# Enhancing social outcomes from mega urban transport development

Lee, Ju Hyun

*DOI:*
[10.33612/diss.136047572](10.33612/diss.136047572)

**IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.**

*Document Version*
Publisher's PDF, also known as Version of record

*Publication date:*
2020

[Link to publication in University of Groningen/UMCG research database](Link to publication in University of Groningen/UMCG research database)

# CHAPTER 1.

## INTRODUCTION: SOCIAL OUTCOMES FROM MEGA URBAN TRANSPORT DEVELOPMENT PROCESSES

## 1.1 Social outcomes and mega urban infrastructure planning

Worldwide, megacities make huge investments in urban infrastructure to deal with growing pains that arise from the rate and quality of their development (Cervero 2001; UN-HABITAT 2016). Problems that those cities face include urban sprawl, traffic congestion, environmental degradation, and unbalanced spatial development. The role of infrastructure development in promoting sustainable urban growth and enhancing quality of life is increasingly emphasized in the international urban agenda (Chapin 2012; UN-HABITAT 2017). In particular, mega urban transport infrastructure projects (MUTPs) are often seen as a catalyst in the process of urban and regional (re)development, providing connectivity for the development of society and the economy (ADB 2006; Dimitriou et al. 2015). Consequently, megacities such as London and Seoul have established extensive urban transport networks such as metro networks in response to continually expanding metropolitan areas and economic.

In practice, however, MUTPs seem to fail in their critical role in urban and regional (re)development (Dimitriou et al. 2015). Mega urban transport infrastructure planning often lacks consideration of the broader long-term consequences on society and fails to meet the many varied interests in project outcomes (Jones and Lucas 2012; Martens 2012). The currently dominant approach of top-down governmental master planning does not involve rigorous assessment of the socio-economic consequences of MUTPs, and cost benefit analysis (CBA) identified limited-range impacts from projects (Lee 2018; Vanclay 2017). The general model for infrastructure delivery incentivises stakeholders to maximise their own (sectoral) interests instead of communicating and cooperating across sectors and levels to deliver greater, common benefits (Legacy et al. 2012). With political and economic interests typically being dominant in the decision-making process, long-term social outcomes (e.g. enhanced accessibility to opportunities and fair distribution of benefits among urban population), especially at a local scale, are not well addressed, nor are they measured or assessed in the planning and delivery of urban infrastructure (Brenner et al. 2011; Miller and Patassini 2005). Localised effects of projects are not as clear as widespread impacts in many cases, and opportunities of local development are not fully realized (Rydin 2010). In addition, a few authors (Brenner 2000; Beyazit 2010) argued that there is a mismatch between people who enjoy the benefits and receive negative impacts.

There have been attempts to go beyond these limitations by assessing the wider range and long-term impacts of urban policies, programmes and projects (e.g.

Social Impact Assessment, Multi Criteria Analysis; see Vanclay 2002; Dimitriou et al. 2015). However, in practice, such alternative ways of evaluation seem to be insufficiently translated into the decision-making process. The broader implications of spatial changes associated to urban infrastructure projects are seldom evaluated or discussed. Research into the actual costs and benefits of long-term impacts is limited, especially in terms of micro scale (local) impacts — e.g. consequences on quality of daily life of urban population (Lee 2018).

Recently, policy discussion and theoretical debates addressed the critical needs to improve planning processes of transport development in order to ensure desired outcomes from mega urban infrastructure development (Banister 2008; Bertolini 2012). An integrated approach to transport and spatial development is considered to be essential to achieve sustainable urban development (Cervero 2001; Straatemeier and Bertolini 2008). Although many discussions addressed the rational and urgency of utilizing an integrated approach in order to realize the desired outcomes, in practice, the approach is often not fully operated or the effects are not always clear, especially in terms of societal consequences (Bramley and Power 2009; Curtis and James 2004; Jenks 2019). There is little research on "if" and "how" an integrated approach to transport and spatial development planning can contribute to the broader social outcomes from MUTPs including overall and fair distribution of accessibility to opportunities and quality of life across a city (Lee 2018).

Overall, it is not clear whether investment in mega urban infrastructure projects brings broader positive societal consequences over time that meet the varied interests, despite the long-standing discussion on their critical roles in promoting sustainable urban growth and enhancing quality of life. To this end, there is necessity of exploring how to realize the delivery of the desired social outcomes, rather than simply addressing an integrated planning process. A gap between knowledge and practice of mega urban transport development — i.e. how the social outcomes from MUTPs are facilitated over time and how an integrated approach can contribute to enhancing the social outcomes — needs to be addressed.

## 1.2 Theoretical background

This section discusses theoretical backgrounds related to social outcomes from mega infrastructure development and to integrated planning approaches, building up a conceptual framework to conduct the study. This includes literature

on deficiencies in current mega urban infrastructure development processes, multi-scale spatial changes induced by MUTPs and social outcomes, and integrated approaches to transport and spatial planning.

## Deficiencies in current infrastructure development decision-making processes

Mega urban infrastructure development has been promoted as an agent of change for sustainable growth and wellbeing of urban population. Megacities invest in mega urban transport infrastructure such as urban rail infrastructure to improve economic efficiency and productivity, reduce traffic congestion, and enhance accessibility to opportunities. However, many scholars (e.g. Fainstein 2008; Graham and Marvin 2001; Martens 2012; Stopher and Stanley 2009) argued that mega urban infrastructure development do not always lead to sustainable urban growth and fair distribution of benefits among urban population, due to the spatial and intrinsically political nature of decision-making processes. Infrastructure integrates cities as shared spaces of common life, but also splinters urban territories into zones of differential access and exclusion (Graham and Marvin 2001). Levinson (2002) argued that any new transportation project or policy creates both winners and losers from the standpoints of mobility, accessibility, and environmental and economic concerns.

The outcomes from mega urban infrastructure development are closely related to planning and decision-making processes — i.e. complex processes of interactions among various actors at different levels, who often have different goals and ways of achieving their goals (Hall 1980). Megaproject development rarely satisfies everyone, often reflecting mainly the interests of (limited) key stakeholders and macro-scale economic development goals (Dimitriou et al. 2015; Lee 2018). The broader long-term goals such as enhancing public (social) interests and fair distribution of benefits are often not prioritized during decision-making processes, despite arguments suggesting that urban space and infrastructure need to be managed in a way that represents society in its entirety (Fisher 2009; Hoekveld and Needham 2013).

Discussion of the limitations of mega urban transport development — e.g. impacts of imperfect market mechanisms, the political nature of decision-making, narrow scopes and fragmented planning across sectors and levels — is lacking in the content of current evaluation tools, which mainly rely on the ratio of general costs and benefits (Naess 2015; Stopher and Stanley 2009). Infrastructure appraisal still tends to focus on monetizing a limited range of effects of projects, applying top-down, economically focused approaches to ex-ante evaluation, and

neglecting broader consequences on society. Lee (2018) argued that to enhance the ultimate benefits for society from mega urban infrastructure projects, there needs to be investigation on the *socio-spatial implications of such projects at multiple scales over time*, rather than simplistic distributional analysis. For measuring impacts at local scale, adequate indicators and pragmatic approaches to data collection methods are needed to observe the real impact on local neighbourhoods (Rydin 2010).

## Multi-scale spatial changes induced by MUTPs and social outcomes

Literature suggests that infrastructure development has a strong influence on urban spatial structure and form at multiple scales, and that spatial changes induced by such development over time need to be considered in order to understand broader social outcomes from MUTPs (Graham and Marvin 2001; Lee 2018; Rodrigue 2017; UN-Habitat 2016). The relation between transport development and urban form has been much discussed (Bertolini 2012; Geurs and van Wee 2004; Wegener and Fürst 1999); however, limited research has been conducted on how the long-term spatial changes influence the societal consequence of MUTPs at multiple scales (Martens 2012; Jones and Lucas 2012). Urban transport infrastructure development facilitates spatial changes at multiple scales (i.e. change in spatial structure of a city, and land use and physical environment in a local neighbourhood) as it continually interacts with urban (re)development processes at city and neighbourhood scales (Geurs and van Wee 2004; Hall and Pain 2006; UN-HABITAT 2009; Wegener and Fürst 1999). Such spatial changes and enhanced transport networks together gradually influence the socio-economic wellbeing of society at macro and micro scales (e.g. Bramley and Power 2009; Cervero 2009; Hall 2008). Macro-scale spatial transformation (e.g. polycentric spatial structure) and enhanced connectivity across a city contribute to the productivity of economic production (ADB 2006; Hall and Pain 2006). Local-scale changes arising from infrastructure development influence the way people live, work, and play, which affects the overall quality of everyday life of local communities (Jones and Lucas 2012; Vanclay 2002). The long-term changes often facilitate differentiated distribution of benefits among social groups and over varied local areas, gradually affecting the social equity of cities (Adli et al. 2019; Vecchio et al. 2020).

Overall, based on theoretical discussion above, Figure 1.1 illustrates that social outcomes from mega urban transport projects (MUTPs) need to be understood by considering consequences that occur at multiple scales over time as a result
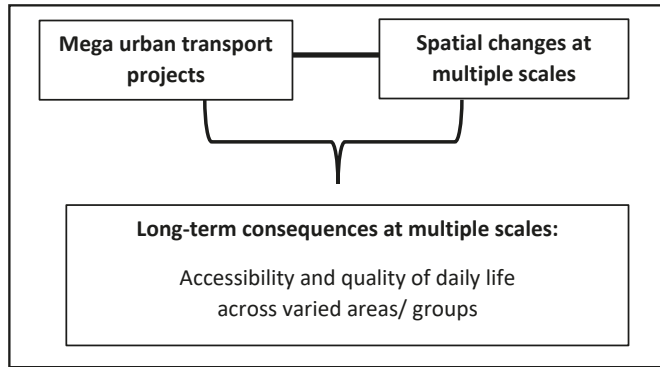
**Mega urban transport projects**

**Spatial changes at multiple scales**

**Long-term consequences at multiple scales:**

Accessibility and quality of daily life
across varied areas/ groups

*Figure 1.1: Understanding social outcomes from MUTPs*

of spatial transformation enacted by projects and the implementation of projects themselves. The long-term societal consequences include accessibility to opportunities and quality of life, and distribution of the benefits across a city and among social groups. Lack of attention to the positive and negative consequences of the spatial changes may lead to a failure to address the outcomes that meet varied interests of urban population (Healey 2009; Hoekveld and Needham 2013; Lee 2018; Martens 2012).

## An integrated approach to transport and spatial planning

Integration of transport development with spatial sectors has been advocated as a key to enhance desired broader goals of mega urban transport development (Stopher and Stanley 2009; Straatemeier and Bertolini 2008). Literature (Banister 2008; Heeres et al. 2017; Legacy et al. 2012) suggests that an integrated approach to transport planning and spatial planning is essential to enhance positive benefits from projects such as environmental quality and socio-economic wellbeing of urban populations.

Despite much discussion on an integrated approach, transport planning and spatial planning still occur in separate silos, each with its own objectives and priorities, failing to achieve the desired outcomes from MUTPs (Curtis and James 2004; Lee 2018; Switzer et al. 2013). Some local populations have experienced limited accessibility to opportunities and little positive changes to everyday life (Straatemeier and Bertolini 2008). A few authors have argued that to realize the delivery of the desired outcomes, there needs to be integration of not only policy (plans) but also planning processes through strategic to operational stage (Heeres 2017; van Geet 2018). Simply setting up an integrated vision or arranging integration in organisational structures would not lead
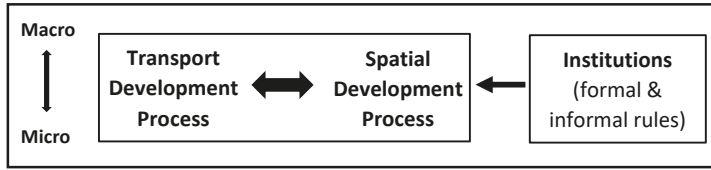
*Figure 1.2: Understanding planning processes of MUTPs*

to desired outcomes (Legacy et al. 2012). Moreover, to ensure positive social outcomes from (urban) policy and projects, an integrated approach needs to be considered at different scales: at macro scale, establishing transport networks that address various patterns of land use across cities (Martens 2012; Wegener 2004); and at micro scale, assessing the consequences of spatial changes on local environments (Heeres 2017).

Many authors (Healey 2003; Ostrom 2011) have argued that to understand how (desired) outcomes from policy and projects are produced, there needs to be a close investigation of actors, institutions, and their interaction at multiple levels. In the real world, policy formulation and implementation are negotiated among various actors at multiple levels, in which, various rules are taken up and used through a planning process (Hooghe and Marks 2003; McGinnis 2011; Veeneman 2018). Institutions (i.e. formal and informal rules) shape planning processes by defining what actions and outcomes are required and prohibited by whom, and what information is exchanged among actors across the tiers (Ostrom 2005). Understanding outcomes from project (policy) requires in-depth investigation on how actors with different interests select actions, interact, or dominate, and solve problems across levels within an institutional setting (Alexander 2005; Healey 2003; Ostrom 2005).

To identify how desired outcomes from MUTPs can be facilitated by an in-tegrated approach to transport and spatial development, there needs to be examination on how institutions influence interplay between transport and spatial development processes at macro and micro levels, potentially affecting the outcomes (Figure 1.2).

## Conceptual framework: an integrated planning approach towards social outcomes from MUTPs

Bringing together the various strands in literature discussed in this section, Figure 1.3 provides a conceptual framework of this study. It illustrates that social outcomes from MUTPs are closely related to spatial changes induced by transport development at multiple scales, and that understanding the social
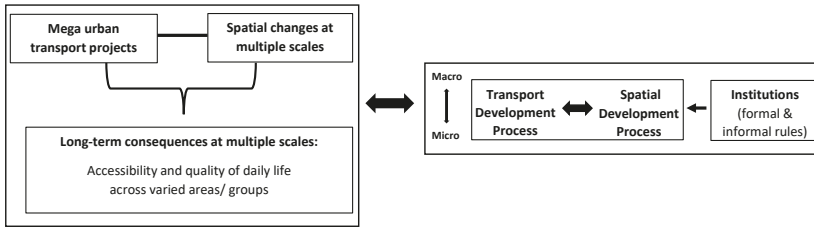
20

*Figure 1.3: A conceptual framework for social outcomes and integrated planning processes at multiple levels*

outcomes requires a careful analysis of the interplay between transport and spatial development at multiple levels in specific institutional contexts. Accordingly, questions that drive this research are: how do the social outcomes play out given the spatial changes at multiple scales induced by MUTPs over time? and how can social outcomes be enhanced by an integrated approach to transport and spatial planning?

## 1.3 Aim and Focus

Policy makers and researchers increasingly acknowledge the critical needs for addressing social outcomes from MUTPs and for applying an integrated approach to transport and spatial development in order to realize desired broader outcomes (Graham and Marvin 2001; Martens 2012; Stopher and Stanley, 2009; UN-HABITAT 2013). Such recognition stemmed from persisting limitations in current planning practices and the delivery of broader social outcomes from mega urban transport development. Infrastructure decision-making (still) rarely considers long-term broader social outcomes, and transport planning and spatial planning still occur in separate silos, and outcomes from MUTPs do not always meet all the varied interests of stakeholders. Although many studies focus on societal consequences of transport development, the broader outcomes that occur at multiple scales as a result of the implementation of projects and multi-scale spatial transformation induced by MUTPs are under-researched (Lee 2018). Moreover, even though an integrated approach to transport and spatial development has been much discussed in literature, research has focused on either institutional arrangements for an integrated approach or desired integrated outcomes, rather than on how to actually realize the delivery of the desired outcomes (Hull 2008; Legacy et al. 2012).

Research on if and how an integrated approach to transport and spatial planning contributes to facilitating social outcomes from MUTPs seems to be rather limited.

Accordingly, this study aims to address gaps in current planning practice and research regarding the delivery of broader social outcomes from MUTPs and integrated approaches to enhancing such outcomes. The overarching objectives of this research are: to examine social outcomes from mega urban transport development by considering the spatial changes induced by such development at multiple scales over time; and to explore an integrated approach to transport and spatial planning to achieve desired social outcomes.

These objectives can be translated into a main research question that this PhD seeks to address:

*How are social outcomes from mega urban transport development related to the spatial changes induced by such development at multiple scales over time and how can the social outcomes be enhanced by an integrated approach to transport and spatial planning?*

This main research question is divided into a set of sub-questions that structure the overall study (visualised in Figure 1.4). Research sub-questions 1 and 2 focus on the social outcomes from MUTPs and associated spatial changes at multiple scales, and research sub-questions 3 and 4 concern integrated planning processes at multiple levels to enhance social outcomes. Each sub-question is explained below.

*Research sub-question 1: What socio-spatial changes do mega urban infrastructure development processes create or facilitate over time at urban regional and local neighbourhood scale?*

The first sub-question focuses on the socio-spatial implications of mega urban infrastructure development processes by considering the limitation of mega urban transport infrastructure planning in practice. It is to examine long-term spatial changes facilitated by a MUTP at multiple scales from the perspective of public (social) benefits, local sustainability, and spatial equity. To answer this sub-question, this study establishes a multi-criteria analysis ex-post evaluation framework as a pragmatic and integrated tool to assess the socio-spatial changes that occur over time.

*Research sub-question 2: What are the broader negative and positive social consequences that stem from spatial changes enacted at multiple scales by mega urban transport development? To what extent do such consequences reflect varied interests in the outcomes of the projects?*

The second research sub-question explores social outcomes by considering broader and non-monetised benefits and costs related to the spatial changes induced by MUTPs at multiple scales. It concerns positive and negative social consequences that occur as a result of the implementation of such projects and the subsequent spatial transformation at multiple scales — e.g. change in spatial structure, land use, and local environment. The sub-question also concerns the extent to which project outcomes meet the respective interests from varying perspectives — e.g. sector: transport and spatial development; and level: national, metropolitan and local neighbourhood levels.

*Research sub-question 3: How are the varied interests in MUTPs addressed during project planning and implementation at macro and micro levels? How do institutional factors influence the planning processes of MUTPs, affecting social outcomes from mega urban transport development?*

The third sub-question zooms in on how varied interests relating to MUTPs — i.e. interests (goals) related to transport and spatial development at metropolitan and local neighbourhood levels — are addressed and realized through various stages of MUTP development. The sub-question explores the interplay between transport and spatial planning processes at the macro and micro levels through strategic and operational stages, and investigate institutional contexts that influence the processes and potentially affect social outcomes from MUTPs. To answer this sub-question, this study adopts the Institutional Analysis and Development framework of Ostrom (2005), which offers a theoretical setting to examine how actors select actions, interact, and realize outcomes in the institutional and broader socio-economic contexts.

*Research sub-question 4: What is necessary for an integrated approach to MUTPs to contribute to overall distribution of accessibility to opportunities and the quality of life across a city?*

The fourth sub-question focuses on critical elements and processes to achieve positive societal outcomes by an integrated approach to MUTPs. It explores key
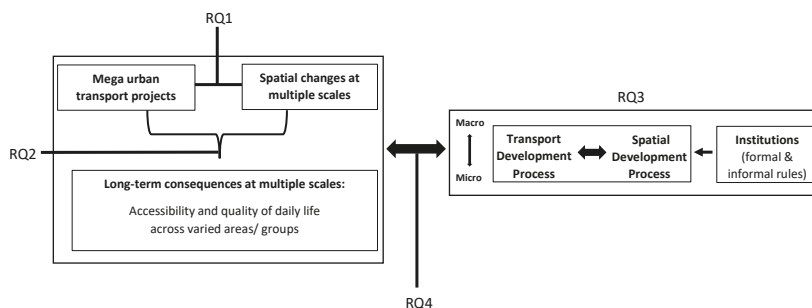
*Figure 1.4: Relations between research sub-questions (RQ)*

issues of current land use and transport integration (LUTI) policies and practices and identifies necessary conditions for an integrated approach to delivering desired social outcomes. To answer this sub-question, this study investigates the views of key stakeholders such as local communities, local governments, and metropolitan governments regarding outcomes of LUTI policies and practices, and barriers and opportunities to enhance social outcomes by an integrated approach. It particularly concerns megacities which established an extensive urban transport network via MUTPs and already applied land use and transport integration (LUTI) with an aim to achieve sustainable urbanization.

These research sub-questions together address issues related to the *delivery of social outcomes from mega urban transport development processes* (RQ1 and RQ2) and *an integrated approach to realizing the desired social outcomes* (RQ3 and RQ4) (see Figure 1.4).

Ultimately, this study aspires to contribute to both societal and scientific debates. Societally, the study aims to strengthen understanding on how to enhance broad societal goals of mega urban infrastructure in practice. It establishes broader perspectives to identify solutions to maximizing positive benefits to society by investigating interactions between transport systems and spatial transformation at multiple scales. This is of great importance for policymakers and planners who must deal with the limited benefits or unexpected negative impacts from mega urban infrastructure development processes (Dimitriou et al. 2015; Lee 2018). This study contributes by a series of recommendations about critical elements and processes to enhance social outcomes by an integrated approach to transport and spatial development. In particular, it provides lessons for megacities, which intend to make strategic investment in mega urban transport infrastructure development in the near future to achieve sustainable urban development. Furthermore, this research addresses the ethical perspectives of mega urban projects planning (Hooghe and Marks 2003; Upton 2002;

van Wee 2012) by considering the extent to which varied interests are met by urban development planning processes. By revealing linkages between social outcomes and spatial and political nature of urban decision-making processes, it aspires to encourage policy makers and planners to reflect on their roles and responsibilities and to consider improving planning policies and practices.

The scientific significance of this study can be seen, firstly, in the application of multi-methods to understand social outcomes from mega urban transport development processes. Rather than applying top-down static approach to project evaluation as often noted in practice (Miller and Patassini 2005), the study tests integrative and pragmatic approaches to assessing broader social outcomes from mega urban projects and policies. By applying flexible, multi-scalar, context-specific approaches to impact evaluation (Rydin 2010), this study contributes to identifying broader benefits and costs generated over time due to mega urban transport development processes. Secondly, this study adapts an institutional analysis — i.e. the Institutional Analysis and Development Framework (Ostrom 2005) — to understand complex planning processes of MUTPs that influence social outcomes to be achieved. By focusing the interactions between actors and institutions within a collective action arrangement (Healey 2003; McGinnis 2011; Ostrom 2011), this study contributes to explaining ongoing difficulties in transport and spatial development planning integration and adds to current debates on how to achieve sustainable and equitable outcomes by an integrated approach (Banister 2008; Legacy et al 2012; Stopher and Stanley 2009). Third, this study contributes to enhancing the understanding of the varied contextual factors that influence planning processes and outcomes of urban projects and policies — e.g. broad socio-economic conditions that structure planning processes (Healey 2003; Ostrom 2005). Reflecting carefully on broader socio-economic contexts such as stage of urban development and local contexts such as actors" capacities to plan and implement integrated policies, it provides insights on context-specific approaches that go beyond "panaceas problem" (Ostrom et al. 2007) to enhancing social outcomes from mega urban project development.

## 1.4 Research approach and methodology

This research is positioned at the intersection of theory and practice. Planning issues are highly context specific and every issue is different due to the specificity of its context (Flyvbjerg 2011). Therefore, empirical investigation needs to

examine a contemporary phenomenon in its real-life context, rather than focus on traditional statistical summary (Healey 2003; Yin 2014). Moreover, (urban) planning research requires a flexible approach that can tolerate the complex and unruly elements of urban transformation (Campbell 2003). Due to such reasons, various authors (Barnett and Bridge 2017; Campbell 2003; Flyvbjerg 2011) argued for case studies as a strategic choice to understand multiplex, often contradictory urban situations and to explore if and how new (planning) approaches work in given contextual circumstances.

This research uses a case study method to examine socio-spatial consequences and planning processes of urban (infrastructure) development by considering the varied contextual circumstances (Healey 2003; Switzer et al. 2013). It applies an exploratory approach to investigating "how" social outcomes from mega urban transport development can be enhanced by integrated planning processes: it examines in-depth the societal consequences of such development and the interplay between transport and spatial planning in the specific contexts of chosen cases.

The research consists of two phases: the first phase that examined the social outcomes from mega urban transport development processes by considering the long-term consequences of spatial changes associated with the development and varied interests in project outcomes; and the second phase that investigated the planning processes of MUTPs involving the interplay between transport and spatial sectors at multiple levels, and explored critical factors to enhance social outcomes by an integrated approach to transport and spatial planning.

## Case selection

Effective case studies benefit from careful selection of cases (Campbell 2003). Two exemplars of mega urban transport infrastructure projects in metropolis were selected for this research: the Jubilee Line Extension (JLE) in London, and the Second Phase Subway Development (2PSD) in Seoul. There are several reasons to choose these cases. London and Seoul are examples of large metropolitan cities that have around 10 million population and have established extensive mega urban transport networks (i.e. metro) in response to needs for sustaining economic growth and improving accessibility to opportunities (OMEGA Centre 2011; SMG 2015). In these cities, huge investment was continually made to expand metro networks, and metro became one of main transport modes for urban population (SMG 2015; TFL 2013). JLE and 2PSD were particularly selected from each city, as they started operation about 20 years ago, meanwhile having caused spatial transformation and societal consequences (Choi et al.

2012; Hall and Hickman 2008; Kim and Suh 2016; OMEGA Centre 2011). In addition, two cases differ on aspects such as stage of urbanisation (i.e. extent to which urbanisation happens). London faced a challenge to reduce development pressure in the city centre and regenerate urban spaces after experiencing much urban transformation through the 20th century (Hamnett 2004). Seoul recently experienced rapid urban growth and faced a challenge to manage fast spatial changes occurring across the metropolitan area (Sung and Oh 2011).

To understand the social outcomes from mega urban transport development processes (Phase 1), each case in London and Seoul was studied with consideration of specific contextual circumstances of each case that influence the spatial changes and thus social outcomes. Investigation of each case focused on how the social outcomes from MUTPs typically played out given the spatial changes induced by the mega urban transport project at multiple scales and varied interests in outcomes of the projects. To explore the planning processes of MUTPs, and critical elements and processes to achieve the social outcomes by an integrated approach (Phase 2), the case in Seoul was further studied as an example of metropolis that recently attempted an integrated approach as a key to achieve sustainable urban development (SMG 1997; SMG 2003; Sung and Oh 2011). The in-depth analysis of the planning processes and social outcomes in Seoul is particularly relevant to megacities which consider MUTP development and an integrated approach to transport and spatial development as a response to rapid urban transformation. To this end, using both cases are instrumental in answering the main research question of this study.

### Data collection and analysis

To examine the social outcomes and explore the planning processes relate to MUTPs, this study used a multiple method approach, which is central to enhance the empirical validity and credibility of case study research (Yin 2014). Using multiple sources and data collection techniques, the study investigated the defined research problems (Figure 1.4) through triangulation of different but complementary kinds of evidence (Rahim and Daud 2015). It involved analysis of primary source documents (e.g. key project documents and planning policies) and secondary sources (e.g. journal articles), official statistical data (e.g. census data and spatial data), in-depth interviews with experts and key stakeholders, focus group discussions, and onsite observation. Detailed information concerning the collection and analysis of data is provided in Chapters 2 to 5.

First, document analysis was conducted. For the Phase 1, data (documents and official statistical data) about interests and outcomes were collected and

*Table 1.1: Criteria and indicative measures used to examine outcomes from infrastructure development*

| Scale | Urban spatial changes | | Long-term consequences | |
|---|---|---|---|---|
| | Construct | Example proxy measures | Construct | Example proxy measures |
| **Macro** | Change in spatial structure of cities | - number, size, and type of transport/ regeneration projects implemented, and employment density in (newly created) centres (e.g. within 500m from stations) | Accessibility and quality of life (macro level) | - number and % of population commuting over 60 minutes<br>- number and % of population with access to subway within 500m |
| **Micro** | Change in land use and physical environment | - pattern and density of land development along corridors (e.g. within 500m of station)<br>- condition of newly created and existing public infrastructure around nodes<br>- quality and quantity of pedestrian access around transport nodes<br>- functionality of road layout | Accessibility and quality of life (micro level) | - local safety; range of local amenities<br>- accessibility to jobs and services, and public transport (e.g. no. of jobs within 30 min journey time; journey time of locals)<br>- differential outcomes among local neighbourhoods (e.g. % of population commuting less than 60 mins by local district; % of area without subway within 500m by local district) |

analysed at multiple levels and across the different areas (local neighbourhoods) in each city (i.e. London and Seoul). Quantitative and qualitative measures were considered to investigate the multi-scale spatial changes and long-term consequences in line with the conceptual framework — see Figure 1.3. As not all the relevant concepts are readily measurable, some proxy measures were used (see Table 1.1). Documents that were analysed for the Phase 1 include official project documents, impact assessment reports, White Papers, transport plans and spatial plans and policies at different scales, results of local surveys, historic maps, and empirical studies on the spatial changes and long-term consequences of each project. Official statistical data were examined, including journey-to-work time, public transport accessibility data, income data and the deprivation index across cities. Various time periods and scales of data were used to identify the changes taking place in London and Seoul over time and space. For the Phase 2, documents concerning transport and spatial planning

28

processes related to the case project in Seoul and land use transport integration policies (e.g. policies regarding station area development) were analysed. In addition, laws and regulations on urban rail development, land-use, and station area development at different periods (1980s to 2000s) were examined. Documentation of changes in spatial policies and transport policies were also studied.

Second, in-depth semi-structured interviews with key informants and residents were conducted to understand social outcomes and planning processes of each case. 39 interviews were conducted with people working for government or policy institutes or public corporations on matters concerning transport, territorial (spatial) planning, project development from various levels — the national, metropolitan, and local neighbourhood levels. Interviewees were selected according to their roles in the planning processes (i.e. key decision-makers, technical planners, and experts). Interviewees were identified through snowballing. Collection of interview data ceased when recurring viewpoints occurred with additional interviews and saturation was achieved (Hennink et al. 2010). Appendices A and B include the list of interviewees and interview formats. In addition, 29 semi-structured interviews were conducted with residents in Canning Town in London to investigate spatially differentiated outcomes and interests at a local neighbourhood level. The interviews were done in a manner consistent with ethical social research (Vanclay et al. 2013). All interviews were audio-recorded, and subsequently transcribed and summarised.

Third, focus group discussions were conducted to gain a deeper and nuanced understanding of critical elements and processes to enhance social outcomes from mega urban transport development by an integrated approach (Hennink et al. 2010). Barriers and opportunities to delivering the social outcomes by land use and transport integration policies and practices in Seoul were explored by considering views of key stakeholders such as local communities, local government, and metropolitan governments (see Table 1.2). Three locations were selected for focus group discussions by considering the varied levels of centrality, commercial land-use, amount of foot traffic, and other socio-economic characteristics — i.e. the Centre (CBD) and sub-centres; Quarter centres; and District centre. Random selection was chosen as it is central to probability methodologies to ensure that bias does not occur (Salkind 2010). Eight focus groups discussions with local resident groups (of the selected locations), three focus groups with local authorities (of the selected locations), and one focus group with planning officers working for the metropolitan government were conducted.

The analysis of qualitative data from interviews and focus group discussions was executed using Atlas.ti 8. The interviews and discussions were transcribed

*Table 1.2: The structure of focus group discussions*

| | Local residents | Local planners | Metropolitan planners |
|---|---|---|---|
| **What** | What are local people's experiences of the consequences of LUTI and MUTPs on their daily life? | Validating focus group results; societal consequences of spatial transformation at local level (what happened, what aims were met?). | Validating focus group results; societal consequences of spatial transformation at metropolitan and local level? |
| | Why some interests were achieved and others not? | Reasons behind that some interests were achieved and others not? | Reasons behind that some interests were achieved and others not? |
| **How** | How to enhance social outcomes through local spatial planning policy & processes? | How to enhance social outcomes through: (i) local spatial planning policy & process; and (ii) multi-level planning process & MUTP planning in general? | How to enhance social outcomes through: (i) spatial planning policy and process; and (ii) multi-level planning process & MUTP planning in general? |

and analysed using a mixture of theoretical and inductive coding through an iterative process (Hennink et al. 2010) (see Appendix C). Codes were assigned to interview quotes based on their latent content to capture the underlying meaning of the data (Babbie 2010). Subsequently, connection between the different categories were established, often resulting overarching themes. The data analysis is further specified in Chapters 2–5.

Fourth, spatial data was gathered and analysed to supplement the focus group discussion results, especially regarding accessibility to opportunities. To understand macro-scale accessibility (of the metropolitan area), the number of nodes people can reach by the metro lines within a given time (30–45 minute and 45–60 minute) was identified (Palmateer et al. 2016). To understand micro-scale accessibility (of the specific locations), the number of public facilities and shops located within 5 minute and 10-minute walking distance from the nodes were identified.

Fifth, site observation was undertaken in London and Seoul during weekday and weekend, which involved walking around in the vicinity of the selected nodes. The observation of the surrounding environment and quality of pedestrian paths were conducted to validate results from interviews and document analysis. Photos were taken, and notes were made in a research diary.

**Ethical considerations**

Ethical issues were considered carefully in this study given that the qualitative research methods (i.e. in-depth interviews and focus group discussions) were applied to get to know perceptions, beliefs and feeling of people (Hennink et al. 2010). The ethical principles (Vanclay et al. 2013) were applied throughout the research process: seeking permission and informed consent (see Appendix F), voluntary participation, minimization of harm, and anonymity and confidentiality. First, all participants were provided with sufficient information about the research in a format that is comprehensible to them and made a voluntary decision to participate in a research. Second, participants were asked for permission to audio-record either the interviews or focus groups discussions. Summaries of the interviews were sent to the interviewees when requested. Third, to minimise harm and do justice to the participants, their names or positions were anonymised and only job descriptions and expertise were shown. Participants were informed that the research information would be collected, analysed and reported anonymously so that participants could not be identified in any of the research data. Fourth, recordings are kept in a secure location, where only researcher had access. The procedure to manage and store data were explained to participants before conducting interviews and focus group discussions. Additionally, focus group discussions were held in a closed setting so that discussions could not be heard, and confidentiality were established.

## 1.5 Outline of the study

In line with the structure of the research questions depicted in Figure 1.4, this study consists of six chapters (Table 1.3).

The first part (Chapters 2 and 3) investigates social outcomes from mega urban transport infrastructure development processes. Chapter 2 deals with socio-spatial implication of mega urban infrastructure decision-making processes. It focuses on spatial changes facilitated by mega urban infrastructure development processes over time at urban regional and local neighbourhood scale. Chapter 3 identifies social outcomes from MUTPs, by considering the long-term consequences of the spatial changes induced by MUTPs at multiple scales and varied interests in project outcomes (interests related to transport and spatial development at the macro and micro levels). The second part (Chapters 4 and 5) focuses on integrated planning processes to enhance the social outcomes. Chapter 4 focuses on the interplay of transport and spatial planning

*Table 1.3: Overview of the chapters of this study*

| | |
|---|---|
| **Problem statement**<br>**Main objectives** | **Chapter 1**<br>Introduction |
| **Diagnosis of social**<br>**outcomes from mega**<br>**urban transport**<br>**development** | **Chapter 2**<br>Socio-spatial implication of urban decision-making |
| | **Chapter 3**<br>Long-term societal consequences of spatial changes induced by<br>mega urban transport development at multiple scales |
| **Investigating barriers**<br>**and opportunities**<br>**to enhancing social**<br>**outcomes by an**<br>**integrated approach** | **Chapter 4**<br>Planning processes of MUTPs influencing social outcomes: interplay<br>between transport and spatial sectors in institutional contexts |
| | **Chapter 5**<br>Critical elements and processes for an integrated approach<br>to enhancing social outcomes from MUTPs |
| **Conclusion**<br>**Recommendation** | **Chapter 6**<br>Conclusion: Enhancing social comes from mega urban infrastruc-<br>ture development |

processes at the macro and micro levels in institutional contexts, and how the planning processes influence the social outcomes to be achieved. Chapter 5 explores critical elements and processes to enhance the social outcomes from MUTPs by an integrated approach to transport and spatial planning. It concerns stakeholders" views on what is necessary for an integrated approach to planning policies and practice to achieve social outcomes. Finally, Chapter 6 draws overall conclusions based on the performed study. It reflects on the research findings and provides recommendations for further research and lessons for practice.