlement. People should first obtain the authority of presence, behaving freely, using the space's facilities freely, appropriation, modification and disposition. This authority is another form of control. The freedom they obtain corresponds to their control. However, responsible control does not mean power, status or dominance. Instead, proper control guarantees a harmonious society and space. Communities depend on good control of their living spaces.

Lynch's (1984) theory offers ways to measure a quality life (space). Some of Lynch's viewpoints are similar to Maslow's (1943) hierarchy of needs, in which needs are assigned to five hierarchically organised levels. Physiological needs are on the bottom of the hierarchy, followed by safety needs, social needs and esteem needs. Physiological, safety, social and esteem needs are deficiency needs. The top level is self-actualisation, also known

as growth needs (Maslow, 1943). Needs should be fulfilled from low level to high level to construct a quality life.

In *Public Space*, Carr (1992) developed the needs that should be met by a public space. Satisfying these needs are the basic factors for constructing a quality life:

> It is important to examine needs, not only because they explain the use of places but also because use is important to success. Places that do not meet people's needs or that serve no important functions for people will be underused and unsuccessful. (p. 91)

The five types of needs from public spaces are comfort, relaxation, passive engagement with the environment, active engagement with the environment and discovery (Carr, 1992).

Comfort is a basic need. Similar to Maslow's physical needs and Lynch's vitality characteristics, comfort refers to the need for food, drink, shelter from the elements and a place to rest when satisfied. A public space should first fulfil comfort needs, as it is difficult to perceive how other needs can be met if comfort is not obtained. A comfortable public space should provide enough sunshine, sufficient seating and toilets.

Relaxation is a higher-level need and is a more developed state than comfort. A sense of psychological comfort may be a prerequisite of relaxation (p. 104).

Passive engagement as another public space need that leads to relaxation. Whyte (1980) found that people-watching was the most popular activity in downtown plazas. People are drawn to watch other peoples' activities. Performers, formal activities and public art are

also all attractive in a public space. This passive engagement makes people's public lives interesting and alive.

Active engagement represents a more direct interaction with a place and the people within it. People desire more direct contact with other people. A public place can provide a link between people and promote strangers talking to each other. This social connection also corresponds to Maslow's social needs.

A quality public space may lead to a quality public life. As Carr (1992) stated, a quality public space (life) can offer relief from the stress of work, providing opportunities for relaxation, entertainment and social contact.

2.2.4 Urban rapid transit

Rapid transit is a type of high-capacity public transport in cities, agglomerations and metropolitan areas (Chicago Transit Authority, 1974). Since the first URT system was constructed in 1863, URT has had a long history of more than a hundred years. One hundred and eighty-seven URTs have been constructed around the world already and that number is still increasing (Metrobits, 2013). URT systems have advantages when transporting large numbers of people at high speed and with little use of land. URT systems in other countries are also known as metros, undergrounds, tubes and subways, among others.

The first URT system was constructed in London in 1963. It is now part of the London Underground. This rapid transit system is called the London Underground, the Tube or the

Underground by its users (Transport for London, n.d.). The informal term ‘tube’ is also used for the deep-underground tunnelled systems. However, strictly speaking, ‘the Underground’ should only refer to the deep lines that run in bored circular tunnels, not those constructed near to the surface (James, 1977).

The New York City Subway, which is the world’s largest URT system, was constructed in 1868. In a transit sense, ‘subway’ refers to either a rapid transit system or a light rail system that travels underground (Cervero, 1998). This term is most commonly used in the United States and the English-speaking parts of Canada. It mostly refers to the underground parts of the system, but sometimes refers to the full system. ‘Metro’ was originally the informal, short version of the French Le Métropolitain, but has become a common word used to describe subway networks (Railway Technology, n.d.).

The meaning of ‘metro’ is more clear and detailed than that of subway. It refers to an urban, electric rail transport system with high capacity and high frequency of service. Metros operate in both tunnels and elevated structures. Some even operate at the surface, physically separated from other traffic.

In German-speaking Germany, Austria and parts of Switzerland, the terms U-Bahn, short for untergrundbahn, meaning ‘underground railway’, and S-Bahn, short for ‘stadtschnellbahn’, meaning ‘fast city train’, are used. In Singapore and Taiwan, the subway is called the Municipal Rapid Transit, or MRT. The Hong Kong subway is commonly called the Mass Transit Railway, or MTR.

Unlike other city public transport, tunnels or elevated railways are parts of URT systems. The line is separated into several parts by stations (Rapid Transit, n.d.). Each URT system

consists of at least one line. Most URT systems operate several lines. These lines are described with different names, colours or numbering. Some of the lines share the same tracks and others have their own tracks. There are many crossover points and there is always a central terminal or multiple interchange stations between lines in the city centre. This central station can be used to transfer to most of the lines and it always covers the main business, financial and cultural area. Along with the usual radial web, some systems have a circular line around the city centre, such as Tokyo's Yamanote Line and the Moscow Metro's Koltsevaya Line. Some URT systems extend to the boundary of the city or the inner ring of the suburbs. There are frequent train station stops in the inner ring of the suburbs. The suburbs may then become a separate transportation net, such as the high rail in the Hong Kong MTR. In some cases, there are no obvious differences between the urban rapid transit and suburban systems (Chicago Transit Authority, 1974).

The station is the hub of the URT system. It allows passengers to board and disembark from trains. Stations are payment check and transfer points. Passengers can transfer to buses or other city traffic. URT systems are supplemented by other systems, such as buses, trams or commuter rail, which is convenient for citizens. Connections between systems reduce the long walking distances between outside access points. Bus or tram feeder systems transport people to rapid transit stops. Some URT stations are integrated into shopping centres or large nearby commercial buildings.

The URT system is a relatively new form of transportation, so the environment inside is often good. As Bradley (2007, p. 43) pointed out, Wellington Williams, one of the earliest proponents of sub-railways for London, described the future subway as 'light' and 'airy'. He wished the underground and runnels on the top to be the same as a London street, with 'goods, passengers and cattle'. He also argued that the removal of traffic from the street

should ease some of the inconveniences and annoyances of the streets. A pamphlet described an enticing vision of the proposed metropolitan: a dust-free subway, roomy, dry platforms and cars that would not be obliged to wait for the lazy or obstinate truck man (Brooks, 1997, p. 19). Matti (2006, p. 281) showed that they considered the metro to be a cheaper, safer means of transport and thought that it would solve traffic and environmental pollution problems. It was believed that the city would change into a cosmopolitan city with a sense of discipline and cleanliness.

With the development of technology and modern society, the definition of a URT system has become complex and diverse. Its territory and boundaries have changed, becoming comprehensive and ambiguous. The URT system is a public space with facilities, stations, ways and users. It covers a large proportion of the city and will continue to gradually obtain a more profound definition.

2.3 Review of urban rail transit

The URT system has a history of more than a century. It is like an old man underground, watching how the city develops, how its people change and how history unfolds. It has become a part of the city's history and has experienced tremendous development. The URT system has changed from a basic transportation system to an underground city, and it is expected to develop further.

2.3.1 The development of the urban rail transit system

In any discussion of the history of URT systems, the globally significant London Underground and New York City Subway systems must be mentioned. These were the first two URT systems in the world and have guided the development of all subsequent URT systems.

Transport tool at the beginning of construction

Transportation is the basic function of a URT system. The original reason for rapid transit was to solve transport problems and the attendant economic, security and hygiene problems. The construction of a new URT system to move citizens about aims to solve the crowding, chaos and congestion problems caused by an increasing population. Matti (2006) mentioned that in modern times, in developed countries, planning for metro systems usually begins when a city's population exceeds one million. When the population grows further to two or three million, there are too many new problems. Most cities construct URT systems for transportation reasons.

London was the first city to construct a rapid transit system. It did not possess a popular transport system until the public carriage was introduced in 1829. From 1800 to 1831, the population of London increased from 1 million to 1.75 million. The city was full of houses and the streets were narrow and crowded. The transport problem became intractable and urgent. London was described as a dirty, crowded and unhealthy city during that time. Bradley (2007) mentioned that peoples' lives were threatened due to the scarcity of food and confined cabins. London's already weakened working class was attacked by cholera in 1832 and the slum residents continued to succumb to the disease throughout the 1840s and 1850s.

When the cholera epidemic menaced London in early 1832, Pearson, the chairman of the city of London's board of health, decided to move respectable poor labourers to the healthy suburbs. Those moving needed a reasonably priced transport service as the disease had already hit the poor the hardest. This was one of the original plans for a London Tube. Pearson's efforts faced numerous delays. The railway opened to the public in January 1863 (Bradley, 2007, p. 2). Euston Station, opened in 1837, and King's Cross, built in 1852, were two important railway stations that terminated along London's north perimeter. Victory Station (1860), Waterloo (1848) and Charing Cross (1864) were built along the south perimeter. The transit railway helped to dispel a variety of popular fears about travelling below ground, a style of transport many people associated with unsavoury journeys in the dark realms of ancient mythology (Cudahy, 2003, p. 124). When the first rapid transit was opened to the masses, many thousands were able to indulge their curiosity about travelling under the streets of the metropolis. Over the next several years, London's rapid transit expanded. Its route eventually became part of a 13 mile circumferential transit line.

New York City faced similar transportation problems before the construction of its subway. The disharmony between transit patterns and New York's geographic form generated many problems. In Cudahy's book *Under the Sidewalks of New York* (1995), he claimed:

> From 1850 to 1865 the street surface horse railways were sufficient for the requirements of [the] travelling public. As the city grew rapidly, the congestion spreading northward[s], to and beyond the Harlem River [and] the service of surface roads became entirely inadequate. (p. 15)

Until the late 1880s, the various forms of street transport used to move people across and uptown were all propelled by horses. The animal themselves presented their own problems,

including environment damage, which made life in the city not only depressing but also life threatening. Citizens constantly complained of 'pulverised horse dung blowing in their faces'. In 1908, Harold Bole, writing in Appleton's magazine, claimed that each year, 20,000 New Yorkers died from 'maladies that fly in the dust, created mainly by horse manure'.

In addition to damaging the citizens' health, the congestion had serious negative economic consequences (Brooks, 1997). Merchants warned that the city faced an economic crisis as the cost of moving goods through congested streets rose. Tax and rent also rose as the city became congested. City businessmen realised that the situation was not only a nuisance for their daily commute but also threatened the financial health of the city, nation and empire (Brooks, 1997, pp. 10-32). A new rapid transit system was needed to move merchants, artisans and the poor out of the crowded downtown streets into areas of small huts and separate villas. In 1868, 44 well-known New York businessmen formed the New York City Central Underground Railway Company to build a line from the city hall to the Harlem River.

Based on the Metrobits world metro database (2013), there are 189 metro systems worldwide today, including 89 metros and 21 subways. The growth in URT system construction is shown in Figure 2-2.

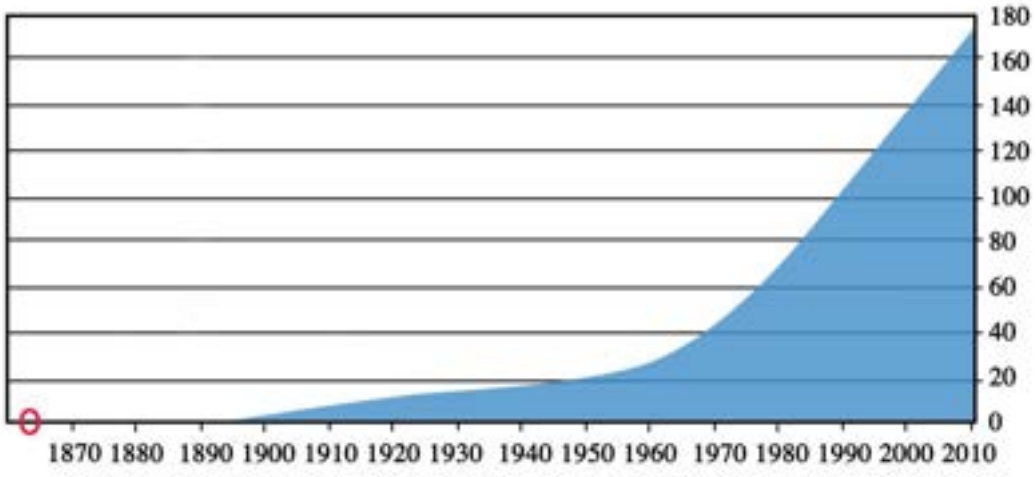


Figure 2-2 The growth in URT system construction

The URT system is a special, creative transport tool that can solve social problems. It has reduced traffic pressure from emergency levels in a number of countries over the last century. The London Underground system carries three million passengers a day between 301 stations (Bradley, 2007, p. 201). The New York Subway delivers over 1.604 billion rides, averaging over five million on weekdays, over three million on Saturdays and over two million on Sundays. In 2011, the Hong Kong MTR carried on average four million passengers each day (MTR, n.d.). Taipei MRT also transfers two million passengers each day (Metro Taipei, n.d.). Although subways are diverse today, the basic, original function of the subway has not changed.

Shelter during wartime

Although most subways were constructed for traffic reasons, some were initially built for martial reasons. The nature of the subway means that it can be used as a shelter. Underground space is considered the most secure place to dwell. Williams (2008) stated that it is natural to find peace and security in an underground room, as it is the original place for life, called the ‘mother land’.

The Moscow Metro was considered the most beautiful subway when it was constructed in 1935. The population of Moscow was less than two million at the time and did not suffer from congested traffic. The government constructed the Metro for military reason. The Moscow Metro can shelter four million people. It is the deepest metro in the world and some of its stations are more than 100 metres deep. Even today, it takes over three minutes to reach the underground subways from the surface using a high-speed electric lift. During the Soviet-German War, the Moscow Metro played a significant role in protecting soldiers and residents.

The same process also occurred in the city of Beijing. The first line of the Beijing Metro was finished in 1969, however, it was not open to residents until 1981. The subway was originally designed as a shelter. The material used is firm to protect against assault from the air. Besides the normal ventilation, special channels, explosion-proof wave devices, dust removal equipment and filtrating equipment were installed to protect the people from harm. The Beijing government originally ranked the Metro's civil air defence role as of equal importance as its transport function. However, recently, the protection standards have been reduced to accelerate subway construction and reduce the budget (Development Tiexue, 2013).

The London Underground is another example of shelter. The function and nature of the Underground as a shelter was not designed on purpose, but naturally arose in the war era. When war came, London looked beneath her streets, like a nervous person looking beneath the bed. People preferred to travel in the well-lit tube cars rather than slow bus and tram journeys through darkened street (Croome & Jackson, 1993). At the start of the air bombardment, the Underground Board made preparations to give shelter in its Tube stations

to people caught in the streets. In September 1917, there were an unprecedented six air raids in the space of a month. The attack was so persistent that it led to the first mass use of the stations as shelters.

Warned by the 1917-1918 experience and the rapid development of aircraft, the post-war government devoted considerable, detailed thought to air-raid precautions. Anti-gas features were included in all new Tube stations and the post office made plans for an emergency communication system using the Tube tunnels. In 1938, the London Passenger Transport Act authorised the Underground Board to make agreements for the supply of electricity in emergencies. In Croome and Jackson's book, *Rails through the Clay*, they stressed the many reasons for the popularity of the Tube as a shelter:

> The stations were easily accessible to many, and provided companionship and warmth with a very high level of security against the bomb then in use; the noise of the explosions above could not be heard and it was possible to sleep, or at least rest, in preparation for the work of the following day. There was nothing comparable, as the public shelters provided by the government were either trenches, which were often flooded, or reinforced basement with much less security. (p. 298)

During World War Two, the London Underground helped over 200,000 children escape to the countryside and sheltered 177,500 people. Although the authorities were initially intent on discouraging and preventing people from sleeping in the Tube, they did supply some facilities as people became homeless during the war. After the war, libraries and classrooms were held in some stations. Eight deep-level shelters were constructed under stations (each deep-level shelter could hold 8,000 people) for emergencies later in the war (Bradley, 2007).

The underground part of a subway can protect citizens from war and emergency weather conditions. The subway's role as a shelter is natural and ingenious. Although in the modern peaceful world, new URT systems do not often experience war, sheltering citizens is a significant historical role of the subway that cannot be neglected.

Catalyst for city development

At the beginning of the construction of the New York Subway, the government aimed to decentralise the citizens from the central to the urban city. The New York citizens were told during the 1870s that rapid transit would move merchants, artisans and the poor out of the crowded downtown streets into areas with small cottages and detached villas. Olmsted, writing on *The Future of the New York* (1879; cited in Brooks, 1997, p. 34), expected that New York, with its new elevated railroads, would develop in the same direction as Boston, which was composed of 'healthy', 'charming neighbourhoods' around an urban core. However, New York did not follow Boston. Instead, middle class New Yorkers rushed to live in the city. Houses in the city centre were built with five or more stories, with two or more families on each floor.

Later, skyscrapers emerged in the city centre. Although the distance between offices and factories continued to expand for the New Yorkers, people increasingly moved to the centre of the city to hunt for opportunities (Brook, 1997, p. 116). Brook argued that the skyscraper and the subway were both part of a vicious circle. The subway increased the land value, encouraging state promoters to build taller buildings to earn more money, which attracted more people to work in the city centre. The changes in New York were so fast and so vast because the subway covered the city. The city centre flourished and the urban places developed rapidly. Cemetery at 153rd Street showed the effect of rapid transit: after the

construction of the subway, it changed from a ‘desert waste’ to a prosperous district with many glorious houses and buildings (Brooks, 1997, p. 108). The subway was a stream bringing beneficial ‘water’ to each place it reached.

Brooks (1997) described the relationship between the subway and the city in his book, *Subway City: Riding the Trains, Reading*. The subway has long played a positive role in city development. It was initially both a transportation conduit and a symbol of the city as it connected places in an organised city net. The subway was then a vision and a symbol of optimism in peoples’ eyes. After the 19th century, the subway developed quickly and people began to use it frequently. Although the development of the subway generated some discontentment, it remained associated with dynamism and growth. It was only in the mid-1960s that the subway became the symbol of a population divided against itself and the negative factors of the subway became serious and unavoidable. During this period, the New York City Subway was the symbol of a city in decline. The subway has always seriously affected city development, whether positively or negatively.

A subway not only promotes the value of the land and accelerates economic growth, but also changes the environment around the subway in a city. In Delhi, the construction of the Metro affected the whole city: the shopping malls, cafes, restaurants, cinemas and housing around the Metro were developed or rebuilt. *The New York Times* and *CNN* proposed that the Metro was a vehicle for promoting the bright future of Delhi as a high-tech, rationally planned, competitive city (Matti, 2006, p. 285).

Today, the construction of subway stations is always connected with the land price, city economy, urban development, environment quality and so forth, especially in developing countries. Lewis (2012, p. 3) mentioned that Chinese cities portray subways as necessary

symbols of urban development, saying 'A city is not a true city unless it has a subway system'. Tan (1983) found that the possession of a system of mass rapid transit appeared to be a status symbol for all of the world's greatest cities. In *New Connections: New Architecture, New Urban Environments and the London*, MacCormac stressed the same points:

> One of the tests that distinguishes an ordinary city from a megalopolis is when the intensity of people, the interaction of their activities and the manufacturing of value start to invert logic. Numerous outward signs can mark this stage: embanking or reversing the flow of river, reclaiming land from water, moving people underground. London, the first megalopolis, achieved this status in the 1860s, with the embankment of the Thames, construction of a unified sewer system and the first underground railway, from Farringdon to Paddington.

If the city is compared to a human body, then its streets, hub and tube or URT system can be considered its meridian system. URT systems have had great influence on cities and their citizens' lives. The birth of the subway was a significant turning point for the world, the city and peoples' lives. Although it has resulted in some trouble for society, the subway can also be considered the catalyst for city development in history and in the modern word.

2.3.2 The characteristics of the URT public space

A URT system, as the meridian of a city-body, occupies significant city space. URT life happens in the space around its stations, the space in its stations and the space inside its

compartments. A URT system develops gradually from a link to a space, then from a space to a place, gradually obtained its own characteristics.

Continuous and systematic space

During the subway construction process, almost all URT systems begin by joining several main points. The points are gradually transformed into links, until the system becomes a large web covering the city. Similarly to a spider's web, woven out from a single point, a subway system's influence increases as it fans out to connect more points. People are fluent in this large web, entering and exiting the web every day.

No matter the distance a person travels on the URT system, they remain within the URT space as long as they are inside or around its stations. Unlike other city public spaces, the URT space is not a point but a continuous web connected by subways. Connections happen between each station. Simultaneously, as the URT runs on an exclusive right of way, it separate its passengers from the city. Unlike the most attractive public space, the street, URT space deprives its travellers of the opportunity to interact with the city space during their journeys. In *Public Art in MRT*, Yang (2005) mentioned the 'alienation feature' of the MRT space in Taiwan. He stressed that as the MRT has become the main transport tool for Taiwanese citizens, the citizens' lives have been simplified to 'point to point' lives without purpose, process or unexpected changes. The image of the city has been weakened, as its citizens have developed three-point lives: they move between their dwellings, workplaces and the dark MRT tube (p. 7).

Although the URT space is shared by different people, it is not an open space as it is not open to people without payment. The URT space can be divided into the free space around the

stations, the pay-to-enter areas in the stations and the compartments (tube), as depicted in Figure 2-3.

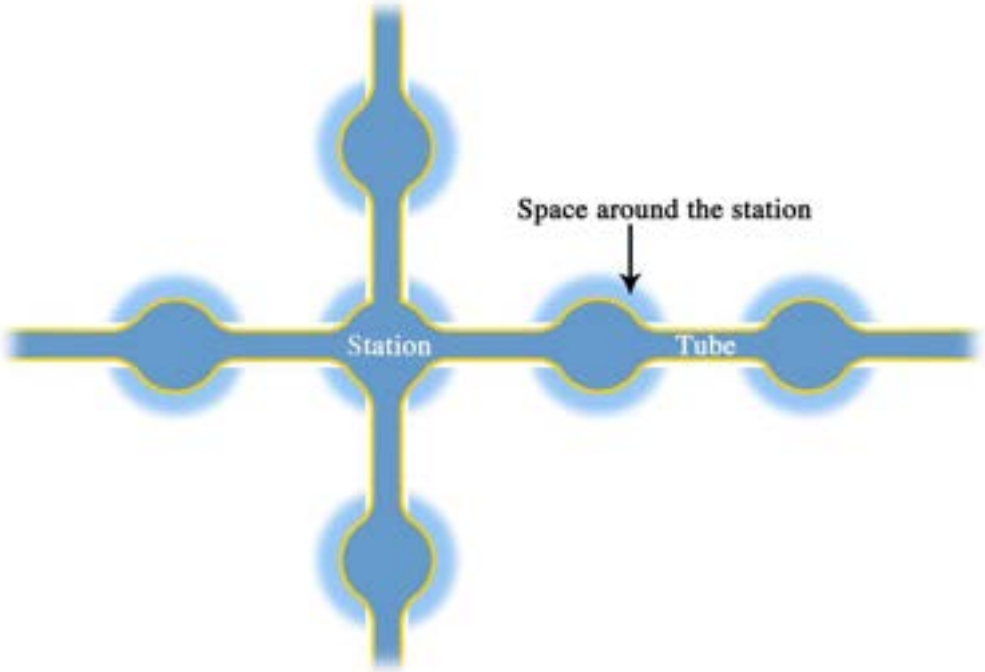


Figure 2-3 The URT space

The subway space is like a carbon molecule, in which each station is a carbon atom and the tube is the carbon bonds between them. The paid access areas and the free areas are distinguished by yellow lines in Figure 2-3. The closer that travellers get to that boundary, the more they connect with the city space. The free area around the station is portrayed with blurry boundaries. Before entering a station, travellers sometimes gather in this free space. Interesting social issues and URT-related activities often happen here. Figure 2-4 and figure 2-5 are architecture drawings of the MTR stations.

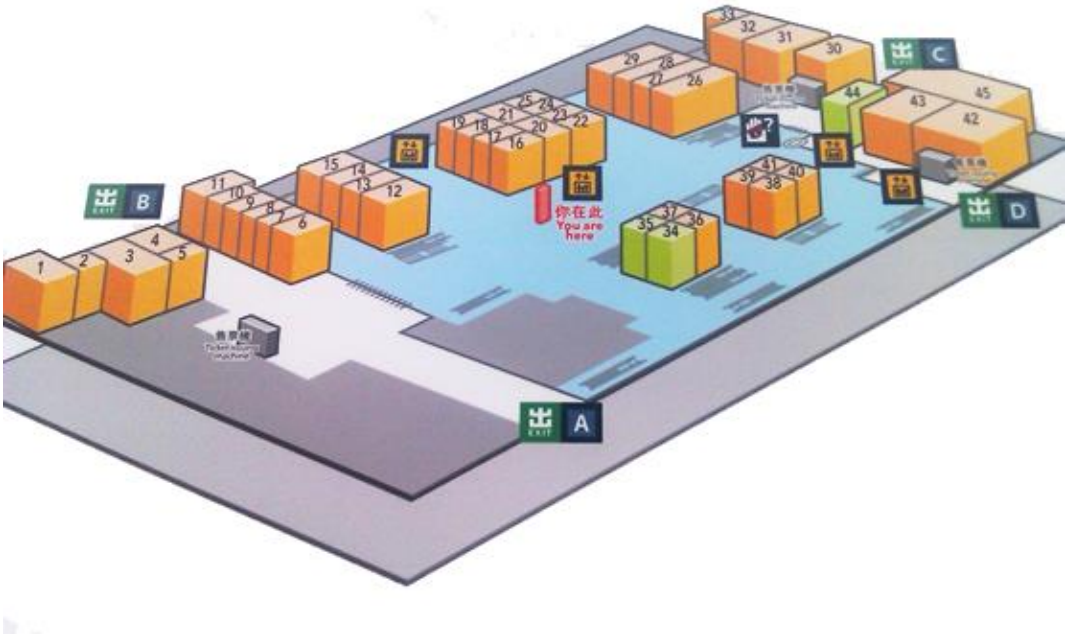


Figure 2-4 Map of Tai Wai Station

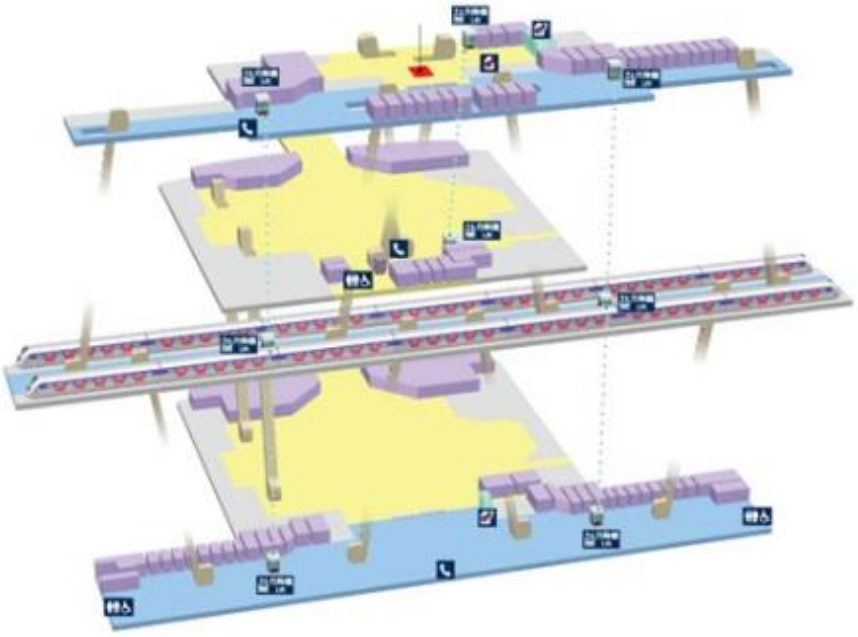


Figure 2-5 Map of Lok Ma Chau Station

In summary, the URT space is a systematic, continuous space located in the city. It is a chargeable, separate space.

Diverse space users

Due to the continuous character of the URT space, people can enter stations freely and exit at any station. The URT is a switching element in the city system and is a manifestation of the city's flow. People do not consider the URT space to be a destination, but a space interface (Yang, 2005). People go to work, go shopping, see friends or perform other daily activities using the URT system. No matter their purpose for travelling, the travellers are all going out. The Chinese consider food, clothing, shelter (housing) and transportation to be the basic necessities of life. As the public transportation system of a city, almost all of the city's citizens can use the URT system. Another significant factor of the URT space is the diversity of its space users.

The main users of the public space in shopping areas are female. The main users of public community parks are the neighbouring residents. The main users of the public area of a campus are students. However, the users of a URT system are not so easily summarised. Every day, many people pour into URT stations, from children who take the URT to school, to those over 70 years old travelling to elderly people's centres; from the poor migrant worker, to the white collar worker in an elegant suit; from the local who has lived in the city his whole life, to the tourist on his first trip in a new city. URT users may be of different education levels, cultures, age and genders, but they share this space. The URT space is a melting pot, used, shared and produced by different people.

Plastic space

The URT system's history of around 150 years is very short, compared with the Greeks' original public space. However, the URT space has shown great space potential. As a URT

system contains people of different occupations, status and countries of birth, it becomes a complex object with contradictions, arguments and even violence. URT systems have strongly plastic features and there are many possibilities in the URT space. Artists, architects and users produce the space from within. Writers and filmmakers portray the space from outside using art and present an abstract space. Art is an important element for showing the space's plasticity. Some people even consider the URT space to be a museum. The URT space offers surprises and possibilities.

The New York Subway was one of the first URT systems to introduce art into its space. The drive for subway art was born in discussions following a lecture at the Artists' Union by the art historian Meyer Schapiro in 1836 in New York. The artists were told to break away from the old capitalist system of artistic patronage by the rich (Brooks, 1997, p. 149). The subway art movement encouraged artists to go into the real lives of ordinary men and women. By communicating with ordinary citizens, the subway tried to be a place where people could find something to look at.

In 1938, Ruth Chaney, the chairman of the Public Use of Art Committee, said the subway was too dark, too dirty and had too many commercial advertisements. Changes were soon made to the subway. The *Daily Worker's* Louise Mitchell (1938; cited in Brooks, 1997, p. 154) also mentioned that the new Moscow Metro had already led the way in decoration and that New York should attempt the same. She quoted with approval from Ruth Chaney's declaration that subway art would bring art to people who never attended museums. It was thought that art in the subway would have a therapeutic effect, as pleasant or peaceful art work would stabilise emotions and result in comfortable feelings, relaxing citizens after the day's tasks. New Yorkers would thus develop healthier minds and bodies (Brooks, 1997, p. 156).

Subway art plays an important role in improving citizens' mental health. Graffiti also plays an important role in subway art. Graffiti is scribbled, scratched or sprayed illegal writing or drawings on walls or other surfaces in public spaces. Once artists realised that the subway space itself could be a medium, they used the system's advertising spaces to transform the underground environment. The creation of each drawing became a kind of performance art. Some artists have aimed to challenge urban despair and self-destructive anger. Other artists have made their art part of the daily journey and tried to reclaim a crucial urban space (Brooks, 1997, pp. 214-215). The artist successfully reproduces the space with art.

Station architecture can also provide many surprises for a city. Art Nouveau generated the deep green bronze casting subway station. In France, the Metro is a famous historic spot. The entrance of the Spanish Bilbao Metro was designed by the great architect Norman Foster. There is no static design for stations; their space can be designed in many forms.

Art bring many possibilities to the URT space. Subway art can be found in many forms, such as writing, subway songs, paintings, prints, illustrations, sculpture, photography, graffiti, advertisements and even performance. All of these art forms can be used to reproduce the URT space.

Subway art demonstrates peoples' lives, affects citizens' emotions and even determines the value of the readers. Although it has been considered a problematic part of the city, part convenience and part ordeal, subway art provides lively, contested debate. As Brooks emphasised, thinking about the connection between a subway and art is the same as thinking about the connection between the subway and its city or urban life.

The URT space can be used as a stage, a painted corridor, a media platform or even a museum. There are many additional unexplored possibilities for this space. The artist, the manager and even the user can shape the space.

2.4 Review of the development of the Hong Kong MTR

2.4.1 1970-1989: The growth age

In the 1960s, Hong Kong experienced industrialisation, economic development and serious traffic problems (Wu & Berman, n.d.). The bus system played a significant role in the Hong Kong transportation system at the time and the two bus companies in Hong Kong, China Motor Bus and Kowloon Motor Bus, began to import larger capacity buses as the population grew to three million. In 1964, the Hong Kong government invited the London Transport Board and Road Research Laboratory to research the future of Hong Kong transportation. In September 1967, the *Hong Kong Mass Transit Study* was published. The report suggested that a mass transit underground railway system should be constructed, using the Kwun Tong, Tsuen Wan, Island and Sha Tin Lines. This was proposed as the most effective way to solve the existing traffic problems and possible future transport pressure from the growing population (Chen & Li, 2012).

In 1968, the government released the predicted population of Hong Kong for 1986, which was 1.2 million less than the prediction on which the *Hong Kong Mass Transit Study* was based. After a long period of discussion and modification, the modified initial system (MIS) was proposed in 1975, which was a shortened system of 15.6 miles from Kwun Tong Station to Chater Station (the current central station). After four years of construction, the

first part of the MTR was finished in 1979. This was a milestone for Hong Kong. As the *Sing Tao Daily* said at the time, 'transportation in Hong Kong [entered] a new century'.

The MIS had only three sections, shown in Figure 2-6. The black line (Kwun Tong Station to Shek Kip Mei Station) containing nine stations was opened on 1 October 1979. The rest of the system was opened on 12 February 1980. The MTR was a fashionable form of transport at the time and the daily passenger load was 850 000. The MIS line platforms were decorated with mosaics to make the stations good-looking and harmonious.

Figure 2-6 Map showing the first section of the MIS

From 1980 to 1985, the Tsuen Wan and Island Lines were opened to all passengers. The design of the Island Line was different from the Kwun Tong and Tsuen Wan Lines. Its platform walls featured arched supports and the colourful walls were decorated with handwriting to reduce the sense of pressure, as shown in Figure 2-7.

Figure 2-7 Handwriting on the colourful walls of an Island Line station

In 1985, when the MTR project was almost finished, traffic congestion began to occur in the sub-bottom tunnel. The government decided to construct a tunnel across the sea. The sub-bottom tunnel was very convenient for citizens. An MTR website was produced.

The MTR became an efficient transportation tool for Hong Kong, which threatened the bus companies. After a discussion about which company should be in charge of shuttle buses, in 1983 China Motor Bus and Kowloon Motor Bus worked together to open the first five shuttle bus lines. Shuttle bus services have since been provided to MTR users. With the construction of the MTR, MTR property also quickly developed. Many buildings have been constructed on or around the MTR stations. The development of the MTR has brought great economic development to Hong Kong.

2.4.2 1990-2012: The development age

In this period, the MTR developed significantly in technology, facilities, environment and culture. In 1997, the railway had been in use for nearly twenty years and had used up half of its designed life. The MTR acquired two new trains for the Kwun Tong, Tsuen Wan and Island Lines to see how users responded to them. The trains featured modern compartments with information lights showing the direction, comfortable seats and a special design for blind people. In 1998, all of the MTR trains were renovated. After the train renovations, the MTR moved on to renovate the platforms and stations. TVs, lifts, air conditioning and platform safety doors were all installed (Chen & Li, 2012).

MTR shops were also developed in this period. In 1982, there were only small convenience stores in the MTR stations, selling paper, bread and water to passengers. Several Heng Seng Banks later moved into the station. As electronic tickets were not yet popularised, people had to queue to buy tickets or change money. Heng Seng Bank not only provided banking services, but also sold tickets. The introduction of the MTR changed people's EDL styles and consumption patterns. The MTR shops grew quickly in the 1990s. At the end of the 1990s, every station had MTR shops selling a range of products. Some stations even had shopping streets.

The MTR tickets also changed. From 1882, ticket vending machines were found in the stations. The machines only sold one kind of ticket with a fixed value and did not give change. The stations thus also contained many money changing machines and Heng Seng Bank branches. From 1986, the ticket vending machines offered tickets of different values. The ticket was then printed on white paper with KCRC on it. In 1993, a new, colourful ticket was introduced. Ticket categories were also introduced, such as the adult single

journey ticket, child journey ticket, stored value ticket and common stored value ticket. Reusable tickets were widely used until the Octopus card was introduced in 1997. The Octopus card brought about a revolution in payment methods in Hong Kong. It is a reusable, contactless, stored value smart card for making electronic payments in online or offline systems in Hong Kong. The Octopus card's Chinese name means the 'go everywhere pass'. It is still widely used by locals and tourists on the MTR.

The MTR's facilities, environment and construction were also improved. The Airport Express and the Tung Chung, Tseung Kwan O Extension, Disney and Ma On Shan Lines were all constructed. In 2007, the Kowloon-Canton Railway Corporation combined with the MRT Corporation Limited. After this combination, the MTR owned 10 lines and 84 stations. The MTR has grown from 140 compartments to 1863 compartments today.

2.4.3 2010-current: The golden age

After its rapid development period, the MTR entered a golden age. Construction continues and new technology are being adopted. The MTR stations connect the whole city, forming the city's skeleton. The West Island Line will be finished in 2014 and the South Island Line is proposed to use unmanned train technology. As of today, there are five lines are under construction and four extension lines planned for the future (Chen & Li, 2012). Rather than only focusing on construction and improving accessibility, the MTR began paying attention to its environment, community life, culture and service. In the MTR report of 2013, the president of the MTR Corporation, Dr Qian, mentioned that the aim and responsibility of the company was youth development, arts and culture development, environmental protection, the construction of a healthy life and community concerns.

The MTR has recently put more effort into its service system. In March 2012, the Hong Kong MTR launched the Listening, Responding Programme to enhance train services, upgrade station facilities and strengthen passenger communications (MTR, n.d.). The MTR was eager to give its passengers a more efficient, pleasant journey. The MTR's Listening, Responding Programme (MTR, 2013) was organised as follows.

- Ease crowding: More train trips were added to the busiest lines.
- Enhance access: New external passenger lifts were opened.
- Add convenience: Public toilet facilities were opened in some old stations.
- Enhance comfort: Two hundred and thirty-one additional seats were installed in stations.
- Deliver more information directly to passengers: Smartphone apps and website content will be enhanced to keep passengers up-to-date with timely, relevant information during their train journeys.
- Quieter train journeys: New inflatable train door seals will make travel quieter.
- More user-friendly customer service centres: New customer service centres that are brighter, more user-friendly and more accessible to people with disabilities will replace the existing centres.
- Improve passenger flow: New station designs to improve passenger flow were completed at Sheung Shui and Fanling Stations in 2013. Work has commenced at Fo Tan and Kwun Tong Stations, which will be completed in the next two years.
- Facilitate ease of access: Additional wide gates will be installed at 30 MTR stations to enhance access, especially for senior citizens, people with disabilities and those with bulky luggage or baby prams.
- More barrier-free access at stations: A new external lift was completed at Shek Kip Mei Station in 2013. Eight more lifts will open by 2015.

- Enhance communication: Fifteen minute free Wi-Fi hotspots will be made available at every MTR station to help passengers stay connected.
- Improve signage and information display: New and enhanced signage will be installed in stations to make it easier for passengers to find their way around, both within and outside the MTR network.

The Listening, Responding Programme addressed some users' needs in the MTR journey that are not easy to sense and are not related to the MTR's transportation function. However, these detailed services play a significant role in improving the quality of MTR life and supplying the transportation function. As the MTR system has developed, it has played a more significant role in people's EDLs. People rely increasingly on the MTR. Service to humanity has become the standard for evaluating the quality of MTR life. The degree to which the Listening, Responding Programme is valued by the MTR indicates that it has entered a new era. The MTR life should be designed with not only accessibility and speed in mind, but also humane service and good quality.

Over 30 years, the Hong Kong MTR has grown from half of a line to a subway realm, from a baby URT system to a world famous case. Carrying an average of four million passengers every weekday, the MTR is regarded as one of the world's leading railways for reliability, safety, customer service and cost efficiency (Wu & Berman, n.d.). The MTR has grown in the city, with the city and finally has become part of the city. In the future, the MTR will follow the London Underground to become an old man in its city, respected by its citizens.

2.5 Summary

This chapter reviews the literature on particular research terms and the development of URT systems globally and in Hong Kong. The characteristics of the URT public space are summarised. The definitions of the terms confirm the research scope and the development review gives a general background for the research area. This literature review is necessary before conducting research on the URT public space, URT EDL and quality URT life.

Defining the research terms clarifies the research content. As this study focuses on the URT public space and aims to construct a quality life (space), the review of these terms shows the feature of public space, the scope of the URT system, the current evaluation factors for quality space (life) and the significance of researching EDL. The detailed descriptions of the research terms provide concrete research points for the study.

The review of the URT system shows how the city has experienced URT over the past 100 years. The review demonstrates that Hong Kong has a working URT system. The review of the historical development of URT systems in the West and East, from antiquity to today, demonstrates that URT systems have gradually become a part of city life. The URT life has gradually permeated citizens' EDLs and is now a significant city element, cultural element, symbol and element of life. The URT life can be part of EDL and its study is meaningful and significant. The general characteristics of the URT public space are also reviewed. These space features can be used to design niche targeting research methods. The review also provides references to explain public space.

This chapter also reviews MTR development. The MTR has a short history of around 30 years. This general review of the development of MTR construction, technology and service shows that the MTR has become a functional city space. The MTR has begun to change its focus from basic construction to the construction of a quality MTR life, which is also the

research aim of this study. Thus, this is a current research topic and has broad research prospects.

CHAPTER 3 Control and freedom in public space

3.1 Introduction

Both freedom and control are critical elements in public space. Lynch (1995) stressed that an open space should be free, yet controlled. To understand this statement, control and freedom must be defined and how freedom and control exist in space and who they act on must be analysed. Only then can the relationships between freedom, control and quality public space be investigated.

This chapter analyses the research terms freedom and control. From a historical viewpoint, their definitions provide a comprehensive, profound explanation. The two terms are defined from different perspectives and used to define each other.

This chapter then reviews freedom and control in public space, focusing on their relationships and intersections with public space and how they exist in a space. Beginning from the definition of 'openness', freedom is found to be a main factor for defining open space. Based on Lynch's theory, public space rights are reviewed to demonstrate how freedom exists. Control is interpreted from the environmental, psychological and participation perspectives. Public space issues related to control, such as ownership, control patterns and conflicts, are discussed to obtain a more comprehensive, solid understanding of control.

Finally, this chapter reviews the relationship between freedom and control. Building on existing theory, it is found to be a negatively linear relationship, a causal relationship, and a dependent relationship, depending on the situation. The significance of achieving a balance between freedom and control in public space is reiterated.

3.2 Definition of freedom and control

3.2.1 Freedom

Freedom is both a political and a philosophical word (Gray, 1995). Freedom is defined as the ability of agents to make choices that are unconstrained by certain factors. These factors can be physical constraints (such as chains or imprisonment), mental constraints (such as compulsions or phobias, neurological disorders or genetic predispositions) and social constraints (such as the threat of punishment or censure) (The Institute of Art and Ideas, 2014). Marx and Engels (n.d.) attributed a physical meaning to freedom in a bourgeois society. They claimed that freedom in such a context allows people only to purchase and sell in a free-trade market. Sartre's (1966) philosophical description of freedom stressed that freedom could be considered an escape from existence. When people put themselves out of sync with what exists, they are out of reach and cannot be acted upon. The resultant isolation is freedom.

The existing definitions of freedom have mostly been connected with liberty and free will (Lynch & Carr, 1995; Siu, 2011). The word 'liberty' emerged after the 17th century as a derivation of 'liberality', which means the virtue of love and generosity (Gray, 1995). Liberty can also be considered a quality that individuals use to control their own actions.

Locke (1728) defined freedom as '[a person living] as what he likes, what he pleases and not to be tied by any laws'. One common understanding of freedom is that freedom is found in a person's ability to exercise agency. People prefer to have the freedom to choose what authority they will submit their agency to and what free will they will lose in the process. This definition has mainly been used to stress 'free action'. However, Locke (1728) proposed that any superior power on Earth can be a key element that constructs liberty. In political society, laws and constraints must be established by the commonwealth. People should be dominated by their selected law-making powers, according to the trust put in those powers. Freedom should be constrained by laws in both the state of nature and political society. The nature of freedom is to be under no other control than the rules that the law-making powers establish. People have the right or liberty to follow their own will in all things, except when the law specifically prohibits an action to protect people, such as others' arbitrary wills.

Mill (n.d.) first recognised the difference between liberty as 'the freedom to act' and liberty as 'the absence of coercion'. The distinction between these two factors is the same as the difference between positive and negative liberty. Positive liberty is the means or opportunity to do things freely, whereas negative liberty refers to situations in which an individual is protected from the arbitrary exercise of authority.

Freedom thus indicates liberation from an oppressive or dominating influence such as sin, spiritual servitude or worldly ties. Freedom represents the absence of control and an eagerness for self-determination. It can also be considered the act of overstepping the restrictions placed on behaviour and speech. Freedom is the dodging of control and constraints and is indicated by the ability of agents to make choices freely without hurting

others. Freedom can be summarised by the definition give in *Declaration of the Rights of Man and of the Citizen* (The History Guide, 1789):

> Liberty consists in the freedom to do everything which injures no one else; hence the exercise of the natural rights of each man has no limits except those which assure to the other members of the society the enjoyment of the same rights. These limits can only be determined by law.

3.2.2 Control

The study of control suggests several established concepts. Although the word's original meaning was applied to French business organisations, it is now used in a broader, looser sense to describe governing concepts of authority and power (Tannenbaum, 1962, p. 239). Control can used as a verb or a noun. Its synonyms are dominate, command and govern.

To control is to exercise restraint or direction over something, or to test or verify (a scientific experiment) by a parallel experiment or another standard of comparison. As a noun, control is the act or power of controlling, regulating, dominating or commanding, the situation of being under the regulation or command of another, or a legal or official means of regulation or restraint. Control can be interpreted as grasping the whole process of an issue, from its origin to its development and results. In economics, control is the power to govern the financial and operating policies of an enterprise and thus to obtain benefits from its business activities. In management, control means to prevent staff from performing unauthorised actions, beyond the range of manipulation.

From the above definitions, people can either send or receive control. People can control other people and things, and can also be controlled. Tannenbaum (1962) identified mutual control, in which each person in a group has control over the rest, and unilateral control, in which people are split into a controlling and a controlled group. Control as restraint is the opposite of freedom: when control acts on people, they are deprived of their freedom.

When people are control senders, they obtain great satisfaction from that control, especially when they are able to control their own lives. In contrast, people are not satisfied when their lives are out of control. In *Control Theory: A New Explanation of how We Control our Lives*, Glasser (1985) stated that our most painful times are when we lose control. Control as 'control of your life' refers to internal control. William mentioned that:

> We are not controlled by external events, difficult as they may be. We are motivated completely by forces inside ourselves and all of our behaviour is our attempt to control our own lives.

Control is always related to people's behaviour, which is driven by needs. Fulfilling one's needs is a significant way of controlling one's life. It is not wise to control other people unless what they are forced to do satisfies some image in their heads. Control theory stresses people's interactions in society. It points out that to gain effective control over themselves, people must satisfy what they believe is basic to them and they must learn to respect and not frustrate others in fulfilling what is basic to them. This is the same as freedom. The interactions between people in society must be considered.

3.3 Freedom in public space

3.3.1 Freedom and open space

Kevin Lynch was one of the leading urban planning scholars. He promoted the idea of openness in open space and stressed its importance. In Lynch's view, a public space should first be an open space. In *The Openness of Open Space* (1995), Lynch defined open space as an outdoor area in a metropolitan region that is open to many people's freely chosen, spontaneous activities, movement or visual exploration. Lynch described an open space as free, rather than referring to the space's scale, function or ownership. An open space is characterised by free access and behaviour. A space's degree of freedom is directly related to its degree of openness. As Lynch (1995) concluded:

> Open is free to be entered or used, unobstructed, unrestricted, accessible, available, exposed, extended, candid, undetermined, loose, disengaged, responsive, ready to hear or see as in open heart, open eyes, open hand, open mind, open house, open city. (p.109)

Neal (2010) also described public space as a place in which individuals are free to express themselves through performance, styles of dress, street painting and other activities. Carr et al. (1992) identified public space as a comfortable, freely accessible, assembly place in which celebrations are held and communal life lived. In *Life Between Building: Using Public Space*, Jan Gehl (2011) mentioned that a street should provide its passengers with many choices. People can not only pass in and out, but can also walk, stay, sit, see, listen, talk and experience happiness in and on the street. The many choices offered by the street (public area) implies users' freedom in the public space. Similarly, Schumacher, in

Buildings and Streets: Notes on Configuration and Use (1978), mentioned that streets that used to be freely accessible were livelier in the past than today. These studies have shown that freedom can be used to define open space in addition to becoming a characteristic of quality space.

Public space is a symbol of freedom. According to Arendt (1990; cited in Mensch, 2007), freedom is obtained during interactions with others through behaviour and words. As freedom depends on activities, it does not exist separately from the real world and the pursuit of inner freedom is meaningless. Freedom can also be considered the possibility of what people may become in the real world. As activity is the necessary condition of freedom, freedom must be manifested in a carrier, such as public space. People's behaviour is respected and protected in these carriers. Without public space, what we call freedom is not true freedom. Without freedom, space cannot be called public space, as it has no content (Cox, 2013; Herbert & Thomas, 1997).

3.3.2 Rights in public space

Rights in public space cause conflicts. Carr et al. (1992) emphasised that a central question in public space is whether people are free to achieve the types of experiences that they desire in that public space, whether they have the right to use the space and whether they have a sense of control within the space.

Lynch (1984) asserted that a quality public space should provide its users with rights to access, freedom of action, claim, change and disposition. These rights involve the freedom

that people require. Carr et al. (1992) stated that these dimensions represent degrees of freedom and that access is fundamental for the attainment of other rights.

Presence

The ability to enter a space is a basic requirement for its use. Access can be physical, visual or symbolic. A space is severely restricted if its gate or entrance is closed or limited through gates or gatekeepers. Without access, a public space offers almost no rights or freedom. Access is the basic right of an open space. The space becomes lively due to its users' access. Carr et al. (1992) stated that with access, the street becomes a paved, landscaped area where pedestrians and children can move freely.

If a space is physically accessible, it has no barriers to entry and is well-connected with paths for circulation (Siu, 2013b). The connections between a plaza or small park and the adjacent sidewalks are an important aspect of access (Whyte, 1980). Visual access or visibility is also necessary to make people feel free to enter a space. They can judge whether the space is safe to enter if they can see inside it from outside, which is especially important for women and the elderly. A space with too much noise and too many sports activities is difficult for the elderly to tolerant. Symbolic access involves the presence of cues to suggest who is and is not welcome in the space. These spaces use people or design elements to demonstrate a threatening, comforting or inviting environment. The expensive shops and cafes that dominate indoor malls and atria provide clear signs as to the intended users. Physical, visual and symbolic access are users' basic rights in an open space. The three accesses frequently interact with each other and present a strong or ambiguous picture of who is free to enter a space and who has control over the right of access.

Use and action

Freedom of action is another right in public space. Lynch defined freedom of action as users' right to behave freely in a place or to use its facilities. Like freedom, the definition of freedom of action in public space has two parts: people can carry out the activities that they desire and use the place as they wish, but they must also recognise that the space is shared. Responsible freedom enables personal satisfaction without abusing the rights of others.

Psychological comfort is an important consideration in freedom of action. Psychological comfort or ease implies freedom from worry and concern. People need to feel at ease if they are to use a space as they wish. However, some space only provides its users with physical freedom, not psychological comfort. In many instances, public spaces are designed and constructed by their developers according to their interests. The interests of users and developers clash, as do the interests of different users. The competing interests of a heterogeneous society sometimes make freedom for one group a potential threat to the freedom of others. In summary, Carr et al. (1992) described the nature of freedom of action in public space as:

> Freedom of action, thus, is a product of conditions and designs that maximise people's freedom to engage in satisfying activities in public space while assured of freedom from disturbance, interference or threats. It is a product of reasonable rules, adequate choices and opportunities for use and designs that support the needs of users. (p. 20)

Appropriation

Claims for a space go beyond access and freedom of action to a stated proprietary interest. Individuals and groups claim spaces to carry out desired activities or achieve a desired state. A particular group may claim a space so that they can act freely and comfortably in that space (Carr et al., 1992). People sometimes use control to achieve their goals and one group or individual may restrict the freedom of others in claiming a space to fulfil their own needs. Control strongly demonstrates that some people care about a place, respect it and value its presence. The development of a sense of control and territoriality over a space that enhances its use and serves the local residents' needs is a critical issue that should be identified in studies of community open spaces.

Privacy and territorialism are two frequently discussed behavioural science concepts whereby people can increase the range of options open to them and maximise their freedom of choice in a given situation. Sometimes different groups claim a space at different times. Individuals, small groups or families' control of a space does not generally represent a threat to the freedom of the rest of the public to use the space. However, larger groups often transform public settings into territories by claiming the space.

Public space management and policy can be very helpful for promoting group claims or for limiting or tempering those claims when they restrict the freedom of others. The design and planning of public space can also play a role in groups' claims. When one group seriously restricts other people's freedom, management should intervene to balance the benefit of the space between the different groups. A manager is necessary to promote the free, comfortable use of a space. Planning and design can also be used to direct users' behaviour or hinder improper claims.

Modification

Change is an important dimension of a successful public space. The ability of a place to evolve and change over time is an important quality of a good environment. Users are most likely to see opportunities for change when they are involved in the development of a space. People cherish the ability of a space to change, as this can bring more possibilities to the space. Siu (2007b) stated that individual city users are perhaps able to find and manage a way to live in an environment to best suit their EDLs. People have their own ways to reasonably change a space. In *The Practice of Everyday Space: The Reception of Planned Open Space in Hong Kong*, Siu (2001) concluded that change redefines meaning and functions, territorialises boundaries, rebuilds planned environments, re-establishes rules and reorders temporal order.

De-territorialisation and re-territorialisation are both common in public space. De-territorialisation refers to taking control and order away from a land or place (territory) that is already established, thus effectively undoing what has been done. Re-territorialisation involves the restructuring of a place or territory that has experienced de-territorialisation. It can be interpreted as removing existing visible or invisible boundaries and constructing new boundaries in their place (Brenner, 1999). Change makes a public space alive and full of surprises. Contemporary plans and design are sometimes considered the only way to construct a suitable space, however, users often seek opportunities under government or management institution strategies. They use tactics to change a space and find suitable ways to solve their problems.

Disposition

Disposition is a form of ultimate control, encompassing and transcending the rights inherent in access, free of action, claim and change. This right is permanent and transferable. The disposition right mostly belongs to owners. A truly public space is owned by the public, although the control implied may not be exercised. In our society, ownership offers owners permanent rights over the owned object. Legal ownership is actually a bundle of rights including sale, development and mineral rights and various rights of use. There is a strong link between disposition and ownership. If it is acknowledged that people own a public space, they have the right to make changes when the site no longer meets their needs.

The owner of a space has disposition rights over that space and the responsibility to manage the space if its users damage it. In this situation, a new conflict emerges between users and owners. It is difficult to achieve a satisfactory balance between the public's freedom to use a space and the necessity of imposing certain limitations and control. Without control, users' free behaviour may damage a space, which the owner has the responsibility to repair.

3.4 Control in public space

3.4.1 The concept of control and public space

The first sentence of the chapter on control in Lynch's (1984) *Good City Form* is 'Space and the behaviour associated with it must be regulated (p. 205)'. Regulated behaviour can be defined as control. Lynch (1984) defined control in public space as the ability of an individual or group to gain access to, use, influence, gain ownership over and attach meaning to a public space. Jackson (1984) stated that the goal of public control of an environment is to make favourable differences in the lives of those using that environment.

Spatial control makes people anxious, satisfied, proud or submissive. It has been a critical element for civic improvement throughout history and will continue to shape the urban environment in the future. Regardless of whether control is positive or negative, the relationship between public space and control is very delicate. Francis (1989) discussed control as an environmental, psychological and participation concept.

Control as an environmental concept

Control as an environmental concept grew out of the 'city beautiful movement' in the United States in the late 19th century. Numerous visual improvement societies emerged to protect public space. Local groups were founded to promote outdoor art and develop town parks. Control over the environment is now enacted through laws and regulations, and is used to improve the quality of public space.

In *Public Places and Spaces*, Francis (1989) described control as a mechanism by which people attach positive or negative meaning to public space. Meaning can be attached to public space at the individual, group or state level. People obtain meaning through EDL in the public space and control over the space, as public control affects how the space is used, perceived and valued. For example, an individual experiencing memorable activities in a public space, a group of people organising regular gatherings in a plaza and millions of people celebrating a festival evening together in a public place are all instances by which people attach meaning to a space.

Carr and Lynch (1981) stated that a user's satisfaction is determined largely by their ability to control their experience of a place. Control as an environmental concept under these

circumstances can be explained as people's ability to directly influence their own use and experience of a place, simultaneously attaching meaning to the place.

Control as a psychological concept

Control as a psychological concept has been extensively examined. As previously mentioned, control brings people both positive and negative feelings. Burger and Cooper (1979; citied in Francis, 1989) stressed:

> The desirability of perceived control in a variety of situations has been found to be a prerequisite for a positive experience for some people. (p. 156)

Langer (1975) also stated that control is a 'mindful process of mastering', rather than the previous concept of 'achieving an outcome'. Similarly, Francis (1989) concluded that control has been defined in various ways in the social sciences, including mindful process mastery, efficacy, internal versus external control and process versus decision control.

In environmental studies, control is a critical factor for reducing people's stress in a public space, especially in a crowded space (Ulrich et al., 1986). A common phenomenon in mass transit demonstrates this statement. It is common to see people move to the doorway in a crowded bus or turn away from the people next to them on a subway during rush hour. In these situations, people are adapting the environment to fit their needs and constructing territories to avoid stress. Altman (1975) distinguished three kind of territories as mediums for control. The first territory is that inside homes and bedrooms, which people occupy for significant portions of their lives and obtain permanent control over. Bars and neighbourhood parks form the second kind of territory, in which the space and its control is

shared by many users. The third type of territory is public territory, which obeys the rule of 'first come, first served'.

Territory is the expression of public control. Control as a psychological concept is mostly related to people's feelings. It emphasises how the exterior environment affects users' feelings and how interior ideas affect outcome behaviour.

Control as a participation concept

Control is considered a critical goal of participation. Arnstein (1969) suggested several levels of participation. Citizen control is the ultimate goal of participation, followed by delegated power, partnership, placation, consultation, informing and therapy.

Participation in designing, building and managing an environment has been widely discussed by urban scholars and is commonly considered to be an efficient way to increase users' satisfaction (Wandersman, 1981). Direct involvement in designing or building a place also helps to attach meaning to a public space. Hester (1985) showed that users' involvement in construction increased the use of the place and the users' satisfaction. Iacofano (1990) found that participation was instrumental in fostering a sense of personal growth, self-actualisation and political efficacy.

However, participation in public space does not always lead to justice unless control accompanies participation. Control implies a sense of individual or group ownership or stewardship. Real control requires power-sharing. Arnstein (1969) pointed out that participation without real control over decision-making can often lead to decreased

environment equity. Control as a participation concept has a significant role in environmental studies.

Perceived control also affects users' responsibility. Participation can result in both control and responsibility. The limit of users' control is actually the limit of the users' responsibility over a space. If people have the chance to participate in the designing and planning of a space, they consider themselves to be one of the owners of the space and to have a responsibility for protecting the space. Thus, participation is a tool to achieve perceived control in a public space and leads to users' positive behaviour (Francis, 1989).

3.4.2 Control issues in public space

Users, designers and managers have to deal with control issues. As a public space develops, control changes its role, existence, nature and status. The discussion of these issues helps to illustrate how control exists in and influences public space.

Control and ownership

Ownership is a commonly discussed issue in public space. Ownership determined the nature of a space and its possibilities, rights, control and freedom. The ownership of a space must be confirmed before analysing its freedom and control. In *A Good City Form*, Lynch (1984) stated:

> One way of lessening spatial conflict is to clarify and enlarge the social consensus about rights in space, so that everyone knows who controls a space and how to act properly there. (p. 214)

In the past, public space was differentiated by time, ownership and use. Public spaces, such as the Greek agora, Roman forum and Soviet square, were predominantly owned at the national level. The public space was a symbol of nation citizenship: public spaces were used by local residents.

Today, the ownership of public space has changed due to investment. Private sector organisations make large investments into the land, design and management and thus become the new owners of the public space. Private interests, including merchants, bankers and developers, are all people who have the right to make and manage public spaces. Public space is today divided by ownership, into government owned (state/city level), and privately owned space (Xing, 2013). Privately owned public space is a new form of space, combining private investment and space allocated by government. As the ownership of a public place changes, the control in that public space also develops and changes, altering conflicts and needs.

Control patterns

Control exists in different forms in the public space. These forms work together in the space to demonstrate a function of control or provide a sense of control. Control can be both physical and symbolic. Lynch (1984) pointed out numerous physical means to maintain control such as making boundaries of hedges, fences and landmarks. These boundaries confirm the territory in the space and demonstrate control over the space. Symbolic barriers and painted lines are boundaries that symbolically indicate control over a space.

Control can also be political, using laws or regulations. Regulation can protect a public landscape, such as zoning land use, general plans to control density and design guidelines to control building heights (Francis, 1989). Lynch (1984) stressed that laws are used to assert the rights of ownership, to summarise common understandings about group territory and personal space, to educate about proper spatial behaviour and to record spatial rights.

De Certeau (1984) defined authoritative institutional controls as strategies. Siu (2001) claimed that these strategies (such as policies, plans, ordinances, rules, regulations and programmes) are used to maintain the city in an orderly way, planning and measuring everything according to the authority's will and anticipation. Control thus belongs to the authority institutions, who use strategies as a tool to ensure their control.

It is difficult to give a clear scale of the pattern of control. The patterns of control change as society and space develop. As mentioned by Siu (2013b), to ensure the quality of design standards: policy, implementation, and management are important ways. Control can be either symbolic or real, temerity or permanent, inclusionary or exclusionary, individual or group, single use or continuous (Francis, 1989). However, it is undeniable that all control forms and patterns and all media through which control is expressed have the same function and bring the same feeling to people and space.

Control conflicts

Different people use and manage public space together. In reality, public space can be considered to be a meeting ground of the interests of many groups. Altman and Zube (1989) categorised the people in a public space as professionals, those involved in the design and development of the space; the interested public, those who gain the benefit from the

construction of the space and who have the direct right to shape the space; and the general public, those who use the space but do not participate in its design, planning or management. Based Altman and Zube's categories, Francis (1989) identified the users, non-users, space managers and owners, public officials and designers of a public space. Each group has its own needs, rights and responsibilities in the space. Berman (1986) stressed that public space reflects individuals, the greater culture, private beliefs and public values. When different groups of people have different needs and simultaneously pursue control over a space, conflict emerges. Francis (1989) concluded that conflict happens due to the 'growing privatisation of public space by corporations and building owners', 'the increasing use of public spaces by the homeless and other disenfranchised groups' and 'the role of user ownership and accessibility in satisfactory relationship[s] with public space'.

As previously mentioned, control can bring people a sense of comfort, relaxation and security. The unjustified and improper distribution of control can be considered a reason for conflict. Francis (1989) stated that when different people compete for interests, conflict arises. Control thus becomes a process through which conflict is identified, negotiated and resolved. Control is a critical element in public space that produces and is a means of solving conflict. Solving conflict in a public space involves the control issues in that space.

3.5 Relationship between freedom and control in public space

The relationship between freedom and control is complex and delicate. They work together in a public space to affect people's behaviour. Understanding the relationship between these two factors helps in understanding public space phenomena and can be used when pursuing balance between the two.

3.5.1 Negative linear relationship

Freedom and control are both significant elements in the public space and are used to define each other. Control is inversely defined against freedom, as freedom indicates a lack of being controlled and the presence of individual-determined behaviour (Tannenbaum, 1962). Tannenbaum (1962) pointed out the negative linear relationship between individuals' freedom and control:

> The more an individual's behaviour is determined by others (i.e., is controlled), the less an individual is free to determine his own course of action. (p. 239)

'Individual' and 'others' are mentioned in this statement. When control from external issues acts on people, their freedom decreases. Control is discipline handed down by institutions of power, legal provisions or even social values. Control is an outside action that restricts people's behaviour and reduces feelings of freedom. Control and freedom thus have a negative linear relationship for the individual.

3.5.2 Causal relationship

Control and freedom are opposite concepts and have a negative linear relationship. If control is present, is there no freedom? The answer is definitely not. Both control and freedom possess internal and external forms. Both control and freedom can act on others and oneself. Control can be obtained from the external environment and from internal

emotion. Similarly, freedom can describe both physical behaviour and psychological feelings.

This analysis of freedom and control in public space has shown that people's rights in a public space emphasise not only what they can do in the space to obtain freedom, but also how they can control the space. Freedom and control have an indivisible relationship and sustain each other. When people enact control over a space, they reduce their anxiety and stress and feel more comfortable, which are all feelings associated with freedom. People are eager to control their external environment but reject being controlled. When people have the right to control a space, control and freedom demonstrate a causal relationship: exerting control over the space causes an increase in the feeling of freedom.

3.5.3 Dependent relationship

Freedom and control are commonly present in public space and their definitions change according to specific situations and locations (Kwok, 1998; Lynch, 1965, 1990). As different people share public space, control and freedom in public space have a complex relationship. They restrain, affect and are dependent on each other. Lynch (1995) proposed that open space, like an open society, must be free and yet must be controlled to maintain order. The free use of open space may offend us, endanger use or threaten the seat of power. However, freedom is an essential human value. We prize the right to speak and act as we wish. People learn from those who act more freely and free use of an urban space brings great psychological and physical pleasure to people. People can thus find a way to express themselves, unfettered by the routine constraints of workplace and family.

In the real world, freedom and control demonstrate their advantages and disadvantages in the public space. The conflict between freedom and control always exists. A balance between freedom and control is important in creating a quality space. Lynch stated:

> Open space is the common ground for movement and communications, and likewise the place of deviance and crime. What is felt to be threatening in public differs from place to place and time to time. The line constantly shifts between freedom and riot, and the struggle for control has sharpened, as cities have grown larger and more diverse. (p. 415)

Freedom and control should exist together to produce a high quality space. In more pluralistic cultures, public space becomes a battleground over appropriate behaviour. Lynch (1995) pointed out the importance of achieving a balance between openness and articulation that allows mixed occupancy and use. This can also be called a balance between freedom and control in public space. To achieve this balance, Lynch suggested distinguishing the harmful from the harmless, controlling the harmful without constraining the harmless, increasing general tolerance of free use while stabilising a broad consensus of what is permissible, separating the activities of groups that have a low tolerance for each other and providing marginal places where extremely free behaviour can go on with little damage.

It is necessary to understand how social order develops to design public space well and to achieve the appropriate balance (Hsia, 1994; Siu, 2001). The precise balance between freedom and control at a particular time is depend on a number of factors, including the norms and behaviour of the individuals and groups using the space, and the design and management of the space (Carr & Lynch, 1981). Design and management policies are also two effective ways of achieving a balance. When the claim of one group seriously restricts

the freedom of others, the management can intervene to produce a fair space. In some cases, the presence of a manager and guards are necessary to promote the free and comfortable use of a space. For example, successful recreational events involving members of different groups can occur only if street workers and policemen are present to keep the peace.

3.6 Summary

This chapter discusses the theory of freedom and control in public space. It reviews the definitions of freedom and control, the relationships between freedom, control and public space, and the connection between freedom and control in public space.

Freedom and control are shown to be strongly connected. The definition of freedom includes control, and control is defined by the word free. Freedom and control are two sides of the same coin: they restrain, affect and depend on each other. Lynch pointed out the dialectical relationship between freedom and control in open space and proposed that both are required, at appropriate levels, to maintain the stability of an environment. This study is concerned with what these appropriate levels are, the balance between freedom and control.

Control and freedom commonly exist in public space. They are not only part of the definition of open space but are also the factors affecting the characteristics of open space. Freedom in a public space can be described as rights. Users' rights make the abstract concept of freedom more concrete and practical. Freedom in public space is not a distant, fuzzy concept, but a specific feeling, action and emotion that can be realised through obtaining these rights in public space.

Control is also a complex concept and is discussed from different angles. Control as an environmental concept is a mechanism to attach meaning to an environment. The psychological perspective emphasises people's emotions and feelings when controlled. The participation perspective stresses the importance of participatory design in control. Control in the public space has different meanings, functions and content. Many related issues are also discussed, including ownership, control patterns and conflicts. The owner of a space determines how control exists and the amount of control distributed to the people in the space. Regardless of whether control follows a legal, ethical, strategic or design pattern, conflict occurs in a space if control is not properly distributed between the different groups of people in that space.

Finally, this chapter reviews the relationship between freedom and control. Using definitions, evidence and the affecting factors, the dialectical relationship between freedom and control is shown to be negatively linear, causal or dependent, depending on the situation. As public space is shared by different groups of people, people can both act and receive an action or behaviour. When people exert control over a space and other people, they act freely in that environment, experiencing the feeling of freedom. However, in this situation, the rights of the receivers of this control are affected and their freedom is restricted. Freedom and control must be balanced to maintain a harmonious space. Balance results in a free space with sufficient control to guarantee security and order, which are also critical aspects of a quality space.

In conclusion, this chapter analyses freedom, control and public space. This theoretical discussion provides a foundation for further study and clarifies and makes more practical the research aims of the study.

CHAPTER 4 Research methods

4.1 Introduction

This chapter describes the research methodology. This study focuses on both theoretical and practical issues. The purpose of this study is to explore the relationship between people, between people and space, and between people and policies. Special attention should be paid to relationships and inter-behaviour. According to Herman and Egri (2002), quantitative research can help to explain what is happening, whereas qualitative research can explain why it happens. To achieve both aims and avoid the limitations of each method, a mixed research method is used here, according to the research aims. The study is divided into a general review, an overall interpretation and a targeted case study. Observations, a case study (field study), questionnaires, direct interviews, data recordings and analysis are all used. These methods supplement and sustain each other.

4.2 Research structure and framework

4.2.1 Research framework

This study's research questions focus on people's real lives, people's expectations for a quality life, relationships and conflicts in EDL, and the methods of solving these conflicts. This study aims to answer the what, why and how of the research questions. The research process is summarised in Figure 4-1. The study is divided into a general review, an overall interpretation and a targeted case study.

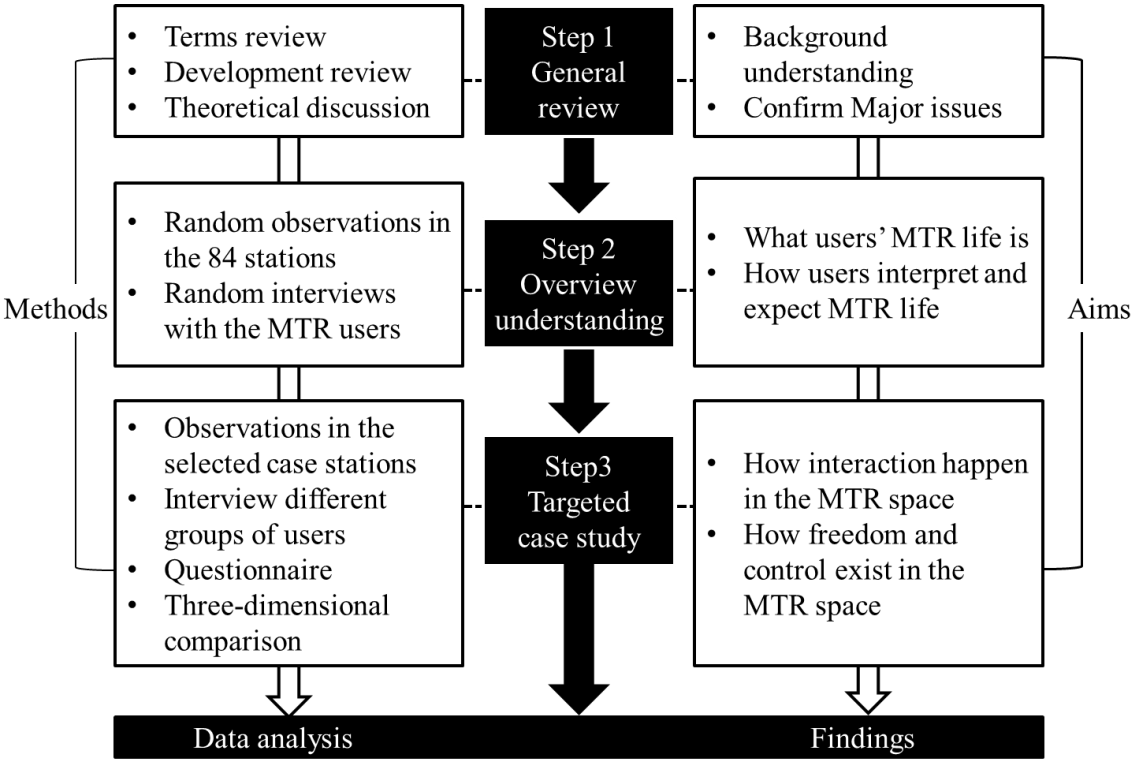


Figure 4-1 Research framework

The review forms the foundation of the rest of the study, as it provides the study background and narrows the research direction. The phenomena observed in the latter parts of the study can be explained by the reviewed theory. New theory models are also developed following the theoretical review.

Before selecting the specific cases for study, an overall interpretation of the MTR space is obtained from random observations and interviews. The overall interpretation provides a general impression of the Hong Kong MTR life. Through general observations and randomly conducted interviews, a general picture of the MTR environment, people's MTR lives and users' behaviour in the space is obtained.

The targeted case study is the most time consuming part of the study. Targeted observations, group interviews and the administration of a designed questionnaire are conducted.

Each phase of the research plan is required. The phases are closely related to one each other and different kinds of data are collected in each phase.

4.2.2 Phase one: Literature review

The literature review of the research terms, historical developments and the theory needed were presented in Chapters 2 and 3, providing a foundation for the study. It is essential to have a full understanding of a topic before conducting further research. The review first defined the research terms, then reviewed the development of the general URT space and the MTR space in Hong Kong. The key terms' definitions narrow the research area, pointing out what needs to be considered in the following observations and interviews. The historical review shows how the URT space has developed over the past century, allowing the current phenomena to be interpreted from a comprehensive viewpoint using a historical perspective. Theories on freedom and control in public space were analysed, focusing on how scholars have interpreted this topic, how the topic developed and how the theory needs to be improved. The theoretical discussion is used to interpret the topic and conduct the rest of the research at a high level. It also helps to avoid repeated work.

The literature review is the foundation of the study, required before conducting any quantitative or qualitative research. An efficient, in-depth review ensures a more efficient study.

4.2.3 Phase two: General impressions

The literature review clarifies the research topic. In this phase, some research practices are used. There are 84 stations in the Hong Kong MTR, with more lines under construction and in planning. A case study is an efficient method of examining this system. However, before conducting a case study, it is necessary to obtain a general impression of the whole MTR space.

Although the MTR space is designed systematically, the ambient environment, location, potential users, development level and size of each station is different, so an overview of the whole MTR space is needed. A random observation of the MTR space is conducted over two months. The facilities in the stations, the construction of the space, the interactions in the space and people's MTR experiences are recorded by camera and with qualitative descriptions. Interviews are also conducted at random in the MTR space. By talking to MTR users, more research directions can be suggested.

The general observations confirm the characteristics of MTR stations and the representative cases. Users' experience of the MTR space and their general interpretation of MTR life are also obtained. The data collected in this phase are useful for designing the questionnaire and interview questions used in the third phase. These data are used to summarise and illustrate the MTR, and to supplement the findings for specific stations in the third phase.

4.2.4 Phase three: Case study

The three phases proceed step by step and the research objectives of each successive phase are more specific. In phase three, qualitative and quantitative research methods are used

together. Observations are made at different times and places. Case stations are selected from the general impressions in phase two and subjected to focused observations. Typical times for these focused observations are again selected using the general impressions data. The observations are made regularly throughout the day at the same places in each case station.

The people observed are divided into users and non-users. The users are divided again into several groups for observation and interview. Following Siu's (2003) reader reception theory, different users have different backgrounds and will understand a particular object or design differently. Each user group will interpret and interact with the design in their own way. The users thus cannot be considered one large group. A comparison study is conducted to obtain a comprehensive understanding of users' expectations of a quality URT life. Figure 4-2 shows the plan for the three-dimensional comparison study.

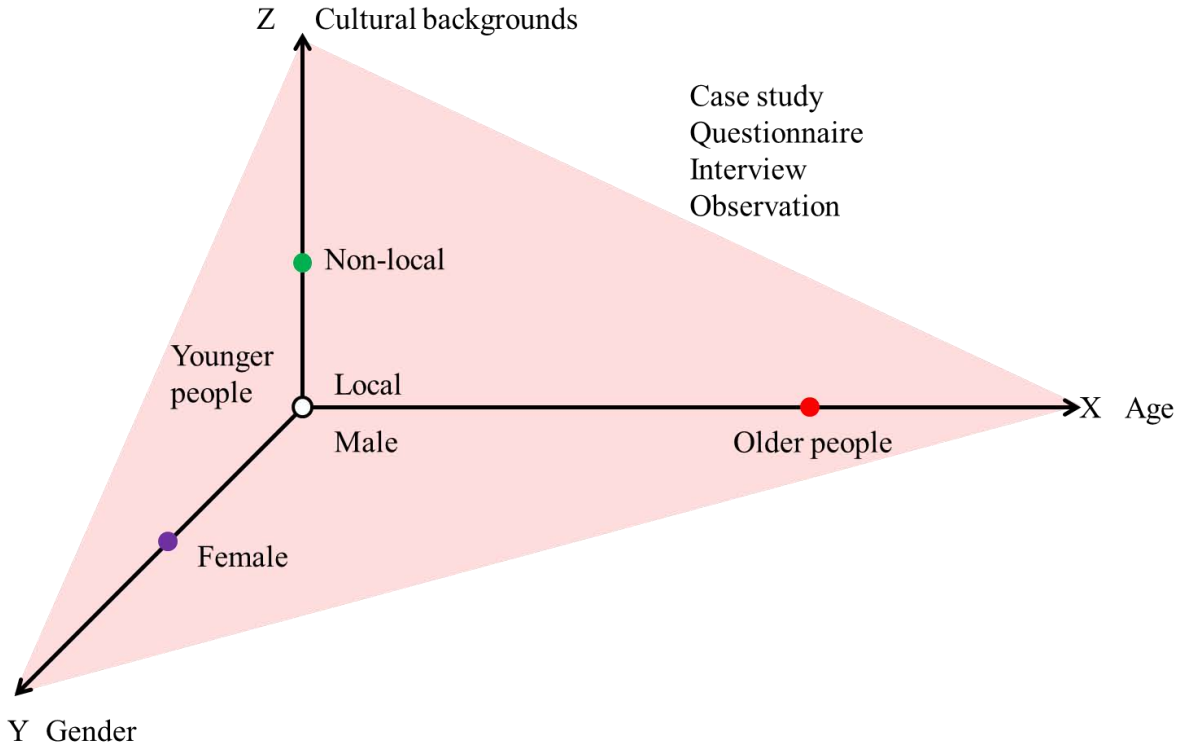


Figure 4-2 A three-dimensional comparison method

In the X dimension, people of different ages are analysed separately. As people of different ages have different characteristics and requirements, the questionnaires are changed slightly for each group. The distribution number is also diverse according to the proportion of users. In this dimension, people are divided into the elderly (above 60 years old) and young people (20-40 years old). These two groups of people are representative, as there are many young people on the MTR and it is challenging to find sufficient elderly people.

People under 18 years old are not selected for study as most of the children and younger people who use the MTR are accompanied by their parents. Their behaviour is more or less affected by the adults they travel with. Children are also a small proportion of MTR users. Their opinions and behaviour can be analysed in focused studies aimed only at children.

People aged 40-60 years old are also not selected. These adults' ages fall between young people and the elderly. Their physical situations and attitudes may also lie between young people and the elderly. To save time and money, this study focuses only on young people and the elderly.

The Y dimension considers gender. Among young people, males and females are surveyed differently. Their questionnaire data are analysed separately. Additional observations and interviews are conducted to supplement the data.

The Z dimension considers cultural background. As Hong Kong is an international city with many non-local people from mainland China and other cities, locals and non-locals are interviewed separately.

This three-dimensional, comprehensive research method covers the most important aspects of assessing a quality URT life. After comparing the three basic aspects, the data are organised to discover the regulations behind these phenomena.

4.3 Research design

4.3.1 Combined research approach

Qualitative research methods aim to gather an in-depth understanding of human behaviour and what governs this behaviour. Qualitative research is an umbrella concept covering several forms of inquiry that help in understanding and explaining the meaning of social phenomena with as little disruption of their natural settings as possible (Denscombe, 1998).

Qualitative methods investigate why and how decisions are made, not just what, where and when. Smaller, focused samples are more often needed than large samples (Marginn, 2007).

Quantitative research methods are used to transform numerical data into knowledge that supports an assumption in design (Siu, 2009b). This knowledge is represented and visualised in the best possible ways to enable a better understanding of the original information. Findings are presented in graphs and tables, and convey a sense of solid, objective research. Quantitative methods require computational support and computer tools to carry out numerical calculations and reasoning.

The use of multiple methods is called triangulation, which was broadly defined by Denzin (1978, p. 291) as 'the combination of methodologies in the study of the same phenomenon'. In geometry, multiple viewpoints increase accuracy. Similarly, organisational researchers can improve the accuracy of their judgments by collecting different kinds of data on the same phenomenon (Jick, 1979). Qualitative methods can be used to understand the meaning of the conclusions produced by quantitative methods. Quantitative methods can be used to give precise, testable expressions to qualitative ideas. The most prevalent attempts to use triangulation are reflected in integrated fieldwork and survey methods. Researchers using qualitative methods are encouraged to systematise their observations, use sampling techniques and develop quantifiable schemes to code their complex data sets. As Vidich and Shapior (1955) said:

> Without the survey data, the observer could only make reasonable guesses about his area of ignorance in the effort to reduce bias. (p. 31)

Quantitative and qualitative research methods have advantages and disadvantages. The study setting and research purposes determine which method should be used. Table 4-1 compares the two methods and their integration.

Table 4-1 Comparison of the three methods

A quantitative B qualitative C mixed	
	o (advantages) ▪ disadvantages)
A	o Scientific: The analysis appears to be based on objective laws rather than the researcher's values. o Confidence: It gives additional credibility to any interpretations made. o Measurement: It provides a solid foundation for description and analysis. o Analysis: It allows for quick analysis. o Presentation: It is easy to communicate with others.
	▪ Quality of data: The numbers are meaningless before analysis. ▪ False promise: Sometimes quantitative data are no more objective or neutral than qualitative data. ▪ The knowledge may be too abstract or general for direct application to specific local situations, contexts and individuals. ▪ Too much attention may be paid to hypothesis testing, rather than hypothesis generation.
B	o The data and analysis are grounded in reality. o The data are rich, detailed material. o It can tolerant ambiguity and contradictions. o It offers deep insight into a topic and a better understanding of a problem
	▪ The data may be less representative. ▪ Reliability: Interpretation is bound up with the self of the researcher. ▪ It is more difficult to test hypotheses and theories. ▪ There is a danger of oversimplifying the explanation.
C	o Words, pictures and narratives can be transformed into numbers, and numbers can be used to add precision to words and pictures. o It can answer broader and more complete ranges of research questions because the researcher is not confined to a single method or approach.

	○ The researcher can use the strengths of an additional method by using both approaches in a research study. ○ It can produce the more complete knowledge necessary to inform theory and practice.
	▪ Time consuming. ▪ The researcher must be knowledgeable about and able to combine two methods. ▪ When different measures yield dissimilar results, they demand that the researcher somehow find similarities. In fact, divergence can often turn out to be an opportunity for enriching the explanation.

The mixed method (qualitative and quantitative research methods) is chosen, as it complements the research topic. The mixed method can overcome the shortcomings of the individual methods.

4.3.2 Qualitative research methods

Case study

Merriam (1988) pointed out that the case study design is 'an ideal design for understanding and interpreting observations of social phenomena' (p. 2). As the core objectives of this study are to define the relationships between people, spaces and principles, and understand the ways in which users operate in public spaces, the case study approach is a suitable strategy.

Considering the number of users and the functions and sizes of the stations, the East Rail and Island Lines are selected as the cases. The connecting stations between these two lines, Tsim Sha Tsui and Tsim Sha Tsui East, are also selected. These two connecting lines

include transit shipment stations and cover the nearby shopping areas, residential areas, financial centres and schools.

According to the Population Census Summary Result for Hong Kong in 2011 (Census and Statistics Department, 2011, p. 93), 34.4% of Hong Kong citizens list the MTR as their main transportation tool. Among these, 42.3% of those who use the subway to go to work are from Kowloon. The new towns also provide a large number of subway users. Kowloon district has the highest overall population and the highest population of working individuals. The new towns are all central residential areas containing public and private housing, basic living facilities and convenient traffic systems. Sha Tin is the largest new town in the New Territories and already has a population of more than 600,000, 20 times its previous population. The East Rail Line provides transportation for the citizens of Sha Tin.

The financial centre of Hong Kong is in the middle of Hong Kong Island. The Island Line is the only line on Hong Kong Island and many people who live in Kowloon work on the Island. The Island Line should be studied as it carries many working people (Census and Statistics Department, 2011). This study focuses on the train compartments of these lines.

Specific stations are selected for study. On the East Rail Line, Sheung Shui Station, Sha Tin Station, Dawei Station and Hung Hom Station are selected. Sheung Shui Station is filled with bootleggers and connects Hong Kong and Shenzhen. It is the closest Hong Kong station to mainland China. Sha Tin Station covers the large residential area. Tai Wai Station is a transfer station. Hung Hom Station is not only a transfer station, but is also the beginning point of the Hong Kong railway. On the Island Line, Tsim Sha Tsui Station, Central Station, Admiralty Station and Wan Chai Station are selected as 20.8% of Hong Kong residents work on Hong Kong Island and most of them are concentrated in these

places. Figure 4-3 shows a map of the Hong Kong MTR. The selected lines and cases are marked in red.

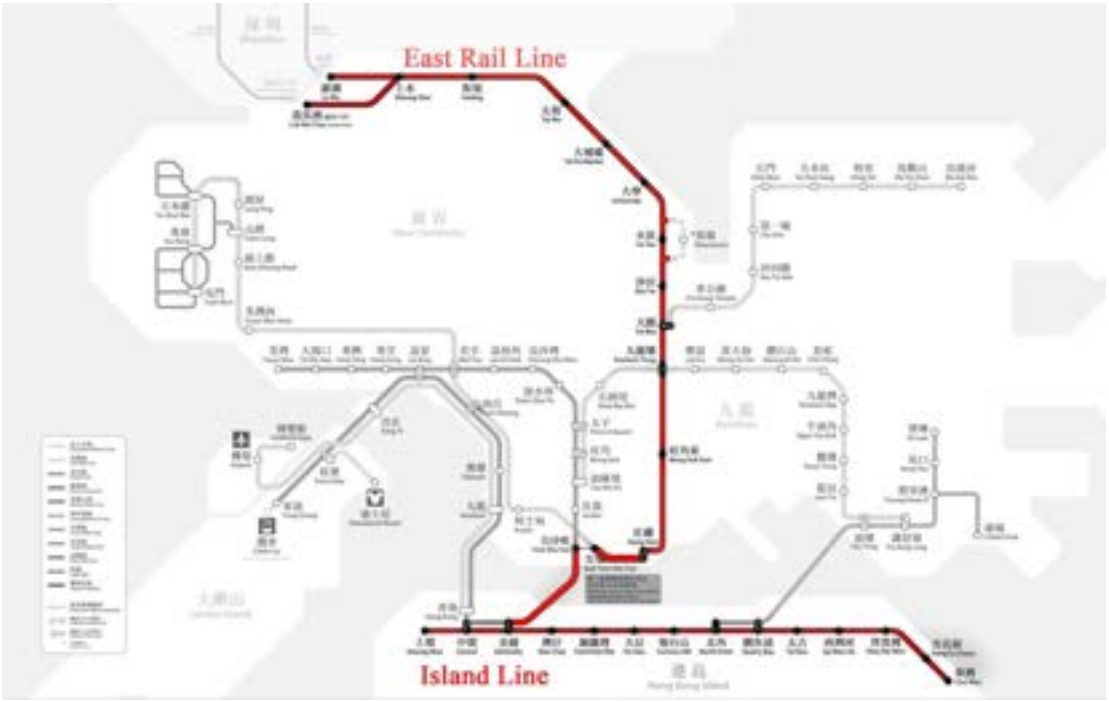


Figure 4-3 Map of the Hong Kong MTR. The lines and stations selected for further study are marked in red.

Observations

Observations can be used to 'obtain a better understanding about people's behaviour in the environment, as it is a method of looking at action between people and their environment' (Sanoff, 1992, p. 33). Observations can show regulations, as field observations give a more genuine picture of what it is like 'in the field' (Siu, 2007b). As design practice has increasingly focused on people, focusing on and modelling human behaviour has become an explicit responsibility for designers (Keinonen, 2010). Observations can also 'cover events in real time and cover the context of the events' (Yin, 1994, p. 80).

The observation findings are recorded with a camera and with qualitative descriptions, recorded by hand. The collected data include observations of the space and users' interactions with the space. Specifically, each set of observations includes answers to the following questions. a) What is the current situation of the static space? b) What are people (users and non-users) doing in the MTR space? c) What are the differences in people's behaviour at different times of day and on different days? d) How do people interact with each other and with the space? The observations are conducted at different times and in different locations.

Figure 4-4 shows how the observations are divided by time for analysis and comparison. Across the whole year, the observations are divided into weekday (Monday to Friday), weekend and holiday observations. Across each day, the observations are divided into early morning, rush hour, noon, afternoon, rush hour, evening and night observations. These divisions simplify data collection and make comparisons more specific (Siu, 2001).

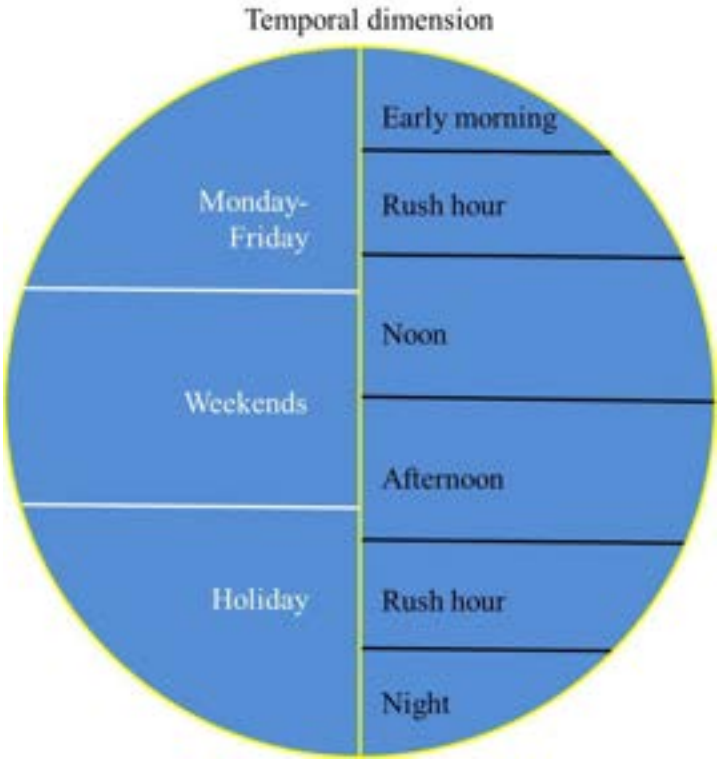


Figure 4-4 Observation divisions by time, across the year (left) and each day (right)

Figure 4-5 shows how the observations are divided by location. The observations are conducted in the selected stations and in compartments on the selected lines. The MTR space is a continual space that begins from the blended area of the station entrance and its surrounding neighbourhood. The observation area for each data point is confirmed with the users' journals.

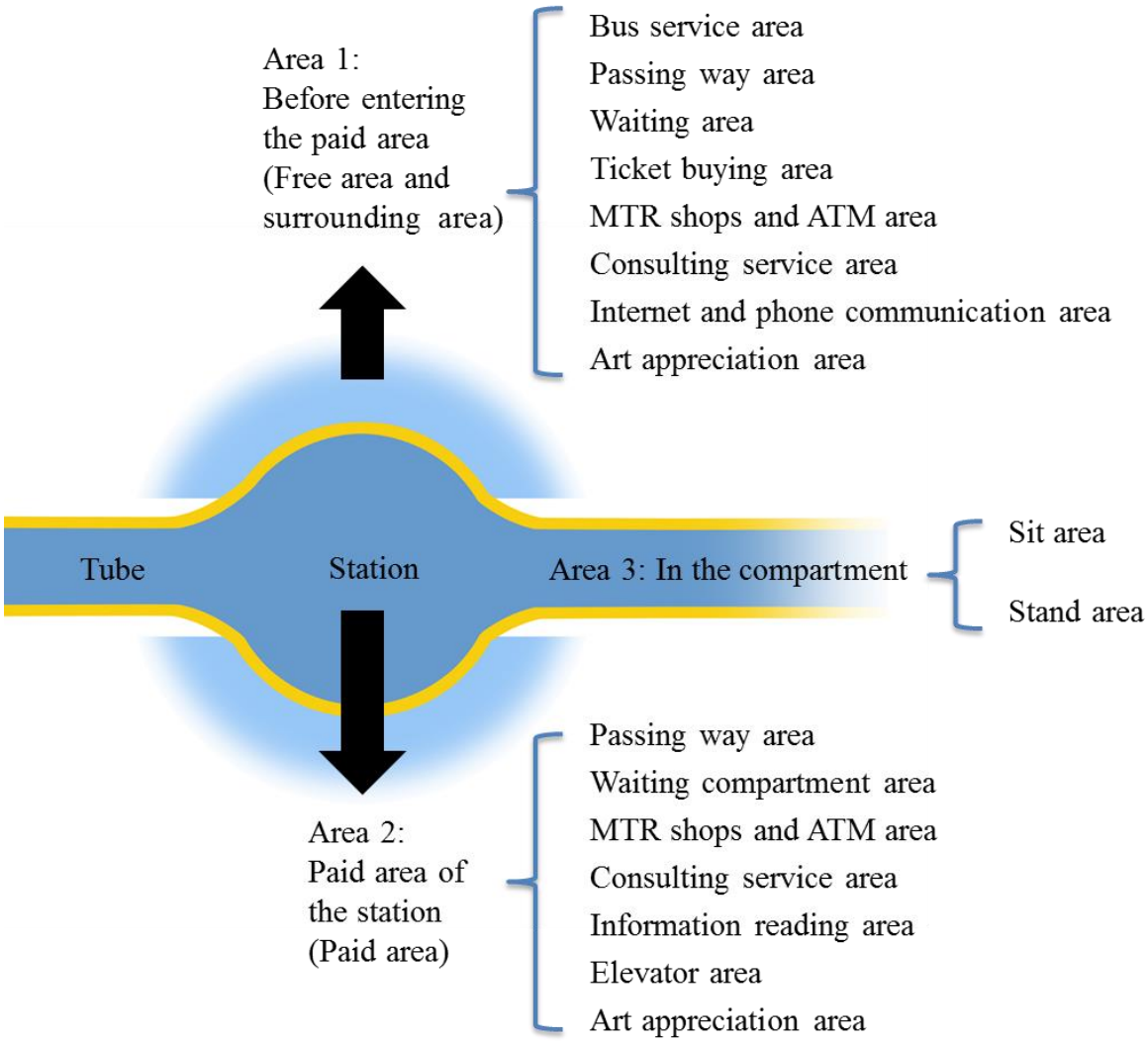


Figure 4-5 The locations of the observations

Each day, millions of users with different backgrounds use the MTR together. The people in the MTR space are also categorised into several groups. Francis (1989) divided people in a public space into users and non-users. He stated that users are those who frequent public places and rely on them for passive and active engagement. Non-users are another important and often neglected public space group: many people pass by parks, plazas and atriums on foot, in buses and in cars without using these spaces. Although the MTR space is a transportation space, it has many non-travelling users due to the diversity of users and density of the environment. According to the general observations made, the non-users in the Hong Kong MTR are MTR workers, store sellers, hawkers, buskers, people distributing and retrieving papers, and propaganda people, which includes salesmen, publicly spirited people and political people. As these non-users are in the MTR space almost every day and their existence strongly affects users' MTR life, the non-users are also observed. The user observations are compared across three dimensions, gender (male vs. female), cultural background (local vs. non-local) and age (young vs. old).

Interviews

Interviews are a direct, effective, valid way to obtain users' opinions (Merriam, 1988). Interviews can be structured, semi-interview, unstructured, individual or group/focus group. The open-ended findings of interviews may lead to a deeper understanding of the inner thoughts and experiences of the interviewees.

In this study, local Hong Kong residents, Hong Kong residents from China and foreigners living in Hong Kong who use the MTR are interviewed. Interviews are also conducted with

young people and the elderly. Both individual and group interviews are conducted. These in-depth conversations with URT users provide insights into different users' expectations and requirements of the URT. Sample interview questions are 'How do you define a quality URT life?', 'Are you satisfied with your current URT use experiences?', 'Which points are you unsatisfied with and most satisfied with?', 'What are the factors affecting the quality of MTR life?' and so on. Some extempore questions are also asked. The conversations are recorded.

Qualitative data collection and analysis

a) Data collection

Qualitative data are the product of an interpretation process. The data only become data when they are used as such. The data do not exist somewhere, waiting to be discovered. Instead, they are produced by the way they are interpreted and used by researchers (Denscombe, 1998). Qualitative data can be obtained from a variety of research methods and can come in a variety of formats, such as fieldwork notes, interview transcripts and texts, among others.

All data formats must be organised before the data can be used in analysis. The collection materials must be converted into similar formats. For instance, transcripts of recordings could be reproduced in the same word-processing document format and pictures could all be converted to the .jpg format and given an introduction. The raw data should be collected in a way that allows researchers' notes and comments to be added alongside. For example, a column could be kept on the right-hand side of each page of notes for later comments. The

raw data material should be identified with a unique serial number and all files saved with these serial numbers (Denscombe, 1998).

b) Data analysis

The analysis process is distinct from the labelling of the various pieces of data with reference codes, which is done during data collection. The raw data can be in various forms. Regardless of the data format, units for analysis must first be determined. During data analysis, qualitative researchers should be on the lookout for the occurrence in the data of particular ideas or events. The researcher needs to go through the raw data. During the analysis, new things might emerge as relevant and the same data may give rise to new interpretations. The new insights should be recorded on the data to act as a reminder of each new thought and to form a log of how the new line of thought develops. When revising the whole data set, researchers should be on the lookout for themes and interconnections that recur across units and categories. Respondent validation suggests that tentative results should be presented to the subjects and their reactions used to refine those results (Denscombe, 1998).

4.3.3 Quantitative research methods

Qualitative research methods are primarily used in this study. However, as previously mentioned, triangulation offers several important opportunities for data refinement. Quantitative methods can be used to assist in data analysis. In this study, the quantitative results are used largely to supplement the qualitative data, rather than the reverse.

Triangulation improves confidence in research findings, which is the overall strength of using multiple methods (George, n.d.). It can play constructive roles, such as stimulating the creation of inventive new methods of capturing a problem to balance with conventional data collection methods. In this study, quantitative data are mainly obtained from questionnaires and structured observations.

Questionnaires

Questionnaires tend to collect facts and opinions (Denscombe, 1998). A questionnaire cannot affect or control people's attitudes, but can be used to obtain facts about respondents and their opinions. The factual information is usually obtained from responses to factual questions, revealing straightforward information such as gender, age and some life details. Opinions, attitudes, views, beliefs and preferences can also be investigated. A questionnaire should be designed to collect information that can be used as data for analysis. A questionnaire consists of a written list of questions. It is efficient to gather information by asking people directly about the points concerned with the research. There are many advantages to questionnaires. They are an economic method for obtaining valid, accurate data using little manpower, funding or materials. The disadvantage of using questionnaires is that the researcher has little opportunity to check the truthfulness of the answers given by the respondents. This study thus also uses direct interviews to obtain a deeper understanding of the questions and to avoid the disadvantages of questionnaires.

The questionnaire is designed based on the second phase interviews and observations. There are no open-ended questions in the questionnaire as the direct interview is a more valid method for obtaining this kind of information. The main purpose of the questionnaire is to

determine how people define a quality MTR life and how they weight each factor. Only quantitative information is collected through the questionnaire.

The questionnaires are distributed to Hong Kong young people and the elderly. Young people living, studying and working in Hong Kong are asked to complete the questionnaire online, as Internet access and computer knowledge are common for this demographic (Castells, 1996, 2001). The older URT users complete the questionnaires on paper in a community centre that is primarily used by the elderly. Ma On Shan Older People Community Centre is selected for this purpose because the Centre is located near Ma On Shan Station, so is likely to be frequented by older people with abundant MTR travelling experience. The young people's questionnaire is shown in Appendix 1.

Quantitative data analysis

Quantitative data take the form of numbers. They are associated primarily with surveys, experiments, questionnaires and observations (Denscombe, 1998). The numbers obtained can be the answers to closed-ended questions or the frequencies or times of observation events.

In this study, two simple quantitative data analysis methods are used, nominal and ordinal data analysis. Nominal data are derived by counting things and placing them into categories. Ordinal data are based on counts of things assigned to specific categories that have an order. In this study, observations are recorded with photos and users' behaviour are coded with numbers. The questionnaire is used to obtain the weight sequence, so the users are asked to give points to each factor. The Hong Kong MTR users are asked to evaluate the importance

of each factor and give a score to each. The scores range from 1 (not important) to 5 (very important) (Li, 2007).

4.4 Summary

This chapter provides a comprehensive description of how the research for this thesis is conducted. The framework of the thesis is outlined in relation to the study's three phases. Qualitative and quantitative methods are used together in this study to obtain valid, reliable findings.

The first phase of the research is a comprehensive literature review. The history of URT systems and issues related to public space are examined in Chapter 2, followed by a review of the theoretical discussions of freedom and control in public space in Chapter 3. The literature has suggested that URT life has become part of citizens' EDLs, and that its status will continually increase. The balance between freedom and control are two significant elements in producing a quality public space.

In the second research phase, a general observation of the MTR space is conducted to obtain an overall impression of the characteristics and features of citizens' URT life in Hong Kong. General interviews are conducted to give specific ideas for the rest of the study. The overall impressions gained are used to select stations and lines for a case study and to provide information for questionnaire design. They also provide supplementary data for the case study.

The third phase is the most significant part of the study and is the most time-consuming. Case studies, structured and unstructured observations, direct interviews and a questionnaire are all used, as the methods complement one another.

Although the whole study is conducted in a step by step fashion, the different methods are sometimes conducted together and other times alternated. The goal is valid, reliable findings.

CHAPTER 5 The production of MTR space

5.1 Introduction

The MTR space shapes us as we shape it (Yeung, 2004). It affects people's lives, values and societal cultures. People change and produce the space through their behaviour, thoughts and interaction with the space. People in the MTR space demonstrate different characteristics and belong to different groups. Francis divided the people in a public space into users and non-users. These people are in the space every day and produce it through their EDLs.

This chapter analyses people's practices in the MTR space and the relationships between people, between people and space, and between space and city. The MTR space is different from other public space and it possesses its own groups of people. By grouping the people in the space, their behaviour can be interpreted and described in a profound way. Different groups of people harmoniously share and produce the space. The location and relationship perspectives are used to describe how different groups of people share space.

This chapter also focuses on the MTR space users. The users' behaviour during immobility periods in the selected stations are observed and summarised with statistical data. This analysis of users' practices is used to divide the space into levels and logically describe how communication between levels is conducted.

Finally, by describing people's practices in the space and analysing how they produce the space, this chapter analyses the roles that the MTR space plays in people's EDLs and the significance of the MTR space to the city.

This chapter provides a comprehensive analysis of people's practices in the MTR space. These practices are classified by grouping people. The space is divided into levels by analysing the users' behaviour. The importance of the MTR life is determined by defining the relationships between people and between people and space.

5.2 The people in the MTR space

EDL is the lives of the ordinary people. Although EDL is normal and ordinary, it significantly reflects most of the things and relationships in society. EDL can enrich sociological knowledge, fleshing out general ideas and theories. EDL is also a reflection of social conflicts (Inglis, 2005). This study focuses on people's EDLs in the MTR space. The people in the MTR space are organised into groups using observations. According to their purposes in the MTR space, they are divided into users and non-users, with some sub-classifications.

5.2.1 Users

Users are always the core part of a public space. Without users, the space cannot be defined as a public space. The majority of the people in a public space are users. By definition, users are the people who have the right to make use of a space and who that public space provides services to. They use the public space according to the functions for which it was designed.

They are an independent group and do not aim to obtain benefits from other groups of people. Their behaviour and thoughts should be widely considered by designers, policymakers and managers. As the MTR space is a social public space that provides public transportation, its users can be divided into travelling users and non-travelling users.

Travelling users

Chapter 2 showed that the URT space is a continuous space. Figure 2-3 showed that the scope of the URT space includes the pay-to-enter area and the nearby spaces. Users within the pay-to-enter area are travelling users, as they have paid money to use the MTR's travel facilities. The fee that they pay is used to carry them from one place to another. They can also use the other facilities and services provided in the MTR space. Travelling users pay their ticket fees first, go to the appropriate platforms, get into compartments and get off at their destinations.

Travelling users move between MTR stations every day. They walk quickly, do not spend time stopping and watching and do not participate in other activities. They do not stay in the pay-to-enter area for long after they finish their journeys, unless they have a problem. Travelling users have the right to use the facilities inside the pay-to-enter area, such as the elevators, dustbins, instruction information, seats, security faculties and TVs. The whole environment is designed for these travelling users. The MTR's facilities are designed to assist the mobility of its users and to make their mobility more convenient and interesting. Unlike public space such as parks and streets, people in the MTR space, especially in the pay-to-enter area, have clear objectives and needs. The main benefit they get from the MTR space is mobility.

Non-travelling users

As the MTR space also includes the space around the stations, many people use the free area inside the stations and the area around the stations, which are part of the MTR space. The MTR space in Hong Kong is not a separate space, but is a complex space that connects with passageways, shopping malls and platform bridges. The special structure of the space attracts people to use it for purposes other than mobility.

People in Hong Kong often meet at MTR stations. The MTR is highly accessible, so can bring people to almost any place in Hong Kong. People consider MTR stations to be landmarks and it is easy for them to meet each other and pick up friends at a station. Figure 5-1 shows the entrance/exit of Hung Hom Station. Many people wait or gather at stations. Regardless of whether they plan to travel by MTR later, they use the MTR space as a meeting point.

Figure 5-1 People standing in front of the free area of an MTR station

The MTR space is also used as a passageway. For instance, the shortest route from the student halls of residence of the Hong Kong Polytechnic University to the university campus uses the Hung Hom MTR Station passage. This is also the shortest route to the main bus stations nearby. Every morning, people whose route to work includes the station passage and those who travel to work by bus walk through the passage together. However, these people do not travel on the MTR and merely pass through the space. They can be considered non-travelling users.

The same occurs in the passage between East Tsim Sha Tsui and Tsim Sha Tsui Stations. The underground passage, which is designed for transferring between stations, is used by people during rainy weather and the hot summer. The passage space provides a cool, close environment and elevators to save time and labour.

The MTR shops and public facilities in the Hong Kong MTR are distributed in both the pay-to-enter and free areas. Users thus sometimes go to the stations to shop, eat food, use the ATM machines, use the public toilets and post mail using the post boxes. Figure 5-2 shows an advertisement for a restaurant in Hung Hom Station. People who work near to the station have become its main customers. These persons are also non-travelling MTR users.

Figure 5-2 Advertisement for a restaurant in Hung Hom Station

Non-travelling MTR users use the MTR resources and facilities as they are convenient. Although they do not pay to enter the MTR space, they benefit from using the space.

5.2.2 Non-users

MTR workers

Non-users are also found in the MTR every day, the MTR workers. Unlike other public spaces, as the MTR is functional space, many workers and managers are required in the space to guarantee the normal running of the whole system, deal with emergencies, clean the environment, instruct users' behaviour and keep order. These people generally belong to authority organisations.

Shop workers

Commercial MTR shops are now found in most stations, such as food stores, flower stores, laundries, cobblers and locksmiths. MTR shops are found almost everywhere in the stations, inside the pay-to-enter and free areas. MTR shop workers are a changeless group of people inside the MTR space. They do not represent a particular organisation. They just aim to make money from MTR users. The MTR also makes money from them.

Hawkers

The *Mass Transit Rail By-laws* (MTR, 2012) clearly stress that 'hawking is prohibited':

> No person, unless authorised in writing by the corporation, shall sell or expose or offer for sale any goods, wares or services in or upon any railway premises.

Hawking in Hong Kong has been prohibited in public space since the 1990s. Hawkers and the hawker control team have clashed since then. Siu (2001) analysed hawkers' tactics and

found that hawkers have always had methods for surviving in public space and escaping from control strategies. Similarly, hawkers have continued to operate in the MTR space.

In the MTR free area and the surrounding areas, hawkers emerge during bad weather or on weekends. It appears as if they are informed of suitable days to avoid the hawker control team. Although hawking can be punished by a fine of HKD5000 and six months imprisonment, hawkers continue to sell basic necessaries, such as socks, belts, earphones and umbrellas, in the passageways of the MTR space (Figure 5-3).

Hawkers often stay together in the 'blurred area' between the MTR-managed space and the platform bridges, which is public space around the stations. They put their goods on a box in a small handcart. The goods on the box are easy to put away if the control team comes. Although the passageways are crowded and noisy, many people stop and flick through the goods, which can cause traffic jams. However, passengers seldom complain about hawkers, as they bring the MTR space alive. Hawkers do not operate in the MTR space every day and they are always prepared to escape. However, like the shop workers, they produce the MTR space, affect users' lives and have become a significant group of people in the space.

Figure 5-3 Hawkers in the MTR space

Buskers

Buskers in the MTR space play instruments or sing. They stay in corners of the 'blurred area'. Although they occupy small spaces and there are few of them, their spatial influence is strong and wide, as music plays an amazing role in people's EDLs. People can usually hear the buskers from far away from the MTR space. Some people stop and appreciate the shows, some slow down as they pass by and others discuss the shows with their companions as they pass by. Of course, many people pass the buskers without paying them any attention. Buskers use their performance to produce the space. One of the interviewees said:

> Every day I go back home late from office. I always see an old man play[ing] violin and harmonica together at the entrance of the Hung Hom MTR station. His music is not that beautiful but it is lively and simple. His music has accompanied with me so many lonely nights and I really feel moved by the lovely songs, which made me relax[ed], happy and forget the lonely feeling.

Buskers earn money in the public space through their performance in that space. In a noisy public space, the performance creates a separate space with musical boundaries. The public space provides the buskers with both a stage and a job. Figure 5-4 shows buskers giving a performance in the connection space between an MTR entrance and platform bridge. Some people have stopped to listen. It looks like a small public concert.

Figure 5-4 Buskers in the MTR space

Newspapers distributers and collectors

Newspapers are distributed for free in Hong Kong during rush hour, as shown in Figure 5-5. People read newspapers to pass the time on their way to work in the mornings. They can collect the newspapers either from boxes provided by the MTR or from newspaper distributers. There are also people who collect the used newspapers. According to their needs, people collect or give away newspapers. These people in the MTR space create a circulation. MTR users are helped by these non-users' work. In return, the newspaper distributers and collectors get jobs and obtain some of the benefits of the MTR space.

Figure 5-5 People collecting newspapers at the entrance of an MTR station

Propaganda people

As the MTR space is always crowded with people, it is used by organisations to obtain benefits or conduct propaganda to the public. Salesmen, publicly spirited people and politicians occasionally use the free area and surrounding areas. They target the MTR space due to the diversity and density of its users. This group of people always stay in the blurred area, which does not belong to the MTR but is used by the MTR users around the stations (Figure 5-6).

Figure 5-6 Propaganda people in the MTR space

Thus, the people in the MTR space can be classified according to their purposes in and their relationships with the space. Different groups of people share and produce the space. A systematic organisation is developing in the MTR space and it is running well. All of these people have become a part of the space, regardless of whether their behaviour is legal or illegal, regular or occasional, deliberate or unaware. People interact with the environment and with other groups of people in the space, and search for their own positions in the space.

5.2.3 People's relationships in the MTR space

Using the above analysis of people's EDLs in the MTR space, the MTR space and its people can be described by either location or relationship.

The MTR space is made up of the pay-to-enter area, free area and surrounding areas. The free area and the surrounding areas can be called the blurred area, as illegal activities happen here and the division between the two areas is indistinct. The pay-to-enter and free areas are divided by ticket gates. Both are managed and constructed by the Hong Kong MTR. The surrounding areas are the places around the stations such as the passageways, platform bridges, squares in front of the stations and the blurred parts between stations and shopping malls.

People cannot freely choose where they move in most of the MTR stations. They are directed to move in particular directions after they finish their MTR journeys. It is thus not easy to define the boundaries of the surrounding areas from a physical space perspective. However, the people and activities in the surrounding areas all have similar relationships with the stations and the travelling users. Different groups of people stay in their own spaces and sometimes flow between different areas. Figure 5-7 shows the physical areas of the MTR space and where each group of people is localised.

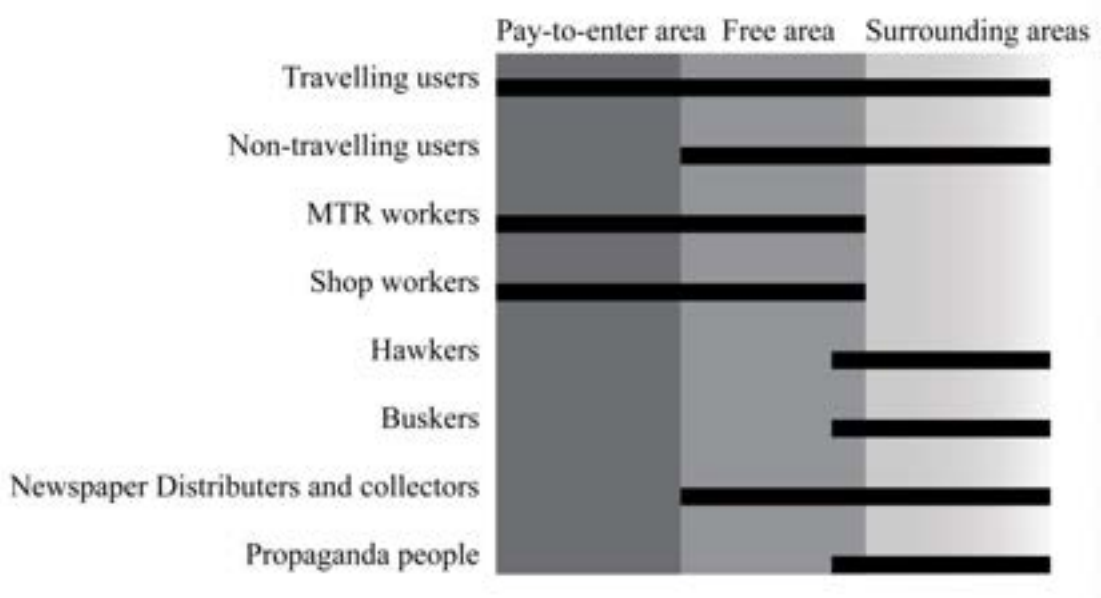


Figure 5-7 Location description of the groups of people in the MTR space

There are relationships between these people in the MTR space. They are not independent groups but depend on each other. Gehl (2011) stated that where there are people, there are activities. People attract other people in a public area. When people are surrounded by others, activities happen. Human relationships form a web over the MTR space, as in Figure 5-8.

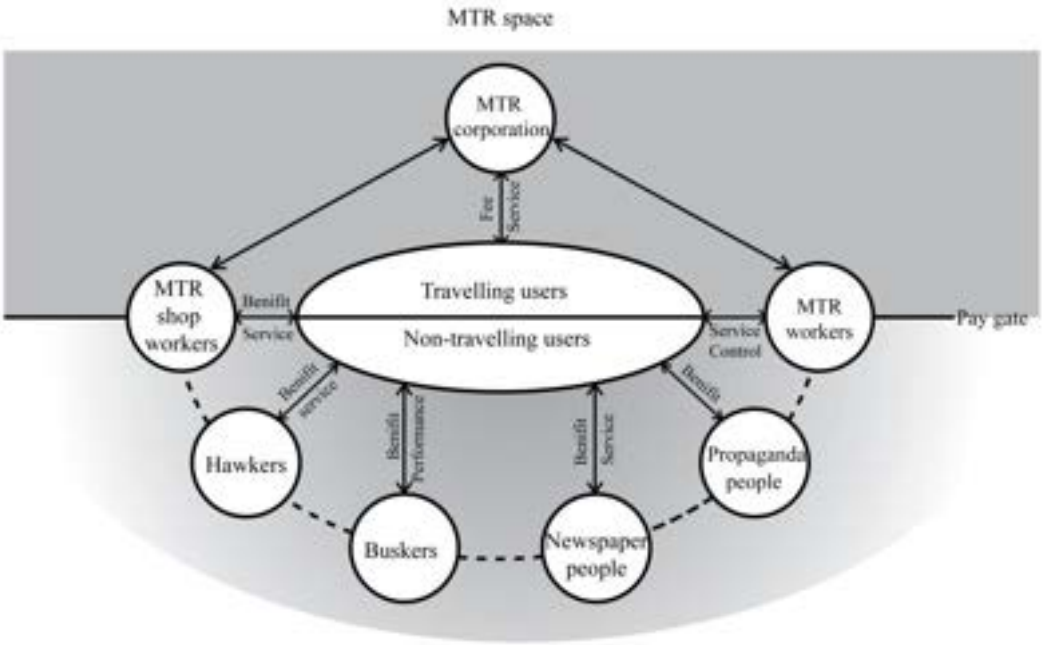


Figure 5-8 The relationships between the groups of people in the MTR space

The MTR space is user-centred. All of the groups of people in the MTR space depend on the users. The relationships between the groups are maintained by the benefits that each group reaps from their connections. People who are not allowed to cross the ticket gates wish to obtain commercial or social benefits from the moving pedestrians (users). The MTR shop workers and MTR employees can legally cross into the pay-to-enter area as their interests are associated with the MTR Corporation. Most of the non-users are in the space to obtain benefits from the pedestrians and to add convenience and colourful activities to the users' MTR lives.

Different groups of people flow through the MTR space. Their roles in the space change according to the purpose of their journeys and their locations. The relationships between different people are framed by the space. It is not only used to separate the people inside but also support the space they produce.

5.3 Practice in the MTR space

The classification of the people in the MTR space and the analysis of their behaviour showed the space's structure. Most of the people in the space are pedestrians. The non-pedestrians' behaviour depends on and is affected by the pedestrians' behaviour. The pedestrians do not only interact with the other groups of people. They have their own lives in the MTR space and interaction with each other. Users can be either mobile or immobile. Mobility is the interaction with the MTR facilities and space for travelling purposes. When immobile in the MTR space, each user deals with their own waiting time. A statistical analysis of how MTR users spend their time in the pay-to-enter areas and train compartments is conducted in this chapter. The users' interactions with the MTR facilities and space will be discussed in Chapter 6.

5.3.1 Levels of MTR space

The case study observations indicate that MTR users' activities can be divided into doing nothing, chatting with others, sleeping, playing in the compartments, reading newspapers, reading books, listening to music, watching TV, speaking on the phone, playing with mobile phones and playing with tablets. These activities happen in the MTR space, but are also processed in different levels of space. Space can divided from different perspectives. The most common division of space is between real (physical) and mental (philosophy and epistemology) spaces. In *The Production of Space*, Lefebvre (2010) proposed the perceived, conceived and live levels of space. These levels correspond to the physical, mental and social levels. In this research, the MTR space is also a multiple space. Although people stay

in the same space, their communication happened in different spaces. According to people's behaviour in the MTR environment, the MTR life spaces are divided into the physical, media and network spaces, as suggested by the case study observations.

Physical space

Physical space is the perceived space in which a city's inhabitants, or users, can act. It is a concrete space with real facilities in which communication occurs. Yeung (2004) stated that through spatial practices in physical space, city dwellers are able to act against the dominating restrictions and transform the space. Physical space, the traditional concept of space in the real world, contains citizens' EDLs. The MTR activities of doing nothing, chatting with others, sleeping and playing in the compartments are practiced in physical space.

Media space

With the development of technology, people's daily lives are filled with various media, from newspapers to advertisements, audio broadcasts to television and books to magazines. Representational signs can be seen everywhere. People are faced with an empire of signs rather than the real world (Barthes, 1970, 1983). According to Lefebvre (2010), society is full of pseudo-events, pseudo-information and pseudo-news. People reproduce and consume messages. Media determines the quality and value of people's lives (Kwok, 1998).

As UTR systems are closed and continuous, their content is monotonous. URT media constitutes a significant portion of the entertainment in the URT environment. URT space can serve as museums or performance halls for displaying music, graffiti, installation art

and advertisements, among other media. Art pieces from the Imperial Palace Museum are displayed in Taipei Metro's stations. China's historical moments are portrayed on the walls of Beijing's Chaoyangmen and Jianguomen Stations (Lewis, 2012). The most common media is advertisements on each side of the passageways (Figure 5-9), forming an empire of signs that are separate from, but representing, physical (real) space.

Figure 5-9 Advertisements on both sides of a passageway

The MTR also provides newspapers and television programmes, which inform the physical space because people depend on them. The MTR activities of reading newspapers or books, listening to music and watching TV are practiced in the media space. This space is as important as the physical space because people greatly depend on it.

Network space

The abovementioned media sources are all one-way communication with no interactions between the media and the user. Before the emergence of communication networks, mass

media began the communication revolution (Castells, 2001). The function of a network is to transport a visual world. Networks are so popular in the modern world that they have permeated every aspect of people's daily lives. As mentioned by Kwok (1998), the computer serves as a seamless transmission medium in almost all daily activities, such as working, learning and meeting friends, and almost all aspects of the communication, entertainment and information industries.

Due to the monotonous nature of a commute, subway users spend most of their time on the Internet, which makes the network space part of the subway space. Figure 5-10 shows that people play with their mobile phones and iPads in both the subway compartments and stations. The subway is different from a train as there is not enough time to recognise a new friend. It is also different from a bus, as most of the subway is underground and its seats face inwards. People do not watch the view outside the compartment, as in a bus. Playing with their mobile phones and using Facebook, Twitter or other websites are the best choices to pass the time and escape from a physical world filled with strangers.

Figure 5-10 People play with their mobile phones in the compartments and on the platform

The MTR's characteristics and space suggest that it is a 'structured world' (Heidegger, 1971). Its closed, continuous characteristics make the physical aspects of subway life boring, making the media and network spaces important. Thus, this place allows for multiple spaces with characteristics at each level. The place is endowed with a special spirit by the space. These factors interact, affecting the space's people.

5.3.2 Users' behaviour in the pay-to-enter area

A survey about the current situation is conducted in the case stations. This study surveys 1,235 randomly chosen MTR passengers, including seniors, adults, youth and children. The results are presented in Table 5-1 and Figures 5-11 and 5-12.

Table 5-1 The results of a survey of passengers' activities while on the subway

The results of a survey of passengers' activities while on the subway			
Lines	East Rail, Kwun Tong, Ma On Shan and Tsuen Wan		
Stations	Hung Hom, Mong Kok East, Kowloon Tong, Tai Wai, Sha Tin, Che Kung Temple, East Tsim Shat Tsui, Tsim Shat Tsui, Monkok and Shek Kip Mei		
	People's activities	Platform	Compartment
Physical space	Do nothing	164	261
	Chat with others	194	99
	Sleep	0	33
	Play	0	3
Media space	Read newspapers	8	7
	Read books	6	20
	Listen to music	37	69
	Watch TV	0	34
Network space	Chat by phone	28	32
	Play on mobile phone	105	107

	Play on tablet	7	8
Others		3	10
Total		552	683

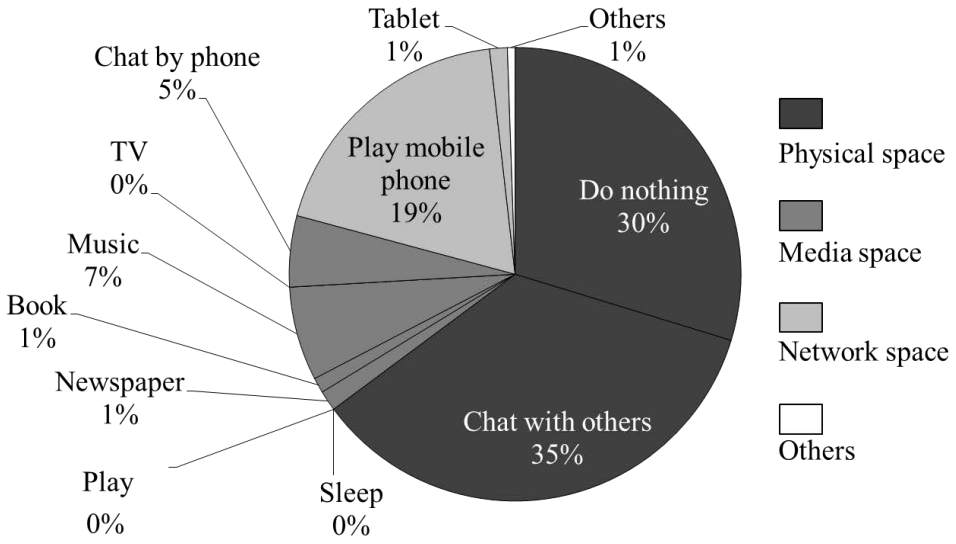


Figure 5-11 People's activities while on subway platforms

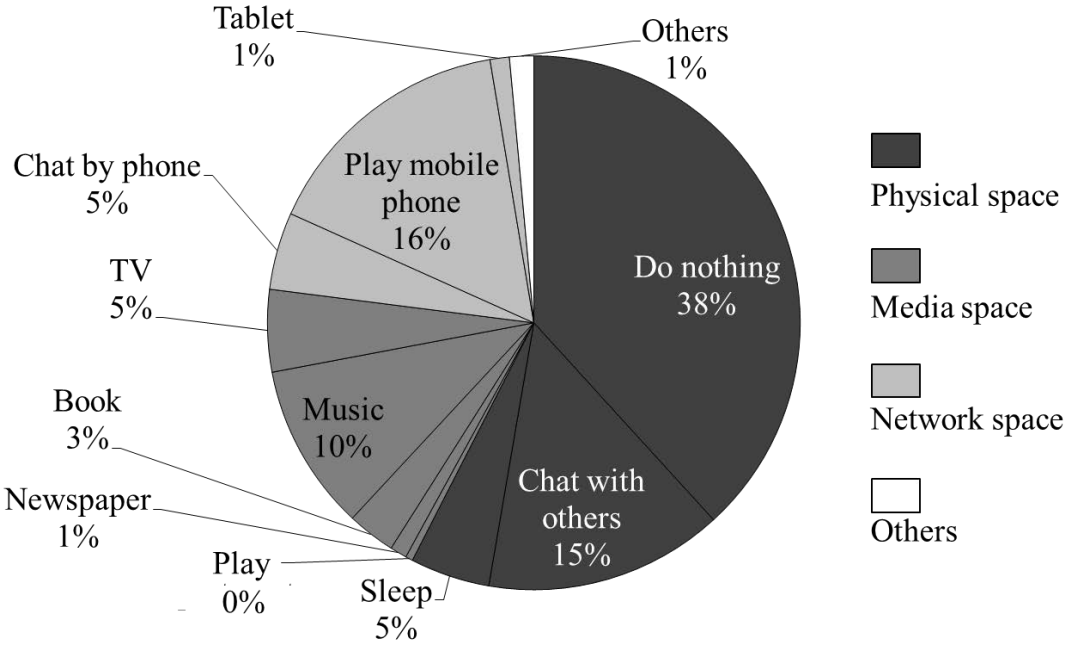


Figure 5-12 People's activities while in subway compartments

The results show how pedestrians spend their time in the MTR space during their MTR journeys. Subway users, particularly the young, depend heavily on electronic equipment to provide entertainment and information that enriches their lives while passing the time. Almost 40% of the subway users travel alone and are dependent on this kind of equipment in both the subway stations and compartments. With the development of the smart phone and the popularisation of the Internet, the mobile phone has become the easiest way for people to access entertainment in public space. Mobile phones with Internet access provide more optional information than the MTR newspapers and television. Of those people in the media and network spaces, the elderly are less interested in playing with their mobile phones or iPads. Instead, they use their phones to talk with friends. Some of the elderly read newspapers or watch TV, but the majority do nothing. The entertainment for the elderly is thus more monotonous than that for the young. The young also experience a monotonous life if they do not have their phones.

Human beings have a natural desire to communicate with their companions. The subway is a good place in which to conduct such communication. In the subway's physical space, 30% of users chat with their companions and 5% speak with someone on the phone. A third of MTR users in this sample communicate in the MTR space. Communication appears to be the most meaningful subway activity. Travellers with companions experience a less monotonous subway life. Similarly, groups in which adult users travel with more than one child are much livelier. The children play games with each other and encourage their adult companions to participate. Other users appear to gain enjoyment simply by watching the activities of these groups.

The results also reveal that although communication is present in all of the subway spaces, it is space-specific. When people converse in the physical space, both conversation

participants stay in the physical space. When a conversation is conducted by mobile phone, both participants stay in the network space. In *Life between Buildings*, Gehl (2011) mentioned that communication between people in public space is ephemeral, but staying in the same space is the essential precondition for conversation.

Figure 5-13 shows how communication works in the three spaces. They are not separate and independent. People can flow from one space to another freely. When people stay in the same space, they can communicate with each other. The three spaces determine people's activities. The people's behaviour and relationships with one another in the environment affect how the three spaces develop. From the above analysis, it is obvious that space and human relationships interact. Changing or improving the human relationships and lives in the subway requires analysing and developing the space. Improving subway life quality and users' freedom is a space improvement and creation issue.

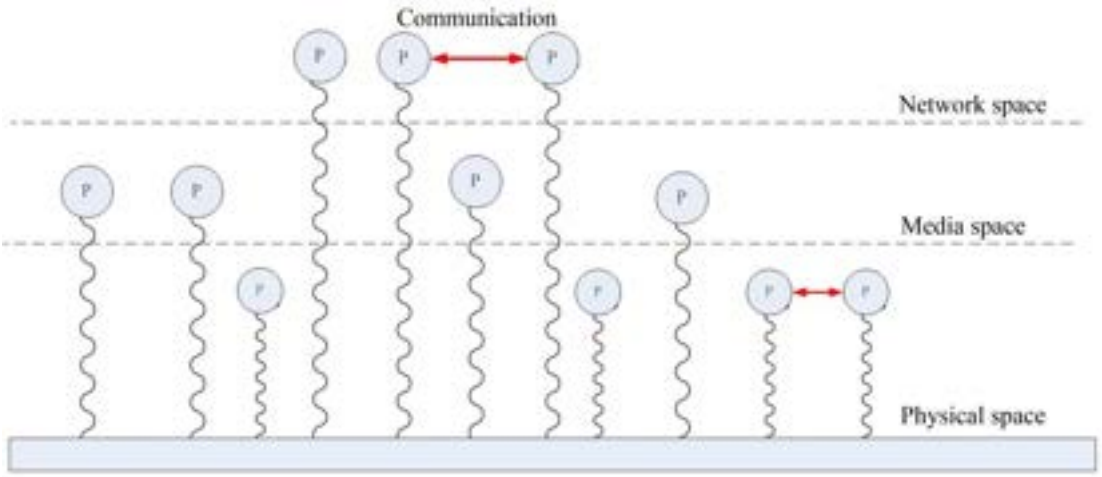


Figure 5-13 How people communicate in each space

Here, space is divided according to users' behaviour. Communication happens between people in each space level. MTR affects or even changes people's lives with its multiple spaces. MTR is a special space, so produces unique human lives and relationships.

5.4 The roles of MTR space/life in the city

People spend their EDLs in the MTR space. The MTR life thus becomes part of people's city lives. As the MTR system has developed, the MTR space and life has developed critical roles in the city. By analysing people's behaviour and relationships in the space, the MTR's roles in a modern city and in city life can be defined.

5.4.1 The MTR as a miniature city

Yeung (2004, p. 16) explained that a metropolis is a combination of a metro, the structural part of a UTR construction system, and a polis, the social space produced by urban movement within the UTR system. The Hong Kong MTR and the American subway are representative examples of a metropolis, reflecting urban life. Brooks (1997) maintained that the New York subway provides much more than a transit. It can be considered a symbol of the city through which citizens can express their emotions and feelings regarding an urban future. The Hong Kong MTR also can be considered an underground miniature of Hong Kong life. Although it is just one of Hong Kong's transportation tools, it reflects the positive and negative unusual aspects of the city. The local culture, residents' habits and life rhythm of Hong Kong are energetically and correctly demonstrated by the MTR (Siu, 2007c).

There are many advertisements on both sides of the MTR's passageways. They produce a media space. The advertisements concern commerce, politics and entertainment, among others. Lewis (2012, p. 1) claimed that advertisements in urban public space are an 'influential' and 'ubiquitous' form of economic and political communication. They are a bridge between the cultural and real worlds. In *Culture and Consumption*, McCracken (2012, p. 74) described his belief that advertisements can transfer cultural meaning by bringing consumer goods and a representation of the culturally constituted world together. Advertisements are sometimes a representation of a culture. In Hong Kong, social advertisements showing the rich culture of Hong Kong are concentrated in the MTR. Figure 5-14 shows examples of social advertisements in the MTR, advertising local food and opera.

Figure 5-14 Advertisements in the MTR during the Chinese Lunar New Year

The MTR also demonstrates Hong Kong peoples' lives and habits. During rush hour, it is full of expressionless passengers walking quickly. Businessmen typically wear black and grey formal clothes, which are called the Hong Kong dress. Their walking speeds show that Hong Kong people value their time and live at a quick pace. Figure 5-15 shows images of human morning rush hour traffic, the majority in suits, on the MTR.

Figure 5-15 People wearing suits on the MTR during morning rush hour

The Hong Kong MTR elevators run faster than those in metros in other cities. During rush hour, people even walk on the elevators to save time. The fast pace of Hong Kong life can be felt everywhere in the MTR space. The stream of people pushes others to move at the same speed.

Although it is always crowded on the MTR, especially during rush hour, the passengers also wait in lines on the platforms. This shows the good quality of both the people and society. Figure 5-16 shows people waiting and walking in regulation lines in the MTR space.

Figure 5-16 People observing public order on the MTR

People seldom communicate with strangers when waiting in MTR stations alone, although they do like to communicate with their companions. As mentioned before, users are eager to communicate in the media and Internet spaces. However, they are embarrassed to actively speak with others in the real world (Figure 5-17). People also do not like sitting near strangers. In Figure 5-18, as the MTR arrives frequently, people stand on the platform rather than sit with strangers on a small seat. These situations occur both on the platforms and in the carriages. Modern people in Hong Kong are afraid of or dislike talking with strangers in public space. There appears to be boundaries around their bodies. These situations show the intrapersonal thinking and habits of modern Hong Kong people.

Figure 5-17 People read and play alone in their own worlds

Figure 5-18 People choose not to sit next to strangers in the MTR space

All of the findings presented in this section give a general impression of the city and people's lives in Hong Kong. Even if you do not travel above ground and see the crowded skyscrapers, you can imagine the Hong Kong life from the MTR. As most of the working class travels on the MTR, it presents an inverted image of the city on the surface.

5.4.2 The MTR as a service centre

As the MTR has developed, basic facilities have been completed across the system. Supplementary facilities have also been developed. As most people travel to work on the MTR every day and many tourists use the stations during the tourism seasons, the MTR stations also provide service facilities for the convenience of the passengers.

Yeung (2004, p. 16) said that the MTR has become a network of infrastructures that house people's social practices, including what the Chinese consider to be the four basic necessities of life, '衣'(clothing), '食'(food),'住'(shelter/housing) and '行'(transport). It is not an exaggeration to claim that the MTR has already developed into a gigantic network of urban life spaces. Figure 5-19 shows some MTR shops in a station.

Figure 5-19 MTR shops in a station

Today, the MTR offers free basic service facilities such as Wi-Fi, post boxes, ATM machines, newspapers and book drops. Many commercial MTR shops can also be found in most of the stations, including food stores, flower stores, laundries, cobblers and locksmiths. Some of the stations are now physically connected to commercial centres and markets,

making the subway exits into shopping centre entrances. The commercial and transportation spaces overlap and cross one another, making the line between the two indistinct.

Physical services makes the underground space more lively and convenient for peoples' lives. As mentioned before, the multiple services mean that people in the MTR tend to not have a single purpose. Moral service is also a significant part of MTR life. For example, MTR art exhibitions offer passengers culture and moral service, and make their lives more colourful and delicate. As the MTR official website (MTR, 2011) stated:

> Among life's pleasurable moments, many are related to the enjoyment of art. With its "art in the MTR" initiative, the MTR Corporation aims to enhance not only the MTR journeys of passengers, but also their life's journeys.

The initiative has been a success since its inception in 1998 with the pioneer project, 'Airport Express Artwork Programme'. MTR managers have since brought live performances, art exhibitions and displays of artwork by established and emerging artists, students and young children into stations. They have even made art part of the station architecture when building new or renovating existing stations (MTR, 2011). Figure 5-20 shows cultural events in the MTR. Cultural service does not appear to act as directly as physical service, but it affects peoples' lives silently and gradually.

Figure 5-20 Cultural events in the MTR

(Source from: http://www.mtr.com.hk/eng/community/art_in_mtr.html)

The MTR is just like a service centre that provides both physical and moral service. It covers both people's needs and their moral pursuits. These additional service facilities in stations enrich people's MTR lives.

5.4.3 The MTR as a city image

In *The Image of the City*, Lynch (1960) claimed that a city is constructed of paths, edges, districts, nodes and landmarks. The URT system has almost all of these elements.

The railway tracks are the same as other paths. The tracks are for the subway's exclusive use. Initially a subway can only be considered a collection of paths, as it connects a few

stations. As the subway system develops, lines cross each other and multiple lines interweave together, causing the stations to become nodes. As different lines cross each other, the tracks form districts. As the whole URT system develops and becomes more important, the URT stations become city landmarks. The subway is a web, forming the skeleton of the city.

The MTR map has gradually become the city map. Early London subway maps were based on standard geographic city maps. The subway was overlaid on geographic features with complex, detailed directions and locations. However, this kind of map was not used for long. In 1931, the first diagrammatic map of London was designed by Beck. He realised that the railway ran mostly underground and that the physical locations of the stations were irrelevant to the travellers, who wanted to know about the subway, not what the surface looked like. He invented a new map approach that was similar to electrical circuit diagrams, using only straight lines. It was an immediate success with the public and is now commonly regarded as a design classic. An updated version is still in use today.

Hong Kong uses the classic subway map with intricate lines and points. The first MTR map was simple and clear, as the MTR was made up of only three MIS lines and only a few representative places were chose to be the stations. Today, the MTR is composed of 10 lines and more than 80 stations across the city. The current MTR map covers most of Hong Kong. Yeung (2004, p. 16) asserted that a route map becomes a real city map as stations are constructed and arranged according to the suitable orientation of the city. As the subway expands, the underground map becomes a good, rational summary of the surface. Figure 5-21 shows the current MTR map.

The MTR shows tourism places on the MTR map, which is a creative, useful idea for tourists. The MTR is the best advertisement for tourist attractions as it not only shows what the attractions are, but also brings tourists to them. The MTR can help travellers to realise their travel dreams from the moment they arrive in the subway.

Figure 5-21 The MTR system map, indicating local tourist attractions

Tourists like to take photographs inside the MTR stations, under their remarkable logos. Taking photographs next to station names on walls is a direct, clear way for tourists to demonstrate where they have been in Hong Kong. The MTR design is creative and systematic. Its colourful mosaic walls have become a symbol of Hong Kong. Figure 5-22 shows examples of creative photographs taken with the MTR space and logos.

Figure 5-22 People take creative photographs in the MTR stations

(Source from: http://www.landofnocheese.com/2012/04/rainbow-station.html)

The MTR also acts as a landmark. As previously mentioned, many non-travelling users are found in the MTR space. They use the MTR stations as meeting places. City landmarks are not only famous for their special appearances, but also for their widespread use and accessibility.

Subways and cities have interacted with each other for a long time. The basic, classic functions of a URT system are maintained and developed by most cities. The modern subway plays many roles in today's cities. Hong Kong is a city with Western and Eastern culture, and has built a unique MTR. This analysis of the subway's roles in the city shows that as peoples' lives have changed, so the subway's functions have changed. The subway's roles in the city

have also affected the citizens' daily lives. In other words, the city life shapes the subway and the subway shapes the citizens' subway lives. This necessary, busy public place has become an essential part of urban life and a new realm for lifestyles. Recognising subway functions and characteristics will play a significant role in improving citizens' subway lives.

5.5 Summary

This chapter discusses how the MTR space is produced. Space is produced through the human behaviour and interactions that happen in that space. This chapter depicts MTR life through the division of the people in the space, the classification of the levels of space and the promotion of the roles that the MTR plays in the city. People in the MTR space are divided into several groups according to their reasons for being in the space. The MTR space is classified into levels based on people's activities. The MTR's roles in the city are proposed, based on the two classifications. This chapter shows that the MTR life is comprehensive and three-dimensional. The relationships between people, between people and space, and between space and city are analysed.

Both MTR users and non-users play critical roles in producing the MTR space. Different groups of people share the space and interact with each other. With a long running-in period, different groups of people in the MTR space get on well with each other. They spend their EDLs in different MTR areas and maintain their human relationships through benefits. This chapter groups the people and analyses their EDLs, giving a more specific, real image of MTR life. It analyses the human relationships in the space, showing that it is user-centred. Non-users provide service to and obtain benefits from users.

Users' behaviour in the MTR space during their journeys suggest that it can be divided into physical, media and Internet space. The physical space can be perceived in reality. The media and Internet spaces are commonly used by modern users. People physically stay in the MTR space and conduct activities and obtain information from the other two spaces. The results also show that people can jump from one space to another as they communicate with each other in different levels of space. The space classification shows how people communicate in the MTR space and how that space is structured through production.

Finally, this chapter summarises the roles that the MTR plays in the city. The MTR's roles demonstrate the relationship between space and city. The MTR space is produced by people, and simultaneously, the MTR space shapes the city. The MTR plays a significant role in the lives of modern city dwellers, affecting multiple aspects of society from city development to human relationships. MTR systems have gradually grown in scope, status and function, evolving from simple links within cities into living spaces. Today's MTR systems are not simply transportation tools. They are cities in their own right, with comprehensive functions, multiple spaces and specific human relationships that produce truly unique environments and experiences.

In conclusion, this chapter demonstrates a lively MTR life and space. People are grouped and the space is classified. The MTR roles in the city are proposed. By observing the basic EDL in the space, this chapter shows how the MTR space functions and develops. The relationships in the space are logically analysed to illustrate how it is produced. By comprehensively describing MTR life, this chapter lays a basis for identifying the factors that affect a quality MTR life.

CHAPTER 6 Quality MTR life from the users' perspectives

6.1 Introduction

The previous chapter discussed EDL in the MTR space and found that URT systems play a significant role in city workings and people's EDLs. The URT system has changed people's traffic modes and lifestyles. The URT life has become part of people's EDLs and the URT space is residents' everyday space. Many mature technologies have recently been used in URT systems, especially those constructed recently. Users do not only require their URT systems to be fast and accessible. They have changed their focus from an efficient URT life to a quality URT life. Constructing a quality URT life is a current area of research and has broad research prospects.

This study uses a three-dimensional comparison to obtain a comprehensive understanding of quality URT life, comparing age, gender and cultural background. Using the descriptions of everyday MTR life in Chapter 5, this chapter extracts the factors that affect a quality MTR life and uses them to design a questionnaire. People of different backgrounds and ages are interviewed and asked to complete the questionnaire. Quantitative and qualitative research methods are applied in each of the three dimensions, such as a case study, questionnaires, observations and interviews. The goal of this three-dimensional comparison is to gain insight into what users understand a quality URT life to be and how different factors affect the quality of URT life, using the active and passive participation of hundreds of Hong Kong URT users. The requirements of each user group are organised and a general needs pyramid of quality URT life is proposed. The multidimensional comparison provides

useful information for designers by demonstrating the distinctive attitudes of different groups of people. This interpretation of quality subway life is from the needs perspective and focuses on specific public areas.

This study also aims to apply data from online social networks in subway design work and propose a new way to develop a design. By comparing social network data with users' needs levels, an updated theoretical image-need-design opportunity model with a cyclical process is created. This research provides insightful information for future design work and aims to evoke in researchers a desire to derive potential design information from online social networks.

6.2 Factors affecting a quality subway life

In Chapter 5, the MTR life was analysed by discussing people's interactions with each other, the division of the MTR space and the MTR life's city roles. These three aspects described the MTR life comprehensively. The factors that determine a quality MTR life can also be extracted from these three aspects, helping to obtain a systematic, comprehensive understanding.

The factors that determine a quality MTR life must first be defined using Chapter 5's analysis of the people in the MTR space. They are mainly divided into users and non-users. Factors can be extracted from the interactions between people and space, using people's purposes in the space and based on the principle of user-centred design.

The URT space is a systematic space. People enter and exit the web daily. Unlike other city public space, the URT space is not a point but a continuous web connected by the subway tubes. Connections occur between each station. The URT runs on an exclusive right of way that separates its passengers from the city. People's URT lives happen in the URT space.

Travelling users' main aim in the MTR space is mobility using the railway. The whole travelling experience can be divided into entering the MTR, walking to the platform, waiting on the platform, being in the compartment, transfer (if needed), walking to the exit and exiting the station. Travelling users are concerned with many sub-factors at each step. Non-travelling users use the MTR stations to meet people and use the MTR shops and EDL facilities. When users (both travelling and non-travelling) interact with non-users in the MTR space, they obtain different benefits from the non-users. For example, MTR workers give human services, buskers offer musical entertainment and newspaper distributers offer newspapers.

Twenty MTR passengers, including male, female, local, non-local, young and elderly people, are interviewed. They are asked to give their ideas of the factors that determine a quality MTR life in each travel step. The interviewer does not specifically limit quality life. The interviewees are encouraged to open their minds on this topic. Factors can be obtained from the interviewees' opinions. Through this method, the factors obtained are all meaningful ones from users' perspective. Although these factors are obvious factors that users can explain well, they can be considered as the direct needs and most urgent needs.

Users' behaviour in the MTR space can be used to extract factors from different levels of space. The users' behaviour occurs in physical, media and Internet space. Different factors affect quality life in each space level. Most of the behaviour in each space level is related to

entertainment. Thus, the factors that determine a quality MTR life are a good environment in which to sleep and communicate with others, free newspapers and interesting TV shows, good telephone and Wi-Fi signal, and interesting, attractive advertisements.

Chapter 5's discussion of the role of the MTR life in the city focused on the MTR's macroscopic functions. To fulfil its role as a city transport system, the MTR requires factors such as good accessibility, identity (easily found) and connections with other city public transportation. To fulfil its role as a city mirror, city image and service centre, the MTR requires special factors in the city.

Table 6-1 lists the factors obtained from the above discussion and interviews.

Table 6-1 Factors that affect young peoples' URT life quality

A: Before entering the subway; B: From the entrance to the compartment; C: Inside the compartment; D: From the compartment to the exit/transfer; E: Exiting the subway station	
A	Distance between home and the station. Ease of finding the MTR entrance in the city.
B	Convenience of the payment method. Price. Barrier-free structures. Cleanliness of the environment. Clarity of instructions. Punctuality of the trains. Enough seats. Attractive environment (advertisements and artwork). Human services.
C	Safety and reliability of the trains. Availability of seating. Orderly environment. Entertainment (Availability of Wi-Fi. Availability of free newspapers. Provision of

	interesting TV programmes.)
D	Transfer distance. Availability of toilets. Convenience of shops.
E	Efficiency of feeder bus services.

These common factors are summarised from the all of the interviews. However, during the interviews, the participants show different attitudes towards their URT lives. They are more excited and show more dissatisfaction when discussing certain factors than others. Attitudes also differ between groups of people.

6.3 A three-dimensional comparison of the factors affecting a quality MTR life

As described in Chapter 4, questionnaires, interviews and observations are used together to obtain a comprehensive understanding. The questionnaire is distributed to different people. The interviews and observations are used to obtain more first-hand interpretations.

The questionnaire is designed based on the factors that affect a quality MTR life. Hong Kong MTR users are asked to evaluate and score the importance of each factor. The scores range from 1 (least important) to 5 (most important) (Li, 2007).

6.3.1 How age affects views on a quality MTR life

Sixty completed questionnaires from young people (20-40 years old) and 40 completed questionnaires from elderly people (above 60 years old) are obtained. These two groups of people are selected to due to their representative characteristics. The majority of the MTR

users are young people. Elderly people always have special requirements. Children less than 20 years old and adults (40-60 years old) are not surveyed. As the elderly do not always understand the meaning of Wi-Fi, the Wi-Fi related questions are removed from the elderly people's questionnaire. The ranking results for each factor, compared by age, are shown in Table 6-2.

Table 6-2 Rankings of the factors affecting URT life quality, compared by respondent age

Ranking		Factors affecting URT life quality	Mean	
Young	Old		Young	Old
1	5	Safe and reliable trains	4.75	4.31
2	7	Clear instruction facilities	4.53	4.19
3	6	Punctual trains	4.52	4.27
4	12	Reasonable price	4.42	3.52
5	9	Clean station and compartments	4.37	4.095
6	8	Easy to find the MTR entrance	4.35	4.12
7	4	Short transfer distance	4.03	4.35
8	1	Enough toilets	4.02	4.50
9	–	Available Wi-Fi	3.98	–
10	2	Barrier-free facilities	3.93	4.48
11	13	Convenient payment method	3.93	3.42
12	11	Short distance between home and station	3.93	3.62
13	10	Efficient feeder bus service	3.92	4.09
14	3	Enough seats	3.77	4.40
15	14	Convenient MTR shop	3.42	3.33
16	18	Free newspapers	3.1	2.67
17	15	Attractive artwork	2.83	2.81
18	16	Interesting TV programmes	2.75	2.76
19	17	Interesting advertisements	2.62	2.71

In Siu and Wong's article (2013), they have divided the Visual visually impaired persons' needs as physiological needs, psychological, cultural, social and ideological needs. In our research, the young people's results indicate that the factors can also be summarised into

five groups, from most to least important: *A* group is functional needs (safe and reliable trains, clear instruction facilities and punctual trains), *B* group is economic needs (prices), *C* group is physical needs, *D* group is entertainment needs (available Wi-Fi, convenient shops and free newspapers) and *E* group is art needs (attractive artwork and interesting advertisements). Functional needs are the elements related to the basic travel experience. Economic needs are related to necessary consumption in the URT space. Physical needs are those related to the requirements of the body, such as clear air for breathing, less labour to save energy and less thinking to save time. Entertainment and art needs make life interesting.

Ensuring a quality life for young people

Young people are a special group of MTR users. They are a low-income group of people. Most of the young people in Hong Kong are at the beginning of their careers. Modern young people have their own personality. They experience great pressure from society, especially in a fast-paced city like Hong Kong. During rush hour, the MTR is full of young passengers. They walk quickly with no expressions on their faces. Their quick pace shows that people in Hong Kong value their time and live fast-paced lives. Many young people walk on the escalator instead of standing on it to save time. When young people wait on the platforms or get into the compartments, they frequently play on their mobile phones.

The factors are arranged from most to less important, using the questionnaire results, to construct a pyramid similar to Maslow's pyramid of needs. Maslow's theory of the hierarchy of needs is widely used in many fields. It divides human needs for QoL into several levels and arranges these levels into a pyramid. Physiological needs are at the bottom of the hierarchy, followed by safety, social and esteem needs. These four needs are

deficiency needs. Esteem needs lead to self-actualisation, also known as growth needs. In consumer marketing, Maslow's hierarchy of needs corresponds to the consumer requirements of function, body, social image, symbolic and individual brand needs (Wu, 2001).

When different levels of needs exist together, the needs on the lowest level motivate the users' behaviour first. Once the needs at the lowest level are met, the next level of needs becomes the focus. The higher up the pyramid a need is, the more difficult it is to satisfy. As Sirgy (1986) stated, from a human developmental perspective, QoL goals can be defined as the satisfaction of human developmental needs in a community or society. The fulfilment of one need allows an individual to fulfil another need at a higher level (Siu, 2007c).

The results show that young people rank functional needs the most important, followed by economic, body and entertainment needs, forming the needs pyramid in Figure 6-1. The most important needs, which score highest, are at the bottom of the pyramid and are the foundation for QoL. The less important factors are at higher levels. Functional needs are the most important for young people, as these needs deliver the people to their work and entertainments efficiently and safely. Young people want to use the least time to finish the most things, which is in agreement with the characteristics of modern people.

Economic needs are ranked second due to young people's low incomes and the high pressure exerted on them by their work and society. Young people do not obtain any preferential treatment from the government. Their transportation costs are a large proportion of their daily expenses. The continually rising MTR prices exert economic pressure on them.

Several physical needs are ranked next. Body needs are ranked third, as these needs do not significantly affect young people's efficient work and economic situations. Young people have strong bodies so they are not concerned about whether they have a seat, whether they can find the toilet easily and whether they need to stand for a long time. Entertainment needs appear to be more important than the art found in the MTR space, demonstrating the 'snack culture' of modern young people. Entertainment can quickly and efficiently bring happiness. Art installations in the space can only be appreciated if passengers slow down.

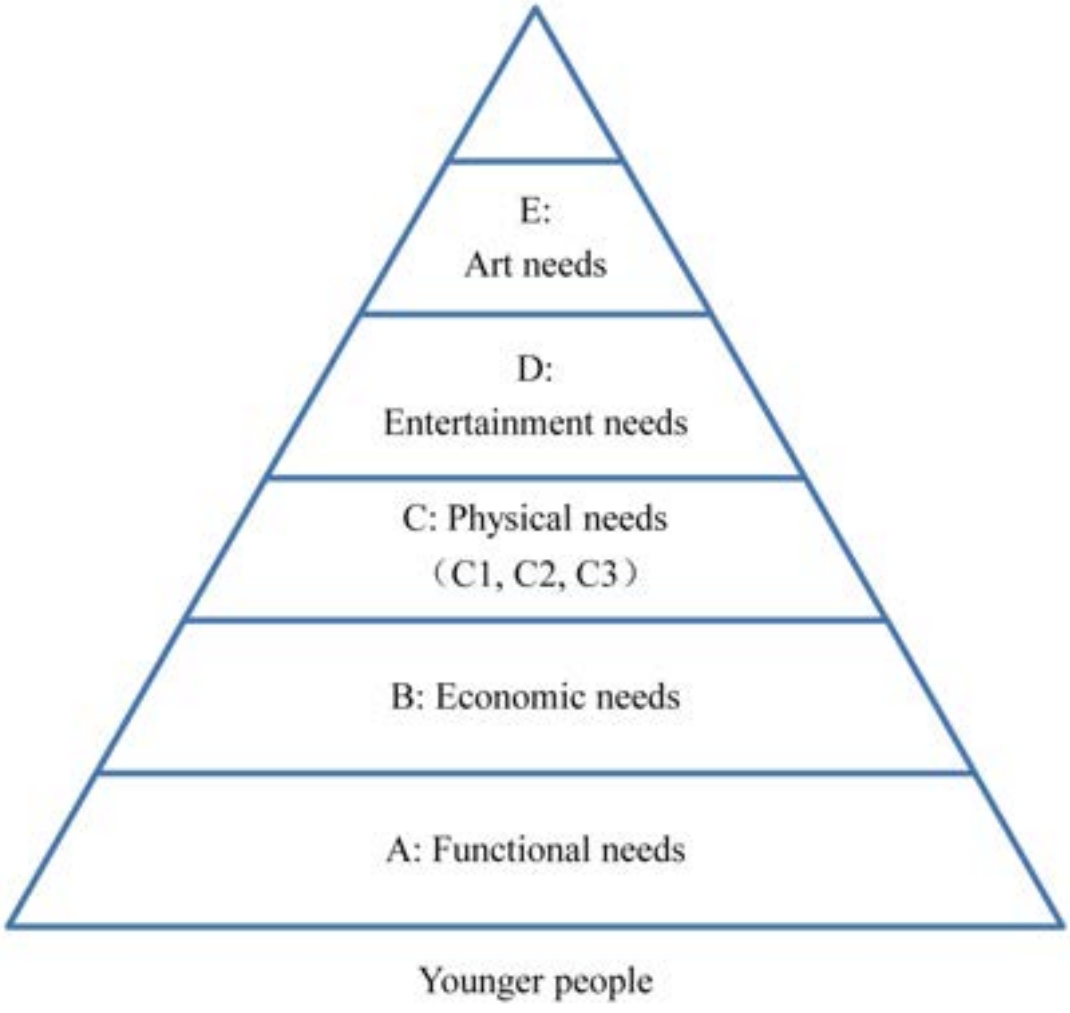


Figure 6-1 Needs pyramid for young people

Ensuring a quality life for elderly people

Elderly people have a slightly different pyramid (Figure 6-2). The elderly focus on their physical needs more than young people, as their physical functions are reduced. Economic needs play a less significant role for the elderly because the government provides them with incentives such as the public transport fare concession scheme for the elderly and eligible persons with disabilities (MTR, n.d.). Body needs for the elderly can be reclassified into *C1*, inside environment needs (clean station and compartment); *C2*, necessary physical needs inside the station (barrier-free facilities, enough seats and short transfer distances); and *C3*, needs related to the city (easy to find the MTR entrance, short distance between home and station and an efficient feeder bus service). Entertainment and art needs enrich peoples' lives by adding fun.

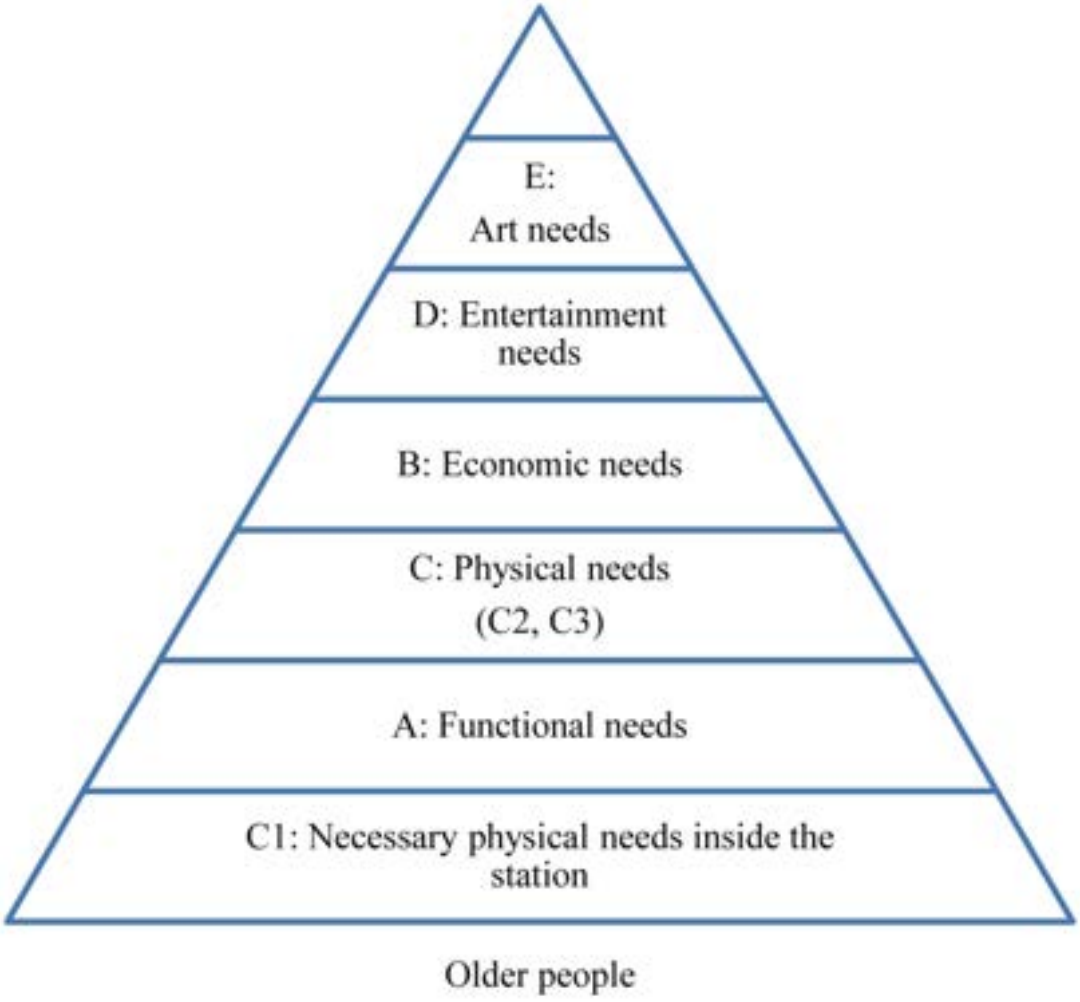


Figure 6-2 Needs pyramid for the elderly

The above findings reveal the key factors that influence the quality of subway life for the elderly and the features that could be improved. Elderly people's requirements for a quality URT life are summarised below.

a) Physical comfort

As they age, people experience changes in their sense of sight and hearing, memory and body flexibility, for example (Kwok, 2006). These physical changes bring many special

requirements and these requirements play a significant role in the elderly's subway experience.

> Respondent: 'I don't like to go out during rush hour. There are so many people in the station, I cannot get a seat during the whole 30 minute journey. This makes me very tired. But I don't think this issue can be solved as the MTR already provides a frequent service. There are too many people in Hong Kong now.'

Providing a restful environment is important for older users of the MTR. A rocky train can be difficult for the elderly and they cannot endure standing for long journeys. If the problem of overcrowding cannot be solved quickly, it is important to ensure that there are priority seats for the elderly and to instruct younger people to offer these seats to them.

Toilet facilities are also important for older people. There are not enough toilets at MTR stations. When asked about toilet facilities, the interviewees unanimously reply that they were not satisfied.

> Respondent: 'Currently there are not enough toilets in the station and they are too small. I have to walk a long way to find the toilet. This really needs to be improved.'

Among the MTR's 84 stations, only 37 have a toilet inside the station. Ten of these are inside the pay-to-enter area and most of them are located near the station entrances. It is a long way for the elderly to walk from the train compartment to the toilet.

The respondents raise three points about this issue. First, they often do not know whether there is a toilet nearby. Second, they do not know where the toilet is located. Third, even if

they know the location, it is inconvenient for them to walk far to get to it. Greater consideration should be given to this issue. Although adults are also aware of these issues, these problems seem more serious for the elderly.

b) Independence

Independence is important to QoL because it enables people to get outdoors, enjoy life, meet people and avoid having to rely on others (Gabriel & Bowling, 2004). In the MTR environment, independence is also an important factor as older people find it difficult to control their direction, speed and body in the crowded public space (Siu, Ng & Chan, 2011). The interviewees do not like going out during the rush hour because they cannot walk as fast as younger people. The moving crowds push them to walk faster, making them feel uncomfortable and out of control. Older people try to control their life rhythm, as demonstrated by the sub-theme 'having freedom as opposed to limitations' (Borglin, Edberg & Hallberg, 2005). Efficient barrier-free facilities, feeder bus services and a short distance between home and station are significant factors.

c) Suitable entertainment

The observations reveal that there is insufficient entertainment for the elderly in the subway. The questionnaire results suggest that the respondents do not consider this to be an important feature, although they also rate it as unsatisfactory.

> Interviewer: 'Do you feel bored in the compartment?'
>
> Respondent: 'I don't care about it because I think there is no way to solve this. The TV programme is discontinued when they announce the station name. We cannot

hear the TV in the noisy environment. In the crowded compartment it is even difficult for us to get a seat so how we can read the newspaper? I choose to listen to the radio sometimes, like on the bus. But unlike the bus, the train is quite fast and the time between each station is quite short. Even [if] I want to listen to music, I have to maintain vigilance to see whether I should get off the train.'

According to Gabriel and Bowling (2004), social entertainment is one of the most significant factors affecting elderly people's QoL. Social entertainment makes older people feel busy and provides mental stimulation. Although people pay less attention to entertainment in the MTR space, this aspect should not be ignored. Older people are not interested in current fashions such as mobile phones, which entertain younger people. Suitable entertainment should be designed for the elderly to improve their QoL during subway journeys.

6.3.2 How gender affects views on a quality MTR life

Gender differences in young people are investigated through observations and interviews, to prevent age-related factors from interfering with the results.

Many cities' URT systems provide special care for women. In Japan, there are women-only compartments. Taipei provides waiting zones for women during the night. Emergency buttons are set up in the station toilets. Women need special care and protection in the public space.

There are no special provisions for women in the Hong Kong MTR. Young women demonstrate a range of attitudes regarding this issue. Some young women hate to take the MTR due to the crowds. They try to stay in a corner in case their body is hit by other people. Some young women consider Hong Kong to be a secure place and that special considerations for women are not required. The results of a comparison between young men and women's views on the factors that affect a quality MTR life are summarised below.

Female users are more sensitive

The results show that female users are more sensitive than male users. Women users are better at describing their detailed requirements than men. They also have higher standards of requirements for the environment than men. Female users are less satisfied with the cleanness of the environment, the security of the space and the human service in the stations than male users. As young and old people differ physically, men and women are physically and emotionally different, so have different focuses when considering a quality MTR life. Female users also deal with travelling with small children and babies more often than male users. The female interviewees discuss their experiences of travelling with baby carriages and luggage carriers in the stations. Women play a more significant role in taking care of children in the compartments and they are sensitive to small children's needs.

Male users criticise the MTR

Although women have high requirements for the MTR environment, men criticise the MTR space and service. Men analyse weaknesses from a macroscopic perspective. They criticise politics, policies, the government and the social system. For instance, women see the issue of advertisements in the MTR space from an aesthetic perspective. In contract, men criticise

advertisements by considering commercial monopoly and passive acceptance. Some local young men also mention that the construction of the subway increases real estate values. Only rich men can live near to stations. The government does not consider the requirements of poorer residents. In summary, male users consider social issues from a political, macroscopic perspective.

The MTR shops are more meaningful for women

Women love shopping. Almost all of the women interviewed show positive attitudes towards the MTR shops and the shopping malls connected to the MTR stations. Shopping activities bring female users great entertainment and interest. One of the young ladies from The Chinese University of Hong Kong said:

> 'I lived in Tai Wai Station. There are some clothes stores inside the station. Every day, [when] I came back from university, I would like to take a look [at] the clothes in the store. Sometimes, when I like some clothes, I just wait for the sales time as I can check the store every day. Haha … I love shopping. From University Station to Tai Wai, many shopping malls are located in Sha Tin Station. It is so convenient for me to go shopping. Shopping in the Sha Tin Station is the walking time after dinner for me. I also spent a lot of money … wuwu … haha.'

Female users view the MTR shops as convenient services. Some male users view the MTR shops as insignificant and others consider them to remove the right to choose. Men can see the nature of capitalism and they have a more rational attitude.

6.3.3 How cultural backgrounds affect views of a quality MTR life

Young Hong Kong people are divided into local Hong Kong residents (74.6%), Chinese residents visiting Hong Kong (21.9%) and foreigners visiting Hong Kong (3.5%) to investigate the effect of different cultural backgrounds. Interviews with local and non-local young people show that they have different ideas about URT matters. Table 6-3 compares sample local and non-local interview reports to illustrate some of these differences.

Table 6-3 Interviews with young local and non-local people in Hong Kong

Question1: How do you feel about the MTR space?
Local interviewee: I took [the] MTR to go to school every day when I was young and now it takes me to work. I have a lot of memories about going to school by MTR with my friends. The MTR has expanded over what it was before. When I take the Ma On Shan Line, which I took every day when I was young, I feel amazing and warm when I see the old decorations! It seems bring me back to childhood! I suddenly feel I am old! Hahaha…. (Local Hong Kong resident) **Non-local interviewee:** I feel the MTR environment is ice cold. Of course the air conditioning is low. But I am not meaning that. I cannot feel emotional care in the MTR. People stay in their own worlds, walk fast and speak fast. Advertisements change as frequently as the passengers in the MTR. In this strange environment, actually, I feel alone. (Person from mainland China who works in Hong Kong)
Question 2: How do you define a quality URT life? What are the advantages and disadvantages of the MTR, in your eyes?
Local interviewee: A quality MTR life should be user-centred in every aspect. I feel unsatisfied about the price of the MTR. The MTR company has already earned a lot from the real estate and they are still greedy. They constructed the MTR in an open space and then constructed real estate on the open space to earn money. The poor bottom dwellers have to walk a long way to the station. I feel angry about the government. I also oppose the plan for the high-speed rail. For the basic function, I feel OK. It has been improved year by year. I hope MTR will consider bicycle users in the

future. Also, I feel the MTR is too noisy. I prefer an environment that is quiet, like the Tokyo metro. (Local Hong Kong resident)

Local interviewee: I feel that the MTR has changed a lot. Several years ago, they didn't distribute the newspaper, we didn't use the Octopus card (The Octopus card is a reusable contactless stored value smart card for making electronic payments in online or offline systems in Hong Kong.), and it was not as accessible. Every great advance in the MTR made me happy. I even feel a little pride in the MTR as I find it is becoming much better than before, although it is still not perfect. Now, when I see a colourful mosaic, I feel it is a logo of the Hong Kong MTR. Although this design did not reflect the Hong Kong culture at first, it has become part of Hong Kong culture now. A quality URT life, er…I think it should be quiet and comfortable, with civilised people. (Local Hong Kong resident)

Non-local interviewee: I think the Hong Kong MTR is good enough compared to the subway in China's mainland. It is humanised and well designed. I do not expect higher services from the MTR, such as the MTR shops or artwork. To improve the functionality is more important than other things. I can just view this city in a bystander's way, as I don't think it is easy for me to integrate into this society. So I don't expect too much. (Interviewee from mainland China who studies in Hong Kong)

Non-local interviewee: Comparing Hong Kong's MTR and Guangzhou Metro, I think Guangzhou Metro is more emotional for me, although the basic function is not as good as in Hong Kong. People communicate with each other on the metro after work. Their communication made the compartment alive. Although it was noisy, the scene made me feel warm. I am afraid of a silent compartment. (Interviewee from mainland China mainland who works in Hong Kong)

Non-local interviewee: I think a quality MTR should be clean, safe and well-managed. The Hong Kong MTR is good enough. I don't have trouble reading the information, as the whole city is so international. (Foreigner working in Hong Kong)

The interview report reveals that local people have great memories of the MTR. Their descriptions of the MTR exhibit a sense of responsibility and emotion. For local residents, the MTR has been around for a long time. Neither their positive nor negative attitudes are

expressed with much emotion. Local young people are both harshly critical and proud of the MTR. Their expectations for an MTR life are more complex than the expectations of others. Local people are more sensitive to the details than non-locals. They connect their basic needs with their EDLs, political views and memories. By communicating with local young people, designers can find more detailed design opportunities.

The non-locals' attitudes towards the MTR are calmer and simpler. They focus on the basic functions instead of higher-level requirements and do not have the same emotional investment in the city. The longer young people stay in the city, however, the more harshly they criticise the URT. The non-local people do not put much emotion into the environment and also do not obtain emotional rewards from the environment. Some of the non-locals consider this city to be a place where they are temporarily working, instead of a place where their future families will be located.

6.3.4 Direction of quality MTR life in Hong Kong

The different user groups have differing and overlapping URT needs. As the URT is shared by people of different backgrounds, the general requirements of the MTR are summarised based on the above discussion to best fit the needs of all users. A general pyramid including all of the users' ideas can be constructed by combining the needs pyramids for each group (Zhao & Siu, 2014b). Beyond the elements used to create the pyramid, both the local and non-local interviewees mention emotional needs several times during their interviews (through the use of such words as 'alone' and 'memories'). Emotional needs are extracted by users, but cannot be anticipated through common sense (Ho and Siu, 2011; Siu, 2013c).

These less obvious needs are positioned at the top of the pyramid with other potential needs. The integrated URT needs pyramid for a quality URT life is shown in Figure 6-3.

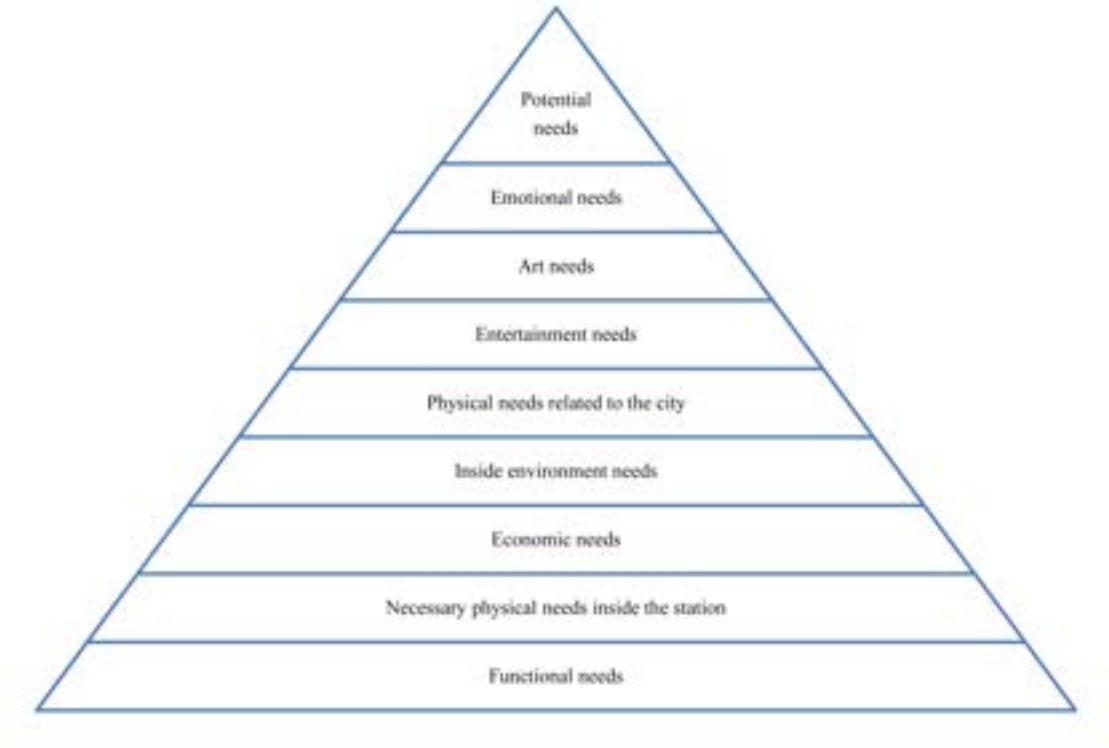


Figure 6-3 Quality URT life needs pyramid

In this general needs pyramid, the most significant needs are located at the bottom. The elements located higher up are less necessary. This needs pyramid demonstrates how to pursue a quality URT life for all users. Just as with Maslow's needs theory, the low level needs should be fulfilled first, followed by higher level needs, to construct a quality URT life. The width and height of the pyramid affect quality. Low level needs determine the stability of the pyramid, whereas high level needs affect the more subtle aspects of the pyramid's attractiveness to users. If the area of the pyramid is considered to be the degree of QoL, a stable (wide base), high (supporting many higher-level needs) construction corresponds to a high quality URT life. More detailed potential needs can be added to the

pyramid as they are discovered. A better URT life should result as the pyramid area increases.

The URT needs in the pyramid are obtained from the users' perspectives. It is a general needs pyramid. The lower level needs play a more significant role in people's URT lives and are easy to fulfil and perceive. Higher level needs are more difficult to fulfil and sense. However, as with Maslow's (1943) needs, the pyramid does not describe an absolute needs hierarchy. Different people will demonstrate some differences in their hierarchy of needs. Different groups will grant greater priority to different needs, as shown in the three-dimensional comparison. However, the final pyramid generally follows the trends indicated by all of the participants.

6.4 Discovering design opportunities with the needs pyramid

A quality MTR life has been defined with the needs pyramid. A creative method for searching for design opportunities through multimedia in the modern world using this needs pyramid is now proposed.

6.4.1 Social media and design

In the modern society, social media is widely used by people of different education levels, cultural backgrounds, and ages to facilitate communications within social networks. A social network is a social structure comprising of persons or organizations with social relations (Yu & Kak, 2012). Social media is the sister of social networks; it comprises platforms that help users to create and exchange content, it is also widely called consumer-

generated media (Loader, 2008; Reynolds et al., 2010). Online social networking services (SNSs) are a subset of social media (Yu & Kak, 2012). There are currently no reliable data regarding how many people use SNSs, but many people have integrated these sites into their daily practices (Ellison, 2008). Since there are many users sharing their opinions and experiences via social media and SNS, there exists therein an aggregation of personal wisdom and different viewpoints (Yu & Kak, 2012). The data available via social media can give us insights into the scale and extent of social networks and societies. This digital media can transcend the boundaries of geography to facilitate the study of human relationships (Lauw et al., 2010) and help measure popular social and political sentiments without the use of explicit surveys (Kumar et al., 2009; Ritterman et al., 2009). Thus, social network data is widely researched by scholars from disparate fields to understand the practices, implications, cultures, and meanings of the sites, as well as the users' engagement with them (Bothos, Apostolou & Mentzas, 2010). According to Yu & Kak (2012), network data can also be used to predict some human related events if the data is extracted and analysed properly. Nowadays, data from social networks are used to predict movie box-office results, disease, equity market, tourism, and more (Asur & Huberman, 2010; Tse & Zhang, 2013). In Mayer Schoenberger & Cukier's (2013) book *Big Data: A Revolution That will Transform how We Live, Work, and Think*, it is written that analysing "big data" from the internet would bring an unprecedented revolution of our future life. Many decisions could be made based on big data mining from the online social networks. The fact that participation on social network sites leaves online records offers unprecedented opportunities for researchers.

Considering the character of online social network data, this study tries to apply the data from the network to design work. In order to develop user centred design principles, it is important to discover design opportunities according to the users' opinions (Siu, 2009b; Siu & Wong, 2013). Designers must recognize that they should not, and cannot, make decisions

for users about their requirement and use method. This means that they should not impose their value judgments on users (Siu, 2003b). Currently, there are a great many methods to obtain design opportunities. In his book *Design Investigation,* Li (2007) mentioned that there are 11 methods used to discover design requirements, including interview, observation, questionnaire, users' psychological experiments and so on. All these methods require direct communication with users. They are niche targeting and accurate methods, but they require a good deal of time and labour to perform. As users attitude is always changing over time, it is not easy to catch the design opportunities seasonable.

This research hopes to predict users' needs for subway design and find design opportunities by analysing big data. If big data can be applied to the design work, this will help to reduce costs associated with the labour and time required by the other discovery methods. As Yu and Kak (2012) identified, automatic prediction with machines has a much lower cost than human labour; furthermore, this method could process greater amounts of data and provide answers more quickly (Barbier & Liu, 2011). By comparing the data from social network with users' needs level, an updated Image-Need-Design Opportunity model with a cyclical process is created at the theoretical level. This research attempts to provide an insightful reference for future design work and aims to evoke in researchers a desire to excavate potential design information from online social networks.

6.4.2 The application of an online social network system

In the modern society, people express their opinions through the social network. The words include the evaluation of the environment, the image they perceived and the needs they pursue. It seems there is a black box between the design opportunities and the descriptions on the SNS as shown in figure 6-4.

Figure 6-4 The first black box

In the previous part, the subway needs level is defined according to the Maslow Theory. As the subway is a special functional transport system in the city and is an independent underground facility, users' needs towards the subway space may not perfectly line up with Maslow's identified needs. But it is no doubt that the subway's needs are hierarchical in nature. The first black box is explained as figure 6-5. It is obtained through the directed communication with the users.

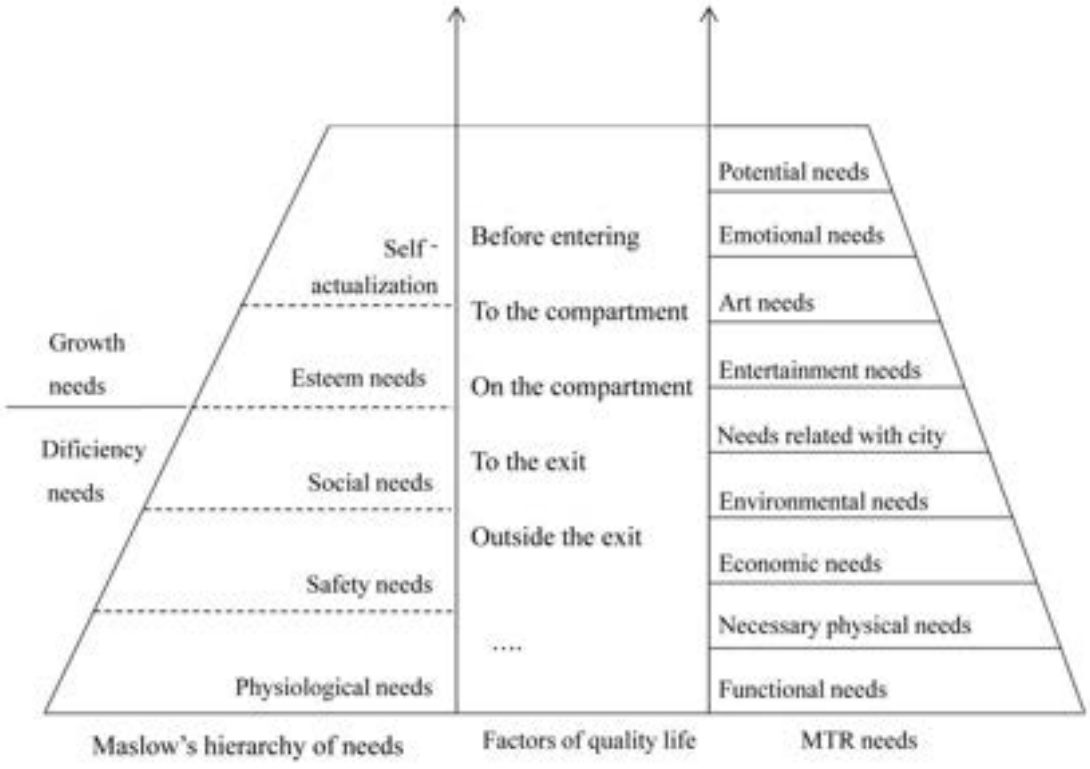


Figure 6-5 The categorization of subway needs

After setting up an integral subway needs level, the author try to obtain users' descriptions, evaluations and images to conduct the data analyzation. There is thousands of information from the social network. In information driven design, the designer tries to define the design problem as strictly as possible (Kruger, 2006). The information from the users is quite valuable. The big data should be used appropriately. Figure 6-6 is another black box, which shows the transaction from social network data to subway needs. The black box can be opened in the following explanation.

Figure 6-6 The second black box

The author set Micro Blog and Hong Kong MTR as an example. When the big data from Micro Blog are obtained from internet, firstly the descriptions with the key words "HK MTR" "Hong Kong Subway" "subway life" are extracted from the large amount of Micro Blog data. Then through data mining towards these extracted descriptions, some high-frequency words can be gained with sequence. The amount of these "high frequency words" depends on the amount of the basic data. Most of these high frequency words can find their positions in the subway needs levels. Based on these high frequency words, the subway needs pyramid for Hong Kong MTR is filled, as shown in figure 6-7.

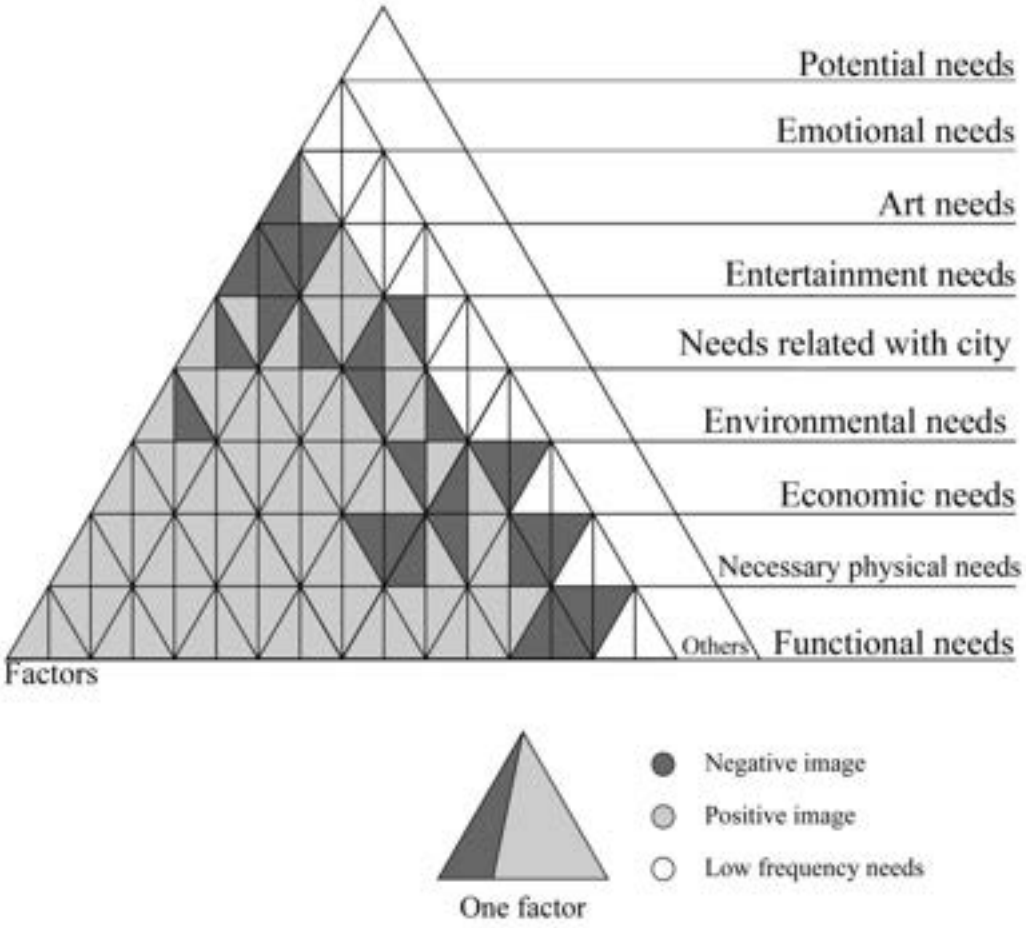


Figure 6-7 Proportion demonstration

Some aspects were described with both negative and positive images. Such as punctual and unpunctual. We then counted the scale of each part. The black part depicted in figure 6-7 represents the negative evaluations while the grey part represents the positive ones. The white part represents images that are just barely high-frequency words. For instance, “indifference” is one of the subway images that emerged only several times–it is sensed only by a few sensitive users. However, it could also be a key design need in the future. By analysing the context of the needs pyramid, including place and time, some design needs can be discovered. In the proportion demonstration shown in figure 6-7, the section in grey colour represents aspects of the subway that should not be paid attention to, the section in black colour represents aspects that should be improved, and the section in white represents

potential design opportunities. Figure 6-7 not only demonstrates the current evaluation of the subway's needs but also includes information about design direction. Based on the above discussion, the whole process that occurs within the black box 2 is shown in Figure 6-8.

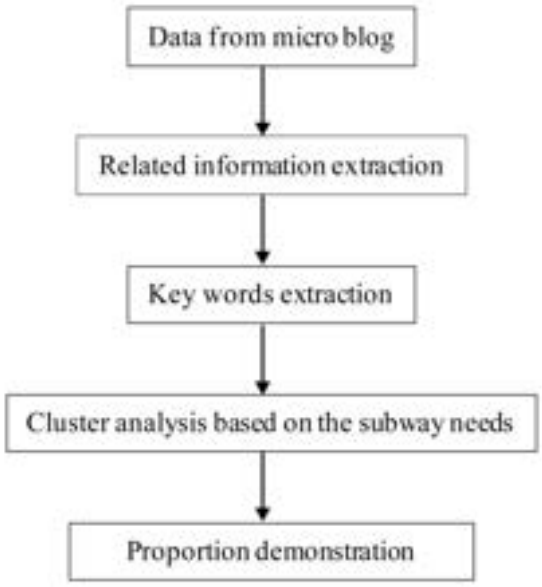


Figure 6-8 Process of data analysis

6.4.3 An update system

The result of data mining demonstrates users' current evaluations of and future needs for the subway. As data from online social networks is dynamic and unending, this method can be designed as an updated system that is sensitive and seasonable. This circulation system, with the name image-need-design opportunity model, is depicted in Figure 6-9. The process described in Figure 6-9 starts from design opportunity, at the top. The designer and policymaker design the current subway space according to the initial design requirements. When users interact with the completed subway design, they have their own image about the subway. Through interviews and questionnaires, the subway's needs can be obtained by

extracting the factors affecting quality life. This step can be designed according to the requirements of the specific location and time in which it occurs.

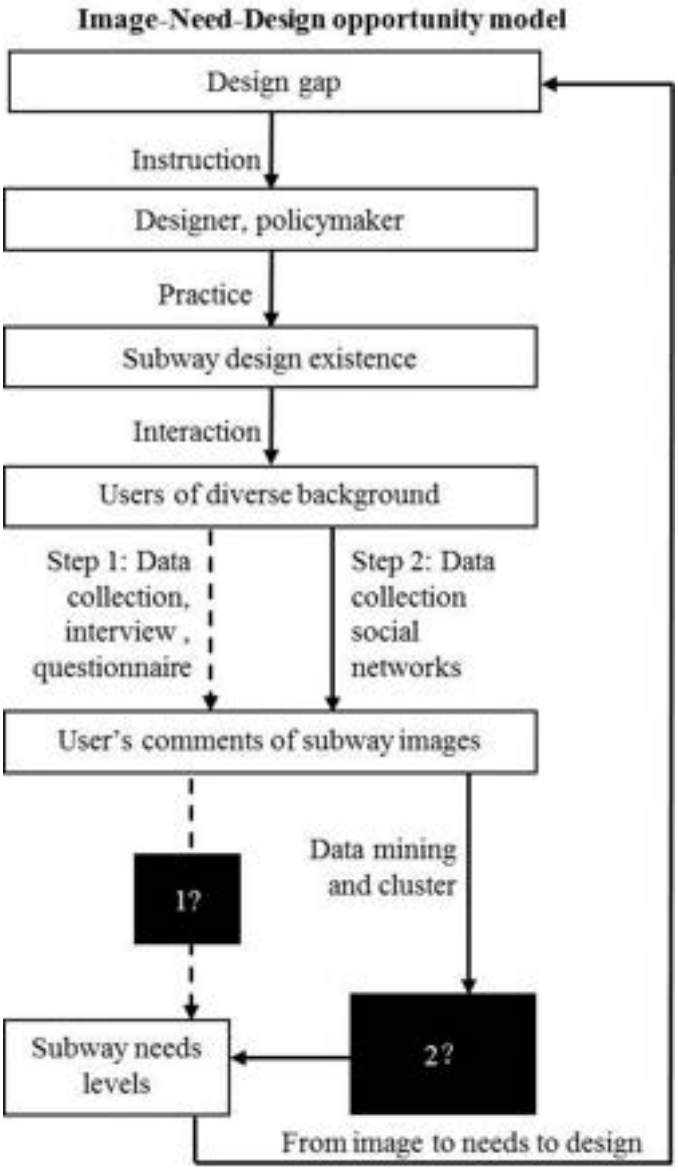


Figure 6-9 Image-need-design opportunity models

In Figure 6-9, black box 1 contains the process of transforming images to needs, as explained in the above discussion. Black box 2 (data mining) represents the transition that occurs from retrieving social network data to determining subway needs. The subway

images retrieved from the social network can be used both to evaluate the current design and to reflect future design needs.

When social network users' subway descriptions and subway images are organized in the needs pyramid, we find the users' current focus and design opportunities. The new emerged requirements can then be used to instruct design work, and the cycle begins again from the top. In this process, the needs pyramid is confirmed in the physical world while the design opportunities are discovered through the network space. The application of the methods in these two spaces have their own characters and the combination may provide a comprehensive information. As Gehl (2011) states that although the mass media can help us to know the sensitive and significant issues in the world, the communication in the real world can help people obtain some normal details of everyday life, which is the same significant. With this information, people constructed the connection between themselves and the world.

Figure 6-10 illustrates the predicted changing of subway needs as the process is implemented again and again, and shows how new design opportunities emerge in the updated system. At the beginning, most of the subway image is about the function and sensory needs. Only a few people can sense the high level image of the subway. When most of these low level needs are fulfilled, people are anticipated to begin to focus on higher level needs. White areas, which represent low frequency key words or newly emerged words, become green over time as design opportunities are fulfilled. Meanwhile, to avoid the confusion that current words of gray part became low frequency words in the future, once some of the factors emerged with almost full gray situation, it can be ignored in the future evaluation. The data analysis finds new needs and higher level needs as time passes.

Like described in Hauffe's *Design and Society Model* (1998), design is changing from function-focused to consumer-focused to human-focused. Currently, design is no longer just a tool for the development of functional, innovative consumer products: it is increasingly seen as a process for radical change–for developing services, systems, and environments that support more sustainable lifestyles and consumption habits (Bjögvinsson & Hillgren, 2012). For example, since the emergence of the smart phone, we seldom see people focused on the quality of connection during phone calls. When asking people their impressions about their mobile phones, they currently focus on the brand, interaction, or even the appearance instead of the basic functions. Sometimes, people also mention how the mobile phone affects their lifestyle. Users' needs of mobile phone are changing from low level to high level. The subway would also experience this process in the future. The development would always bring some surprises. There still thousands of subway needs to be excavated in the future.

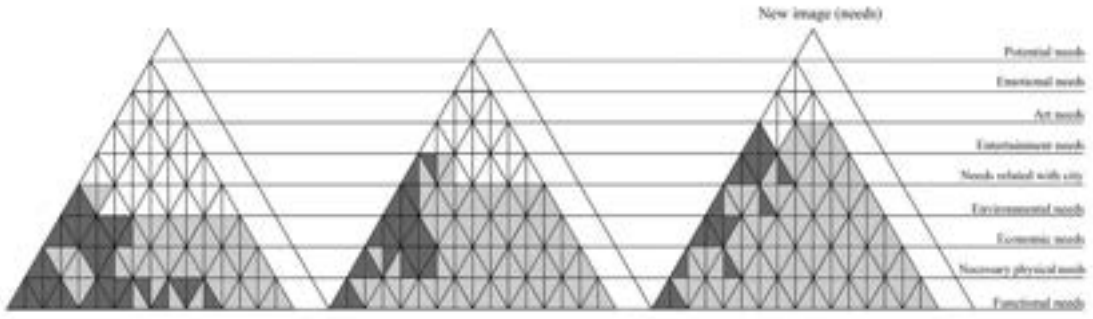


Figure 6-10 Predicted change in subway needs

6.4.4 Problem predictions

Until now, the author has promoted a new method of applying social network data into design work at the theoretical level. More research is needed to supply and test this model

with practice. Some of the difficulties and problems with this method can be predicted in the current stage, and future research should address these potential issues as described below.

We are far from knowing everything about social media. During data mining, it is difficult to avoid unpredictable problems, such as errors in semantic analysis (Yu & Kak, 2012).We don't know whether the selected data with the key words includes some unnecessary message (such as an advertisement) or even interference information. For example, Face book has a limit of 420 characters for status updates and Twitter has a 140-character limit. The shortness of the content affects the reliability of data analysis (Saif, He & Alani, 2011). What's more, users tend to use a large variety of short forms and irregular words, which also increases the difficulty of data analysis. These problems are common problems in the field of data mining, and the quality of the data mining directly affects the result of design instruction.

The subway needs obtained using the qualitative method change across different cities and eras. When applying this method to diverse cities, the subway needs should be designed accordingly. Targeted needs can help to find more suitable design opportunities.

Currently, we are just at the first step of data collection. Some detailed difficulties would be found in the practice. This model provides a basic frame for discovering design opportunities; this frame should be improved and supplemented in practice.

6.5 Summary

Many studies have attempted to define QoL and how to measure it from an analytical perspective. Some authors have suggested that QoL studies should consider the quality of urban life, due to the contradictions characterising urban environments (Pichardo-Muñiz, 2011). The URT space is a common public space shared by different users and thus is a proper place to conduct QoL research. A quality URT life may greatly improve citizens' city lives, as it is a significant part of the city system.

This study's interpretation of quality life focuses on specific public areas in Hong Kong. The three-dimensional comparison method used in this chapter guarantees the reliability and comprehensiveness of the research findings. The opinions of different people in the same environment, of different people in different environments, and of the same people in different environments were used.

The results of the three-dimensional comparison not only demonstrate the differences in each comparison dimension, but also reveal the similarities in people's requirements. Both the differences and similarities can be used to instruct future design work. The quality URT needs pyramid in this study connects abstract life requirements to specific design needs. This study provides a creative idea for defining quality URT life from the needs perspective and analysing the characteristics and future development of the needs pyramid. This research finding has long-term implications for the application of design and policymaking.

Big data from online social networking sites are widely used in diverse fields. The application of online social network data is an unstoppable trend in the field of prediction and may have significant benefits. Based on the needs pyramid of quality MTR life, this chapter proposed a conceptual model, the image-need-design opportunity model, for evaluating subway environments and discovering subway needs by filling the subway needs

pyramid with data from online social networks. Compared with the traditional, interview method of determining design opportunities, this model provides a creative way to collect, extract and use the wisdom of a crowd in an objective manner with low costs and high efficiency. This method can show updated dynamic results by time and location. It can be used to predict updated design needs and may usher in a new era for design. It can be applied in subway space design, product design, city planning, policy formulation, urban design and other design fields that conduct human-centred design work. This exploration and use of online social network data begins a new stage in design and demonstrates unlimited potential for future research.

More practical work is needed to build on this theoretical framework. Future research should construct systematic correlations between object images and design needs, extract design information from online social networks and perform detailed data mining for design.

Chapter 6 discovered the direction of quality MTR life and proposed a method for discovering design opportunities. It also serves as a link between the work in the earlier chapters and the work to follow. The construction of the pyramid in Chapter 6 was based on the comprehensive understanding on the MTR everyday life that was described in Chapter 5. The direction of quality life can be used to construct a connection between quality life, freedom and control. Chapter 7 will discuss freedom and control in the public space based on the definition of a quality MTR life in this chapter.

CHAPTER 7 Balance between freedom and control

7.1 Introduction

The previous chapters defined a quality subway life from the needs perspective. This chapter constructs the relationships between freedom, control and quality EDL by using the needs pyramid as a bridge. The findings show how freedom and control exist in the public space, what the balanced state between the two is and how to achieve it using policy-making and design.

This chapter analyses the beneficial relationships behind the needs pyramid. Focusing on human relationships and the rights of different groups of people, freedom and control in public space, as experienced by different people, is described in a symbolic way.

Control in the public space exists in abstract and concrete forms. Abstract control is interpreted as strategy and ethics, whereas concrete form is considered to be boundaries. The significant role of abstract control is discussed, what constitutes abstract control is explored and the effects of abstract control on open space are investigated. Based on the proposed theory, recommendations for achieving a balance between freedom and abstract control from the social science and policy-making perspectives are proposed. The elements of freedom and abstract control are organised in diagrams and quantitative equations.

A systematic perspective for discovering, perceiving and designing public space boundaries, or concrete control, is presented. The MTR's boundaries are categorised into five groups.

Based on an analysis of user behaviour within these boundaries, the user-centred method is applied to examine how boundaries are designed. Methods are developed to evaluate existing boundaries and suggest design instructions.

7.2 Is there a balance between freedom and control?

The needs pyramid of a quality MTR life shows that needs are a reflection of beneficial relationships. The process by which different categories of needs are satisfied is the process by which people obtain benefits from their environment and space. Space is the carrier in which human needs are satisfied, services are provided to people and human relationships are coordinated. Fulfilling the needs of the users of a public space maximises their benefits. This process is decided by organisations and interest groups.

Figure 7-1 shows how this study moves EDL to quality life to freedom and control. Chapter 5 described people's EDLs in the MTR space and classified EDL from different perspectives. Chapter 6 extracted the key factors that affect a quality MTR life and constructed a needs pyramid. Chapters 5 and 6 showed that constructing a quality life should be implemented through relationships.

In Chapter 5, people were divided into users, non-users (people in the MTR space, but not using the MTR for travel or non-travel purposes) and the MTR Corporation. Different groups of people were found to maintain their relationships in the space through benefits. In Chapter 6, almost all of the needs reflected relationships. The functional needs demonstrated that users obtain services from MTR managers and the MTR Corporation. The economic needs showed the conflict relationship between the authorities and users. The

need for a quiet, clean environment is not only decided by the MTR Corporation but also by the passengers.

Constructing a quality MTR life through needs thus deals with the authorities' and passengers' rights in the space. Freedom describes the rights for each group of people. Constructing a quality EDL requires analysing each organisation's freedom and control.

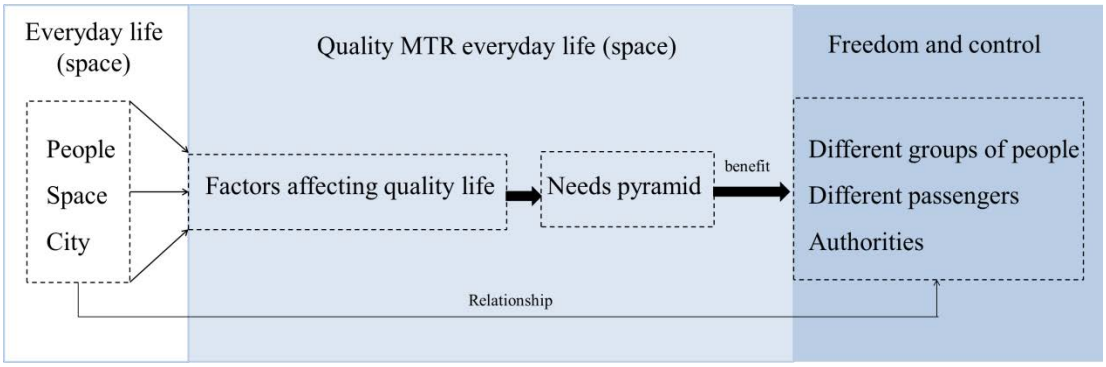


Figure 7-1 The development of the research

As the issue of quality MTR life is a freedom and control problem, the public space is described in a symbolic way. A public space is constructed by the authorities, who include government officials, MTR Corporation managers, designers and those who have the right to make decisions about the space. People then emerge in this space.

People's rights can be described as a collapsible circle. In *Symmetry*, Weyl (1983) suggested that each body produces its own space via motion and energy. Space is not just a container but is also society's product (Massey, 1994). Space also plays a crucial role in the exercise of power as there is a reciprocal relationship between power and space (Foucault, 1977). It is allocated according to social processes that reflect how power is exercised by one to, over or through another (Foucault, 1984).

Freedom and control can be interpreted simply according to this theory. Each user occupies space. When they have control over their environment, they feel comfortable (Kaya, 2004; Leaman, 2000). When a person feels freedom in a space or has the right to control their environment, their circle grows. Conversely, their circle shrinks if they do not feel free or have no rights. This space takes the form of an imaginary field that changes according to the user's sense of freedom. It exists within authority figures' larger space, which constitutes the whole public space. The balance between freedom and control is thus a balance between spaces (Siu, 2011). As individual circles of freedom can be altered, so too can circles of freedom around groups of people affect other groups and individuals.

Figure 7-2 shows a dynamic public space that has a dynamic size. The size of each rubber ball/circle indicates the freedom obtained by each institution and individual. The small circles represent individual people, the larger circles represent groups of people and the large rectangle represents authority figures' rights. When a new service is added to the space by the authorities, the whole space grows and each individual's and group's freedom space grows accordingly.

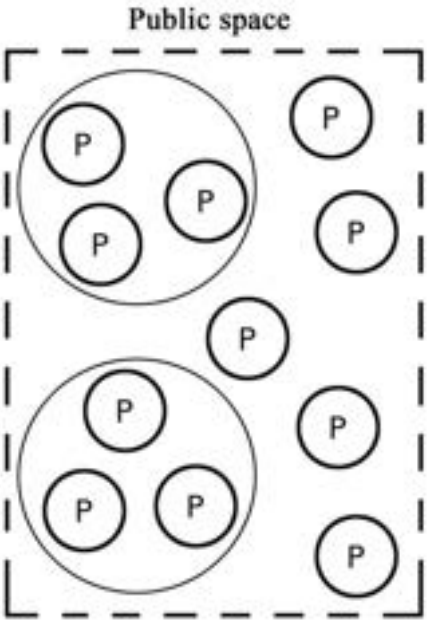


Figure 7-2 Symbolic description of public space. ‘P’ indicates individuals, small circles indicate individuals’ freedom, larger circles indicates groups’ freedom and the rectangle indicates the rights of the authorities.

Control and freedom are sure to depend on and conflict with each other in a space that is shared by many people. Skilful management is needed to keep the expression of one group from inhibiting the expression of others in public space (Lynch, 1995). Every individual user is a part of the crowd making use of the environment and thus no-one can ask for total freedom, as if the space were private. Privacy means personal control over interactions and communication with others and the environment (Brill, 1985). A public space cannot provide that kind of personal control. One user’s behaviour may threaten another user’s sense of freedom or result in other negative feelings (Prendergast, 2004). People’s sense of freedom grows when they are provided with good service. There are negative and positive relationships between each rubber ball/circle.

Positive relationships occur if, when one individual's circle increases, other individuals also increase their circles, and vice versa. For instance, when the MTR Corporation provided Wi-Fi in the MTR stations, all of the people in the space were able to use the Wi-Fi signal for free. Every individual's sense of freedom increased. The authority institution had to spend more money to supply this service, slightly reducing its benefits. However, the quality of the MTR space was improved. A positive relationship indicates a positive correlation: all individuals' rights either increase or decrease at the same time.

Negative relationships occur if, when one individual's circle increases, other individuals' circles shrink. People who are undisciplined or who perform too freely are disliked by others. For instance, the handrails inside the train compartments are designed to be shared by passengers. However, many passengers like to lean on a handrail even when the compartments are crowded. This kind of inconsiderate behaviour inconveniences others. There is a reciprocal relationship between the freedom of the inconsiderate passengers and the freedom of others. Another example is queueing. During rush hour, although everyone is in a hurry, passengers are expected and encouraged by the MTR to wait in neat lines as this is the most effective way to get everyone into the train compartments. If a passenger breaks the rule for his own convenience, chaos ensues and other passengers' time is negatively affected.

There are many examples in the public space of the reciprocal relationship between the freedom of different individuals and groups. Only when people act in a proper way, can everyone enjoy a peaceful, normal life. Figure 7-3 shows the negative relationship between freedom and control in a public space.

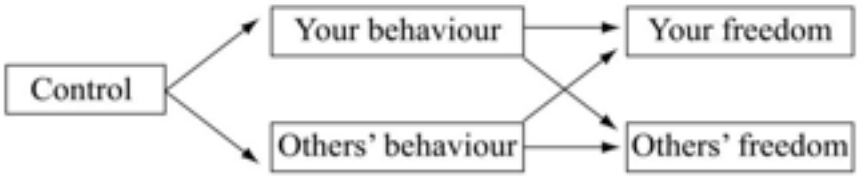


Figure 7-3 The relationship between freedom and control

Many factors can affect freedom and control. Control can increase or decrease people's sense of freedom. A state of balance is better than complete freedom. As people's circles of freedom can be both increased and decreased by the actions of others, what is the balanced state in a public space?

The balance between freedom and control can be described as a space's balanced state. In Figure 7-2, different groups of people share the space and affect each other. Each person has their own freedom space within the public space. A harmonious, balanced space should be fair, democratic and rational. It is not expected that some individual spaces will be larger than others. The different groups of people are controlled by the authorities. The authorities should not occupy a large amount of space while people's freedom is compressed. The ideal state involves users interacting with each other peacefully and fairly, creating harmony (balance) in the public space.

Harmony is not easily achieved. In the real world, there is much variation in public space and in personal 'freedom space'. Control is an outside force that determines the size of the freedom space occupied by each person and authority. This raises the question of what constitutes control. In this chapter, this question was discussed using the abstract and concrete forms of control.

7.3 Freedom and control in public space–Abstract form

7.3.1 What constitutes control?

In public space, control takes the form of social ethics and policies or laws. Many scholars have emphasised the importance of ethics and policy in restricting people's behaviour (Giudice, 2008; Greenawalt, 1987; Pentz et al., 1997; Schmitz-Luhn et al., 2012). Giudice (2008) states that justice is assessed in terms of legal justification and moral justification. In *Where Law and Morality Meet*, Kramer (2004) notes that moral correctness is a sufficient condition for legal validity. These two forms–ethics and policies–overlap each other to constitute control in public space.

Ethics are a large part of control. People are educated by their schools, parents and societies from a young age (Siu, 2013e). Education affects behaviour and values quietly and efficiently. Ethics represent an intangible control in people's lives, no matter the type of space they inhabit.

In addition to enforcing the quality and self-discipline of citizens, policies and laws are made to control their behaviour. Cornuel and Kletz (2003) observe that to preserve people's lives and safety, artificial barriers such as laws should be imposed. de Certeau (1984) defines authoritative institutional controls as "strategies," and Siu (2001) claims that these strategies (policies, plans, ordinances, rules, regulations, programs et al.) are used to maintain the city in an orderly way, planning and measuring everything according to the authority's will and anticipation. No matter the justification, legal or illegal, right or wrong, appropriate or inappropriate, authorities will attempt to find outlets for their urban strategies. Siu (2001, 2011) further notes that strategies serve authoritative parties more than human

beings. Strategies and ethics operate in somewhat different capacities. The observation data in the MTR space can also test and verify the theory that control is composed of ethical and strategy sessions. According to the observation, strategies can also be divided into several parts according to the user/authority relationship (Zhao & Siu, 2014c). Figure 7-4 shows what constitutes control in a public space. Some examples from the observation are stetted to illustrate this classification.

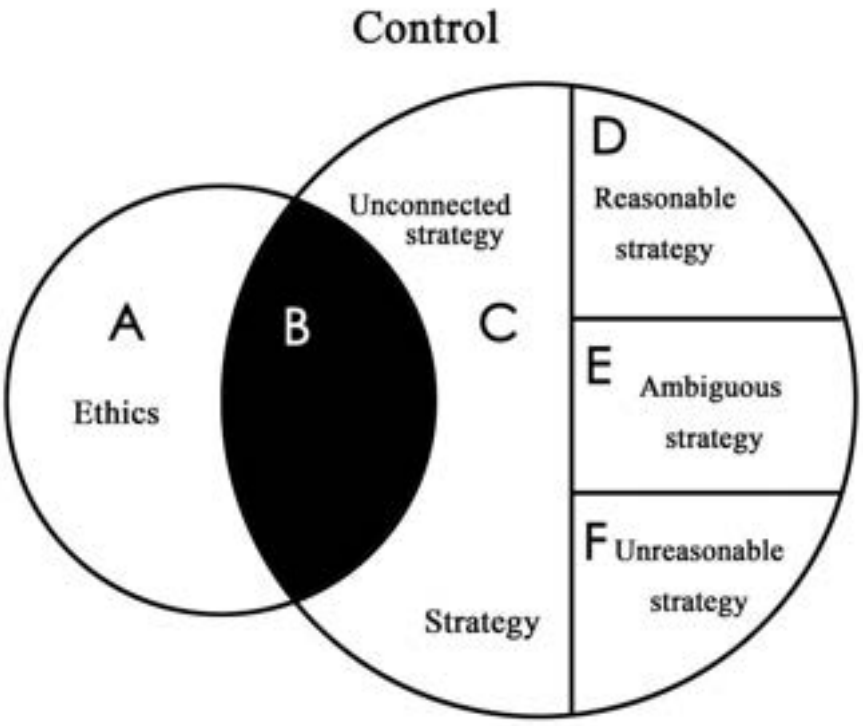


Figure 7-4 The constitution of control in public space

In figure 7-4, A represents an ethics control, B represents both ethics and strategy controls and C, D, E and F represent strategy controls unrelated to ethics. In this group, C represents policies and plans that do not affect user benefits. D, E and F, which are opposite to C, constitute a group that affects user benefits. D is a reasonable strategy, meaning that most users consider the policy good for them. E is an ambiguous strategy. In this instance, forbidden behaviour always has both a negative and positive side. F is an unreasonable

strategy that harms user benefit to guarantee authoritative power. In the following paragraphs, public space examples from the observation data are used to illustrate each part.

A (ethics control): Ethical values play a significant role in a society. This intangible control restricts human behaviour and makes the society healthy and secure. For instance, while no policy restricts physical intimacy of couples in a public space, there is a control in the public environment related especially to eastern ethics that convinces couples they cannot behave as though they are at home. There is also no policy or regulation that forbids loud voices in an open public space. Nevertheless, people tend to keep quiet in silent environments. According to the observations, in the MTR compartment, people seldom stand close to each other. They try to protect their own space–territory–and avoid infringing upon others' space. It is an acquiescent rule and the policy do not define the space for each person. Keeping proper distance from others shows respect for the other people. These controls do not come from others, but from an inner ethical quality.

B (both ethics and strategy controls): Authorities and users alike ask for secure environments in everyday life. Ethics are characterized by principles of autonomy, non-maleficence, beneficence, fidelity, justice and confidentiality. Spitting in public areas is unethical behavior that breaks the principle of non-maleficence. In the MTR By-laws (MTR, 2012), spitting in the public areas of the MTR is prohibited, as spitting spreads germs (figure 7-5). Spitting is thus both unethical and illegal. Passengers performing this behaviour in the MTR are not only punished by law, but will also be treated with disdain by others. This type of control thus belongs to the overlapping areas of strategies and ethics.

Figure 7-5 The note of forbidding spiting in the MTR

Nowadays, most of ethical control becomes strategy control. For example, the policy that a person who finds any lost property in or upon any part of the railway premises shall report to an official at the nearest station, and no person other than an official shall remove any property lost from any train or carriage. This strategy fits the traditional virtue. Similarly, the 22nd rule in the MTR By-laws is that no person shall place his feet on any seat in any part of the railway. This behavior (place one's feet on others' seat in public space) is also considered as an impolite behavior from a moral point of view.

C (unconnected strategy): There are certain policies to which users pay little attention, or that are not directly for passengers' benefit. An example is policies about entering areas restricted to staff. These policies have nothing to do with ethics, and although they are used to maintain order in the subway, they have little relation to passenger travel. Such policies are defined as unconnected strategies.

D (reasonable strategy): As shown in Figure 7-6, many lines drawn on the floor in the MTR stations are used to control people's behaviour. These restraints are made in consideration

of user safety. Though these controls may not be supported by ethics or legality, people follow–obey–these controls because they guarantee people's own security. The same as this, there is an emergency stop button along with a note declaring that people are forbidden to touch the button freely on the platform. Infringing the rule is an illegal behaviour and this rule doesn't belong to the traditional moral standards.

Figure 7-6 Control warning located on the platform

E (ambiguous strategy): In the past, some MTR stations have allowed the exchange of goods at their exits. Sheung Shui Station in the New Territories is the first station located beyond the border customhouse between Hong Kong and Shenzhen (the Chinese mainland). In the late 1990s, many peddlers often exchanged smuggled goods in this station and crowded the exits. This behaviour is now controlled with consideration given to MTR security. There is a debate on the issue between those benefitting from the exchange of goods and those negatively affected by the chaos. Both groups want freedom. The policy control is argumentative and referred to as an "ambiguous" strategy. Figures 7-7 show posted policy declarations that prohibit goods exchange within MTR stations. The ambiguous strategies possess the characteristic that people would obtain both benefit and inconvenience from the strategy.

Figures 7-7 Forbidding note in an MTR station

F (unreasonable strategy): Of the 84 MTR stations, only 40 have washrooms, with reports indicating that the construction on some freight station toilets will not be complete until the end of 2020. MTR managers have also claimed that economic and technological barriers have halted plans to put more toilets in some small stations. This situation is inconvenient for users, especially elderly and child travellers and all citizens consider it unreasonable. This kind of control should be paid attention to. The high price of MTR is another unreasonable strategy for the citizens. From the statistics (Liu, 2012), it is showed that 72.4% of the interviewers consider the price of the subway is unreasonable and 19.4% interviewers consider it is reasonable. 3.2% have no idea. The high price is the invisible unreasonable control for citizens.

The above examples observed in the MTR public space explain the constitution of control. In Figure 7-4, control is divided into two parts, and strategy is also divided into several sections based on user benefit. All the user's behaviours observed in the MTR public space about control can find their positions in Figure 7-4. On one hand, the observation data

testify the theory. On the other hand, the observed behaviour helps to refine this category. Controls can also be classified according to other conditions such as target, environment and degree, but this kind of classification is efficient in analysing the relationship between controls and freedom space.

This part has thus far defined the control/freedom balance and the constitution of control. Classifying controls into the aforementioned six parts allows us to analyse the effect of control on public space as a whole.

7.3.2 How does control act on public space?

Controls acting on a space lead to a diversification of that space. Each control type corresponds with a different situation, and the sum of the controls reveals the nature of the space. This issue can be described by the black box shown in Figure 7-8.

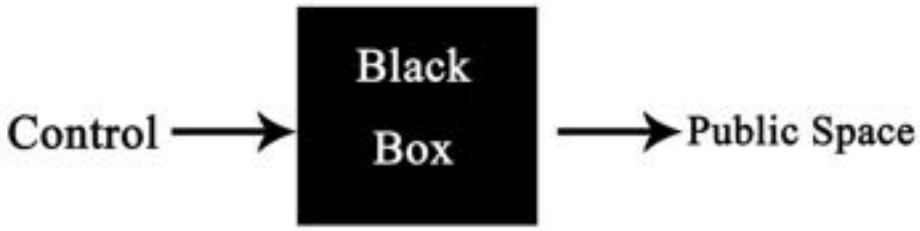


Figure 7-8 The black box between control and freedom space

In Ooi's book (2004), he mentioned that territory can be construed as political action over space and a complex outcome of human relationships. Territory as space is governed or administered by authority of an institution or administration over that territory. Authority is another form of the control. Envision a situation in which only ethics are imposed on a

public space. If ethics are the only control criterion and people behave according to their own ethics autonomously, the space would become unbalanced. People with self-control on public issues strive toward smaller spaces. Others who lack self-control expand their spaces greedily, and the balance suffers.

Another extreme situation involves exerting an unreasonable policy control (F) on the space. People's spaces are compressed and freedom is lost because the authority has occupied too much space. The above two situations are shown in Figure 7-9.

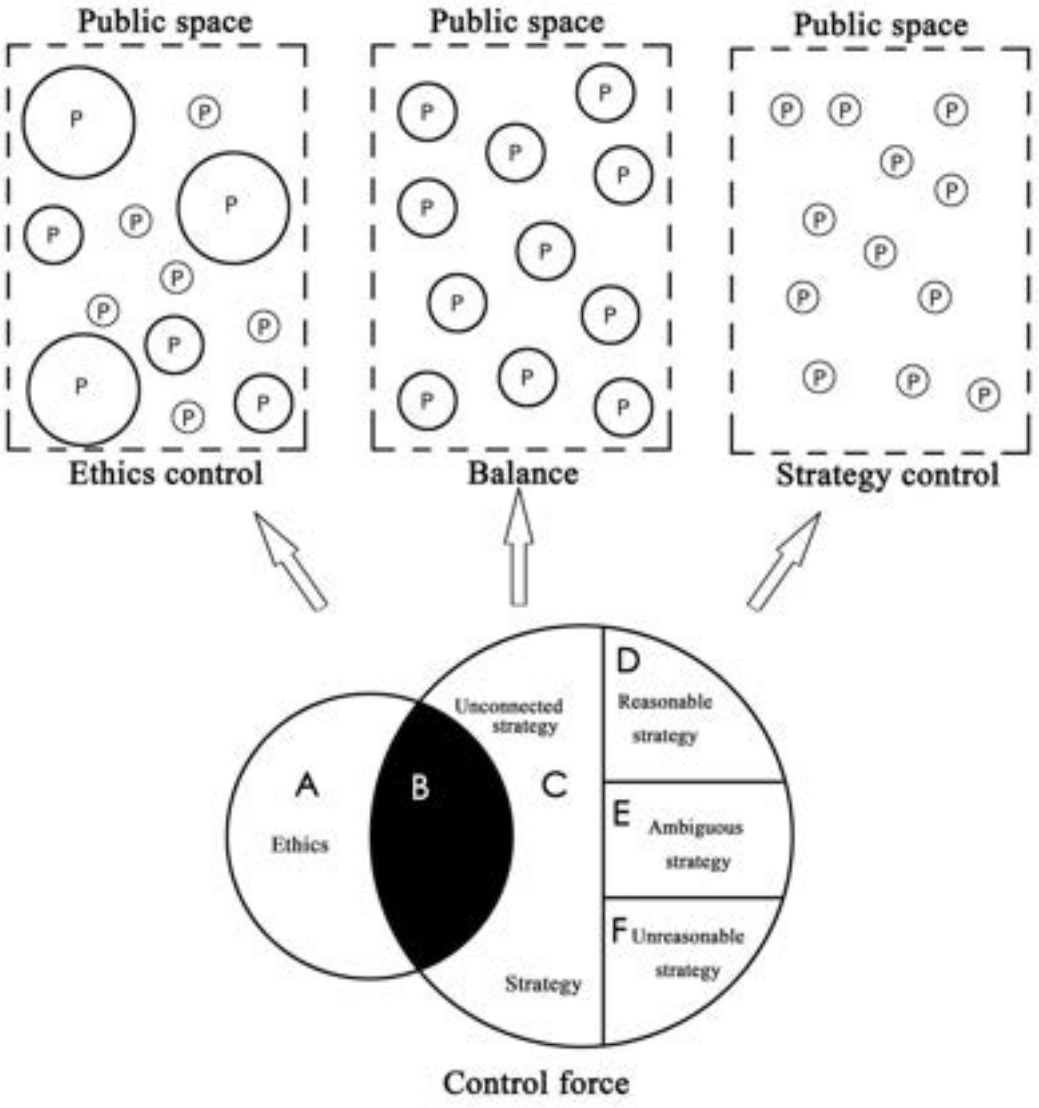


Figure 7-9 The interaction between control and space

In analysing the relationship between controls and freedom space, the reasons for achieving balance emerge according to the imbalanced states of the space, as shown in Figure 7-9.

The first freedom space state is one in which the spaces are unequal. As an individual or group's freedom space becomes larger, that individual or group can do more things freely and arbitrarily. The expansion of that space may threaten the practices of others and even of an authority. For instance, wealthy officials may use their money and power for legal protection when they make mistakes, thereby subverting laws and ethics. This kind of practice dissatisfies ordinary people and leads to economic, political and social problems that hinder the development of the society. According to the observations in the MTR stations, it is not difficult to find examples to illustrate this situation. For instance, if passengers can put their feet on others' seats without punishment, the immoral man occupies more seats, and meanwhile affects others' normal subway life. Again as an example, a passenger breaking the rule not lining up would affect other passengers, and consequently may create some arguments and ripple effect that more in proper behaviour would occur.

Secondly, if people's freedom space is quite small in comparison to that of an authority, it indicates that those people are totally controlled by their governing institution. City-dwelling users live in a society characterized by pressure and invasion. In *The Production of Space*, Lefebvre (1974/2010) promotes the idea that space is the product of a society. Every space has its own era-specific characters. Understanding that societies share characteristics over time, imbalance typically indicates a monarchy in which citizens are greatly and unfairly controlled. People cannot ask for freedom from the empire, and the monarch controls his or her people arbitrarily. However, if their needs are not fulfilled, citizens will

take matters into their own hands and break the rules (Pemsel, Widén & Hansson, 2010). Historical perspective suggests that an unfair and "unfree" society cannot endure. Democracy, justice and freedom are dreams that include the entire world. The imbalanced space or society is destined to die out.

In sum, the above analysis illustrates how control works on the public space. Besides control itself, time and location are other dimensions of the black box. Time and space affect and depend on each other, and both control type and space change over time. For instance, the same policy in different periods is diverse. Hawking in public space was not forbidden in Hong Kong before 1970s. However, nowadays hawkers in MTR may be fined HK$5,000, and this policy is gradually accepted by the citizens. This is an evolution of the policy. Besides, location is another factor. Some reasonable controls for the Hong Kong people may be unreasonable (not easy to be understood and accepted) for the mainland citizens. For instance, people playing musical instruments in Hong Kong MTR station is forbidden while the subway singers are famous and welcomed in Beijing. The difference in culture makes the control diverse in the two places. In this situation, the black box becomes more complex (Figure 7-10). Time and location are influential factors in this question.

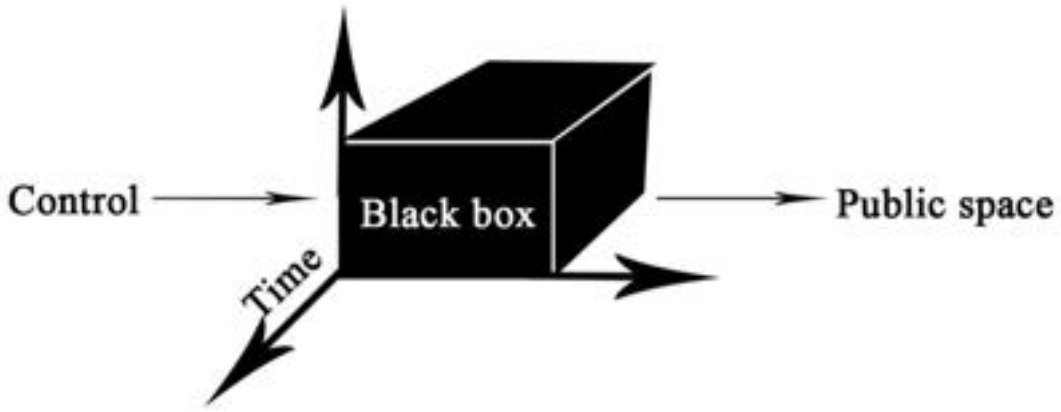


Figure 7-10 Time as a third dimension for the black box

7.3.3 Interpretation of the MTR case study

After obtaining the classification of control and the relationship between control and space through the observation and analyzation, we try to interpret the MTR issue. According to the above analyzation, we firstly analyse how this policy (Forbidding eating in MTR) changed with time dimension and then we discuss the difference of the same policy in the two places.

As this policy has aroused intense discussion amongst locals and non-locals alike. Thus, it can be included within part E (ambiguous strategy) (see Figure 7-4). This control prompts different feelings in the users it acts upon. If users eat or drink in a train compartment, the smell of their food may arouse bad feelings of others. If eating in the compartment is forbidden, hungry passengers would also feel uncomfortable. This typical phenomenon demonstrates the different freedom spaces amongst individuals. Such policies can offer both negatives and positives. But why do locals consider it an ethics policy (B) while those from the mainland consider it an ambiguous (E) or even unreasonable (F) strategy? Which is it?

In fact, when the policy was introduced, locals regarded it as ambiguous or unreasonable. As time passed, the policy changed its position from E/F to D. As far as the locals are concerned, the policy has already been a reasonable strategy, and has become so common and well known that it is now an ethics policy. Some locals have been educated about certain strategies and information from a young age. It is not odd that they have come to consider behaviour such as eating in MTR compartments as an ethical problem. Figure 7-11 shows the changing position of the policy.

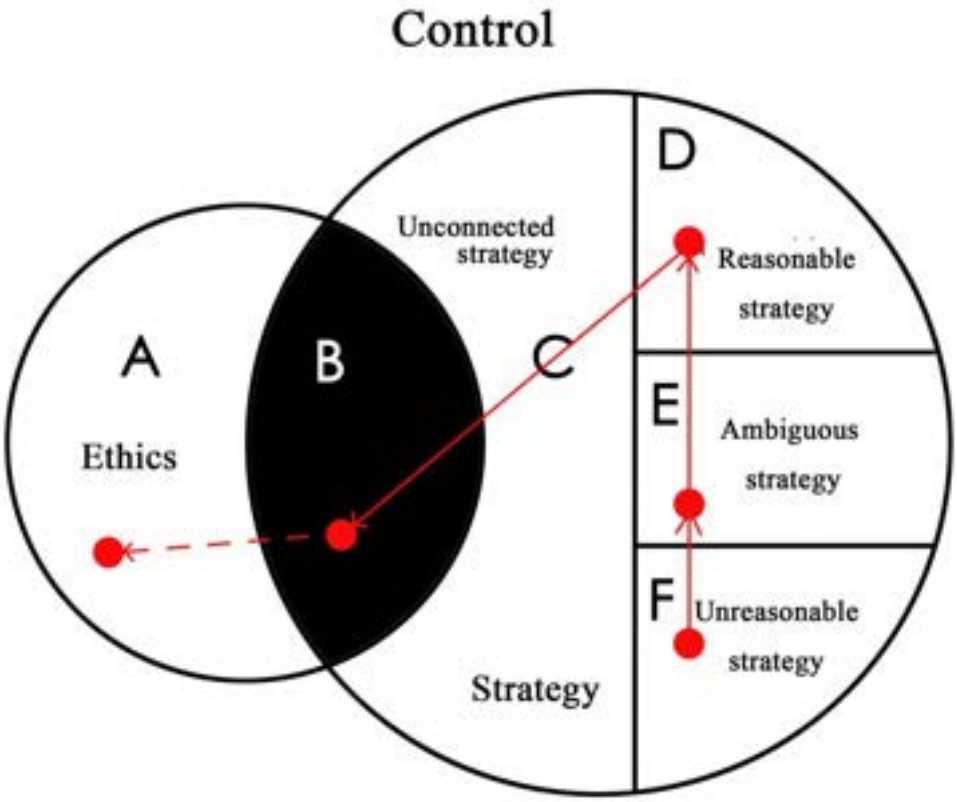


Figure 7-11 How the policy (eating in MTR train compartments) changes position in locals' eyes

However, mainland travellers typically do not know of the policy that forbids eating in train compartments, and as such their behaviour falls under a different control type. When non-locals are told about the existence of this policy, their opinions of it differ. Some consider it reasonable and some do not, while others still are ambiguous. In each case, however, their social background and education prevent them from considering their behaviour as an ethics problem. This is where the conflict arrives. The relationships between freedom and control as well as strategy and ethics are apparent in this phenomenon, and a truth emerges: outside controls act on a public space, leading to different senses of freedom in the users. This is where nature of the conflict is found.

The relationship between target and control has already been defined. How to change the variable result to achieve the target is the final question. The result is a quantitative description and the promotion of instruments to achieve balance.

7.4 Freedom and control in Public space–Concrete Form

The above part discussed the abstract form of freedom and control. Besides this abstract form, control also exists with concrete form. From the definition of control, it is found that the synonyms of control are dominate, command and govern. To control is to exercise restraint or direction over something. When control exists with concrete form, it obtains the character of restraining people's behaviour or even minds. In the public environment, what restrain people's behaviour can be a wall, a closed door, some railings, some instruction words or even the guard man. All these things stop or affect people's behaviour from one state to another state. From the space perspective, these control divided space into two parts which are restrained area and unrestrained area. This concept is the same as the definition of boundary in the space. In our study, to discuss the concrete form of control become the discussion of the term—boundary.

7.4.1 Boundaries in public space

As important elements of space, boundaries are generated for many reasons and are presented in many forms. It is also the concrete form that democrats control in the public space. It is difficult to judge whether a space generates boundaries or vice versa. Both exist within an ambiguous and dependent relationship and both are affected by user interaction, which makes the relationship even more complex (Zhao & Siu, 2014a). Our interactions with boundaries affect the quality of the space, while the design of those boundaries

determines the quality of our lives in that space (Hsia, 1994). Given the strong effect of boundaries and space, it is vital that we perceive and develop the relationships among these factors. Boundaries exist throughout our social environments (Ozaki & Lewis, 2006). It is widely accepted that boundaries play a significant role in characterizing both physical space and the psychological world (Baroth, Schoefs, & Breysse, 2011; Weintraub, 1997). Ashihara (1983) clearly identified in the studies related to aesthetic townscape that "without boundaries, there is no space" (p. 2). As boundaries always exist along with space, the definitions of boundaries are always related to different concepts of space.

In his classic work, *The Image of the City*, Lynch (1960) claims, "cities are constructed using five elements, including paths, edges, districts, nodes and landmarks" (p. 36). Edges represent boundaries between two phases or linear breaks in a community, which can include shores, railroad cuts, and walls. They can be barriers that close off one region from another or seams that join two regions together. In Lynch's theory, boundaries do not demonstrate a fixed form; rather, each individual boundary interacts with other elements in the city and changes according to the people and time.

Boundaries are also interpreted as "signifiers of space" (Sack, 1986), while Blomley (2005) mentions that "boundaries are succinct statements and the only symbolic forms that signify possession or exclusion in a space with direction" (p. 285). In brief, boundaries signify and differentiate (Delaney, Ford, & Blomley, 2001). They unify the insides of the space that they mark (Hsia, 1994; Lynch, 1960).

It can be concluded from the above claims that the basic function of boundaries is to separate. Ozaki and Lewis (2006) give a more generalized explanation. They state that boundaries function at three distinct but related levels: physical (spatial), sociocultural, and

psychological. Thus, “The boundaries at the physical, spatial level are concrete manifestations of social classifications, and social classifications are internalized by people and experienced phenomenologically” (p. 91).

Lawrence (1984) states that boundaries are restrictions that regulate our daily affairs and behaviours during our interactions with space. These restrictions result in unwritten rules that describe how to behave in social space (see also Boyer, 2000; James-Chakraborty & Strümper-Krobb, 2011; Valk & Dijk, 2009).

Lefebvre (1974/2010) has a different view about boundaries and space. In *The Production of Space*, he points out that each body produces space by itself. He uses the metaphor of a spider’s web, an object that becomes inseparable from the body that creates it, to illustrate that the most basic places and spatial indicators are first of all qualified by a body. Boundaries exist along with space, and so each body places a boundary on the space it produces. Siu (2001) notes that once the web vanishes, the boundary is destroyed and the space is invaded. Hence, the web becomes incomplete and unbalanced.

7.4.2 Boundaries and space

Based on the foregoing theories and definitions, several examples from the observations in Hong Kong’s MTR stations were selected to illustrate the relationship between public space and boundaries.

The dependent relationship between boundaries and space

Boundaries and space represent two sides of the same coin. Without boundaries, space has no beginning or ending. Without space, boundaries have no carrier. Boundaries separate space into several smaller units with diverse properties. The diverse properties of space impel the generation of boundaries. Their emergence can proceed differently depending on the situation. However, once boundaries and space emerge, they are mutually dependent for existence.

The MTR examples show this dependent relationship. The yellow line (i.e., warning line) in Figure 7-12a is a boundary that separates the space into two parts designated as “safe” and “unsafe.” This boundary was designed to highlight the hidden danger of the space, and Figure 7-12b shows that most people obey the boundary control while they wait for trains.

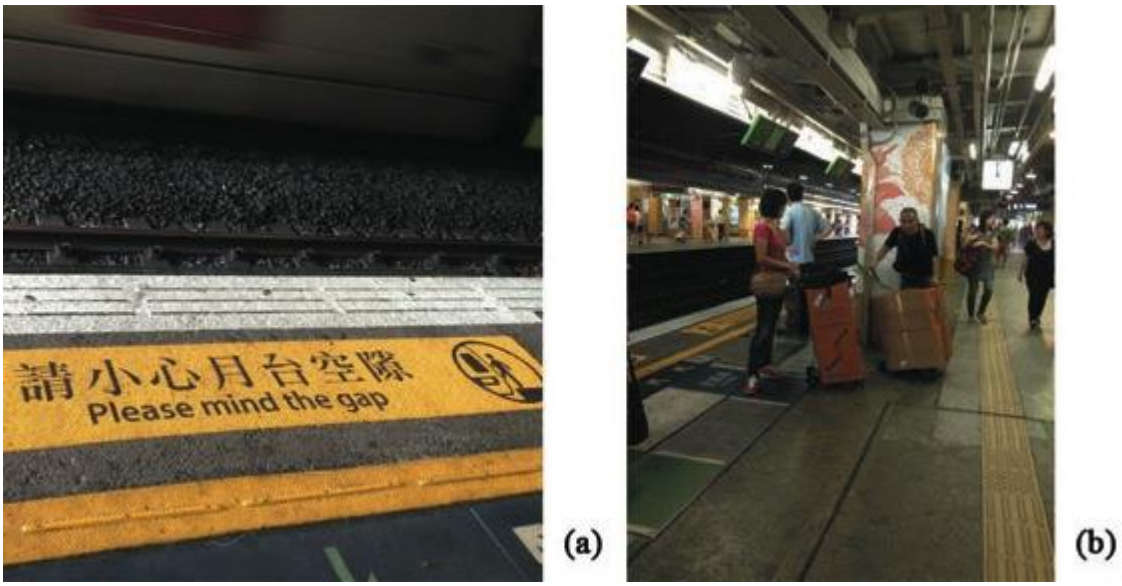


Figure 7-12 Boundary on the platform before the train comes into the station: (a) boundary and (b) peoples’ behaviour

When the train pulls in, the properties of the space on both sides of the boundary (“safe” and “unsafe”) disappear. At this moment, the boundary (yellow line) loses its meaning. Figure 7-13 shows that, as people swarm into the train compartment, the boundary ceases to

serve a separation function for the users.

Figure 7-13 People swarm into the train compartment

As boundaries and the properties of space depend upon one another, the paper focused on the MTR's spatial properties to analyse how boundaries are generated and how they distinguish these spatial properties.

Properties of space in relation to boundaries

A boundary divides one space into two parts, and each part has its own properties. These properties can be opposed or complementary. Boundaries exist at the blending point, when different spaces with diverse properties encounter each other. Where diverse properties of space exist, so do boundaries. The MTR case study described the character, function, and size of the space and used examples to analyse its properties (Siu, 2004). While boundaries change these three spatial properties, they are not absolutely coordinated, but rather overlap and contain each other. The following examples show the relationship between the boundaries and these properties.

a) Character

Just as each person has a distinct individual nature, each space has its own character. In *Genius Loci: Toward a Phenomenology of Architecture*, Schulz (1979/2010) promotes the genius loci viewpoint and mentions that each place has its own character and carries symbolic meaning. The same can be said of an MTR station, in which boundaries strengthen and sometimes add to the characteristics of the space.

A ticket barrier divides the whole space, from the entrance to the train compartment, into two main parts: the paid area and the unpaid area. Each area has its own characteristics, and the facilities, shops, policies, and functions of the two areas differ. This boundary is an obvious one and lends diverse meaning to the space.

The boundary in Figure 7-12a is also a dividing line between safe and unsafe areas. In this example, spatial characteristics emerge first and then a boundary is designed. This differs from the ticket barrier, in which case the boundary is designed first and lends properties to the spaces on each side.

Spatial characteristics are also designated as “public” and “private.” Privacy is both an intangible social concept and an ambiguous spatial boundary (Ding, 2008). There is no public consensus on appropriate boundaries or acceptable etiquette for private behaviour in public spaces (Wei & Leung, 1999). For example, homeless people who are obliged to live their private lives in public view are treated as outcasts (Cresswell, 1996). Some scholars use the word “semipublic” when it proves too difficult to define (Gehl, 2011; Huang & Mynatt, 2003).

Although private and public spaces are not always rigidly defined, they are typically distinguished by their social and ideological functions and material and social conditions (Lee, 2009; Marx, 2001; Weintraub, 1997). Boundaries are always used to define privacy. According to Nippert-Eng (2007), one can draw boundaries around self and family where one prefers them to be. Figure 7-14 shows how the MTR creates a boundary between public and private space: the baby pram provides babies with a space to sleep in, thus marking an exemplary boundary between private and public space. Whether the boundary is obvious or ambiguous, it always exists.

Figure 7-14 Pram in the train compartment

b) Function

The MTR functions as an important service system in Hong Kong. Its spaces are divided into hundreds of obvious functional areas, including areas for personnel and users, areas for waiting and walking, and areas for sitting and standing. Almost all of the spaces in the MTR stations have defined functions; boundaries form where the spaces meet.

Figure 7-15a shows a line on an MTR station floor that marks a boundary between commercial and walking spaces. In addition, different MTR shops are divided by concrete walls. In Figure 7-15b, auto machines divide a space into four areas, as each machine serves a unique function. The space in front of each auto machine can be considered to belong to that machine. Although there is no visible boundary, each area is distinguished by the function it offers for users.

Figure 7-15 Space with boundaries to divide their functions in an MTR station

c) Size

As mentioned before, each space divided by character and function is accompanied by a spatial division in size. Although different spaces may share similar characteristics, boundaries still exist to keep their sizes under control. Figure 7-16a shows the difference in seat sizes due to the absence of boundaries on the seats. However, in Figure 7-16b, when a boundary for each seat is introduced, users are more likely to consider each seat as fit for one individual.

Figure 7-16 Boundary on the chair of MTR compartment: (a) not obvious and (b) obvious

Boundaries and spatial properties exist everywhere in MTR stations. While some boundaries are easy to perceive, others are invisible. The analysis of spatial properties plays a significant role in designing the boundaries.

7.4.3 Classification of boundaries

This section classifies the boundaries in MTR stations and examines how physical boundaries and user perceptions of those boundaries are formed. Almost all of the objective boundaries are noticeable upon classification, and some subjective or invisible boundaries are also discovered. Ozaki and Lewis (2006) have categorized the boundaries into three groups: physical (spatial), sociocultural, and psychological. Liu (2011) classified the boundaries into rigid boundaries and soft edged boundaries. A rigid boundary is an unmovable boundary in the physical world. Gehl (2011) first proposed the concept of a "soft edged" boundary to describe the transition from a public space to a private space. To obtain users' perspectives towards the boundaries, the collected boundaries in the subway

were used to design a questionnaire. Then, pictures of the typical boundaries were shown to selected subway users who were the participants in the study. The subway users are of diverse educational and cultural backgrounds, and using pictures was the most intuitive and accurate way to describe the boundaries. An interview was conducted with ten subway users, who were asked to classify these boundaries and explain their reasons for classifying them thus (appendix 3). By analysing the users' categories of and interactions with boundaries, researchers organized the results with an expert categorization based on users' behaviours and opinions. It was found that the boundaries can be classified according to their form, shape, and visibility.

The visibility of boundaries describes whether they can or cannot be seen. Based on the forms and shapes they take, boundaries can be defined as free style, unclosed, meshy, semi-closed, and full-closed; within these categories, they can be defined further as texts, lines, planes, and objects. Taking these classifications into account, both visible and invisible boundaries become more concrete and specific. Figure 7-17 shows the classification of each boundary, with dotted lines indicating the fluidity of the definitions. Based on the data collected through observation (appendix 3), the percentage of each kind of boundary in the station is shown in appendix 4.

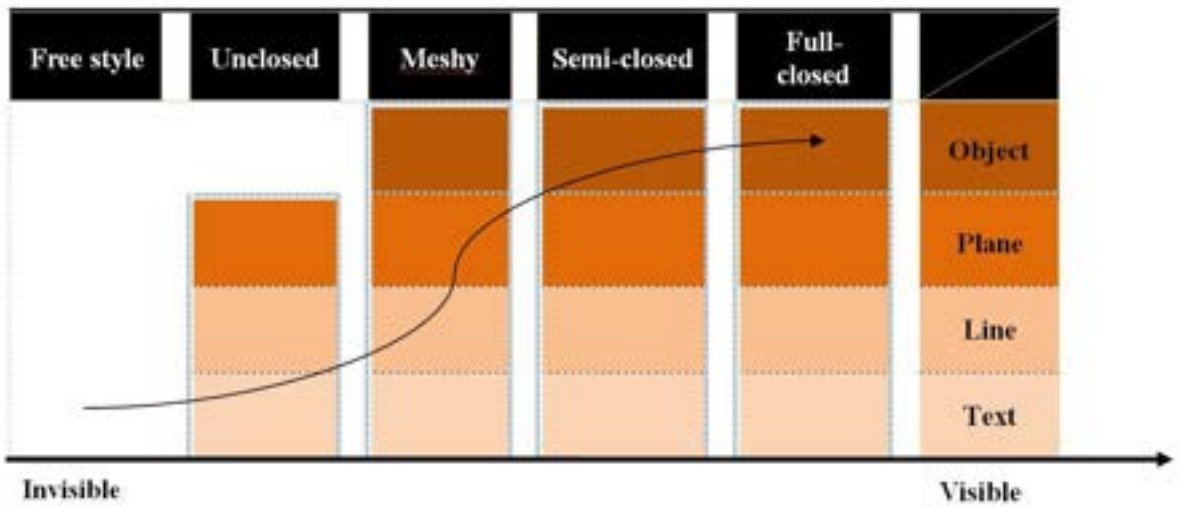


Figure 7-17 The five boundary classifications

Visible boundary

Table 7-1 shows the classification results of the examples collected. Because an invisible boundary is not easy to perceive, the four visible classifications were first analysed using typical cases. Almost all of the physical MTR boundaries can be identified; those that share a group always retain the characteristics of that group.

Table 7-1 Classification of visible boundaries

Visibility	Descriptions	Cases	Form	Physical medias
Unclosed	Unclosed boundaries cannot arrest users' behaviors physically. They are designed open because they change their function according to different situations and people.		Plane Line Text	Instruction, divider line, tactile paving, etc.
Meshy	Meshy boundaries is another form of unclosed boundaries, which can save space and production material.	 	Object Plane Line Text	Stair edges, guard bar function areas, etc.
Semi-closed	Semi-closed boundaries control peoples' behaviors like a rule when it comes to crossing the boundaries. However, users are physically able to cross if they infringe the "rule."	 	Object Plane Line Text	Guard bar, construction rail, escalator boundary, etc.
Full-closed	Full closed boundaries are partitions that physically restrict users' behaviours strictly. Users are unable to cross.		Object Plane Line Text	Wall, ceiling, floor, lift, etc.

Invisible boundaries

Invisible boundaries exist everywhere, and there are often more invisible boundaries than visible ones. Ozaki and Lewis (2006) classify boundaries into three levels, including physical, sociocultural, and psychological. The latter two levels are invisible. The researcher collected invisible boundaries by observing users' interactions with the space, facilities, and other users observed in the research. Through observation, it was found that invisible

boundaries are generated by the habits, values, and cultures of society. They place restrictions on behaviour during human interactions with space and other people.

Figure 7-18 Invisible boundaries in an MTR station: (a) escalator, (b) ATM, and (c) platform

Figure 7-18a shows an MTR escalator. In Hong Kong, it is widely known that users who want to stand should be on the right and those who would like to walk down the escalator should use the left side. Citizens obey this rule because they find it convenient. There is no visible boundary on the escalator and no written marking on the steps; people obey the rule because an invisible boundary has been created in their minds. Figures 7-18b and 7-18c show two similar phenomena related to queues in public spaces. These invisible boundaries apply to people when they create or encounter a line.

Lefebvre's (1974/2010) theory states that each body produces space by itself, and that space is a small field around the body that exists with the body all the time. When people are in a public space, they will try to avoid touching others, no matter how crowded the space becomes. This explains why people prefer to sit next to empty seats rather than next to a stranger. Figure 7-19 shows how each person attempts to claim his or her own space without disturbing (touching) others.

Figure 7-19 Body field in an MTR compartment

These classifications are neither absolute nor unchangeable. They often overlap due to the differences that occur within different times, environments, and ideology characteristics. As time passes, some boundaries change form. Figure 7-20 shows the transference of an invisible boundary to a visible one.

Figure 7-20 Visible boundaries on an MTR station escalator

When boundaries are divided into visible and invisible categories, it is easy to perceive the space and look for the boundaries. A space can be considered to be an area divided by visible or invisible boundaries into several parts. When these boundaries overlap each other

and flow from one form to another, they make the whole space active and colourful.

7.4.4 Boundaries and people

An MTR station is not a natural space nor a mental one, but is a physical public transport space operated by people. As people have unique perceptions of the world and interact with the world through participation (Dittmar, 1992; cited in Ozaki & Lewis, 2006), boundaries can be perceived in terms of human participation. Only when people interact with the boundary can it be called a boundary. If a space is not used by or open to users, its boundaries are meaningless. To recognize the MTR's boundaries, consideration must be given to the ways in which people interact with them. In current Hong Kong culture, peoples' behaviours in relation to boundary design can be divided into two aspects: passive and dominant (Siu, 2003a).

Passive behaviour of people

As Lynch (1960) notes in *The Image of the City*, the city is a text with grammar "written" by planners and historical accretion and "read" by urban citizens. According to Siu's (2008; 2013d) study on the quality assurance of public space in cities, there are three major groups of people necessary to be considered: policymakers, designers, and managers. These three groups work together to decide what information about a space is presented to its users.

The generation sequence always works in the same way. First, the policymakers make a generalized decision and the designers try to realize the total idea. The managers then input changes to make the whole system safe and stable. Finally, users try to decode the meaning

introduced by the “decision makers” (policymakers, designers, and managers). In this process, design becomes “a process of enquiry during which meaning is constructed with diverse stakeholders” (Kimbell, 2011, p. 49); solutions are not perfect resolutions, but rather address certain perspectives and interpretations of meaning (Lockton et al., 2013). Users are also referred to as “end users” (Junnila, 2007; Pemsel, Widén, & Hansson, 2010).

Users passively accept public space boundaries all the time. However, in this context, “passive” does not mean negative. Figure 7-21 shows a boundary in the MTR that was arranged by managers. This “meshy” boundary divides the space into two parts that both restricts and regulates user behaviour. People obey the restriction as a matter of course.

Figure 7-21 Passive, but not negative, boundary

Another interesting phenomenon occurs when comparing MTR stations with downtown Hong Kong streets. Siu (2001) examines many cases surrounding the re-territorializing behaviour of shop owners and observes that city users often set up new boundaries when redefining meanings and functions of space. However, in the case of the MTR, shop owners are strictly restricted by station boundaries. Figures 7-22a and 7-22b compare an open market shop boundary to an MTR shop boundary. In Figure 7-22a, the downtown shop

owner extends his territory towards the street, which is the same as Siu (2013d) mentioned: "Some people reterritorialized their boundaries of public space for their own social activities." However, in Figure 7-22b, it shows how the MTR shop's design implements a more withdrawn presentation. As the MTR is a system of public spaces managed by a private company, the private company is able to exercise more controlling influence over use than is seen in other, non-privatized public spaces.

Figure 7-22 Shop owners' behaviour: (a) downtown shop and (b) MTR shop

Dominant behaviour

As mentioned before, decision makers play a dominant role in both design and management for public spaces. Decision makers generate the space and the objects in it (as shown in Figure 7-23). Although some user surveys are conducted during the creation process, it is not easy to imagine how people will interact with the space and facilities in the real world, as different people can have different interpretations of the same content (Pask, 1975). What the users perceive may not be what the designers, policymakers, and managers conceive.

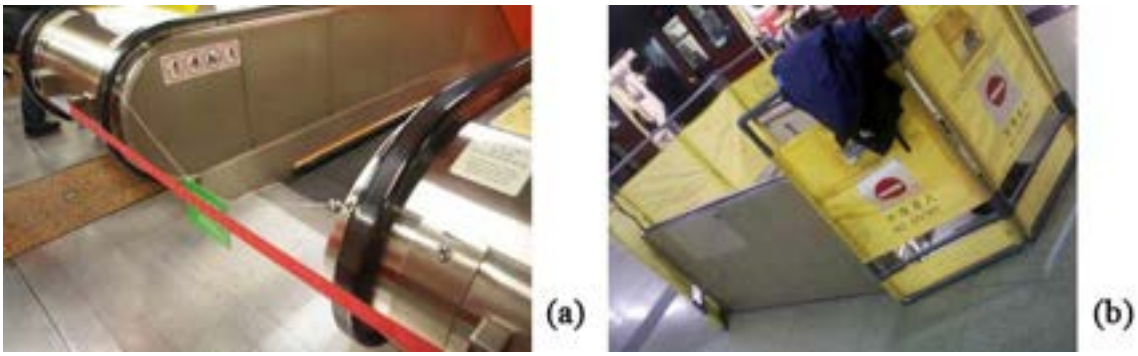


Figure 7-23 Design of the MTR managers

Although almost all possible boundary interactions are imagined and designed by decision makers, users are not always passive receivers. Users have the ability to reterritorialize boundaries, and can do so instinctively in any environment.

Siu (2007b) has stated that city users–individuals–are perhaps able to find and manage a way to live in an environment in such a way that best suits their everyday lives. Deterritorialization and reterritorialization are both common phenomena in public space. Deterritorialization refers to taking control and order away from a land or place (territory) that is already established, thus effectively undoing what has been done. Reterritorialization involves the restructuring of a place or territory that has experienced deterritorialization. It can be interpreted as removing existing visible or invisible boundaries and constructing new boundaries in their place (Brenner, 1999).

Figure 7-24 shows three old women working together to recover newspapers from pedestrians at the entrance/exit of Hung Hom Station. Like a boundary, the bias line constructed by their bodies restricts the walking direction of pedestrians. The women do not stand directly behind one another, as such a line would hide some of them from the sight of pedestrians. Meanwhile, people always choose to walk around the crowd of women instead of moving between the intervals among them. Every morning, the women reterritorialize

this visible and invisible boundary with their bodies at the station exit, and it more or less affects user behaviour. Passenger interviews reveal the following opinions of this boundary.

> Interviewee 1: I can see them every day when I go to school. Sometimes I even give the unread newspaper to them as the old women look so poor. I seldom go across them as their arms would reach out to me, which makes me uncomfortable and slows down my walking speed.
> Interviewee 2: I often skirt around them because I do not want to give my newspaper to them. It seems that they have already occupied that territory. I know it is an excellent team, although they are old women. Haha….

Figure 7-24 Boundaries constructed by old women

The same phenomenon happens at the station's ticket barrier. Figure 7-25 shows a common phenomenon in Tai Wai Station: a group of old women chatting on each side of the ticket barrier. Although the barrier prevents the women from crossing freely, it does not affect the communication among them. In this case, the physical boundary only affects where they stand. Kaya (2004) notes that when people own a space, they change their environment and overcome their territoriality. The observation in Tai Wai Station indicates that, because the height of the boundary allows the women to lean over it, the semi-closed boundary acts as a table for women to chat around. When the boundary between the paid and unpaid areas was

deterritorialized, an invisible reterritorialized boundary emerged around the women, dividing the semi-public space from the public space. We interviewed the older women about their behaviour.

> Interviewee 1: OK la... I just talk with my friends for a while. If I go out, I need to pay the money. I am not that stupid. This is a good place for us to talk with each other. We didn't affect other people and we didn't violate the rules.

Figure 7-25 Women chatting at Tai Wei Station.

Users also reterritorialize boundaries in train compartments. As there is no special compartment for babies, they stay with their parents. For example, in one observation, an infant was crying in the compartment due to hunger and continued to cry over the course of two train stops. The crying disturbed the people in the compartment and the mother felt embarrassed. She finally decided to feed the baby and asked her friends to cover her and the baby with clothing while she did so. In this case, the mother reterritorialized a private space for herself and the baby with a "full-closed" boundary.

An additional example of how people create their own space involves use of the handrails in

the compartments, which passengers can use for support when crowding in the compartment requires some passengers to stand. The railing is designed to allow many people to grip simultaneously, with each passenger taking up a hand's width of space. Figure 7-26 shows one boy's use of the handrail, which included leaning against it and taking up the entire space around it. In line with Lefebvre's (1974/2010) theory, each person builds a field around his or her body; hence, other users in the same compartment would not cross the boy's boundary unless the compartment became too crowded. The boundary exists whether or not it is strictly visible.

Figure 7-26 Boy leaning against compartment handrail.

The above examples reveal the different ways in which the users of a place or facility interact with boundaries. These interactions are an important factor in generalizing, developing, and changing boundaries. Analysing this research will make it easier for users to perceive the boundaries and for decision makers to design boundaries that complement the spaces we create for ourselves.

7.5 How to balance freedom and control in public space?

7.5.1 For the abstract existing form

The foregoing discussion about abstract form of control shows that “my freedom space”, “others’ freedom space” and the “authority’s space” together constitute the public space. Although they may overlap, public space is divided into these three elements. Public space can be considered as a constant. Equation 7-1 is a description of this analysis.

$$\boldsymbol{F}_{my\ freedom\ space} + \boldsymbol{F}_{others'\ freedom\ space} + \boldsymbol{F}_{authority's\ space} = \boldsymbol{F}_{total\ public\ space} \quad \text{Eq. (7-1)}$$

The aforementioned cases show that ‘our freedom space’ is influenced by control both of the self and of others. If ‘my freedom space’ is considered a dependent variable, then ‘my control’ and ‘others’ control’ are independent variables. The positive correlation between ‘my freedom space’ and ‘others’ control’ and the negative correlation between ‘my freedom space’ and ‘my control’ are described in equation 7-2.

$$\boldsymbol{F}_{my\ freedom\ space} = -\boldsymbol{f}_{my\ control} + \boldsymbol{bf}_{others'\ control} \quad \text{Eq. (7-2)}$$

To obtain a harmonious and stable society, citizens’ freedom space must be guaranteed. Freedom and equality are both important. A balance between them can be achieved in a public space when the freedom space of one user is equal or close to that of other users (Eq. 7-3) and both parts are as large as possible.

$$\boldsymbol{F}_{my\ freedom\ space} - \boldsymbol{F}_{others'\ freedom\ space} = \boldsymbol{0} \quad \text{Eq. (7-3)}$$

The equations illustrate the relationship and balance between each factor. As this research is social research and human behavior or feelings cannot be calculated with a simple mathematical method, these equations are used as a supplement to describe the linear relationship in the research findings, rather than to conduct actual operations. However, this approach offers insights and hints on how people understand the relationships amongst the factors. From the equations and figures mentioned above, several conclusions and principles are obtained.

- As shown in Eq. 7-1, the total space has two status. When the space is finished designing, the total space is a constant quantity or does not change drastically. When different service are provided and added into the space, total space would enlarged. When the total space is unchangeable, the authority's freedom space should be reduced in order to enlarge users' space. In other words, the unreasonable strategy (F) should be refused as it infringes upon user benefits. Only when this space is small can the user space become larger and a state of balance be achieved. Otherwise, providing more service to fulfilled people's needs is another way to enlarge people's right space.
- Eq. 7-2 clearly shows that the controls directed at users decide their freedom space. A user cannot ask for too much freedom, as he or she may come to occupy the freedom space of others. When defining freedom, types of freedom that would seriously affect user benefits should be discounted. Citizens should realize that it is not ethical to ask for freedom from ethics and strategy controls (B).
- Figure 7-4 shows that ethics are a large part of control. However, the effectiveness of this part is not easily guaranteed. Only by strengthening education to promote ethical behaviour can ethical controls (A) be useful and equal for all citizens. As citizens become more ethical, part A of the ethical circle is expected to contract and part B to increase. When ethical control is sufficiently developed to maintain public order, then

some of the strategies can be cancelled. Part A of the ethical circle will then expand and part B will become smaller again. Education is an effective way of achieving balance in public space.

- The most difficult part is the ambiguous strategy (E). This part should be paid more attention, as it is the core part of the conflict between freedom and control. The example of eating in MTR compartments presents an effective way of solving the problem. Via education, this strategy develops into an ethics policy. When their behaviour leaves this area, people cease asking for freedom from the control. Other methods to solve this kind of strategy require further discussion.
- Social background also plays a significant role behind the scenes. Culture, historical background and location also affect the balance of freedom and control. These relationships require further study.

These five findings can be used as a reference for policymakers, professionals and the public when considering freedom and control policies in public space. A balance between freedom and control is possible, and we have the instruments to achieve it.

7.5.2 For the concrete existing form

The same as the above discussion–enlarge users' space, many scholars have developed and promoted the user-centred design method to improve the quality of space (Siu, 2008; Veryzer & Mozota, 2005). User-centred design can improve the users' QoL (Dong et al., 2012; Garner & Evans, 2012; Green & Jordan, 2002; Patterson, 2012). While the user-centred design method is widely respected and considered successful, it is difficult to generate public space designs with a high degree of user fitness, because user behaviour

within such spaces is so unpredictable (Siu, 2003b; see also Hsia 1994; Yigitcanlar, 2010). In addition, a number of researchers in different disciplines, including sociology, civil engineering, and urban planning, are still trying to define public and private boundaries (Baroth, Schoefs, & Breysse, 2011; Baxter & Kroll-Smith, 2005; James-Chakraborty & Strümper-Krobb, 2011; Valk & Dijk, 2009). The Usability Professionals' Association (UPA) (2008) defines User Centred Design (UCD) as an approach to design that grounds the process in information about the people who will use the product. UCD processes focus on users throughout the planning, design, and development of a product. UCD is regarded as a broad umbrella covering several approaches that follow generic UPA principles (Keinonen, 2010). Siu's (2007b) long-term study of public space in Hong Kong stated that "designers should not become a weapon with which they impose their personal preferences on users … but make good use of their knowledge and experience so as to assist users to fulfil their own preferences and needs" (p. 45). Each construction project should keep its end users in mind throughout the process (Dewulf & Van Meel, 2002). MTR boundary designs, in particular, should be devised according to the user-centred method (Wong, Chan & Siu, 2010). Because there are so many boundary classifications and types of user/boundary interactions, evaluating existing boundaries and developing new ones is a complex issue.

Based on the above discussion about the boundaries in the public space, to investigate the design opportunities of subway boundaries, decision makers should be made aware of the distance between the current design and user centred design. This study thus applied the boundary classifications to search for user-focused design opportunities.

First, the boundaries were classified into several groups, each of which can be represented with a number. Invisible and visible boundaries are distinguished with positive and negative numbers, as shown in Figure 7-27.

Step 1 Classification of the boundary and number representation

invisible	*visible*			
invisible	unclosed	meshy	semi-closed	full-closed
-1	1	2	3	4

Figure 7-27 First step of the evaluation approach

Secondly, the boundary is described using points with coordinate values x and y, which represent user-centred design and the current state. The group number of current designs can be described through observation. Users' expectations for boundaries should be obtained through interview and observation. Interviews allow for users' opinions to be obtained directly. Their answers to questions should always be the first hand source for design. Asking questions should lead to a deeper understanding of the inner thought processes and experiences of interviewees (Denscombe, 1998). Researchers can ask users what group the boundary should be in or their feelings about current boundaries. Users' feelings that they are being controlled, that the design is meaningless, or that they expect to be protected are frequent responses to design, and often correspond to different design improvements. However, users often do not pay much attention to design issues or cannot clearly express their ideas. In such situations, observations should be used. The rate of users' utilization of a boundary and their unexpected usage modes demonstrate whether its current design is appropriate. Through the observation, when users' unexpected usage model emerged, design opportunities would also emerge, as shown in Figure 7-28.

Step 2 Boundary number representations

boundary (*x*, *y*)

	meaning	*evaluate method*
x	users' idea	observation
		interview
y	non-users' idea (current design)	observation

Figure 7-28 Second step of the evaluation approach

Third, a coordinate system was constructed. The coordinate values of these boundaries will be input to this system. In Figure 7-29, the X-axis represents users' anticipations and requirements while the Y-axis represents the current design, which can be considered a decision makers -focused design (Kwok & Siu, 2004; Siu, 2010c). However, as mentioned by Siu (2013c), Policymakers and designers often tackle urban problems in a piecemeal and short-sighted way. So this may different from the users' idea. Line *l* is an assembly of the points with the same value of x and y, which will describe when the existing design matches a user-centred design. The four quadrants of the graph demonstrate different design opportunities. The first and the third quadrants are consistent areas, where the distance (*d*) between the boundaries' points and the line show each boundary's degree of user-centredness in its design. Quadrant 2 described boundaries that are controlling and meaningless. Boundaries that fall into this quadrant should be removed or re-designed. Quadrant 4 is a potential area, which means that those barriers that fall within the quadrant have the potential to benefit from many design opportunities.

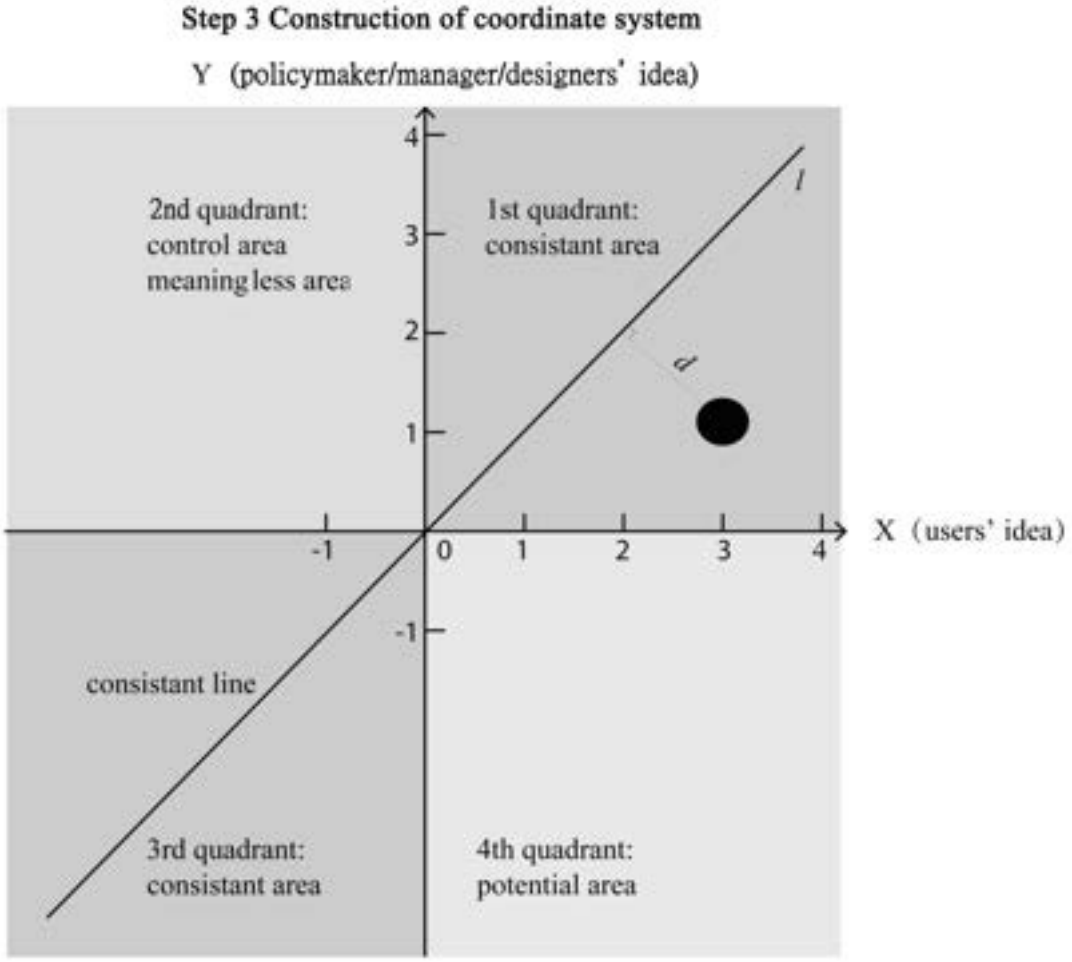


Figure 7-29 Third step of the evaluation approach

Finally, we have used some specific examples to illustrate this method. Figure 7-30 provides a visual representation of the results of a process of doing it.

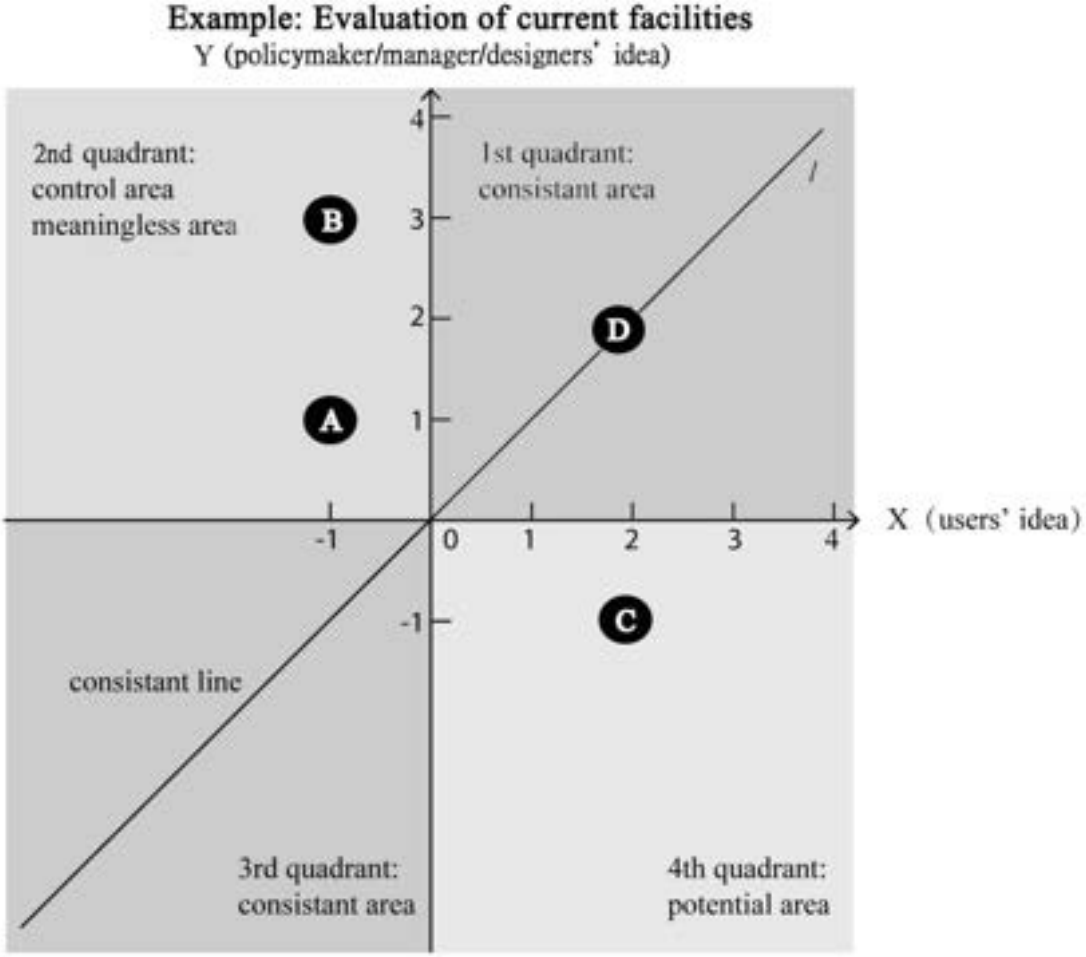


Figure 7-30 Example of applying the evaluation method

In Sheung Shui Station, bootleggers disrupted the motion of users. The MTR has recently begun to crack down on bootleggers by forbidding passengers from entering the station with more than 32 kilograms of luggage. Our interviews indicated that, although this policy reduced the number of bootleggers, it also adversely affected the everyday travel of law abiding passengers. For some of the station's users, this boundary was a meaningless and controlling design. It is shown as point *A* in Figure 7-30. Figure 7-31 shows the electronic balance at the entrance of Sheung Shui station.

Figure 7-31 Meaningless visible boundaries in an MTR station

If the boundary is designed to be visible but users require an invisible boundary, then users feel that a type of unnecessary control is being exerted. Many of the platforms on the MTR's Hong Kong Island Line are designed as shown in Figure 7-32a. The space between the railway edges and the wall is narrow and low. This space can become quite crowded when users are waiting for trains. We interviewed several passengers about their impressions of the platforms during rush hour on the platform.

> Interviewee: Of course I feel crowded, especially during the rush hour. So many people there and so limited space! I have to move through the crowd to find waiting lines, if any are available.
> Interviewee: I feel it is difficult to form a line. People stand randomly in the limit space. I don't know where the end of a queue is. The safe guard is so necessary in this platform to protect the passengers.

People considered the platforms crowded and oppressive (as shown in Figure 7-32b). The length of the waiting area for passengers on the platform is only 200 mm, and during rush hour passengers can stand in five or more irregular lines. The limited space increases users' feelings of being controlled. In Figure 7-30, this boundary is positioned at point B. It is a controlling design.

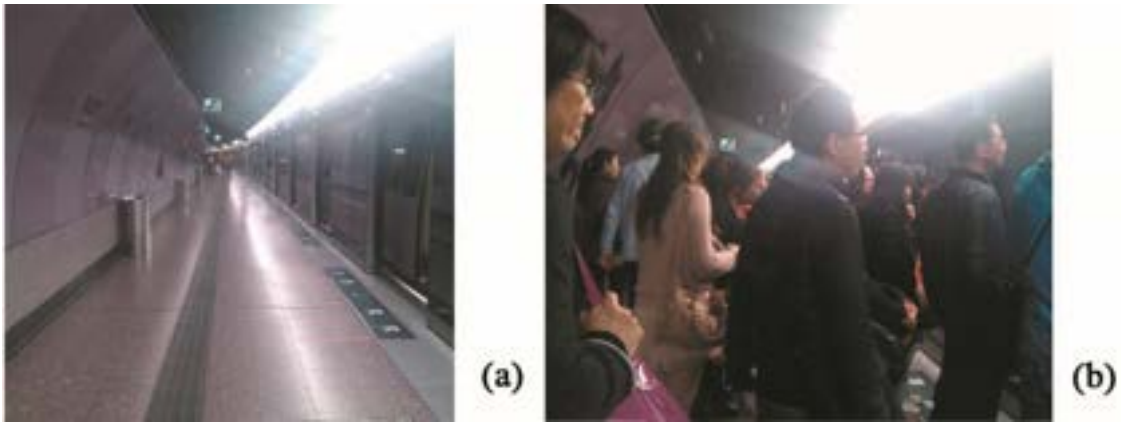


Figure 7-32 Platform in Causeway Bay: (a) no passengers, (b) full of passengers

Designers can find potential opportunities for design in barriers that fall into the fourth quadrant, which are characterized by when users' desires have gone unrealized. If designers were to identify and rectify these points, then they would increasingly emerge as first quadrant boundaries.

From this perspective, the MTR station chairs pose an interesting classification problem. We have done a survey of the platforms of two stations: Tsim Sha Tsui and Sha Tin. The seats in these two stations are different in size and form. The rate of utilization in these two places is similarly diverse.

The chairs in Tsim Sha Tsui do not have visible boundaries (figure 7-33) and are not used as effectively as those with boundaries in Sha Tin station (figure 7-34). We have interviewed the passengers in these two stations:

> Interviewee 1 (in Tsim Sha Tsui station): If I am tired in the platform, I would take a seat. Otherwise I would not. I think the seat in this station (Tsim Sha Tsui) is too small for me to share with other people. I don't want my body to touch with others.

> Interviewee 2 (in Sha Tin station): I think the boundary in the seat is necessary. I would choose to sit on the left or right side instead of the middle. I would feel controlled if I had to sit between two strangers. But if I am quite tired, it's OK–at least there is a boundary there.

This can be explained by the aforementioned "body field." People do not want to disturb the invisible fields of others, and the fields can be quite large if there isn't a physical boundary present. The two cases correspond to points *C* and *D* in Figure 7-30.

Figure 7-33 Chairs without visible boundaries in an MTR station

Figure 7-34 Chairs with visible boundaries in an MTR station

The closest subway station in Shenzhen (just across the border from Hong Kong in the Chinese mainland) is undergoing a design change bringing boundaries in the potential quadrant into quadrant 1. Some of its chairs have been designed with visible boundaries (Figure 7-35). As this station was constructed recently, it can continue to develop its facilities based on the experience of Hong Kong's MTR.

Figure 7-35 Chairs with visible boundaries in the Shenzhen subway station

Based on user-centred design theory, the study categorizes boundaries into a coordinate figure with different classifications. Each existing boundary is positioned within the quadrants based on users' anticipations and decision makers' ideas. During the design process, decision-makers should try to design high quality and sustainably developed boundaries. Boundary improvement can be promoted based on user-centred design theory and the properties of each quadrant.

- Newly designed boundaries should be user-centred. When designs coordinate with reasonable anticipations, users should interact with them in an appropriate way instead of changing the boundaries with their own interpretations.
- Decision-makers should be sensitive to the invisible boundaries in public spaces and find design opportunities by observing users and administering user surveys.
- Controlled boundaries should be improved and meaningless boundaries should be removed. Whether a boundary is controlling depends on how a user interacts with it.

This study was conducted in Hong Kong. Although Hong Kong MTR is a typical subway with people of diverse cultures and backgrounds, the phenomena observed in this city are quite specific to Hong Kong culture. As Schadewitz (2009) stated, in an increasingly multi-cultural environment, designers and design educators need to be aware of differences that may affect the usefulness of a learning design solution across cultures. Future studies should compare how culture affects peoples' behaviours with barriers in order to obtain a more universal design instruction.

7.6 Summary

Freedom and control are the two main factors affecting QoL. This chapter responds to several questions about freedom and control as they relate to public space and makes recommendations for policymakers, designers and the public to establish a balance between the two.

This chapter discusses the relationships between quality of life, freedom and control. It analyses the development from EDL to freedom and control. Users' freedom spaces are defined as circles with changing radii. The total public space is considered a construction of both users' freedom spaces and governing institutions' spaces. Control thus acts as an external force that maintains the state of the space. The balance between freedom and control is thus identified.

This chapter discusses abstract and concrete control. Abstract control includes ethics and strategies. Each element of abstract control affects the whole public space differently. These elements are analysed. The Hong Kong MTR is used as a case study to establish a relationship diagram. Qualitative results are presented in a quantitative fashion. Equations

and a diagram analysis are used, raising five key concerns in the fields of education, policymaking and social background. The results illustrate that a balance between freedom and control does exist in public space and several methods are proposed for approaching that balance.

This chapter also analyses concrete control, or boundaries, in public spaces. Urban space boundaries' forms and functions change and develop. People do not always interact with these changing boundaries in predictable ways. The Hong Kong MTR is used as a case study to examine the relationships between boundaries, space and human behaviour. The analysis of boundaries offers insights into people's understanding of freedom and control in public space.

Physical, psychological and sociocultural boundaries all separate and distinguish. This chapter points out how MTR boundaries are used to distinguish the characteristics, functions and sizes of separate spaces to make the boundaries easier to identify. The boundaries in a public space are divided into five groups using descriptions of visible, invisible, physical and psychological boundaries (control). Human interactions with boundaries are analysed using the behaviour of different groups of people. The dominant role of decision-makers and the passive role of users correspond with each other.

Based on these examinations of boundaries, space and human behaviour and the theory of user-centred design, the elements examined are organised into several graphics. By defining them in terms of user expectations and decision-maker-focused design, each boundary is positioned in one of the potential, consistent, controlling or meaningful quadrants. The aim of defining these boundaries is to help provide suggestions for improving existing designs.

In summary, this chapter discusses how freedom and control exist in the public space and their relationships with people and the environment. This abstract, indistinct concept is analysed in a specific, clear way. The process of developing freedom and control in public space and of achieving a balanced state are identified. Theoretical and practical perspectives are used. The results can be used to inform future studies.

CHAPTER 8 Conclusions

8.1 Introduction

This thesis reviewed the literature on freedom, control and MTR public spaces, provided a comprehensive description of the everyday MTR life, investigated the definition of a quality MTR life and systematically discussed how to pursue a balance between freedom and control in MTR everyday space. This chapter concludes the study by answering the research questions proposed in Chapter 1. Each research question is answered using summaries of the above work. Future work and the limitations of this study are also discussed.

8.2 Answering the research question

This study told a story with time (EDL), location (the MTR space) and characters (the people in the MTR space), aiming to answer the questions of 'what', 'when' and 'how'. The research questions arose naturally in the study. What is the everyday life like in the MTR space? Who stay in the MTR spaces every day? How people define quality MTR life? How to balance freedom and control in the MTR space? This study not only answered each of these questions but also described the process of identifying the issues and searching for the answers.

8.2.1 Q1: What is the role of the MTR life in people's everyday lives?

The literature review showed that the MTR life has been a part of people's lives for only thirty years in Hong Kong. The MTR life has become part of people's EDLs based on the tremendous development of the MTR system and space. As the MTR is one of the most important forms of public transportation in Hong Kong, taking the MTR has become part of people's EDLs. Its function is not restricted to transportation. People travel on the MTR, meet people in the MTR, use the MTR facilities and actively and passively participate in the MTR activities. In the modern world, the MTR plays a significant role in people's EDLs.

In this study, the MTR life was portrayed by analysing different groups of people's lives, classifying their behaviour in different levels of spaces and identifying the MTR's city roles. The MTR space is a public space that is always full of people with different backgrounds. Where there are people, there are activities and stories. The MTR space is a continuous, separated space that attracts people to pass by and stop in its stations every day. Users travel to work on the MTR every day. MTR workers consider this space to be their everyday working space. People who gather around the MTR stations wish to obtain benefits from the crowds. Although the MTR public space has a short history in the city, it attracts many people and diverse users. Like the street, park and shopping mall public spaces, the MTR space has becomes one of the most significant and representative privately owned public spaces with abundant EDL.

Besides its basic function as a transportation tool, the MTR space is a gathering space for people to conduct trade, express attitudes, spread information and demonstrate culture. As mentioned in Chapter 5, the MTR has changed its structure from a point to a line, from a place to a space. It has become part of human life as it contains human relationships. The MTR space demonstrates the real state of citizens' lives in the city. It is a mirror that reflects the city rhythms, culture and habits. As it has developed, the MTR has become an

image of the city, acting as a landmark and city map. As the MTR space contains many MTR shops and facilities, it has also become a city service centre. The MTR life has a different meaning for each citizen. However, every citizen perceives the MTR life as having characteristics that make people's lives more colourful and convenient.

In summary, the MTR life is a necessary part of both citizen's daily lives and city lives. There are thousands of possibilities in the MTR space and life. People shape the MTR space. Simultaneously, the MTR space shapes people's lives. They rely on and deeply affect each other.

8.2.2 Q2: What are users' expectations of a quality everyday life?

A quality life (space) can be defined from different aspects. Constructing a quality life is a complex issue involving human relationships, physical constructions, psychological feelings and many other factors. This study focused on specific public areas and described a quality life from the needs perspective, which has a strong relationship with design. Through the combination of qualitative and quantitative research methods, users' opinions of a quality MTR life were surveyed, generating qualitative descriptions and quantitative data.

A general quality MTR life needs pyramid was constructed. The most significant needs were placed at the bottom of the pyramid and the less significant at the top. More potential needs will be discovered in the future. A quality MTR life was described by functional needs, necessary physical needs inside the stations, economic needs, inside environment needs, physical needs related to the city, entertainment needs, art needs, emotional needs

and potential needs. A quality life should be constructed step by step, according to this needs pyramid.

By using the MTR needs pyramid, this study creatively combined social network data with design opportunities. A theoretical image-needs-design opportunities model was constructed. The direction of quality MTR life provided information for designers and policymakers. The model also proposed a method for evaluating the current situation and searching for undiscovered needs. Practical methods for achieving a quality MTR life were thus presented.

8.2.3 Q3: What are the relationships between freedom, control and a quality MTR life?

In Chapter 6, a quality MTR life was defined from the needs perspective. Chapter 7 analysed the relationships behind the needs pyramid. Fulfilling the MTR needs requires balancing the benefits of different groups of people. Freedom and control directly affect users' behaviour and are the best way to describe the relationships between different groups of people. A quality life requires a balance between freedom and control in the public space.

Lynch stated that a public space should be both free and controlled. A quality space should fulfil users' needs and should reasonably satisfy most people. Each factor of freedom and control is a critical element of public space and life. Without freedom, a space cannot be called public. Without control, a public space cannot develop positively. Freedom and control must exist together. Searching for the balance between freedom and control is without doubt of benefit. It is also an effective way of achieving a quality MTR life.

8.2.4 Q4: How can freedom and control be balanced in the MTR public space in citizens' everyday lives?

Freedom and control are both abstract concepts. This study aimed to identify concrete forms of freedom and control in public space to make balancing the two factors feasible.

Each person's or group of people's freedom was represented by an elastic space. Control is the outer force affecting the size of the circle. Both abstract and concrete control were considered. Based on observations, control was divided into policy and ethical control. Each kind of control differently affects the size of an individual's freedom circle. Both policy control-determined space and ethical control-determined space may be unbalanced. The balanced state between freedom and control was symbolically defined. The process by which freedom and control affect one another in public space and how they both affect public space were clearly identified. This analysis can be used in future studies to explain phenomena in the MTR public area and by policymakers to interpret users' behaviour.

Suggestions for policy-making to balance freedom and control were made.

- Ethics and policy should work together to control the public space.
- A balanced state between freedom and control is a state in which different users are treated fairly in the public space.
- Balance between freedom and control ensures that benefits are balanced between different people.
- Strengthening education to promote ethical behaviour will be helpful. Education will ensure that ethical controls are useful and equally affect all citizens.

- Authorities should not enlarge their freedom spaces by shrinking users' spaces. User-centred principles are always the most effective design principles.
- Policymakers should pay special attention to ambiguous strategies as they are the beginning of conflicts.

This study also analysed concrete control. To make this abstract concept more specific, control was defined as the boundaries in a public space. The boundaries in the MTR public space were classified as visible or invisible. By analysing how people interact with different kinds of boundaries in the public space, user-centred design was found to be important in constructing a harmonious space and balancing freedom and control. Designing proper boundaries balances freedom and control. The MTR boundaries were described in a quadrant, according to the boundaries' forms and factors. Based on user-centred design, this quadrant described the process of designing proper boundaries in the MTR space, as shown in Figure 7-29.

8.3 Contributions to the field

This study contributes both knowledge and practice. EDL was identified and the role of the MTR life in citizen's EDLs was confirmed. Quality MTR EDL was defined from the needs perspective and a model for discovering design opportunities was constructed. How freedom and control exist and work in a public space was identified and a method of balancing freedom and control was proposed. The contributions to the field can be summarised as follows.

- The people in the MTR space were classified. The relationships between different groups of people during their EDLs were analysed.
- The MTR space was divided into three levels and the characteristics of each space were analysed.
- The MTR's roles in city life were identified.
- A quality MTR life was defined with a needs pyramid.
- Different groups of people's requirements for a quality MTR life were analysed.
- The importance of balancing freedom and control in a public space was identified.
- How freedom and control exist in and act on a public space were identified.
- A method for achieving a harmonious, balanced public space through design and policy making was proposed.

8.4 Limitations of the study

URT systems have been constructed in many cities and more are constructed each year. A quality URT life must be developed in both developing and developed URT systems. This study focused on freedom and control in the Hong Kong MTR public space and aimed to construct a quality MTR life. Although qualitative and quantitative methods were combined, limitations remain due to limited resources, time and a narrow research scope.

8.4.1 Title and topic

The title of this study defined the research area as the Hong Kong MTR public space. Freedom and control in relation to public space were discussed. Representative lines of the MTR system were selected for a case study. Interviews and questionnaires were conducted with Hong Kong MTR users. As this study focused on a specific area, it was proper and

effective to focus on the research area. However, Hong Kong is a special city with both Eastern and Western cultures. The Hong Kong MTR is a world-famous, highly-developed URT system. Future studies can be conducted in other typical cities, to compare with these results and thus determine the special characteristics of the MTR space in Hong Kong. A comparison of different MTR spaces in different Asian cities can be conducted to understand the Hong Kong MTR's status. Design information can also be obtained by observing the URT systems in different cities, such as the Tokyo Metro, Taipei Metro and Singapore Metro.

The abstract concepts of freedom and control were discussed in a specific way. This analysis method can be used in other public spaces. Freedom and control are the two main factors in all public space that is shared by different people. Both personally owned and government managed public space need to balance freedom and control. Future studies on freedom and control in other public spaces would extend this study.

8.4.2 Methodology

Qualitative and quantitative research methods were used in this study. The research methods were conducted step by step. Due to time and funding limitations, the research methodology should be improved in future and further studies.

Two representative lines were selected for the case study. These two lines were representative for demonstrating people's daily lives due to the many users with different cultural backgrounds. The findings obtained from the case lines persuasively described the MTR life and human interactions in the public space. However, people's purposes in a station are affected by the surface area and their behaviour may reflect surface

characteristics. Representative stations could be used to conduct an in-depth study of this issue. For instance, the Disneyland resort station has a special design and users, and the racecourse station is only open on race days. People travelling on the MTR to the racecourse station all have the same travel purpose and are mostly older people. The Airport Line carries passengers who are travelling to the airport to undertake a journey. The two case lines studied here gave a comprehensive summary of EDL and normal behaviour. Studying additional case lines and stations will provide more information on representative stations and the relationship between MTR station life and surface life.

Future studies should also conduct interviews and observations with more people. This study divided people in the MTR by age, gender and cultural background. More categories could be added to the analysis, such as occupation, region of residence and income. More interesting and meaningful comparison results would be obtained.

8.4.3 Findings

The MTR public space is a developing space. Over the three years that this study was conducted, new instruments have been added to the URT system and its policies and design have changed. The questionnaires and observations used here only collected users' current or recent perspectives. The findings are thus real-time findings and are not generalisable across time. As the MTR space is dynamic and has many possibilities, additional research should include long-term studies. This is a general limitation of urban studies. However, the research methods used here can be used in any public area research. Additional studies should interview users at different times to see how their perspectives change as the MTR develops.

Chapter 6 proposed a theoretical dynamic method for identifying people's perspectives using the Internet. Putting this method into practice would be a significant, meaningful future study. Research findings can only be considered convincing and reasonable when they are based on reasonable, valid survey results.

This study was based on user-centred design principles. It reflects citizens' real lives in public space, which are often neglected by the authorities. Additional, in-depth studies of designer and authorities should be conducted to identify how conflicts happen.

8.5 Further research

Further studies, including practical work, comparison work and work in new research areas, are suggested by the limitations of this study.

The use of social network data for design has great research potential. This study presented an initial trial. More practical work must be done to test the model and identify problems with its implementation. The use of mass data in design is a hot topic and offers great future benefits.

Additional observations in more stations should be conducted to both increase the general knowledge of the common characteristics of MTR space and EDL, and explore the special characteristics of particular stations that meaningfully improve the quality of MTR life.

This study investigated the MTR space and its users. Future comparison studies are suggested below.

- Determine the direction of a quality URT life in Asian cities by comparing the URT systems in different Asian cities.
- Determine how culture affects the direction of a quality URT life by comparing Western and Eastern URT systems.
- Determine how freedom and control are affected by human behaviour in public space by comparing mainland China and Hong Kong URT systems.
- Determine how disadvantaged groups of people interact with the MTR space by comparing normal people with pregnant women, the elderly and disabled people.

This study focused on the MTR system in Hong Kong. Freedom and control are widely discussed in public studies. The research methods used here can be used for other public areas shared by different groups of people, such as community parks, shopping malls and streets. All of these public areas need both freedom and control.

Appendix 1 Questionnaire of quality MTR life

影響用户地鐵生活质量的因素調查問卷

亲爱的用户：

你好！

港鐵作为香港重要的交通工具之一，已经逐渐渗透到了每個香港居民的生活。我們是香港理工大学設計學院公共設計實驗室的研究生，希望通過本次調查問卷瞭解：影響用户地鐵生活质量的因素。希望閣下支持！本問卷所收集到的資料，只能學術研究及分析，一切個人資料均會保密，並于研究后銷毀。請安心作答。本次調查大約需要占用您3-5分钟的时间，您所提供的答案不存在对错之分，请您尽量根据您的实际情况回答所有问题。非常感谢您的参与！

1. 性别 *

○ 男 ○ 女

2. 您的年龄段 *

○ 20-40 ○ 40-60 ○ 60以上

3. 出行最常用的交通工具是 * [多选题]

□ 步行 □ 公交 □ 地鐵 □ 自驾 □ 其他

4. 出行采用地铁为交通工具的频率是 *

○ 一周多次 ○ 一周一次 ○ 一个月多次 ○ 多月一次

5. 請給下面影響地鐵生活品質的因素的重要性打分，分数越高越重要 *

	1一般重要	2	3	4	5非常重要
安全穩定性高	○	○	○	○	○
車站內整體環境清潔	○	○	○	○	○
列車能夠準時到達	○	○	○	○	○
車站內空氣質量	○	○	○	○	○
提供充足的站內廁所	○	○	○	○	○
提供充足的車廂內座椅	○	○	○	○	○
提供良好的無障礙設施	○	○	○	○	○
地鐵內標識清晰	○	○	○	○	○
提供方便的地鐵商店	○	○	○	○	○

	1一般重要	2	3	4	5非常重要
提供便捷的巴士接駁服務	○	○	○	○	○
車站與家的距離近	○	○	○	○	○
電視播出有趣的節目	○	○	○	○	○
車站內有無限網絡	○	○	○	○	○
地鐵提供免費報紙服務	○	○	○	○	○
地鐵內廣告的趣味性	○	○	○	○	○
合理的價格	○	○	○	○	○
地鐵入口方便找到	○	○	○	○	○
換乘距離短	○	○	○	○	○
付費方式便捷	○	○	○	○	○

问卷到此结束，谢谢您的支持！

Appendix 2 Questionnaire given to the subway users with pictures of boundaries

Please classify the boundaries in the MTR station and illustrate your reason.


No.1


No.2


No.3


No.4


No.5


No.6


No.7


No.8


No.9


No.10


No.11


No.12


No.13


No.14


No.15


No.16


No.17


No.18

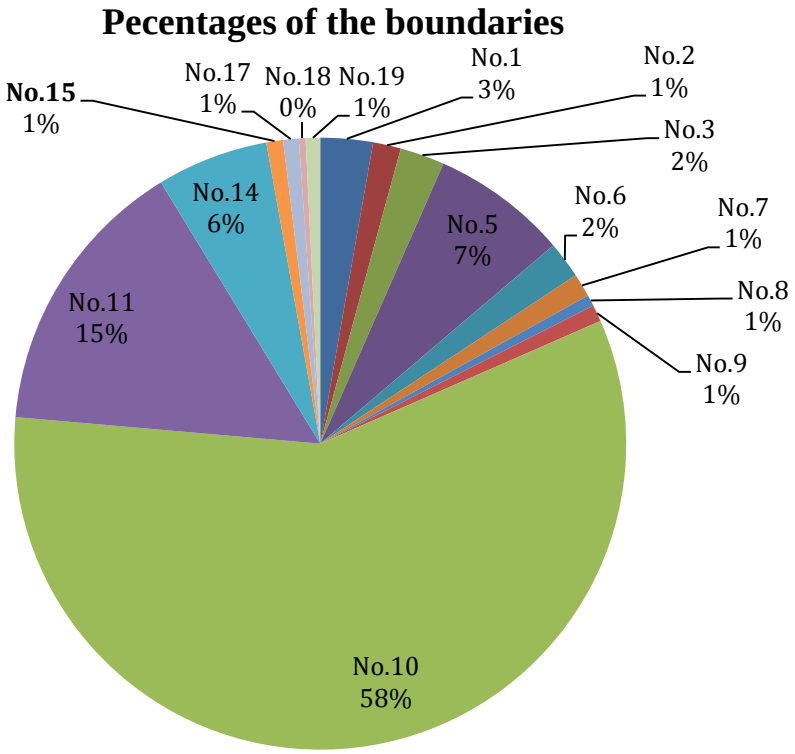

No.19

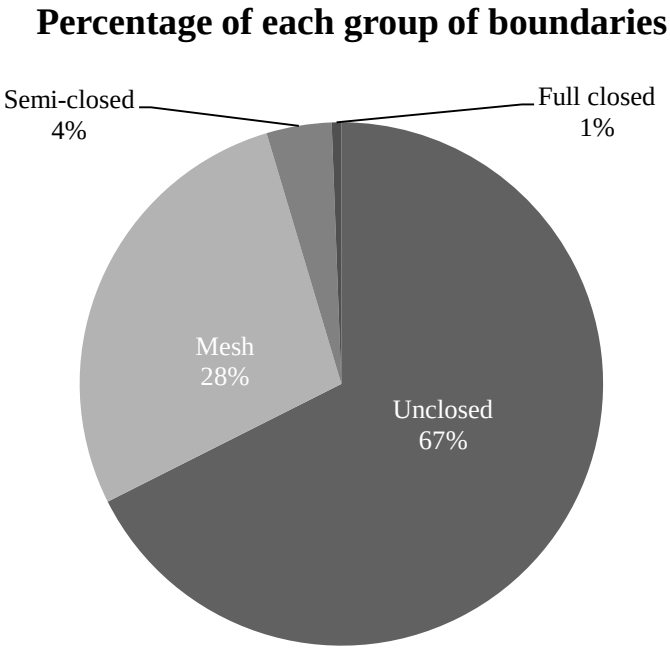

No.20

Appendix 3 Statistics on frequency of existence boundaries in case stations

Boundaries No. (referring to Appendix 1)	1	2	3	5	6	7	8	9	10	11	14	15	17	18	19
Shatin	3	7	6	16	0	0	0	0	240	64	4	4	0	1	1
Tai Wai	5	1	17	30	8	0	0	1	240	6	4	0	3	0	0
Kowloon Tong	8	2	7	11	0	1	0	4	120	34	2	2	1	2	2
Mong Kok East	4	0	7	0	8	0	0	1	2	120	78	3	0	0	2
Hung Hom	4	14	3	15	2	7	0	2	0	4	2	0	0	0	2
East Tsim ShaTsui	5	0	0	8	7	4	2	7	70	25	2	0	5	0	1
Tsim ShaTsui	2	0	0	11	1	4	2	0	78	0	2	1	1	1	0
Central	4	1	0	2	0	1	2	0	78	0	2	0	1	1	2
Admiralty	6	0	0	15	3	1	2	0	78	0	2	2	1	0	2
Wan Chai	6	0	0	14	4	3	2	0	78	0	2	3	2	1	1
SUM	47	25	40	122	33	21	10	15	984	253	100	15	14	6	25

Appendix 4 Percentage statistics





References

Altman, I. (1975). *Environment and social behavior: Privacy, personal space, territory and crowding.* Monterey, CA: Brooks/Cole Publishing.

Altman, I., & Zube, E. H. (Eds.). (1989). *Public places and spaces*. New York: Plenum Press.

Andrews, F. M. (1986). *Research on the quality of life.* Ann Ardor, MI: Institute for Social Research, University of Michigan.

Andrews, F. M., & Withey, S. B. (1976). *Social indicators of well-being: Americans' perceptions of life quality.* New York: Plenum Press.

Arendt, H. (1990). *On revolution*. London: Penguin Books.

Arnstein, S. (1969). A ladder of citizen participation. *Journal of the American Institute of Planners, 35,* 216-224.

Ashihara, Y. (1983). *The aesthetic townscape*. Cambridge, MA: The MIT Press.

Asur, S., & Huberman, B. A. (2010, August 31-September 1). *Predicting the future with social media, in web intelligence and intelligent agent technology* (WI-IAT). Proceedings of 2010 IEEE/WIC/ACM International Conference, Toronto. doi:10.1109/WI-IAT.2010.63

Aubock, M., & Cejka, A. (Eds.). (1996). *Open space: The city.* Wien: Verein Planbox.

Barbier, G., & Liu, H. (2011). Data mining in social media. In C. C. Aggarwal (Ed.), *Social network data analytics* (pp. 327-352). New York: Springer Science+Business Media.

Baroth, J., Schoefs, F., & Breysse, D. (2011). *Construction reliability: Safety, variability and sustainability.* London: Wiley.

Barthes, R. (1983). *Empire of signs.* (H. Richard, Trans.). New York: Hill and Wang. (Original work published 1970)

Baxter, V., & Kroll-Smith, S. (2005). Normalizing the workplace nap: Blurring the boundaries between public and private space and time. *Current Sociology, 53*(1), 33-55.

Benhabib, S. (1992). *Situating the self: Gender, community and postmodernism in contemporary ethics.* Cambridge, MA: Polity Press.

Berman, M. (1986). Take it to the stresses: Conflicts and community in public space. *Dissent, 33,* 476-485.

Bjögvinsson, E., Ehn, P., & Hillgren, P. A. (2012). Design things and design thinking: Contemporary participatory design challenges. *Design Issues, 28*(3), 101-116.

Blomley, N. (2005). Flowers in the bathtub: Boundary crossings at the public-private divide. *Geoforum*, *36*(3), 281-296.

Borglin, G., Edberg, A. K., & Hallberg, I. R. (2005). The experience of quality of life among older people. *Journal of Aging Studies, 19,* 201-219.

Borsay, P. (1989). *The English urban renaissance: Culture and society in the provincial town 1660-1770.* Oxford: Clarendon Press.

Bothos, E., Apostolou, D., & Mentzas, G. (2010). Using social media to predict future events with agent-based markets. *IEEE Intelligent Systems, 25,* 50-58.

Bowling, A. (1997). *Measuring health: A review of quality of life measurement scales* (2nd ed.). Berkshire: Open University Press.

Boyer, C. (2000). Crossing cybercities: Boundary problems separating the regional space of the city form the matrix of cyberspace. In R. Simmonds & G. Hack (Eds.), *Global city regions: Their emerging forms* (pp. 214-228). London: Spon Press.

Bradley, K. F. (2007). *The development of the London underground, 1840-1933: The transformation of the London metropolis and the role of laissez-faire in urban*

growth (Doctoral dissertation, Emory University, 2007). Retrieved from http://search.proquest.com/docview/304942750

Brenner, N. (1999). Globalisation as reterritorialisation: The re-scaling of urban governance in the European Union. *Urban Studies*, *36*(3), 431-451.

Brill, M. (1985). *Using office design to increase productivity.* New York: Workplace Design & Productivity.

Brooks, M. W. (1997). *Subway city: Riding the trains, reading New York.* New York: Rutgers University Press.

Burger, J. M., & Cooper, H. M. (1979). The desirability of control. *Motivation and Emotion, 3*(4), 381-393.

Carmona, M., de Magalhães, C., & Hammond, L. (2008). *Public space: The management dimension.* London: Routledge.

Carr, S. (Ed.). (1992). *Public space*. Cambridge: Cambridge University Press.

Carr, S., Francis, M., Rivlin, L. G., & Stone, A. M. (1992). *Public space*. Cambridge: Cambridge University Press.

Carr, S., & Lynch, K. (1981). Open space: Freedom and control. In L. Talor (Ed), *Urban open space* (pp. 17-18). New York: Rizzoli.

Castells, M. (2001). *The rise of the network society: The information age: Economy, society, and culture.* (Z. J. Xia, Trans.). Beijing: Social Science Academic Press. (Original work published 1996)

Census and Statistics Department (2011). *Population census summery report.* Retrieved from http://www.census2011.gov.hk/pdf/summary-results.pdf

Cervero, R. (1998). *The transit metropolis: A global inquiry.* Washington, DC: Island Press.

Chen, Z. H., Li, J. X. (2012). *Hong Kong railway 100 years.* Hong Kong: Zhonghua Book Company, Hong Kong.

Chicago Transit Authority. (1974). *Glossary of transit terminology.* Chicago, IL: Chicago Transit Authority.

Croome, D. F., & Jackson, A. A. (1993). *Rails through the clay. A history of l London's tube railways* (2nd ed.). Harrow Weald: Capital Transport.

Cornuel, E., & Kletz, P. (2003). Viewpoint: Global responsibility and total freedom. *Corporate Governance, 3*(3), 39-51.

Cox, R. (2013). *Environmental communication and the public sphere*. Thousand Oaks, CA: Sage Publications.

Cresswell, T. (1996). *In place/out of place: Geography, ideology, and transgression*. Minneapolis, MI: University of Minnesota Press.

Cudahy, B. J. (1995). *Under the sidewalks of New York: The story of the greatest subway system in the world.* New York: Fordham University Press.

Cudahy, B. J. (2003). *A century of subways: Celebrating 100 years of New York's underground railways*. New York: Fordham University Press.

de Certeau, M. (1984). *The practice of everyday life.* Berkeley, CA: University of California Press.

de Certeau, M. (1988). *The writing of history.* (T. Conley, Trans.). New York: Columbia University Press. (Original work published 1975)

Delaney, D., Blomley, N. K., & Ford, R. T. (Eds.). (2001). *The legal geographies reader: Law, power and space.* London: Blackwell Publishers.

Denscombe, M. (1998). *Good research guide.* Berkshire: Open University Press.

Denzin, N. (1978). *The research act: A theoretical introduction to sociological methods.* New York: Mcgraw-Hill.

Ge, M. (2013). *The strategic of subway defense*. Retrieved from http://bbs.tiexue.net/post2_5143621_1.html

Dewulf, G., & van Meel, J. (2002). User participation and the role of information and communication technology. *Journal of Corporate Real Estate, 4*(3), 237-247.

Ding, S. (2008). Users' privacy preferences in open plan offices. *Facilities*, *26*(9), 401-417.

Dittmar, H. (1992). *The social psychology of material possession: To have is to be.* New York: St Martin's Press.

Dong, H., Cassim, J., Coleman, R., & Clarkson, J. (2012). *Design for inclusivity: A practical guide to accessible, innovative and user-centred design.* England: Gower Publishing Limited.

Eley, G. (1995). Foreword. In A. Ludtke (Ed.), *The history of everyday life: Reconstructing historical experiences and ways of life* (vii-xi). (W. Templer, Trans.). Princeton, NJ: Princeton University Press.

Ellison, N. B. (2007). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication, 13*(1), 210-230.

Engel, B. (2006). Public spaces in the blue cities in Russia. *Progress in Planning, 66*(3), 147-239.

Fagan, G. G. (2002). *Bathing in public in the Roman world.* Ann Arbor, MI: University of Michigan Press.

Forrest, A., Grecni, J., Mesnikoff, W., & Paxson, L. (1979). *For people's sake: A study in grand and central terminal (Monograph).* New York: City University of New York, Environmental Psychology Program.

Foucault, M. (1977). *Power/Knowledge: Selected interviews and other writings, 1972-1977.* New York: Pantheon.

Foucault, M. (1984). *The Foucault reader*. New York: Pantheon.

Francis, M. (1989). Control as a dimension of public space quality. In I. Altman & E. H. Zube (Eds.), *Public places and spaces* (pp. 147-172). New York: Plenum Press.

Franck, K. A., & Paxson, L. (1989). Women and urban public space. In I. Altman & E. H. Zube (Eds.), *Public places and spaces* (pp.121-146). New York: Plenum Press.

Gabriel, Z., & Bowling, A. (2004). Quality of life from the perspectives of older people. *Aging and Society, 24*, 675-691.

Garner, S., & Evans, C. (2012). Designing for people. In S. Garner & C. Evans (Eds.), *Design and designing: A critical introduction* (pp. 127-128). London: Berg.

Gehl, J. (2011). *Life between buildings: Using public space (6th ed.).* Washington, DC: Island Press.

George, R. T. (n. d.). *Integrating of quantitative and qualitative method in research*. Retrieved from http://books.google.com.hk/books?id=l7WJTcbxcmQC&printsec=frontcover&source=gbs_atb&redir_esc=y#v=onepage&q&f=false

Giddens, A. (1990). *The consequence of modernity.* Cambridge, MA: Polity Press.

Girouard, M. (1985). *Cities and people.* New Haven, CT: Yale University Press.

Giudice, M. (2008). The regular practice of morality in law. *Ratio Juris, 21* (1), 94-106.

Glasser, W. (1985). *Control theory: A new explanation of how we control our lives*. New York: Harper & Row.

Gottdiener, M. (1985). *The social production of urban space.* Austin, TX: University of Texas Press.

Gottdiener, M. (1993). A Marx for our time: Henri Lefebvre and the production of space. *Sociological Theory*, *11*(1), 129-134.

Gouldner, A. (1975) Sociology and everyday life. In L. A. Coster (Ed.), *The idea of social structure: paper in honor of Rober K. Merton* (pp 417-432). New York: Harcourt Brace Jovanovich.

Gray, J. (1995). *Liberalism*. Minneapolis, MN: University of Minnesota Press.

Green, W. S., & Jordan, P. W. (2002). *Pleasure with products: Beyond usability*. London: Taylor & Francis.

Greenawalt, K. (1987). *Conflicts of law and morality.* Oxford: Oxford University Press.

Liu, L. (2012, November 19). Xiang gang chao guo ba cheng ren ren wei jia xin zhui bu shang gang tie jia jia. *Hong Kong and Macao News.* Retrieved from http://haiwai.people.com.cn/n/2012/1119/c345702-17739033.html

Hauffe, T. (1998). *Design: A concise history.* London: Laurence King.

Heidegger, M. (1971). *Building dwelling thinking.* (A. Hofstadter, Trans.). New York: Harper Colophon Books.

Heller, A. (1984). *Everyday life*. London: Routledge & Kegan Paul.

Herbert, D. T., & Thomas, C. J. (1997). *Cities in space: Cites as place* (3rd ed.). London: David Fulton Publishers.

Herman, S., & Egri, C. P. (2002). Triangulation in action: Integration of qualitative and quantitative methods to research environmental leadership. In K. W. Parry & J. R. Meindl (Eds.), *Grounding leadership theory and research: Issues, perspectives, and methods* (pp. 129-148). Greenwich, CT: Information Age.

Hester, R. (1985). Subconscious landscapes in the heart. *Places, 2*, 10-22.

Ho, A. G., & Siu, K. W. M. (2011). Emotionalise design, emotional design, emotion design: A review on their relationships from a new perspective. *The Design Journal, 15*(1), 9-32.

Hsia, C. J. (1994). *Public space* (Chinese ed.). Taipei: Artists.

Hou, J. (2010). (Not) your everyday public space. In J. Hou (Ed.), *Insurgent public space: DIY urbanism and the remaking of contemporary cities* (pp. 14- 30). Florence, KY: Routledge.

Huang, E. M., & Mynatt, E. D. (2003, April 5-10). *Semi-public displays for small, co-located groups.* Paper presented at The SIGCHI Conference on Human Factors in Computing Systems. New York: ACM.

Iacofano, D. (1990). *Public involvement as an organizational development progress: A Proactive theory for environmental planning program management.* New York: Garland.

Inglis, D. (2005). *Culture and everyday life*. Thousand Oaks, CA: SAGE Publications.

Jackson, J. B. (1984). *Discovering the vernacular landscape.* New Haven, CT: Yale University Press.

James, G. J. (1977). *Tube trains under London: An illustrated history of London transport tube rolling stock, including Heathrow airport and fleet line trains.* London: London Transport Executive.

James-Chakraborty, K., & Strümper-Krobb, S. (2011). *Crossing borders: Space beyond disciplines*. New York: Peter Lang Publishing.

Jick, T. D. (1979). Mixing qualitative and quantitative methods: Triangulation in action. *Administrative Science Quarterly*, *24*, 603-611.

Junnila, S. (2007). The potential effect of end-users on energy conservation in office buildings. *Facilities, 25*(7), 329-339.

Katz, S., Ford, A. B., & Moskowitz, R. W. (1963). Studies in illness in the aged: The index of ADL-a standardized measure of biological and psychosocial function. *Journal of the American Medical Association, 185*, 914-919.

Kaya, S. (2004). Relating building attributes to end user's needs: "The owners-designers-end users" equation. *Facilities*, *22*(9), 247-252.

Keinonen, T. (2010). Protect and appreciate-Notes on the justification of user-centered design. *International Journal of Design*, *4*(1), 17-27.

Kimbell, L. (2011). Designing for service as one way of designing services. *International Journal of Design, 5*(2), 41-52.

Kramer, M. H. (2004). *Where law and morality meet.* Oxford: Oxford University Press.

Kruger, C., & Cross, N. (2006). Solution driven versus problem driven design: Strategies and outcomes. *Design Studies, 27*(5), 527-548.

Kumar, S., Agarwal, N., Lim, M., & Liu, H. (2009). Mapping socio-cultural dynamics in Indonesian blogosphere. Paper presented at the Proceedings of the 3rd International Conference on Computational Cultural Dynamics (pp. 37-44). Washington, DC: University of Maryland College Park.

Kwok, Y. C. J. (1998). *The production of space in Hong Kong.* Hong Kong: Crabs.

Kwok, Y. C. J., & Siu, K. W. M. (2004). *The weight of space: Participatory design research for configuring habitable space for new arrival women in Hong Kong.* Hong Kong: The Hong Kong Polytechnic University Public Design Lab Press.

Kwok, Y. C. J. (2006). *From healthy to successful aging: User friendly living environment research and design for older persons.* Hong Kong: The Hong Kong Polytechnic University.

Langer, E. J. (1975). The illusion of control. *Journal of Personality and Social Psychology, 32*, 311-328.

Larson, R. (1978). Thirty years of research on the subjective well-being of older Americans. *Journal of Gerontology, 33*, 109-125.

Lauw, H., Shafer, J. C., Agrawal, R., & Ntoulas, A. (2010). Homophily in the digital world: A live journal case study. *Internet Computing, IEEE, 14*(2), 15-23.

Lawrence, R. J. (1984). Transition spaces and dwelling design. *Journal of Architectural Planning and Research, 1*, 261-271.

Leaman, A. (2000). Usability in buildings: The Cinderella subject. *Building Research and Information, 28*(4), 296-300.

Lee, D. H. (2009). Mobile snapshots and private/public boundaries. *Knowledge, Technology & Policy*, *22*(3), 161-171.

Lefebvre, H. (1984). *Everyday life in the modern world.* (S. Rabinovich, Trans.). New York: Harper & Row.

Lefebvre, H. (2010). *The production of space.* (D. Nicholson-Smith, Trans.). London: Allen Lane. (Original work published 1974)

Lewis, S. W. (2012). The potential for international and transnational public service advertising in public spaces in American and Chinese global cities: Conclusions from a 2010 survey of advertisements in subways in Beijing, New York, Shanghai and Washington, DC. *Public Relations Review, 38*, 765-778.

Li, L. S. (2007). *Design investigation*. Beijing: China Building Bookshop.

Liu, L., Xu, J. S., & Lei, Y. H. (2011). The border design of public space. *Huazhong Architecture, 1*, 116-119.

Loader, B. D. (2008). Social movements and new media. *Sociology Compass, 2*(6), 1920-1933.

Locke, J. (1728). *Two treatises of government: In the former, the false principles and foundation of Sir Robert Filmer, and his followers, are detected and overthrown*. London: A. Butterworth.

Lockton, D., Harrison, D. J., Cain, R., Stanton, N. A., & Jennings, P. (2013). Exploring problem-framing through behavioural heuristics. *International Journal of Design*, *7*(1), 37-53.

Lofland, L. (1984). Women and urban public space. *Women and Environments, 6,* 12-14.

Lüdtke, A. (1995). Introduction: What is the history of everyday life and who are its practitioners. In A. Lüdtke (Ed.), *The history of everyday life: Reconstructing historical experiences and ways of life (pp.* 3-40). Princeton, NJ: Princeton University Press.

Lynch, K. (1960). *The image of the city.* Cambridge, MA: The MIT Press.

Lynch, K. (1984). *The good city form.* Cambridge, MA: The MIT Press.

Lynch, K. (1995). The openness of open space. In T. Banerjee & M. Southworth (Eds.), *City sense and city design: Writing and projects of Kevin Lynch* (pp. 396-412). Cambridge, MA: The MIT Press.

Lynch, K., & Carr, S. (1995). When learning happens. In T. Banerjee & M. Southworth (Eds.), *City sense and city design: Writing and projects of Kevin Lynch* (pp. 418-429). Cambridge, MA: The MIT Press.

MacCormac, R., Murray, P., & Stevens, M. A. (2001). *New connections: New architecture, new urban environments and the London Jubilee Line extension*. London: Royal Academy of Arts.

Marginn, P. J. (2007). Towards more effective community participation in urban regeneration: The potential of collaborative planning and applied ethnography. *Qualitative Research, 7*(1), 25-43.

Marx, G. T. (2001). Murky conceptual waters: The public and the private. *Ethics and Information Technology*, *3*(3), 157-169.

Marx, K., & Engels, F. (n. d.). *Communist manifesto*. Retrieved from http://www.sparknotes.com/philosophy/communist/

Maslow, A. H. (1943). A theory of human motivation. *Psychological Review, 50*(4), 370.

Massy, D. (1994). *Space, place and gender.* Cambridge, MA: Polity Press.

Matti, S. (2006). Message in a metro: Building urban rail infrastructure and image in Delhi, India. *International Journal of Urban and Regional Research, 30*(2), 277-292.

Mayer Schoenberger, V., & Cukier, K. N. (2013). *Big data: A revolution that will transform how we live, work and think.* New York: Houghton Mifflin Harcourt Publishing.

McCracken, G. (2012). Culture and consumption: A theoretical account of the structure and movement of the cultural meaning of consumer goods. *Journal of Consumer Research, 13*(1), 71-84.

Mensch, J. (2007). Public space. *Continental Philosophy Review, 40,* 31-47.

Merriam, S. B. (1988). *Case study research: A qualitative approach.* San Francisco, CA: Jossey-Bass.

Metro Taipei. (n.d.). Retrieved January 15, 2014, from *http://www.trtc.com.tw/*

Metrobits. (2013). *City pages.* Retrieved October 29, 2014, from http://mic-ro.com/metro/index.html

Mill, J. S. (n.d.). *On liberty*. Retrieved from http://www.gutenberg.org/files/34901/34901-h/34901-h.htm

MTR (Mass Transit Railway). (2012). *Mass transit railway by-laws.* Retrieved from http://www.mtr.com.hk/chi/legal/images/mtr_by_law.pdf

MTR (Mass Transit Railway). (2013). *Our pledge for service 2013.* Retrieved January 15, 2014, from http://www.mtr.com.hk/eng/whatsnew/listening_programme2013.html

MTR (Mass Transit Railway). (n.d.). *The Hong Kong Mass Transit Railway.* Retrieved January 15, 2014, from http://www.mtr.com.hk/chi/homepage/cust_index.html

MTR (Mass Transit Railway). (2011). *Art in MTR.* Retrieved January 29, 2014, from http://www.mtr.com.hk/eng/community/art_in_mtr.html

Mumford, L. (1961). *The city in history: Its origins, its transformations and its prospects.* London: Secker & Warburg.

Neal, Z. P. (2010). Locating public space. In A. M. Orum & Z. P. Neal (Eds.), *Common ground: Readings and reflections on public space* (pp. 1-10). New York: Routledge.

Nippert-Eng, C. (2007). Privacy in the United States: Some implications for design. *International Journal of Design*, *1*(2), 1-10.

Olmsted, F. L. (1879). The future of New York. *New-York Daily Tribune.* Retrieved from https://edisk.fandm.edu/david.schuyler/schuyler_urban/fony.html

Ooi, G. L. (2004). *Future of space: Planning, space and the city.* Singapore: Eastern Universities Press.

Oriental Daily. (n.d). Retrieved from http://orientaldaily.on.cc/cnt/news/20130701/00176_026.html

Ozaki, R., & Lewis, J. R. (2006). Boundaries and the meaning of social space: A study of Japanese house plans. *Environment and Planning D: Society and Space, 24*(1), 91-104.

Pask, G. (1975). *Conversation, cognition and learning.* Amsterdam: Elsevier.

Patterson, P. (2012). User-centred design. In S. Garner & C. Evans (Eds.), *Design and designing: A critical introduction* (pp. 129-143). London: Berg.

Pemsel, S., Widén, K., & Hansson, B. (2010). Managing the needs of end-users in the design and delivery of construction projects. *Facilities*, *28*(1), 17-30.

Pentz, M. A., Sussman, S., & Newman, T. (1997). The conflict between least harm and no-use tobacco policy for youth: Ethical and policy implications. *Addiction, 92*(9), 1165-1173.

Poster, M. (1975). *Existential Marxism in postwar France: From Sartre to Althusser.* Princeton, NJ: Princeton University Press.

Prendergast, R. (2004). Development and freedom. *Journal of Economic Studies, 31*(1), 39-56.

Railway Technology. (n.d.) *Toulouse Metro, France.* Retrieved January 29, 2014, from http://www.railway-technology.com/projects/toulouse/

Rapid Transit. (n.d.). *Encyclopedia Britannica.* Retrieved January 29, 2014, from http://www.britannica.com/EBchecked/topic/491506/rapid-transit

Reynolds, W. N., Weber, M. S., Farber, R. M., Corley, C., Cowell, A. J., & Gregory, M. (2010, May 23-26). Social media and social reality. Paper presented at the Proceedings of the Intelligence and Security Informatics (ISI), 2010 IEEE International Conference on. Vancouver: IEEE Xplore.

Ritterman, J., Osborne, M., & Klein. E. (2009). Using prediction markets and twitter to predict swine flu pandemic. In F. M. Carrero, J. M. Gomez, B. Monsalve, P. Puertas & J. C. A. Cortizo (Eds.), *Proceedings of the 1st international workshop on mining social media* (pp. 1-7). New York: ACM.

Rubenstein, H. M. (1992). *Pedestrian malls, streetscapes, and urban spaces*. Hoboken, NJ: John Wiley & Sons.

Sack, R. D. (1986). *Human territoriality: Its theory and history*. Cambridge: Cambridge University Press.

Saif, H., He, Y, & Alani, H (2011, October 23-27). Semantic smoothing for twitter sentiment analysis. Paper presented at Proceeding of The 10th International Semantic Web Conference (ISWC). Bonn, Germany.

Sanoff, H. (1992). *Integrating programming, evaluation and participation in design: A theory Z approach.* Burlington, VT: Ashgate.

Sartre, J. P. (1966). *Being and nothingness.* New York: Washington Square Press.

Schadewitz, N. (2009). Design patterns for cross-cultural collaboration. *International Journal of Design*, *3*(3), 37-53.

Schmitz-Luhn, B., Katzenmeier, C., & Woopen, C. (2012). Law and ethics of deep brain stimulation. *International Journal of Law and Psychiatry, 35*, 130-136.

Schulz, C. N. (2010). *Genius loci: Towards a phenomenology of architecture.* (Z. M. Shi, Trans.). Hubei: HUST Press. (Original work published 1979)

Schumacher, T. (1978). Buildings and streets: Notes of configuration and use. In S. Anderson (Ed.), *On streets* (pp. 132-148). Cambridge, MA: The MIT press.

Shields, R. (1999). *Lefebvre, love and struggle: Spatial dialectics.* London: Routledge.

Simmel, G. (1950). Metropolis and metal life. In K. H. Woff (Trans. and Ed.), *The sociology of Georg Simmer* (pp. 324-339). New York: Free Press.

Sirgy, M. J. (1986). A quality-of-life theory derived from Maslow's developmental perspective: 'Quality' is related to progressive satisfaction of a hierarchy of needs, lower order and higher. *American Journal of Economics and Sociology, 45*(3), 329-342.

Siu, K. W. M. (2001). *The practice of everyday space: The reception of planned open space in Hong Kong* (Doctoral dissertation, The Hong Kong Polytechnic University, 2001). Retrieved from https://theses.lib.polyu.edu.hk/handle/200/265

Siu, K. W. M. (2003a). Continuous settlement and urban redevelopment on Hong Kong's Chun Yeung Street. *Critical Planning, 10,* 55-71.

Siu, K. W. M. (2003b). Users' creative responses and designers' roles. *Design Issues, 19*(2), 64-73.

Siu, K. W. M. (2004). Street furniture design. In T. P. Leung (Ed.), *Hong Kong: Better by design* (pp. 77-86). Hong Kong: The Hong Kong Polytechnic University.

Siu, K. W. M. (2005a). Culture and design: A new burial concept in a densely populated metropolitan area. *Design Issues, 21*(2), 79-89.

Siu, K. W. M. (2005b). Pleasurable products: Public space furniture with userfitness. *Journal of Engineering Design, 16*(6), 545-555.

Siu, K. W. M. (2007a). *Accessible design: Devices for blind persons to access buses.* Hong Kong: The Hong Kong Polytechnic University.

Siu, K. W. M. (2007b). Guerrilla wars in everyday public spaces: Reflections and inspirations for designers. *International Journal of Design, 1*(1), 37-56.

Siu, K. W. M. (2007c). *Urban renewal and design: City, street, street furniture.* Hong Kong: SD Press, The Hong Kong Polytechnic University.

Siu, K. W. M. (2008). Quality in design: User-oriented design of public toilets for visually impaired persons. In H. Pham (Ed.), *Recent advances in reliability and quality in design (Series in reliability)* (pp. 441-463). New York: Springer.

Siu, K. W. M. (Ed.) (2009a). *New era of product design: Theory and practice*. Beijing: Beijing Institute of Technology Press.

Siu, K. W. M. (2009b). Problem solving: A user-oriented approach in public affairs. *The International Journal of Creativity & Problem Solving, 19*(1), 59-68.

Siu, K. W. M. (2010a). User participation: Quality assurance for user-fit design. *International Journal of Quality and Service Sciences, 2*(3), 287-299.

Siu, K. W. M. (2010b). Open for all: Open spaces and new urban lifestyles. *The International Journal of the Humanities, 7*(12), 25-38.

Siu, K. W. M. (2011). Openness: Freedom and control. In Z. W. Zhou (Ed.), *Transactions of K. C. Wong education foundation supported lectures, volume 33* (pp. 31-34). Shanghai: Shanghai University Press.

Siu, K. W. M. (2013a). Accessible park environments and facilities for the visually impaired. *Facilities, 31*(13/14), 590-609.

Siu, K. W. M. (2013b). Design standard for inclusion: Tactile ground surface indicators in China. *Facilities, 31*(7/8), 314-327.

Siu, K. W. M. (2013c). Flexible street furniture design for new urban needs: Leaning rail system in Hong Kong. *The International Journal of Design in Society, 6*(4), 15-34.

Siu, K. W. M. (2013d). Regulation and reception of public space in Hong Kong. In J. Hou (Ed.), *Transcultural cities: Border-crossing & placemaking* (pp. 285-298). New York: Taylor & Francis.

Siu, K. W. M. (2013e). Sustainable policy, implementation and management in street furniture design. *The International Journal of Environmental, Cultural, Economic and Social Sustainability, 8*(1), 19-32.

Siu, K. W. M., Ng, A. W. Y., & Chan, C. C. H. (2011). The imagery vividness and preferences of older people: Implications for visualisation in concept design. *The Design Journal, 14*(4), 413-426.

Siu, K. W. M., & Wong, M. M. Y. (2013). Promotion of a healthy public living environment: Participatory Design of public toilets with visually impaired persons. *Public Health, 127*(7), 629-636.

Siu, K. W. M., & Zhao, T. J. (2013). City spaces and human relations in Hong Kong's Mass Transit Railway: From circulation to everyday life. *Journal of Human Behavior in the Social Environment, 23*(5), 675-688.

Tan, C. T. (1983). *The planning, design and construction of urban public transportation.* Singapore: Maruzen Asia.

Tannenbaum, A. S. (1962). Control in organizations: Individual adjustment and organizational performance. *Administrative Science Quarterly, 7*(2), 236-257.

The History Guide (1789). *Declaration of the rights of man and the citizen***.** Retrieved from Lecture Notes Online Web site: http://www.historyguide.org/intellect/declaration.html

The Institute of Art and Ideas (2014). Fate, freedom and neuroscience [Video file]. Video posted to http://iai.tv/video/fate-freedom-and-neuroscience

Townsend, P. (1962). *The last refuge.* London: Routledge and Kegan Paul.

Transport for London (n.d.). *London underground: History*. Retrieved January 2, 2013, from http://www.tfl.gov.uk/corporate/modesoftransport/londonunderground/1604.aspx

Tse, T. S., & Zhang, E. Y. (2013). Analysis of blogs and microblogs: A case study of Chinese bloggers sharing their Hong Kong travel experiences. *Asia Pacific Journal of Tourism Research*, *18*(4), 314-329.

Ulicny, B., Kokar, M. M., & Matheus, C. J. (2010). Metrics for monitoring a social-political blogosphere: A Malaysian case study. *Internet Computing, IEEE, 14*(2), 34-44.

Ulrich, R. S., Simons, R. F., Losito, B. D., Fiorito, E., Miles, M. A., & Zelson, M. (1991). Stress recovery during exposure to natural and urban environments. *Journal of Environmental Psychology, 11*(3), 201-230.

Usability Professionals' Association (2008). *What is user-centered design?* Retrieved from http://www.usabilityprofessionals.org/usability_resources/about_usability/what_is_ucd.html

Valk, A. J. J., & Dijk, T. V. (2009). *Regional planning for open space.* London: Routledge.

Veryzer, R. W., & Borja de Mozota, B. (2005). The impact of user-oriented design on new product development: An examination of fundamental relationships. *Journal of Product Innovation Management*, *22*(2), 128-143.

Vidich, A. J., & Shapior, G. (1955). A comparison of participant observation and survey data. *American Sociological Review*, *20*(1), 28-33.

Wandersman, A. (1981). A framework of participation in community organizations. *Journal of Applied Behavioral Science, 17*, 27-58.

Wei, R., & Leung, L. (1999). Blurring public and private behaviors in public space: Policy challenges in the use and improper use of the cell phone. *Telematics and Informatics*, *16*(1), 11-26.

Weintraub, J. (1997). The theory and politics of public/private distinction. In J. Weintraub & K. Kumar (Eds.), *Public and private in thought and practice* (pp. 1-42). Chicago, IL: University of Chicago.

Weyl, H. (1983). *Symmetry.* Princeton, NJ: Princeton University Press.

Whyte, W. H. (1980). *The social life of small urban spaces.* Washington DC: The Conservation Foundation.

Williams, R. (2008). *Notes on the underground: An essay on technology, society, and the imagination.* Cambridge, MA: The MIT Press.

Wong, J. Y. M., Chan, C. C. H., & Siu, K. W. M. (2010, June 1-4). User centered design for self-service point in MTR. Paper presented at TRANSED 2010: 12th International Conference on Mobility and Transport for Elderly and Disabled Persons. Hong Kong.

Wu, K., & Berman, R. W. (n.d.). *The Hong Kong mass transit railway.* Retrieved from http://www.greendesignetc.net/Transportation_09/Transportation_Wu_Kwvin_paper.pdf

Wu, Z. Y. (2001). *Marketing.* Beijing: Economy & Management Publishing House.

Xing, N. (2013). *Design for the public: Public design in outdoor privately owned public space (POPS) in Hong Kong Shopping Centers.* (Doctoral dissertation, The Hong Kong Polytechnic University, 2013). Retrieved from http://repository.lib.polyu.edu.hk/jspui/handle/10397/6217

Xing, N., & Siu, K. W. M. (2010). Historic definitions of public space: Inspiration for high quality public space. *The International Journal of the Humanities*, *7*(11), 39-56.

Yang, Z. B. (2005). *Public art in MRT.* Taipei: Diancang Culture.

Yeung, Y. S. W. (2004). *From metro to metropolis: Production and reproduction of urban spaces in Hong Kong by the MTR* (Master Dissertation, The University of Hong Kong, 2004). Retrieved from http://hub.hku.hk/handle/10722/31080

Yigitcanlar, T. (Ed.) (2010). *Rethinking sustainable development: Urban management, engineering, and design.* New York: Engineering Science Reference.

Yin, R. K. (1994). *Case study research: Design and methods* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Yu, S., & Kak, S. (2012). *A survey of prediction using social media.* Retrieved from http://arxiv.org/ftp/arxiv/papers/1203/1203.1647.pdf

Zhao, T. J., & Siu, K. W. M. (2014a). The boundaries of public space: A case study of Hong Kong′s Mass Transit Railway. *The International Journal of Design, 8*(2), 43-60.

Zhao, T. J., & Siu, K. W. M. (2014b). The needs for quality urban rail transit life in Asian metropolitan cities. *Applied Research in Quality of Life.* (on-line)

Zhao, T. J., & Siu, K. W. M. (2014c). Freedom and control: A state of balance in public space. *Facilities, 32*(11/12), 606-623.