# Road Signs: Geosemiotics and Human Mobility

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# ROAD SIGNS

GEOSEMIOTICS AND HUMAN MOBILITY

**BY**
**SALMIAH ABDUL HAMID**

DISSERTATION SUBMITTED 2015

AALBORG UNIVERSITY
DENMARK

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# CV

Salmiah Abdul Hamid (salmiah@gmail.com) is a Ph.D. Candidate in the Department of Architecture, Design and Media Technology, Aalborg University, Denmark. Her research interests include urban mobility, information graphics, road signs system and visual communication. She is currently completing her PhD dissertation on the intersections between geosemiotics and mobility practices towards the study of road signs. She is also a lecturer in the Department of Design Technology, Universiti Malaysia Sarawak and teaches graphic design courses. In the future, her aims are to integrate the mobility research into the graphic design field and improve the Malaysian city design planning and development.

# ENGLISH SUMMARY

How do people make sense of traffic signs in urban settings, and how can this knowledge be utilized to inform the creation of better design policies and manuals? These questions relate to the theoretical and empirical evidence of road signs as traffic guides as well as to how a person moves around in an environment. Different types of road signs exist in this world. Most road signs are uniform signs that are standard for worldwide application, based on the Vienna Convention (United Nations Economic Commission for Europe, 1968). Many research studies in the urban environment and traffic engineering fields focus on human behaviour and traffic sign system recognition. In order to provide an overview of the state-of-the-art developments, this thesis presents a theoretical lens that is used to anchor the subjects of the studies in 'built environment', 'people' and 'road signs' through the theories of mobility and geosemiotics.

The fields of mobility and geosemiotics are important aspects of this research. They provide another theoretical challenge in the form of merging these two disciplines in the analysis in order to enhance a dialogue between the fields of urban design and visual communication practices. Thus, the interrelation between the two theories will help to answer the question of whether road signs have significant impact on human behaviour when moving in urban settings. In order to understand the importance of visual understanding among people, focus group interviews, design manual intervention field observations and were conducted during the research process. The methods were conducted within controlled settings as well as urban settings that emphasised the interaction between the participants and the visual representations of road signs. The key contribution of the findings in this research project is the methodological triangulations of qualitative data used in the focus group interviews, the visual documentation of design manual, and field observations which were inspired by mobility and geosemiotics theories. This thesis aims to be used as a guideline for the urban planning of Malaysian road traffic sign system in the future.

# DANSK RESUME

Når du kører bil, bruger du så færdselstavler som vejviser? Eller når du går rundt i ukendte urbane omgivelser, hvordan navigerer du så for at komme fra et sted til et andet i de omgivelser? Disse spørgsmål relaterer sig til teoretisk og empirisk evidens omkring færdselstavler som vejvisere i trafikken, samt omkring hvordan en person bevæger sig rundt i sine omgivelser. Der eksisterer forskellige slags færdselstavler i denne verden. De fleste færdselstavler er ensartede skilte, som udgør standard for anvendelse på verdensplan. Disse er baseret på Wienerkonventionen om færdselstavler og -signaler (FN's Økonomiske Kommission for Europa, 1968). Mange forskningsstudier indenfor urbane omgivelser og trafikteknik fokuserer på menneskelig adfærd og systemgenkendelse for færdselstavler. For at kunne give overblik over den nyeste forskning, præsenterer denne afhandling et teoretisk objektiv, der bruges til at forankre temaerne indenfor forskning i 'urbane omgivelser', 'menneskelig adfærd' og 'færdselstavler'. I denne afhandling anvendes teorierne indenfor geosemiotik og mobilititet.

Fagområderne geosemiotik og mobilitet udgør vigtige aspekter af forskningen på området, da sammenkoblingen af disse to discipliner i analysen bidrager med en yderligere teoretisk udfordring, for at forstærke en dialog mellem fagområderne 'urban design' og 'visuel kommunikation'. Dermed vil den indbyrdes kobling af de to teorier kunne hjælpe med at svare på, hvorvidt færdselstavler har signifikant indflydelse på menneskelig adfærd ved færdsel i urbane omgivelser. Udvalgte byer i Danmark og Skotland er brugt som undersøgelsesområder i dette forskningsprojekt. For at kunne forstå betydningen af visuel forståelse blandt mennesker, er der foretaget feltobservationer og fokusgruppeinterviews under forskningsprocessen. Metoderne er foretaget i urbane omgivelser samt i kontrollerede omgivelser, som betoner interaktionen mellem deltagerne og den visuelle repræsentation af færdselstavler. Det primære bidrag fra resultaterne i dette forskningsprojekt er de metodiske trianguleringer af kvalitativ data brugt i feltobservationerne samt i fokusgruppe interviewene.  der er inspireret af geosemiotik og mobilitetspraksisser. Baseret på de empiriske forskningsresultater er det hensigten, at denne afhandling kan anvendes som retningslinjer for malaysisk urban planlægning af et fremtidigt færdselsskilt system.

# ABSTRAK BAHASA MELAYU

Bagaimana orang memahami tanda-tanda lalu lintas dalam persekitaran bandar, dan bagaimana pengetahuan ini digunakan untuk memaklumkan kepada pembentukan dasar dan manual reka bentuk yang lebih baik? Persoalan ini berkait dengan bukti-bukti teori dan empirikal papan tanda jalan raya sebagai penunjuk arah serta pergerakan manusia di dalam persekitaran. Pelbagai jenis papan tanda trafik jalan wujud di dunia ini. Tanda-tanda jalan yang sering diaplikasikan di seluruh dunia, berdasarkan kepada Konvensyen Vienna mengenai Tanda-tanda Jalan dan Isyarat Vienna Convention on Road Signs and Signals (United Nations Economic Commission for Europe, 1968). Banyak kajian penyelidikan dalam persekitaran bandar dan trafik kejuruteraan tertumpu kepada tingkah laku manusia dan pengiktirafan sistem papan tanda trafik. Dalam usaha untuk menyediakan gambaran 'state-of-the-art', tesis ini membentangkan teori lensa yang digunakan untuk mengetengahkan kajian 'persekitaran bandar', 'manusia' dan 'tanda-tanda jalan' melalui teori-teori daripada geosemiotik dan bidang mobiliti.

Teori geosemiotik dan mobiliti adalah aspek penting dalam kajian ini kerana ia menyediakan satu lagi cabaran teori dalam bentuk penggabungan kedua-dua disiplin dalam analisis bagi meningkatkan dialog antara bidang reka bentuk bandar dan komunikasi visual. Hubungan di antara kedua-dua teori akan membantu dalam menjawab persoalan kajian sama ada tanda-tanda jalan raya mempunyai impak yang besar ke atas tingkah laku manusia dalam persekitaran bandar. Bandar-bandar terpilih di Denmark dan Scotland telah digunakan sebagai lokasi kajian. Pemerhatian di lapangan dan temu bual kumpulan fokus telah dijalankan. Kaedah-kaedah yang telah diadakan dalam tetapan bandar serta tetapan kawalan menekankan interaksi antara peserta dan perwakilan visual tanda-tanda jalan raya. Sumbangan utama hasil dalam projek penyelidikan ini adalah triangulasi metodologi data kualitatif yang digunakan dalam pemerhatian di lapangan serta dalam temubual kumpulan fokus yang telah diilhamkan oleh teori dan praktis bidang geosemiotik dan mobiliti. Tesis ini bertujuan untuk digunakan sebagai garis panduan bagi perancangan bandar dan sistem tanda-tanda jalan raya di Malaysia pada masa hadapan.

# PREFACE

Why do we need road signs in our environment? What is the relevance of these road signs in our daily lives? These kinds of questions were naïve questions that came to mind when I first started this PhD research three years ago. I was blown away with the context of this research since there were so many angles or vague frameworks that I could have come up with. Being a new researcher in the field of urban design, I thought I had a really valuable perspective of the visual communication design field. Before I came to Denmark, I practised and was a lecturer in graphic design. But since my interest was in road signs ever since I tried to find new avenues of future graphic design fields in Malaysia, I was attracted to the new terms that I encountered from the start: mobility and geosemiotics. Even though mobility is a known research paradigm among scholars internationally, my interest only arose when my supervisor introduced it to me. It was such a great opportunity for me as a designer to have been introduced to this research field since it has potential for future design practice. The term geosemiotics was totally new to me as well as it emphasises the materialities of place, which could have meant a lot of things.

# ACKNOWLEDGEMENTS

The three awesome years during which I worked on finishing this PhD thesis were an amazing experience which would not have been possible without the contribution of those people who have helped me. This PhD journey would not have been valuable without the help and guidance from people across the world to whom I am most grateful. I owe a great deal to my supervisor, Professor Ole B. Jensen, for his charisma and determination in encouraging me throughout my three-year journey. Professor Jensen has been my mentor and inspiration in pursuing my research in Denmark. Without his guidance and patience, I would not have been able to finish my dissertation. My sincere thanks are extended to Victor, my second supervisor, for his time and guidance in helping me with my process of study. My thanks are also extended to all my 'research labmates'; Ditte, Cecille, Anne, Anne-Marie, Simon, Mette, Maria, Ida, Isak and both Jacobs for being such wonderful colleagues and friends for the past three years in giving their ideas and encouragement. Writing this thesis far from home could not have been a reality without the support of my best friend, Donna, who has always been there for me whenever I was in need. Thank you also to my other friends, Candida, and Miaw Lee all the way from Kuching, Sarawak, Malaysia, who supported me in terms of encouragement and lifelong friendship.

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**Salmiah Abdul Hamid**
August 2015

# PUBLICATIONS

**Paper #1**
Signs in place: Choreographing Travel Flow in Urban Spaces
*Published in Spaces and Flows: An International Journal of Urban and ExtraUrban Studies, 2(3), 115–128*

**Paper #2**
Reading Signs in the Cities: Constructing Framework of Embodied Practices through Mobilities and Geosemiotics Approaches
*Submitted to Transfers: Interdisciplinary Journal of Mobility Studies*

**Paper #3**
Walking in the City of Signs: Tracking Urban Pedestrians in Glasgow
*Published in Current Urban Studies, 2, 263-278. doi: 10.4236/cus.2014.23025.*

**Paper #4**
Reading Road Traffic Signs in Urban Spaces: Activity-Oriented Focus Group Interviews
*Submitted to British Journal of Arts and Social Sciences (BJASS)*

**Paper #5**
Qualitative Inquiry: Semiotic Alertness and Mobility Practices through Experiences in Urban Spaces.
*Submitted to FQS - Forum Qualitative Sozialforschung / Forum: Qualitative Social Research Journal*

**Paper #6**
Malaysian Urban Streetscape Sign Design Manual : Towards Pedestrian Friendly Streets
*To be submitted to Malaysian Road Works Department*

This thesis has been submitted for assessment in partial fulfilment of the PhD degree. The thesis is based on the submitted or published scientific papers which are listed above. Parts of the paper are used directly or indirectly in the extended summary of the thesis. As part of the assessment, co-author statements have been made available to the assessment committee and are also available at the Faculty. The thesis is not in its present form acceptable for open publication but only in limited and closed circulation as copyright may not be ensured.

# TABLE OF CONTENTS

## PART 1 | EXTENDED SUMMARY

## PART 2 | PAPER PUBLICATIONS

**Paper #1**
Signs in place: Choreographing Travel Flow in Urban Spaces
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## PART 3 | APPENDICES

The appendices **(Appendix A-G)** can be found in the USB flash drive attached together at the back of the thesis. The appendices are organised in folders according to different data collected.

**Appendix A: Interview guide**

- Pilot interview
- Focus group interview

**Appendix B: Transcripts**

- Interviews in Aalborg
- On-site interviews in Glasgow
- Focus group interview

**Appendix C: Video references**

- Focus group interviews
- Observations in Glasgow

**Appendix D: Sample of mobile methods explorations and field notes on iPad**

**Appendix E: Focus group drawings**

**Appendix F: Observational documentation photos**

- Glasgow
- Aalborg
- Malaysia

**Appendix G: Examples of Current Malaysian Traffic Signs Manual**

# FIGURES

# TABLES

# PART 1
## EXTENDED SUMMARY

# 01 CHAPTER
# INTRODUCTION

# CHAPTER 1. INTRODUCTION

Imagine yourself walking up to a street corner, searching for a specific place. Perhaps you are driving into the busy streetscapes in the city centre and searching for a specific building, or maybe riding a bicycle within a stretch of streets that is full of vehicles. This everyday life movement can be categorised as mobility practices, as these actions are considered embodied practices (Jensen, 2013). These scenarios are common to all of us who live in cities. In your daily routine, you normally know your way without having any difficulties in finding the places to which you are travelling. However, if there were a specific place that you have never visited, and that particular place is located at a different street corner which is far from your ordinary routes, how would you get to that particular place? Do you just use your instincts? Will you use your smartphone to navigate from your starting point to the destination? Will you just ask people in the vicinity to help you?

We all have our own ways of manoeuvring in the built environment in searching for our destination, just as there will always be elements that influence our movement, either through our initial planning or in the form of a spontaneous reaction. For instance, when you are walking in the city centre trying to find a restaurant that you only visited once five years ago, you will likely try to recall the street's name, street signs, building features, landmarks, or even the pathways that you associate with the memory. However, since the streetscapes have changed, you might have difficulties in finding the place. You might see different street names, new buildings, new streets, more traffic lights and so on. City planning can sometimes be troublesome for some people. It affects their daily behaviour, especially for street users (pedestrians, cyclists and drivers) who are first comers to specific place. The design field has also contributed to city planning, a task which includes visual communication design practices. The movement of people between spaces is considered part of the research and development in visual communication studies. Thus, as Jensen (2013) states, mobility is not just moving from A to B. When you move between spaces or places, there are always other elements that influence your travel behaviour.

This PhD research is about looking at the experiences of people when they navigate between spaces, focusing on how they make sense of signs and relate with their daily mobility practices. This research concerns the theoretical impact of research in the mobility paradigm and geosemiotics, which relate to graphic design practices.

## 1.1. MOTIVATION FOR RESEARCH

Being a graphic designer has influenced my way of looking at visual elements that attract my attention. In visual communication design practices, most designers have their own way of designing the visual materials in spatial environments such as billboard advertisements, road signs, street signs and street maps. The role of the designer in this case is to convey messages to audiences. In common design practices, audiences and products are the main aspects of consideration in the design implementation. In graphic design practices, there are five key elements of the design thinking process (adapted from Brown, 2008) that influence visual materials design. These elements include: empathize, define, ideation, prototype and test. The thinking process consists of three stages: (i) inspire, (ii) ideate and (iii) implementation. When designing visual materials such as posters, way-finding signs, road signs, billboards and so forth, designers need to understand their target audience before developing the ideas for design and implementation. Since this PhD research involves research through design practice, the design thinking process helps to relate the importance of the research gap in design practices that will help to develop new knowledge.

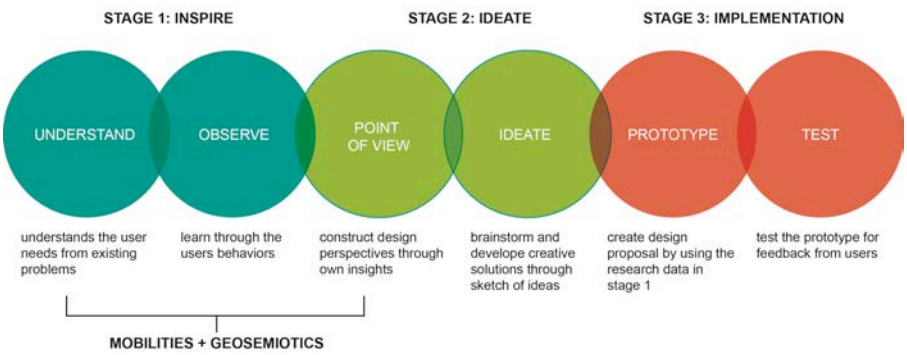


Figure 1. Design process thinking (Adapted from Brown, 2008)

The visual representation in the road signs system can be categorised into the field of visual communication design practices. As mentioned by McClatchey, (2011), two prominent British graphic designers were responsible in designing the motorway road signs in United Kingdom:

> *Britain's roads look as they do because of Jock Kinnear and Margaret Calvert. The graphic designers standardized the road network, created many of its signs and produced two new typefaces, Transport and Motorway. (McClatchey, 2011)*

Drivers obtain basic road traffic codes from guide information such as place names and route numbers (Mitsuda, 1984). The purpose of road signs is to deliver information to road users. In the development of a road traffic system in an urban context, signs may be unhelpful to users if the intended meanings are not effectively understood by the users (Hurtle, Richter, Srinivas, & Firth, 2010, p.55), meaning they may pose a threat to traffic and pedestrian safety. As mentioned by Mollerup (2005), travellers shouldn't be confused or overwhelmed by signs that are too complicated, too different, too numerous or too large. Road signs are specific rules that are placed in particular locations, from urban spaces to rural areas, as guides for road users. In an analysis of the interaction between signs and institutional context, Wagner (2006) stated:

> *On the whole, road visual semiotics is part of a process in which road signs can be generated, shifted or refuted. The significations and symbolization of these signs only become clear when their perception and decodification as well as the legal, cultural and political practices of countries are involved. (p.314)*

Road signs in European countries are regulated by the uniform signage standard of the Vienna Convention on Road Signs and Signals from 1968 (Wagner, 2006). Thus, there are similarities in the icons, symbols and shapes of road signs among the regulated traffic signs across Europe. In terms of icons, road signage systems use iconic representations of real objects. For instance, an icon of a car on a road sign could be interpreted as 'motor vehicles only' or 'no motor vehicles', depending on other supporting elements such as the shape and colour/symbols of the sign. In traffic road signage system regulations, the shapes and symbols of road signs normally complement each other. For instance, a yellow triangle road sign represents a warning sign system.

The study of road signs is not only part of visual communication practices, but also urban design practices. This is due to the fact that the placement of road signs in urban settings helps to increase the understandings of road users' mobility practices. Castells (2005) in Sandal (2005) state, "architecture and urban design are sources of spatial-cultural meaning in an urban world of dramatic need of communication protocols and artefacts of sharing" (p.62). This shows that the road signs can be used as an element of shared meaning among road users. As noted by Corbin and Hunt (2003), consistent graphic elements help to deliver information more effectively, especially when applied to wayfinding systems in complex environments. Arthur and Passini (1992) argue that the built environment functions as a communication device, providing what they called 'environmental communication'. Even though the authors concentrated on buildings in the urban environment, I would suggest that road signs are the communication device that builds the relationship between the user and the environment itself. Ziesel (2006) suggests that physical spaces could be used as a communication medium for communities. Thus, the elements of represented icons, symbols and shape in road signs help to differentiate the way people interact with the communication objects. As argued by Putnam (1981), signs do not exist on their own without serving any purpose or delivering necessary messages. There are three different road signage systems prescribed in the Vienna Convention, according to the following classifications:

(a) Danger warning signs
(b) Regulatory signs:
    (i) priority signs;
    (ii) prohibitory or restrictive signs;
    (iii) mandatory signs;
    (iv) special regulation signs;
(c) Informative signs:
    (i) information, facilities or service signs;
    (ii) direction, position or indication signs;
    (iii) advance direction signs;
    (iv) direction signs;
    (v) road identification signs;
    (vi) place identification signs;
    (vii) confirmatory signs;
    (viii) indication signs;
    (ix) additional panels.

The Vienna Convention on Road Signs and Signals is an international ruling that aims to standardise road signs, traffic lights and road markings around the globe. As stipulated in the Convention, the contracting party should standardise the dimensions of signage for road traffic (road signs, traffic lights and road markings). However, not all countries participate in or have signed the treaty. The US, for instance, previously used words instead of pictures and symbols in their system of traffic control signs. In addition, road signs in the US increasingly use symbols as opposed to words to communicate with road users (United States Department of Transportation, 2002).

In relation to design practices, the Danish Directorate's design of Danish traffic signs (Plejdrup, 2002), suggested that there are four main criteria that determine whether a sign is of good quality. The first criterion is visual qualities, as where the sign is expected to be placed. The second criterion is the legibility of signs—whether they can be read clearly (i.e., the letters or images on the signs). The third criterion is comprehensibility, whether the user will understand the meaning and then act accordingly. This is also dependent on the attitude of the user. In Danish traffic signs guidelines, the classical method of making the user obey regulated signs is through the illustration of 'potential consequences of disregarding them'. Lastly, the fourth criterion of a quality sign is the system itself. This is commonly found in the 'visible grouping' into which road signs are grouped according to their 'family': warning signs are triangular; mandatory signs are round and signs for indicating locations are rectangular (Bernsen, Christensen & Møller, 1996, p. 21).

In everyday lives, people move around from one place to another for countless specific reasons. Guided by either knowledge or experience of their path, people tend to look for signs when manoeuvring in both familiar and unfamiliar spaces. Observing walking, driving and cycling within specific urban spaces provides insight into different ways of orchestrating travelling behaviours. These observation activities are also considered as part of 'empathise' in design thinking process, which helps to determine the behaviours of the target audiences. Jensen (2013) emphasises that people make sense of place when they move through their 'everyday-life mobility'. Thus, this research also tries to untangle the relationship between the way people move and the visual materials that affect/do not affect their travels. We all have different perceptions when making sense of signs in the specific places to which we travel. The interrelationship between experiencing people and experiencing the material world in Scollon and Scollon (2003) and Urry (2007) provides partial inspiration for this research. Human mobility in navigating

from point A to B is also discussed by Jensen, who emphasises interaction in urban travel:

> *Urban travel is not just about getting from point A to point B. It is about producing and reproducing the city and the self in a complex relationship involving mobility cultures and different types of mobility knowledge. (Jensen, 2006, p.161)*

In recent research, there has been a number of studies that integrate mobility theories into the research context. However, there has been no research integrating the notions of geosemiotics and mobilities into the study of graphic design practices, specifically in designing road signs systems. Thus, as described in an inspiring piece by Jensen (2013):

> *One of the main contributions from the Staging Mobilities perspective to the 'mobilities turn' is to bring attention to the work done by 'designers' of mobilities. Here 'designers' must be understood in a very broad sense, including planners, urban designers, architects, engineers etc. These are all representative of disciplines and 'communities of practice' engaged in 'intervention' rather than 'analysis' (or at least with intervention as a necessary outcome of analysis). (p.175)*

Thus, the mobilities turn and the integration of geosemiotic theories can be used as tools in enhancing and improving the design practices of producing visual materials in the environment, such as road signs.

## 1.2. THEORETICAL FRAMING

In relation to the mobilities turn and geosemiotics mentioned earlier, I have adopted the 'Staging Mobilities' model suggested by Jensen (2013) as a conceptual building block for my research. As argued by Jensen (2013):

> *… mobility is more than movement between points A and B. It concerns how the movement of people, goods, information and signs influences human understandings of self, other and the built environment (Jensen, 2013: 3-4).*

### 1.2.1. MOBILITY

Why is mobility important in this research? And how can mobilities influence the design process thinking? In the mobilities turn, mobility is not considered simply 'getting from A to B'. It goes beyond that. The mobilities paradigm integrates movement, meaning and culture. Numerous scholars of mobility focus on tourism (Burns & Novelli, 2008; Larsen, 2001; Sheller & Urry, 2004), virtual mobility (Büscher et al.; 2009) and aeromobilities and automobilities (Featherstone, Thrift, & Urry, 2005; Jensen, 2013; Lassen, 2006; Merriman, 2013). Cresswell (2006) argues that mobility is produced through the interrelation of bodily movement, meaning and power (p.128). In his interpretation, mobility involves embodied practices and experiences of a person within a specific context of meaning and within social and cultural power. Within mobilities, materialities have always been part of the artefacts that are articulated by people in their daily life practices. In the current research on mobilities, there have been numerous interpretations and arguments between the mobilities 'turn' and 'paradigm'. Sheller & Urry (2006) suggested that the mobilities paradigm involves the 'embodied nature and experience' that relates to a person's activities within their spatial environment. In a previous study of staging mobility, Jensen (2013) highlighted the importance of signs and the way people look at them when walking, driving or cycling.

In relation to the mobile semiotics illustrated by Jensen, this research adapted the staging mobilities model to outline several important constituents that are relevant to this research. In addition, Jensen also argues that in the design and planning process, the embodied experiences from the users' perspectives are significant. Ernste, Martens and Schapendonk (2012) argue that practice mobility research involves the different mobility experiences between meaning, people and places. For instance, a person who plans to travel from Glasgow to Edinburgh has to think about changing their modes of transportation due to technical difficulties occurring in the train system. Thus, she has to take an alternative method of travel using a rental car. The mobility practice of driving a car to travel from one place to another will be more challenging when the target destination is relatively new. Therefore, she will need to be ready with mobile devices such as a GPS system to provide a path to the destination. Even with technological advances such as GPS devices,

travellers will sometimes need to search or look for signs that are relevant in their journey. The experiences of searching for meaning are part of the mobilities paradigm, argued by scholars as not just by getting from A to B.

This thesis seeks to reveal the everyday life aspects of mobility that can be related to people consciously looking at road traffic signs. In everyday lives, there are noticeable and unnoticeable differences that a viewer may observe in a specific time period. In urban spaces that are designed for different mobilities practices, a person could have difficulties in identifying or understanding the meanings of complexities of signs and signals in their physical environment. Hansen (2014), defined complexity as:

> *…visual variety in the physical environment…includes: architectural materials, colour, ornamentation, diverse building shapes and sizes, landscape plants, street furniture and signage. (p.153)*

Most regulated streets in the world have some variation of these signs, and the rules and regulations established for their coding are set by policymakers. There are situations whereby road users misinterpret the meaning of signs due to unfamiliar or cluttered signs within a specific location. Thus, people face difficulties when experiencing multiple complex road signs in urban spaces. As mobilities are staged both 'from above' (design and planning of material spaces) and 'from below' (social interaction and performances), this thesis will look into the correlation between both stages that will be implemented as part of the design thinking process.

Briefly, I have encountered a diversity of interpretations in the way people look at signs when they travel in different modes and when they recall these situations. Freudendal-Pedersen (2009) suggested that different levels of mobilities, such as slow and fast, quiet and noisy, and vehicles-human activities, play important roles in meeting our needs in our daily lives (p.116). Laurier et al. (2008) suggest that mobility involves not only moving from A to B but also the activities that happen during movement. Their studies focus on video documentation through go-along interviews inside a car, which recorded daily conversations among the car's users and (some of) the environment that could be seen from inside the car. Their use of video documentation as a research methodology is eye-opening because of the insight it provides into daily life activities. In this thesis, I examine aspects of

mobility practices, geosemiotics and semiotic alertness (as a concept) through examining everyday life experiences. Thus, the interrelations between 'mobility practices' and 'semiotic alertness' were taken from empirical data obtained in this study through different methodological approaches. Some of the significant terminologies in the field of mobilities are:

**Mobility**
Mobility involves the movement of people or goods from one place to another. The experiences of and interactions between actors in particular spaces include mediation and technologies that influence their behaviour.

**Mobility practices**
Daily practices through various modes of mobility such as walking, driving, cycling and even flying. The practices may involve several activities that construct aesthetic experiences in their journey from one place to another.

**Mobile methods**
Different ways of analysing the moving systems and experiences of a person through technology and approaches within specific areas or subject matter.

There have been several research methods and methodologies used in the search for meanings in mobilities research that contributed to the new knowledge of 'mobilities turn'. Thus, the mobilities paradigm is a significant aspect of research that can be applied to the urban and visual communications phenomenon. The multiple methods approach in mobilities research can be used as a guideline by which to corroborate, illuminate or elaborate on the research questions. My contention is that mobilities research helps to strengthen human behavioural methodological investigations. In addition to the theoretical aspects of mobilities, I will now turn to the research methods or approaches that are relevant in the geosemiotics field.

### 1.2.2. GEOSEMIOTICS

What is the study of geosemiotics all about? Why is it important in this research framework? The term 'geosemiotics' comes from Scollon and Scollon (2003), who

write that geosemiotics 'makes reference to the real, physical, material world in which we live our lives' (p. 111). In other words, the definition of geosemiotics is the meaning of signs in the environment/space according to their placement (index). For example, a reading of 'STOP' on a street corner, at the back of a maintenance car, or in an art gallery is interpreted differently due to the placement (geo). In other words, the meaning of each of the signs (STOP) is different according to its context. Thus, the study of geosemiotics is relevant to the study of mobility as it involves the meanings behind specific sign contexts.

There are three main attributes that are important in the study of geosemiotics: 'interaction order', 'visual semiotics' and 'place semiotics'. Interaction order relates to the social relationship between the actors and the spaces (e.g. sense of time, perceptual spaces, interpersonal distances and so on). Visual semiotics, on the other hand, involves visual representations and meanings in space (e.g., represented participants, modality, composition and interactive participants). Lastly, place semiotics is the contributed meanings from semiotic systems that exist in the environment (regulated or natural). In the context of this research, the investigations of the represented meanings involved were embodied in the semiotic spaces known as place semiotics. In Scollon and Scollon's methodological research, regulatory signs and code preferences are all part of place semiotics. Denis and Pontille (2008) argue that in their geosemiotic analysis of the signs placed in the underground in Paris, it is essential to study the operational process of placing the signs through the understanding of signs and visual communication. The authors also suggest that:

> *We examine some of the ways in which discourses come to organize the many spaces of the material world. … If we track the traffic regulatory discourse on an urban street we find it runs through all the streets of that municipality. The stop sign on this corner is the same as the one on that corner. (pp. 167–168)*

The study of geosemiotics also involves the study of discourse analysis, as well as geography as space for materials to be placed. Jaworski and Thurlow (2010) framed the semiotic landscape as the integration of the network of meanings between human geography and semiotics. There are several different approaches and analyses for examining social behaviour and discourses in place; a useful reference work is *Discourses in place: Language in the material world* (2003), by Scollon and Scollon. In reference to the sense of attribution for information use in the thesis, some guidelines and activities from the discourse analysis field are

incorporated into my methods and analysis. For instance, visual images are used as 'the representation of real-world actions' (Scollon & Scollon, 2003, p. 84). Experiments with manipulated images in particular urban spaces that participants can identify are used to reveal experiences from their daily lives. This approach will be explained in more detail in **Paper#4**. As mentioned above, being a visual communication practitioner gives me a different perspective on looking at signs compared to other research field practitioners. I have always been intrigued by looking at signs that not only convey meaningful messages to the users but also use unique pictograms that represent the objects that are found in the environment.

Semiotic theory has always been important in understanding the signs that are seen in our everyday lives. Even designers include the semiotic studies in their design process in order to obtain better understanding of the design executions. People will always have different perceptions of the signs they see in their daily practice. Thus, investigations of different urban street environments rely on 'semiotic aggregates', which Scollon and Scollon (2003) define as 'separate realizations of different semiotic actions but which together form a composite meaning' (p. 215). The way a person perceives what she sees in the urban environment influences her mobility or movement. Terminologies that can be associated with the field of geosemiotics include:

**Semiotics**
The study of signs and symbols, encompassing phenomena from different fields, including anthropology, communications, psychology and semantics.

**Semiotic aggregates**
Materialities that are embedded in their emplacement in spaces create meaning among the users of the spaces. These may include representations such as signs, graffiti art and turf boundaries.

**Semiotic alertness**
The mental state and act of semiotic attunement towards specific physical objects within an individual's surroundings are interpreted through his/her actions and behaviour.

**Sign**

A material object that indicates or refers to something other than itself; includes icons, indexes and symbols.

**Visual semiotics**

A sub-domain of semiotics that deals with the way visual images communicate a message from the signs and symbols within specific semiotic aggregates. This may include the interpretation of signs and symbols in road signs, advertisements, street signs or even notices in urban spaces by road users.

Semiotic studies generally are significant in the development of language and other systems of signs that analyse meanings. Geosemiotics, however, analyses the meanings behind specific codes of signs and symbols in semiotic spaces. Through the lens of geosemiotics, it is important to look at the interactions between users and materials in the urban environment. However, the aspects of geosemiotics that integrate spaces and materials are very significant in investigating the roles of the urban environment and the visual materialities in the environment. In order to best illustrate the relationship between the theories, empirical research and design practices of this PhD thesis, a framework from Jensen's *Staging Mobilities* will be adapted.

### 1.2.3. CONCEPTUAL AND THEORETICAL FRAMEWORK

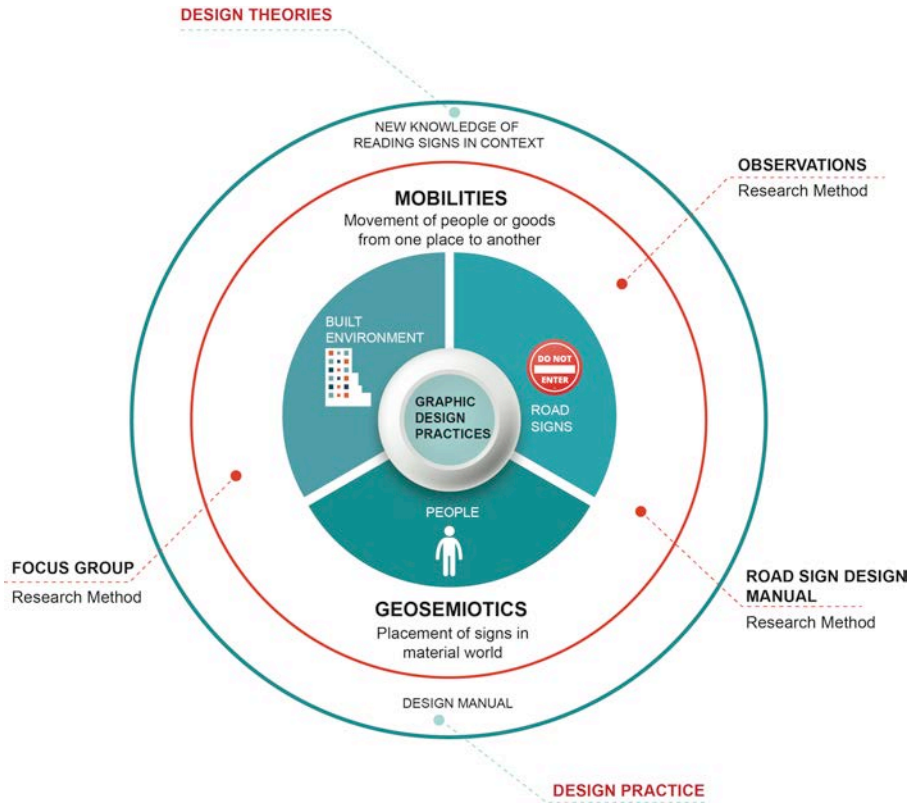


Figure 2. Conceptual and Theoretical Framework (Adapted from Jensen's Staging Mobilities model, 2013)

The conceptual and theoretical framework in Figure 2 consists of three main aspects of investigations (people, built environment and traffic signs) that correlate with two theoretical frameworks (mobilities and geosemiotics) used in this study. The suggested framework is used to close the gap in graphic design practices, which focuses on the visual materials that are seen, used, memorised or experienced by the users. In design practices, the users/audiences will always be the most significant aspect that needs to be incorporated into the design process. This is due to the fact that interaction, reflection or feedback from the users will help to create a better user understanding. The study also looks into how designers can benefit the theoretical aspects of mobilities and geosemiotics in improving the research and development process in designing better road signs system.

## 1.3. RESEARCH QUESTIONS

The goal of this research is to analyse how the road signs in urban spaces are reflected in the way people describe their experiences and knowledge (through qualitative research methodologies). The guiding questions for all the studies carried out as part of this research is:

***How do people make sense of traffic signs in urban settings, and how can this knowledge be utilised to inform the creation of better design policies and manuals?***

Movement in urban environments is assumed to be explained by models from geosemiotics and mobility theories. These models simulate human behaviour towards standardised road signs. The main research question is further detailed in the following three sub-questions:

1) How can empirical findings from mobilities and geosemiotics contexts be used in investigating the travel behaviour within urban settings?
2) What are the critical aspects of semiotic alertness and mobility practices that affect travelling behaviour in an urban environment in relation to the traffic signs system?
3) How can visual data of onsite experiences be used in developing an urban streetscape design manual?

## 1.4. RESEARCH DESIGN

The empirical evidence in this research was gathered via qualitative methods. The choice of approach affects data collection, data analysis and the methodological explorations. The methodologies used in this research reflect the multidisciplinary research realm at the intersection of graphic design practices, mobilities and geosemiotics. In recent research, scholars have mainly used quantitative methods in determining human perceptions of signs in relation to the locations of signs and drivers' characteristics (see Al-Madahi & Al-Janahi, 2002; Dewar, Kline, & Swanson, 1994; Fleyeh, 2004; Ng & Chan, 2008).

However, in this thesis, the fields of mobility and geosemiotics are used primarily as lenses that filter the tools and strategies of investigations. In addition, the theoretical and empirical frameworks of this research are refined accordingly, as will be discussed in a later section of this thesis. Several methodologies used in this research are also described in the papers included throughout this thesis. The triangulation of qualitative methods from field observations (Coulon, 1995; Mehta, 2009; Frey, O'Hair, & Kreps, 1990) and focus group discussions and activities (Coluccia, Iosue, & Brandimonte, 2007; Krueger & Casey, 2000; Marková, Linell, Grossen, & Salazar Orvig, 2006; Morgan, 1997) were used in this research. This is one of the strategies used in investigating the roles of geosemiotic and mobility theories and practices in everyday life by referring to road signs. Merriman (2014) suggested:

> *Sociologists, anthropologists, and human geographers working within social science traditions have been at the forefront of research that constitutes the 'new mobilities paradigm', but there are many long-established approaches to/studies of mobility, travel and transport that might be more usefully positioned in a humanities tradition, or certainly in an extended realm of humanities and social science research that is less concerned with adhering to some of the disciplinary and methodological conventions of the core social science disciplines. (p. 171)*

In everyday life practices, each of us has a different way of manoeuvring from one place to another. However, this way is dependent on several factors that are useful to consider (as I do in this thesis), such as activities, spaces and routes used, and tools commonly utilised by road users. In this research, common everyday experiences of making sense of road signs will be translated into knowledge by road users (pedestrians, cyclists or drivers), and reports of these experiences or events (focus groups, interviews, observations) will be reviewed and synthesised. I will use several methods of interpretation since the research methods used vary according to the activities investigated. The ways of interpreting data from the methods used are discussed in the individual papers on empirical data (**Paper #4** and **Paper #5**). In addition, as part of the research design, I will use some of the visual data from the observations to be incorporated into design-based streetscape framework of a road sign system. The urban streetscape design manual will be used as a proposed 'mobile-method' (Merriman, 2014) for designers. The next section summarises the papers that are relevant to this thesis and the main contributions thereof.

## 1.5. SUMMARY OF PAPERS

The compilation of papers presented later in this thesis consists of six papers/publications that have been published and submitted as journal articles or proposal. Each paper has its own significance to the research process, either presenting a review of the literature or empirical data analysis.

**Paper #1**
Signs in Place: Choreographing Travel Flow in Urban Spaces. *Spaces and Flows: An International Journal of Urban and ExtraUrban Studies*, *2*(3), 115–128.

**Relevance to this thesis:**
The first paper presents a state-of-the-art review of choreographing travel flow from above, which focuses on the common literature in the field of road signs research. The paper also focuses on the globally used road signs that are found in urban spaces. The goal of this paper is therefore to review several different aspects of everyday life that potentially relate to geosemiotics and mobility theories. Thus, this paper is only based on a review of the literature in the environment-behavioural field. The term 'choreograph' is used to describe the staging of actions in moving around urban spaces. It was found useful to look at choreographing travel flow from above (policies, common traffic regulations used in urban spaces) before the more empirical investigation of choreographing travel flow from below (people's experiences, people's movements). Most of the findings in this paper came from literature and document analysis.

**My contribution:**
This paper was presented at the Spaces and Flows Conference 2011 and submitted to the *Spaces and Flows* journal after the presentation. There was some feedback from the audience that was taken into consideration. The presentation began with an introduction to some basic road traffic signs that can be found in European countries. In fact, I showed two different images taken in the vicinity of the conference location portraying 'no entry' signs. During the discussion, most of the audience admitted that they had not noticed the signs on the way into the conference, especially the one with a human figure holding a 'white square'. Most of the audience suggested the figure might be a symbol of 'teasing' the authorities by providing ways for vehicle drivers to enter particular roads. I have found similar signs in some other places in the area. Some also suggested giving each country its

own style of road sign but retaining English as the language used. In fact, one of the participants from France stated that most of the road traffic signs in France have been translated into English because there are more and more foreigners coming into the country every year. This change could lead to another research contribution in the future on policy changes. This paper presents initial findings on common signs in urban spaces that are governed by institutions. This paper is the result of reviewing relevant literature on common traffic signs used around the world. I was the lead author of this paper and had the help of two co-authors in reviewing the overall content and structure of the paper.

**Paper #2**

Reading Signs in the Cities: Constructing Frameworks of Embodied Practices Through Mobilities and Geosemiotics Approaches

*Submitted to Transfers: Interdisciplinary Journal of Mobility Studies*

**Relevance to this thesis:**

This paper discusses the theoretical aspect of mobilities and geosemiotics that are illustrated into a framework as lenses for empirical investigations. The suggested new theoretical and conceptual framework discussed in this paper involved the rationale behind significant variables used for data collection, such as people, built environment and road signs. The focus of this paper is to examine several approaches in geosemiotics and the mobilities paradigm that have the potential to be used as investigation tools.

**My contribution:**

This paper is the extension of the “Signs in place: Choreographing travel flow in urban spaces” paper, which looks into the body of literature regardng people's daily life behaviour in urban spaces. Thus, this paper helps to strengthen the theoretical argument between the geosemiotics and mobilities approaches chosen for this PhD research.

**Paper #3**

Walking in the City of Signs: Tracking Urban Pedestrians in Glasgow City.

*Published in Current Urban Studies, 2, 263-278. doi: 10.4236/cus.2014.23025.*

**Relevance to this thesis:**

This paper focuses on empirical data collected in Glasgow, Scotland while investigating pedestrian behaviour through mobile methods. It encompasses methodological and practical issues in tracking pedestrians' movements in the urban spaces of Glasgow. It also discusses empirical findings such as tracked maps, images of people's behaviour in urban spaces, the signs in place and transcriptions of short interviews. This paper is an outcome of one month of non-participatory observations conducted in Glasgow in March 2012. An abstract of the work in progress of this paper was presented as part of the Environmental Design Research Association (EDRA) 43rd Annual Conference in Seattle, Washington, which took place at the Renaissance Seattle Hotel, May 30–June 2, 2012. During the conference presentation, there was a psychology scholar who raised questions about using Google Maps as a method of looking at signs instead of being in real spaces. It should be noted that Google Maps were used as a tool in the focus group content analysis. However, this paper only used it as a support system for the proposed design-oriented framework that will utilise part of the data collected as case studies.

**My contribution:**

This paper is the result of the exploration of mobile methods that was conducted using iPad applications in Glasgow, Scotland. I was responsible for performing the analysis of the qualitative data and presented part of the empirical evidence as a knowledge dissemination outcome in conferences.

**Paper #4:**

Reading Road Traffic Signs in Urban Spaces: Activity-Oriented Focus Group Interviews.

*Submitted to British Journal of Arts and Social Sciences (BJASS).*

**Relevance to this thesis:**

This paper consists of empirical data from focus group interviews conducted in Aalborg, Denmark. The paper presents a thematic analysis through raw data (transcriptions and drawings) and is supported by related literature and personal reflection. It also describes the tools used and activities conducted during the sessions. Since this focus group explored several activities through the lenses of the geosemiotics and mobility theories and empirical studies, there are several advantages and disadvantages to the methods used. The idea of using the activities

is to support an understanding of road signage systems in daily lives through visualisation of the signs from memory. This paper focuses on the empirical data gathered and analysed through content analysis of the transcripts of interviews and visual data.

**My contribution:**
This paper is the result of the exploration of methods that were implemented during the interview sessions using activity-oriented interviews. No co-researchers or assistants were involved.

**Paper #5**
Qualitative inquiry: Semiotic Alertness and Mobility Practices through Experiences in Urban Spaces.
*Submitted to FQS - Forum Qualitative Sozialforschung Journal and in review.*

**Relevance to this thesis:**
This paper consists of qualitative inquiry that was conducted through focus group interviews. The paper presents thematic analysis through raw data (transcriptions) and is supported by related literature reviews and personal reflections. The goal of this paper is to measure the level of attentiveness of participants in remembering their experiences of dealing with road signs in urban spaces. This paper presents the core findings of this thesis through the knowledge and experiences of participants and provides details on how the interpretations of discussions and themes were obtained. In terms of analysis, this paper also provides relevant literature and other secondary sources to support the findings. This paper is also relevant in answering Research Question No#2 of this research project, and provides additional understanding of people's perceptions of their common understandings of the road sign system. The themes selected for data analysis are taken not only from related literature but also from ideas derived from Paper #2's presentation feedback, such as the use of Google maps as an analysis tool.

**My contribution:**
This paper is the result of my analysis of focus group interviews in which participants discussed everyday experiences related to road signs in urban spaces.

**Paper #6**

Malaysian Urban Streetscape Sign Design Manual: Towards Pedestrian Friendly Streets.

*A proposal to be submitted to the Malaysian Road Works Department*

**Relevance to this thesis:**

This proposed Urban Streetscape framework reports visual materials from the non-participatory observations and visual documentation of empirical evidence obtained throughout this study.

**My contribution:**

Some recommended road signs visualised in this proposal are as a result of the visual materials collected through case studies. The new proposed designs are based on common and standard pictograms for signs and signals.

## 1.6. OUTLINE OF THESIS

The studies in this thesis aim to unfold the theoretical and empirical aspects of road signs through the lenses of geosemiotics and mobility. This thesis is subdivided into three parts. **Part 1** consists of a brief introduction to the research field, methodology and the definitions involved in the theoretical and empirical frameworks of this thesis, followed by a description of the background and current state of this research, conclusions and future work. **Part 2** focuses on the collection of papers written by the researcher during the process of thesis research. Each paper presents a self-contained segment of the research undertaken in the project and can be read independently of the others. The papers are published or are in the process of being published in peer-reviewed journals. **Part 3** provides all the tools used in the course of the investigation, including the field notes, photo and video documentation, iPad mapping screenshots, participants' transcripts, interview guides and sample of current Malaysian Road Signs Manual.

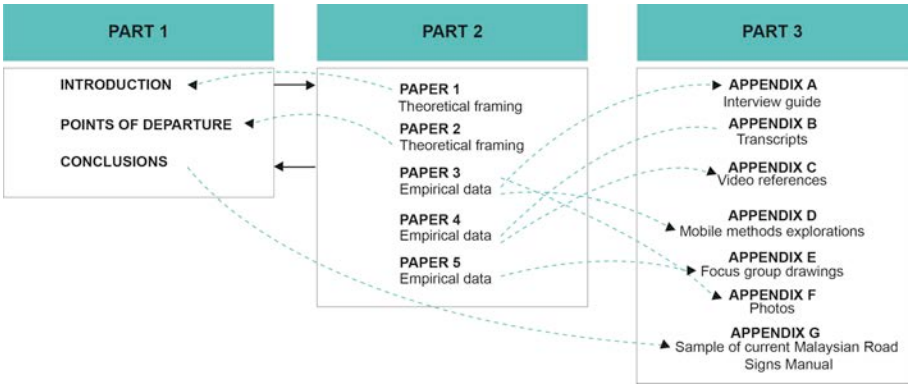


Figure 3. Overview of thesis illustrating relationships among sections, papers and appendices

# 02 CHAPTER
# POINTS OF DEPARTURE

# CHAPTER 2. POINTS OF DEPARTURE

The main goal of this research is to investigate how people make sense of traffic signs in the urban settings. Being brought up in Malaysia and having travelled in major cities like Kuala Lumpur, Penang, Kuching and Johor Bahru led to new experiences when I first came to Denmark. Being in Denmark, especially in downtown Aalborg, gives me a different perspective on the urban environment. The spaces are dominated by pedestrians and bicycle users rather than vehicular drivers. When I first came to Aalborg, I had trouble understanding most of the traffic signs, which were written in Danish by regulation (I was not the one driving). However, since my only mobility practice in Aalborg was to walk or ride the bus, there was no need for me to pay particular attention to the regulated traffic signs. From a semiotic approach, the understanding of signs in a system is dependent not only on language or text, but also on images (in this case the icons and symbols on the signs). In this chapter, the methods and research approaches are presented and discussed in more detail. Firstly, the choice of research subject is discussed. Secondly, the relevance between research questions and data collection methods is discussed. Finally, this section focuses on the strengths and weaknesses of the empirical evidence gathered during the process of this study. More details of the theoretical and empirical approaches are also found in the list of paper publications.

## 2.1 CHOICE OF RESEARCH SUBJECT

Deriving from the illustrated conceptual and theoretical framework discussed in Chapter 1, this section looks into subject matters that are important for the investigation:

(i) People
(ii) Road Signs
(iii) Built Environment

These three main subject matters are the elements that are related to each empirical investigation method. Thus, the next section discusses the data collection methods that are used according to the framework.

## 2.2 DATA COLLECTION METHODS

This section is meant to develop the relevance between the conceptual and theoretical framework illustrated in Chapter 1 and the empirical data obtained in this study. In current studies of environmental behaviour, road signs are considered part of state-of-the-art traffic engineering research. Although there has been some research involving road traffic signs, their semiotic meanings and road-signage policymakers, there is still a lack of studies in investigating the social behaviour of road users with regard to signs through focus groups, behavioural tracking studies and designing a 'visual documentation of design manual' as a research method.

Traditionally, research studies involving human behaviour in urban settings use mixed-methods approaches incorporating surveys, experiments and case studies (Ziesel, 2006). However, this research uses qualitative methods to discover the rationale behind human behaviour regarding signs in the urban environment. Thus, this thesis focuses on several different approaches that are found in geosemiotics (Scollon & Scollon, 2003) and in the mobile methods and methodologies (Büscher, Urry, & Witchger, 2010; and Fincham, McGuinness & Murray, 2010) scope of empirical materials.

### 2.2.1 RESEARCH PROCESS AND DATA COLLECTION

During the process of data collection, some of the findings from the early pilot stage of the project helped to determine the theoretical and empirical approaches that are more relevant in answering the research questions. It is impossible for a research investigation process to be entirely linear. There is always some back-and-forth in the process of trying to weigh the advantages of other methods in the course of the research journey.

The empirical data collection consists of three main stages underpinning the relationship between the theory and practice of conducting the research. Stage 1 is considered a preliminary or pilot study in which observations are conducted in Aalborg. Stage 2 is where the real field observation occurs, with explorations of mobile methods in Glasgow. Stage 3 is where the main empirical material for this PhD study focuses on human behaviour, which was obtained through a more controlled setting of activity-oriented focus group interviews. This PhD research is

intended to be used in a future stage, ideally providing guidelines for furthering the Malaysian vision of becoming a developed nation by the 2020s. Embong (2007) argues:

> *Malaysia must take the bold step in making the necessary investment not only for the advancement of social sciences as a corpus of knowledge but also to institutionalize it. In this way, social science and social scientists can contribute more meaningfully towards Malaysian national development. (p. 151)*

Thus, this research will be used as a base for future research in Malaysia through the data from the case studies. In order to investigate the relationship between the research questions and the empirical framework of this research, I have selected two different locations as study areas in order to investigate people's different perceptions of signs within the urban settings.

## STUDY AREAS

In general, European countries implement similar road traffic signs and signal systems in their urban environments. Even though the Higher Ministry of Education in Malaysia funds this PhD thesis, this research is intended to be used to gather European empirical evidence as a basis for comparison with the Malaysian urban traffic system. Thus, in this research project, two study areas were selected for investigation. The preliminary field investigations were performed in Aalborg, and a more challenging field observation was conducted in Glasgow, Scotland. The rationales for choosing these particular research locations are related to the different scales and complexity of the two urban environments, especially the density of pedestrians and vehicular users.

Currently, Malaysia uses the United Kingdom's standards for road traffic signs in urban environments, rural areas and even on the motorways. Thus, Glasgow was selected due to its similar use of traffic signs, as well as the resources available in the city, such as accommodation for one month's observational data collection. The field observations were conducted as a mean of new tools and technology that are applied based on mobile methods, which are framed for this research from the beginning. The data gathered from Glasgow was used to obtain behavioural tracking, and photographs of the signs in the city are used as comparative data for the sign design manual. However, a more time-consuming qualitative approach

using activity-oriented focus group interviews provided the main source of data for this research that looked at how individual perceptions and behaviour impact their daily life sense making when looking at signs.

### 2.2.2 PRELIMINARY RESEARCH STUDY

This PhD research project started with a pilot study in Aalborg city to test the methods that could be used to gather empirical data. As a pilot study, photographic documentation of the everyday lives of people walking around Aalborg was conducted. This photographic study highlights the relevance of the built environment and the research questions. The qualities of the built environment influence the travel behaviour and experiences of road users. The findings from the pilot study, such as the observational data, were used as a foundation for more in-depth investigations.

#### PILOT OBSERVATIONS IN AALBORG, DENMARK

Currently, there are numerous standards and styles of road sign designs available in European countries. This research mainly uses qualitative approaches, comprising field observations and activity-oriented focus group interviews. As part of a pilot study, observations on the interaction between road users and the signs in place were conducted. In fact, Scollon and Scollon emphasise the importance of the semiotic aggregate within the space in which we live in understanding a person's everyday life: The main expected outcome of this pilot study was to determine whether pedestrians/cyclists noticed the road signs in the location of study. This approach is inspired in part by current issues raised in the UK regarding existing traffic signs: 'A traffic sign in the center of York has been described as "a waste of space" and "odd" by a councilor who wants to see less street clutter in the city' (The York Press, March 3, 2011). As suggested by Scollon & Scollon (2003):

> *[W]e believe that in order to understand how social actors act in the day-to-day world of crossing the street or in any of the very many other situations in which we find ourselves, we will need to give much closer examination to the semiotic aggregates within which we live. (p. 193)*

Thus, as for the observation methods, it is also necessary to identify some other semiotic aggregates that can be seen by pedestrians apart from the road traffic signs that are regulated by the municipality or the authorities. These may include

public notices, commercial posters or other significant elements that appear to exist in the peripheries of human perception during travel in the space. The selected location for the study was an area with a high density of pedestrians in Aalborg city centre. Being a foreign student gave me the opportunity to position myself as an observer in walking around unfamiliar places in Aalborg.

## DISCUSSION OF PILOT OBSERVATIONAL STUDY MAIN FINDINGS

In daily life, people navigate their routine space based on their spatial knowledge (Golledge, 1997) and sense of orientation, and sometimes based on their unconscious behaviour towards their choice of route and decision-making. In the pilot study of pedestrians' behaviour towards existing road traffic signs in Aalborg, observation was undertaken in the Slotsgade area, as can be seen in Figure 4. Based on observations, there were more pedestrians walking through the area during peak hours than during off hours. However, during the observations, none of the pedestrians noticed or looked at the road signs in the pedestrian walking zone area (which doubles as a place to 'hang out'). Though a group of foreign students (non-Danish speakers since they spoke in English) stopped to talk right in front of a road sign (Figure 4b), they paid no attention to it. This shows that the signs are not relevant to pedestrians. There were times when the sign was used as a prop for parking bicycles.

**(a)** Date: 6 Aug 2011 Time: 9 am (Saturday)

**(b)** Date: 6 Aug 2011 Time: 12.47 pm (Saturday)

Figure 4. Pilot observations


Figure 5. Road signs in Aalborg, Denmark

In another observation of 'signs in place' in downtown Aalborg, several regulated signs are identified that serve different functions. The signs are found to be used as temporary signs (see Figure 5 [a]) that are normally only placed when roadwork is in progress. Other signs, such as in Figure 5 (b) to (e), are signs that are permanently positioned on the streets of Aalborg to provide drivers, pedestrians and bicycle users with warnings and information.

### 2.2.3 EMPIRICAL FINDINGS AND ANALYSIS

In this section, I will present the main results of the various methods of investigations (not including the pilot study conducted in the first stage of the empirical inquiry). There were three strategies in analysing the data from the qualitative methods of inquiry conducted. They are explained in the following three sections, corresponding to the three methods of investigation:

(a) Non-participatory observations
(b) Photographic documentation
(c) Activity-oriented focus group interviews

#### 2.2.3.1 NON-PARTICIPATORY OBSERVATIONS

##### TRACKING AND VISUAL NOTE-TAKING

During the non-participatory observation methods phase in Glasgow, Scotland, ten tracking activities were conducted in mapping pedestrians' movements. The tracking varied in terms of the length of the tracking routes. Furthermore, there were several pedestrians who were tracked one or two blocks away from the point of departure. Therefore, there are only three detailed descriptions and analyses of the tracked pedestrians. The chosen pedestrians were selected based on their routes and the tools used for destination searching that they articulated. Some of the findings of this non-participatory method are discussed in **Paper#3**. There were three approaches used to track and map the movements of each pedestrian in this study, which took place in real time. Firstly, the styles of tracking were examined using the Road Tripper tracking application on the iPad, and visual notes were taken using the Penultimate application. Secondly, the Penultimate application was used in drawing the tracked maps, which was done using the integration of pictures captured using a digital camera. Lastly, a pre-downloaded map from Google was used and the journey of the pedestrian was recorded manually by drawing, with supporting images captured using the camera. The rationale for using the digital camera was that the resolution of the iPad's built-in camera is low and sometimes the images are not clear, especially when the weather is cloudy. In terms of note-taking or field notes for the study, notes were taken in bullet-point form during the field observations and then typed up as more detailed descriptions according to their relevance to this thesis. Thus, most of the field notes are in the form of sketches and scribbles on the iPad.

The 'tracked maps' were then analysed from the point of departure to the final destinations, along with the supporting images and field notes. Some technical and practical issues arose during the observations, such as the points that appeared on the application and the unintended lines on the maps during tracking (Road Tripper application). However, the most important aspects of the analysis in the tracking method are the 'red line' indication of the starting and stopping points and the

street names indicated on the map (Refer to **Appendix D** for examples of tracked maps of pedestrians)

Even though the maps used in this application are not as accurate as they should be, they helped to guide me as a researcher on specific areas or locations within the study parameter. Consequently, other styles of tracking were used to create a visual diary by directly drawing the maps and locations of the tracked pedestrians. The method of tracking/shadowing the pedestrians used in this study was a mentally and physically challenging experience. There were times when I had difficulty in tracing their movements because there were many other pedestrians on the streets. However, this method helped me to look into the interactions between the pedestrians and the semiotic aggregates of urban spaces, such as the traffic lights, advertisements, street names, building structures and street maps. Furthermore, the three tracking activities enabled me to observe how pedestrians behave in the environment when searching for their destination. The tracking methods were intended to gain mobilities insight, not just from the movement from point A to point B of the tracked individual, but also from the activities that he was involved in during the journey. The method of documenting video data could be improved upon by using a better quality embedded camera since the low resolution of the iPad's built-in camera makes it difficult to obtain quality video data. However, the use of an iPad in note-taking and mapping the journey while shadowing the tracked individuals gave a large amount of data on mobility practices. The next method was used to provide perceptions from a different kind of interview: an activity-oriented focus group. This method is the most significant data collection instrument used to unravel the behavioural aspect of participants in relation to their making sense of signs.

#### 2.2.3.2 PHOTOGRAPHIC DOCUMENTATION

##### COMPARATIVE VISUAL ANALYSIS OF SIGNS AND SIGNALS IN AALBORG, DENMARK AND GLASGOW, SCOTLAND

The method of gathering data from images of the environment, specifically urban spaces in Aalborg and Glasgow, provided rich qualitative data. It was adapted from the methodological view of semiotic aggregates as part of geosemiotics theory. The two different panoramic views of the urban context were analysed according to the elements of semiotic aggregates in each location. The analysis is based on traffic signs and signals that can be seen in the surroundings that are part of the

materialities in geosemiotics and mobilities practices. The analysis encompassed coded signs and signals and the targeted users.

*VISUAL ANALYSIS OF TRAFFIC SIGNS AND SIGNALS ON SLOTSGADE STREET, AALBORG, DENMARK*

Figure 6. Panoramic view of semiotic aggregates consisting of traffic signs, signals, road markings and other elements in and around a pedestrian area on Slotsgade Street


Figure 7. Traffic signs, signals and road markings in Aalborg, overlooking Slotsgade Street

The images in Figure 6 and Figure 7 were taken on a Sunday, when many of the shops in Aalborg are usually closed. As a result, there were hardly any people walking in the area at that particular time. The urban landscape of the Slotsgade area contains six elements of signs and signals that are regulated for road users. Each of the signs and signals functions differently and is coded for specific types of traffic. The signs and signals were identified and the functions of each are described in Table 1.

Table 1. Relationships of signs and symbols, functions and target users in the Aalborg research area

| | **Signs and signals** | **Functions** | **Users** |
|---|---|---|---|
| 1 | Slotsgade sign | To indicate the name of street (Slotsgade) | Vehicular drivers, pedestrians and bicycle users |
| 2 | Traffic lights | To control the negotiation of movement among pedestrians, motor vehicles and bicycle users | Vehicular drivers, pedestrians and bicycle users |
| 3 | Groups of regulatory signs | To notify drivers of and prohibit drivers from exceeding the maximum speed limit; to notify drivers of the end of pedestrian zones and to prohibit waiting in or parking vehicles | Vehicular drivers |
| 4 | Ensrettet sign | Mandatory sign to direct vehicle users to follow the indicated arrow direction (Danish word used) | Vehicular drivers and bicycle users |
| 5 | No parking sign | To prohibit motor vehicles from parking in the area | Vehicular drivers |
| 6 | No left turn | To prohibit users from turning left | Vehicular drivers |

## *VISUAL ANALYSIS OF TRAFFIC SIGNS AND SIGNALS ON GORDON STREET, GLASGOW, SCOTLAND*

Figure 8: Panoramic view of semiotic aggregates consisting of traffic signs, signals, road markings and other elements on and around the pedestrian path on Gordon Street

Figure 9. Traffic signs, signals and road markings in Gordon Street, Glasgow, Scotland

In Gordon Street (Figure 9), similar traffic signs, signals and road markings can be seen along the pedestrian street. However, the 'No motor vehicles' sign prohibits the daily traffic of vehicles except for loading vehicles at specific times. Table 2 shows the relationships of signs and symbols, functions and target users in the Glasgow research area.

Table 2. Relationships of signs and symbols, functions and target users in the Glasgow research area

| | **Signs and signals** | **Functions** | **Users** |
|---|---|---|---|
| 1 | Gordon Street sign | To indicate the name of street (Gordon Street) | Vehicular drivers, pedestrians and bicycle users |
| 2 | Traffic lights | To control the negotiation of movement among pedestrians, vehicles and bicycle users | Vehicular drivers, pedestrians and bicycle users |
| 3 | 'No motor vehicles' sign | To notify drivers of and prohibit drivers from exceeding the maximum speed limit; to notify drivers of the end of pedestrian zones and to prohibit people from waiting in or parking vehicles | Vehicular drivers |
| 4 | Street map sign | Information sign guiding pedestrians using a large-scale map | Pedestrians and bicycle users |
| 5 | Temporary roadwork sign | To notify and warn road users of current roadwork | Vehicular drivers, pedestrians and bicycle users |

Based on photographic documentation findings in Aalborg and Glasgow, there are similarities in the way the urban streetscapes were designed and developed. These similarities include materialities such as the traffic signs, pavement and both fixed and temporary signs regulated for road users. The findings from this visual documentation approach will be used in the Sign Design Manual as case studies.

#### 2.2.3.3 ACTIVITY-ORIENTED FOCUS GROUP INTERVIEWS

In the focus group interview method of investigation, there were 16 participants who voluntarily agreed to participate through e-mail replies. The focus group gathered participants of different backgrounds in terms of age, level of education, country of origin and employment/student status. I was lucky to have two participants from Malaysia. Some information on their experiences was shared with other participants in the group. Their experiences and knowledge on the road signs in Malaysia are very significant in this research, as they help to support my argument on the state of the current Malaysian road sign system. As a moderator, conducting the focus group interviews was quite challenging. There were twelve steps in conducting the interviews:

1. Distribute invitations and posters seeking volunteers/participants;
2. Wait for feedback and replies;
3. Determine the date, time, and place agreed upon by all participants in each group;
4. Reply to the emails with details for interviews;
5. Set up the room with digital camera (with video recording) and tools for activities;
6. Make sure the digital devices function properly (video recorders, digital video recorders, digital camera, laptop);
7. Take notes whenever possible;
8. Provide token of appreciation (small gifts) for each participant;
9. Ensure the devices worked properly again;
10. Ensure the drawings are labelled;
11. Ensure the room used for interviews is left clean and tidy for others to use;
12. Listen to/watch the recorded interviews and write the summary.

Overall, the focus group interviews were interesting and fun. Some people might argue that 'fun' is not a term that should be applied to conducting PhD research. I would disagree, since in developing the qualitative inquiry with groups of people—some of whom I had never met or had contact with before—building casual communication was significant. Thus, I chose to integrate two activities that could break barriers to interaction between the moderator (me) and the participants. It

was not easy to persuade participants to open up and tell their stories, but in the map-drawing activity, some participants revealed a talent for drawing a mental map on paper in a very effective way that helped others understand. Map drawings are commonly used methods in urban geography and environmental psychology (see Byrne, 1979; Coluccia et al., 2007; Taylor & Tversky, 1992). However, this research is not looking into in-depth psychological processes *per se,* but only the basic context, such as the thematic analysis that is commonly used to study the behavioural aspect of a person through activity-oriented focus group data collection. There were seven steps in my analysis of the focus group interview data:

1. Transcribe the data (audio material);
2. Organise the material according to groups;
3. Generalise some potential themes that could relate to the transcribed interviews and previous findings in the literature;
4. Review literature that is related to the empirical framework;
5. Select themes for which it is possible to generate valuable data from experiences described and visual materials;
6. Refine the themes;
7. Report the transcribed data (quotes) and visual representations in the form of maps and photos according to relevant themes.

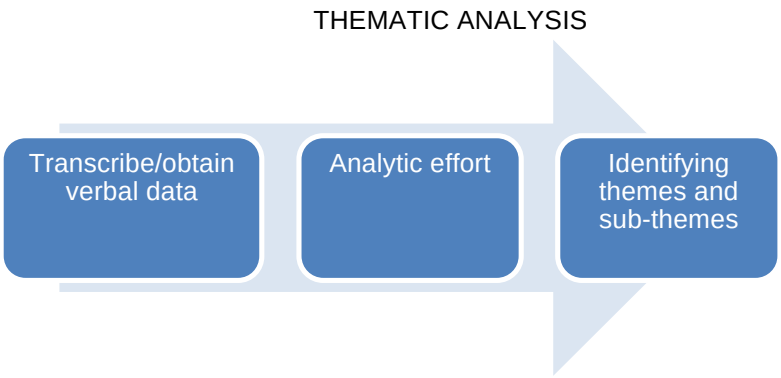


Figure 10. Basic thematic analysis (Source: Howitt, 2013, p. 178)

In order to analytically approach the activity-oriented focus group interview, this study used thematic analysis (Braun & Clarke, 2006; Grbich, 1999; Howitt, 2013; Wilkinson, 2003), which is commonly used in the field of psychology. As seen in

Figure 10, Howitt (2013) illustrates three basic elements of thematic analysis. As argued by Rapley (2007), the focus of analysing qualitative data starts with 'close inspection of a sample of data about a specific issue' (p.276). The archived raw data from recorded voice interactions was transcribed manually using Microsoft Word and labelled with specific themes. The themes were then refined according to relevancies of the phenomenon and raw data selected. Since there were also drawing and manipulated activities during the discussion, linkages between the themes and other data such as map drawings were generated. Thus, during the interpretation of data, the analysis was reported according to specific themes obtained from the focus group discussion. The analysis report was written in two parts: **Paper#4** and **Paper#5** of this thesis. In summary, this report consists of three main areas of discussion:

1. How were the themes selected and chosen for analysis?
2. What is the difference between 'storytelling thematic analysis' and 'mapping and photo-interview analysis'?
3. How does this thematic analysis answer the research questions?

The themes were selected based on raw data from the interviews as well as relevant literatures. Calder (1977) highlighted three different types of focus group used in market research, which was adapted in this study. In this study, I used phenomenological groups to assess the 'participants' unconscious motivation and participants' common sense conception and everyday explanation' (Calder, 1977, p. 255). The rationale for conducting focus groups, as mentioned by Morgan and Spanish (1984), was to gain knowledge from a small group of people in discussing a specific topic.

Figure 11. Four separate activity-oriented focus group settings

The activity-oriented focus group interviews (Figure 11) were conducted to gain insight into how the participants make sense of signs in their daily lives. The discussions in the focus groups were based on a specific framework of themes. The focus group sessions also included some activities derived from the concept of visual semiotics (e.g., advertisements, signs and signals) and place semiotics (e.g., streets, buildings) by Scollon and Scollon (2003), in comparison with the real world signs and sets of manipulated signs. Thus, the activities conducted during the focus group discussion explore both the storytelling thematic analysis and the mapping and photo-interview analysis. The storytelling thematic analysis consisted of narrations and discussions between the researcher and the participants, revealing their past and present experiences of moving between urban spaces. The application of Web-based Google Maps (also considered a mobile method) helped to compare the data from participants (drawings) and the actual reality (Google Street view photographs). During observational data collection, it is impossible to understand people's behaviour when looking at signs. Therefore, the use of manipulated images was important in ensuring that the participants could see the appropriateness of signs in urban spaces. The manipulated photo-interview consisted of discussion with participants concerning the manipulated images of traffic signs that they were shown.

Since this is an exploration of methods of investigation in unfolding the participants' making sense of urban traffic signs in their daily lives, I encountered some practical issues and problems during the process. Some portions of

conversations in the interviews could not be transcribed accurately because some of the words were hard to understand. A few of the participants were not native speakers of English, which resulted in some mispronunciations and misunderstandings. However, the conversations are transcribed according to the researcher's best understanding of their meanings. More detailed analysis of each theme is provided in **Paper#4** and **Paper#5**.

## 2.3 STRENGTHS AND WEAKNESSES OF THE EMPIRICAL EVIDENCE

In relation to the explorations of methods or approaches in conducting the empirical research, I have divided the discussion into two parts. First, I look into the relationship between the field observations and activity-oriented methods in relation to mobility practices in urban spaces. Second, I discuss the role of the geosemiotics approach that was integrated into the activity-oriented focus group interviews.

### 2.3.1 FIELD OBSERVATIONS VS. ACTIVITY-ORIENTED FOCUS GROUP INTERVIEWS IN INVESTIGATING MOBILITY PRACTICES IN URBAN SPACES

In mobility studies, scholars have come up with numerous methods for observing people when dealing with everyday experiences and practices. The terms 'mobile methodologies' (Fincham, McGuinness & Murray, 2010) and 'mobile methods' (Büscher & Urry, 2009; Büscher et al., 2010) were part of my inspiration and the adaptations I made in conducting the empirical research. Thus, part of the goal of the field observation in Glasgow was to explore some recommended mobile methods by using digital devices and onsite interviews. A non-participatory technique was used to investigate the spatial behaviour of people around the city of Glasgow, Scotland. The tools used to collect the empirical data in Glasgow were direct observation, mapping of travel flow, photography and video recording. As the accuracy of the device used during the investigation was unpredictable, some of the documented data was unusable, especially the video recordings. Glasgow, which is the largest city in Scotland, is also "Glasgow is one of Europe's top ten cities for business friendliness and human resources" (Murray, 2015). In terms of mobility practices, it seems that some people who have their own vehicles tend to take public transport, such as buses or trains, or walk to the city centre rather than

drive. This is due to the fact that the cost of parking is very high in Glasgow. In fact, while living in an apartment in the city centre, a friend's brother requested that he be allowed to park on the premises of the apartments, which is only permitted for the residents thereof, to avoid paying the expensive parking charges.


Figure 12. Street signs in Glasgow, Scotland (March–April 2012)

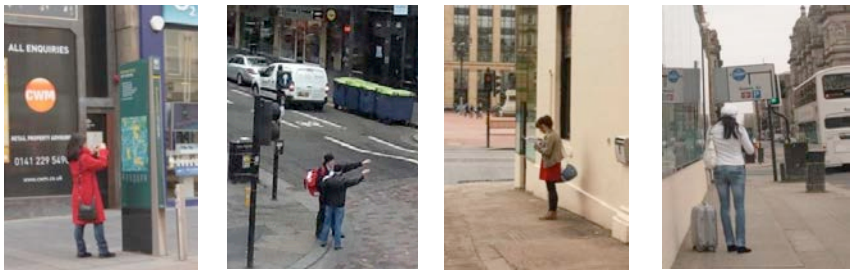


Figure 13. Ways of getting directions in Glasgow, Scotland (March–April 2012)

In order to frame the focus of this research, it is important to understand the most significant theories that relate to the research area and the problem statements. In order to understand more about the relationship between the theories and the actual 'actors' on site, more development of the current methods needs to take place. In an article by Kusenbach (2003), the author states that in fieldwork it is best to 'go along' with the 'actors' rather than just observing their actions. However, I would argue that there are also difficulties that limited the go-along interviews either by getting consensus from the subjects or inadequate knowledge of the study areas. The empirical data and findings from Glasgow's pedestrian observations can be found in **Paper#3**. The findings from the empirical data through observations are used to experiment with the mobile methods that were outlined by other researchers. The outcome of the data will be used in the 'visual documentation of signs design manual', which can be found in **Paper#6**.

In conducting the field observation, I chose to act as both an observer and a marginal participant simultaneously. Zeisel (2006) suggested that in environment-behavioural research, 'marginal participant vantage-point' is considered a natural observational method for everyday life practices. Being a pedestrian in the urban context in Glasgow gave me, as the researcher, a richer experience in conducting the observation. It is a challenge to investigate patterns in pedestrians' naturalistic behaviour in an urban environment, especially with a congested pedestrian flow such as that found in Glasgow. However, since the city is pedestrian-friendly, there are advantages and disadvantages to choosing to be a pedestrian observer instead of an observer of drivers or cyclists. Since there are also urban spaces that separate motor vehicles and pedestrians, this study also focuses on the relationship between pedestrians' behaviour and perceptions when in their own area (pedestrian zone).

In his book *City,* Whyte (1988) suggested that the way to observe people's behaviour in the urban environment is through the bird's-eye-view lens. Another researcher, Jensen (2006), investigated the negotiations among road users at the Nytorv, Aalborg, Denmark intersection space through both lenses, above and below. In my own reflections on this study of the Glasgow context, I find it important to get a different angle and perspective on the social behaviours of the pedestrians; this method of mapping the travel flow by using a digital device is not only an exploration of 'mobile methods' but also recording the social behaviour in real time by using the iPad applications. During the two weeks before I started my observation, I had difficulty in finding the appropriate applications to use in tracking pedestrian behaviours. There are many different applications available online, although some of the really good ones require payment.

Currently, global positioning and geographic information system devices are used for tracking when analysing the tempo-spatial movement of pedestrians in the urban environment (see Koshak & Fouda, 2008; Shoval, 2008; Stauffer & Grimson, 2000; Van der Spek, Van Schaick, De Bois, & De Haan, 2009). However, since my goal was to 'shadow' the pedestrians unobtrusively, a digital device that had several capabilities such as tracking, data gathering from the Internet, visual note-taking, and voice and video recording, as well as capturing *in situ* images of the environment, was used instead.

The purpose of the non-participatory observation/shadowing as part of the mobile methods (Jirón, 2010) is to describe and analyse the way people interact with their

surroundings (urban spaces). Researchers in the past have demonstrated that the presence of observers in applied settings influences subject performances. While implementing this approach, several ethical issues arose that may or may not affect the validity of the data. The most common ethical issue involved in gathering data through documenting natural actions and performances by the subjects of studies is obtaining their consent. However, it is arguable that researchers have the right to document and observe anyone in a public setting for purposes of scientific research. There were several considerations that were outlined for the shadowing approach:

(i) The goal of studying the subject is to observe naturalistic behaviour towards their surroundings in public spaces.
(ii) The documented data, including photographs, voice recordings, video recordings and field notes, are only used appropriately, without exposing the subject's identity directly.
(iii) The researcher should not violate the privacy of the subjects or violate the law (by entering a home or workplace).
(iv) The selected locations are public spaces. (In Glasgow, there are a number of CCTV cameras at every street corner as part of security measures implemented by the councils).

Being watched or observed may influence people's actions and reactions. In the case of non-participatory observation or shadowing subjects, it is also found that information about thought processes, such as the motivations or perceptions of the studied subjects, are difficult to observe. In addition, when shadowing people, the subjects (either the individuals being shadowed, or the elements of traffic signs and regulatory) were documented according to the needs of this research. There was no direct contact with the shadowed subjects in order to eliminate the biases in documenting their natural behaviour. Therefore, as part of my experience as a researcher, there are always advantages and disadvantages in terms of the behavioural issues of shadowing the subjects in public spaces. As Kazdin (1979) argues, "When observers are monitored obtrusively by an experimenter, their interobserver agreement and use of particular behavioural categories differ from when they monitored unobtrusively" (p.714).

In order to support the empirical data from observational methods and answer the research questions outlined in Chapter 1, the research needs to be supplemented by more explicit everyday life experiences from different groups of people.

Therefore, focus group interviews were conducted to investigate how the participants make sense of signs in their everyday lives as well as to explore their perceptions of symbolism and meanings of road traffic signs that are regulated in most countries. Details on the results of the focus group interviews were divided into two papers; **Paper#4** and **Paper#5.** The rich data from the activity-oriented focus group interviews unfolded the experiences and knowledge of participants regarding their sense of signs in their daily lives.

### 2.3.2 SCOLLON AND SCOLLON'S IDEA OF GEOSEMIOTICS IN ACTIVITY-ORIENTED FOCUS GROUP INTERVIEWS

Scollon and Scollon (2003) introduced visual semiotics, which focuses on the analysis of signs and pictures as semiotic structures. In the focus group interviews, the activities were inspired by geosemiotics methods of observation. The use of two types of activities—map drawing and discussion of manipulated signs in place—provides rich empirical data. However, in the future, I would be more selective in terms of deciding whether to use one or both as tools due to the fact that the time taken for drawing journey maps was longer than anticipated. During the focus group interviews, the participants described not only their recent experiences but also their childhood experiences. From the geosemiotics perspective of analysis, the interesting part of the focus group interviews was looking at the relationships between image representation and verbal representation revealed through the manipulated image and drawing activities. Thus, in analysing the map drawings, which represent the participants' mental maps of their journeys, verbal representations (their storytelling) were also used to strengthen the analysis. In geosemiotics analysis, there are numerous methods that can be used in relation to visual materials. Map drawings or doodling are common methods used in urban and visual communication research. The tool is used to measure the level of human interpretation of the real world. The manipulated signs in urban spaces routine is a more challenging instrument to be used as it depended on the skills of the researcher in manipulating the image versus the participants' knowledge of the manipulated signs. Thus, the geosemiotics approach and activities can be used as a visual analysis tool in the field of design practices.

### 2.3.3 SUMMARY OF RESULTS AND ANALYSIS

This research has implemented several different approaches in gathering empirical evidence regarding geosemiotics and mobility practices in everyday lives. The results and analysis of each method used are summarised in Table 3. The main empirical data was obtained through activity-oriented focus group interviews. The observations and photo documentation not only supported the empirical evidence in terms of mobile methods techniques, but also supplement the design manual which is part of the publication compiled in this thesis.

Table 3. Summary of Results and Analysis

| Methods | Summary of results and analysis |
|---|---|
| **Non-participatory observations** | The tool used during the observation and tracking of pedestrians was challenging and risky. It was hard to conduct go-along interviews in the business area of Glasgow (setting aside the difficulties arising from the interviewer being a foreign person). There were few attempts to conduct the interviews on few selected pedestrians. However, in overall observations, most pedestrians in Glasgow were found to be using mobile applications, printed maps or road signs, or the help of other people when searching for their destinations. |
| **Activity-oriented focus group interviews** | The dynamic interactions between the moderator and the participants elucidated varied experiences and perceptions of the ways individuals make sense of signs in their everyday lives. These activity-oriented focus group discussions were time-consuming, especially when the participants were asked to draw their journey maps. Most of the participants took a longer amount of time to draw than the researcher had anticipated, as they needed to remember or had to guess at the necessary signs. |
| **Photographic documentation** | Most of the observations were supported using a digital camera as documentation tool. Thus, the archived photographs from the pilot and actual observations provide rich data for 'visual methods' as suggested by Pink (2013). Although this method of photographic documentation was initially used as a recording tool, it was found to be a very useful approach for extending future activity-oriented focus group discussions or go-along interviews. |

Based on Table 3, there are several aspects of the methodological approaches used in this study that can be applied in new design research practices. For instance, this study tried to define the relationship between an individual's semiotic alertness and how she moves between urban spaces. A person makes sense of signs that they have ever experienced or had knowledge of the specific signs they encountered. The meaning of signs is related to generic and specific codes regulated in the urban environment. Knowing the codes either through knowledge or experience of regulated traffic sign is important in order to understand what the signs mean. However, sometimes common sense also affects a person's behaviour. Another important aspect of mobility practices that could be considered in this context is the speed of movement. As pedestrians, people usually have more time to think and relate newly encountered objects to their existing knowledge in understanding the meaning of signs than they would have in a vehicle. As noted by Degen, DeSilvey, and Rose (2008), "The immediate environment falls into the background and walking happens almost automatically. This look happens particularly often in familiar environments, when we navigate almost blindly" (p. 1910). However, when a person is behind the wheel, he or she has only a limited amount of time to think and thus acts only according to automated thinking based on perception (Fitzsimons, Chartrand, & Fitzsimons, 2008). In the next Chapter 3, I conclude with the theoretical and empirical contributions of this research.

# 03 CHAPTER

# CONCLUSIONS

# CHAPTER 3. CONCLUSIONS

Throughout this thesis, there have been explorations and reports on research related to the Aalborg and Glasgow case studies that could improve future urban design and visual communication practices in Malaysia. The research I have conducted throughout the process of producing this thesis has provided valuable insight into the interrelations of geosemiotics, mobility theories and empirical research that can be further extended toward an open discussion of future guidelines for the Malaysian urban streetscape framework. In Chapter 1, I discussed the idea that this research's significance can be used as a building block in investigating people's behaviour in public spaces, especially when looking at visual communication material such as the road signs. Chapter 2 discusses the findings and analysis that contributed to the empirical data of this research. Thus, this chapter looks into the relationship between the motivations of this research and the data collected based on the outlined research questions. What follows is a summary of the main contributions of this research, an open discussion of the proposed guidelines and concluding remarks.

## 3.1 RELATIONSHIP BETWEEN THE RESEARCH QUESTIONS AND THE EMPIRICAL FINDINGS

In this research, the use of qualitative inquiry in investigating the research questions helped to determine several potential directions for future researchers. I will highlight several outcomes that are relevant and important to answering each of the three original research questions. Once again, the key question informing this research was: ***How do people make sense of traffic signs in urban settings, and how can this knowledge be utilized to inform the creation of better design policies and manuals?***

To recapitulate the research questions, the central analysis of my research was based on the relationships among people, the built environment and road signs, specifically the traffic signs. The data collection methods of activity-oriented focus groups, travel flow mapping and photographic documentations from observations each presented different methodological challenges for me as a researcher.

Below is a summary of the relationships between the research questions, the overall research process and the strategies employed.

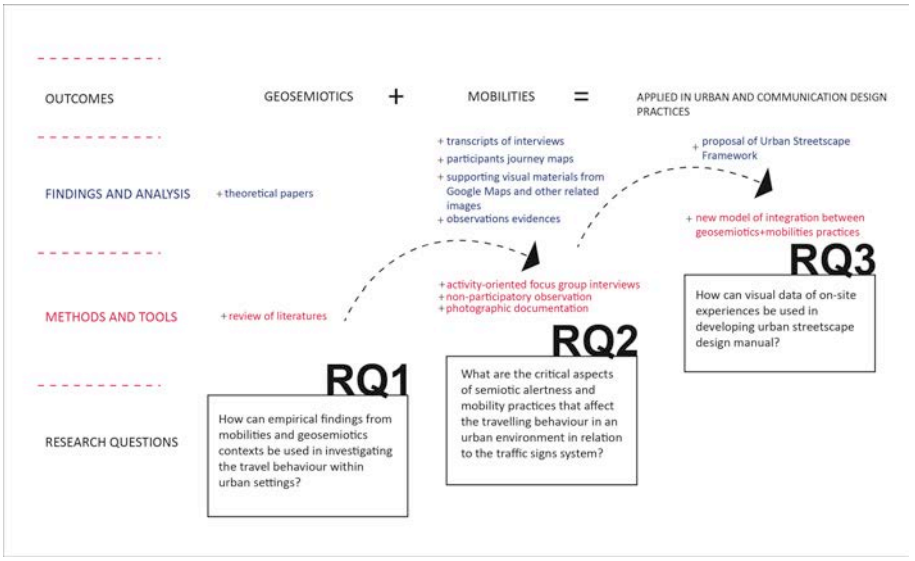


Figure 14. Summary of interrelation between research questions and overall research process

As Figure 14 shows, each research question contributed to different levels of knowledge and practice within the overall research framework. We now turn to specific reflections on each research question.

### 3.1.1 RESEARCH QUESTION 1

*How can empirical findings from mobilities and geosemiotics contexts be used in investigating the travel behaviour within urban settings?*

In unfolding a person's way of choreographing his travel flow in everyday life, theoretical and empirical aspects of travel flow in urban spaces were investigated through secondary data (literature reviews), as written in published **Paper#1**. In **Paper#1,** which concerns choreographing travel flow, the relationship between road signs and preparation for visiting new places was examined, since most people search only for destinations and places of interest on the web. As indicated in the paper, "it may be interesting to consider whether people research the road

signs of a foreign country prior to visiting it in order to obtain an understanding of do's and don'ts when driving or walking in that country" (Hamid, Jensen & Andrade, 2012). Thus, deriving points from the theoretical aspects of investigation presented in **Paper#1, Paper#2** is another theoretical paper outlining the relationship between the adapted model from Jensen and the intended research objectives.

In **Paper#2**, the discussion focuses on important elements of mobilities and geosemiotic empirical approaches that are relevant with this study. In addition, this paper helps to relate Jensen's *Staging Mobilities* model with the adapted model which underpins the empirical methods for this study. This paper opened up discussion on the interrelation between people, road signs and the urban environment. These three areas of investigation are important guidelines to illustrate the best tools to be used in the empirical data collection. The research question is formulated to investigate the understanding of the geosemiotics and mobilities concepts in relation to a road sign design system. In current research, scholars conducted numerous research methods to investigate the notion of geosemiotics in urban spaces in terms of the discourse analysis on outdoor advertising, subway signs, multilingual street signs, and other also street art such as graffiti. Both papers discuss theoretical and empirical approaches conducted by scholars that are relevant to geosemiotics and mobilities. The empirical evidence obtained from other scholars in the field of geosemiotics and mobilities show that there are significant methods that can be utilised in the study of signs in urban spaces. In the current research of sign design in urban spaces, visual coding on regulatory sign systems is meant to be understood at drivers' and road users' first glance.

Experience and knowledge are also considered significant aspects of investigating travel behaviour in urban spaces. For example, a person with a driver's licence understands more about the meaning of signs that regulate the streets according to their categories: regulatory, warning and informational sign. According to law, to drive a vehicle or motorcycle, a person must have the correct driving licence, be of minimum driving age and meet the minimum eyesight rules. However, some of the road signs placed in urban spaces are not specifically for vehicular drivers, as they also address pedestrians and cyclists. Thus, understanding the pictogram is better than a text label for road signs, because identifying an image is easier and faster than reading the text (see Collins & Lerner, 1982; Tijus, Barcenilla, de Lavalette, & Meunier, 2007).

This research question helps to outline several methods that are considered relevant enough to be conducted throughout this research process. There are also important guidelines that were used to illustrate the appropriate activities and mobile methods for this research. In relation to geosemiotics, several activities that are considered sufficiently important to be adapted in the collection of data are:

- Photo manipulation through the representation of real-world actions
- Drawings exercises
- Observations of strangers
- Modality through image comparisons

In the study of geosemiotics, visual materials such as photographs and illustrations are significant tools for discovering visual elements in the cities, including the road signs. As mentioned by Scollon and Scollon (2003:1-2), the meanings of signs in place are bound only when the sign is posted firmly in its place.

On the other hand, mobile methods which are discussed in current literatures include:

- Observing people's movements ('follow the people')
- Mobile Video Ethnography-Time-Space diaries
- Art and Design Interventions and experiments
- Capturing 'atmosphere'
- Mapping 'real' places

These mobile methods were used as guidelines in collecting the empirical data. In current research, GPS and GIS technology are used as tools in analysing the tempo-spatial movement of pedestrians in the urban environment (Koshak & Fouda, 2008; Shoval, 2008; Stauffer & Grimson, 2000; Van der Spek, Van Schaick, De Bois, & De Haan, 2009). The selected tools, either from mobilities or geosemiotics, will be selected and used to investigate the relationship between people, built environment and the road signs, as outlined in the framework adapted from the Staging Mobilities model (Jensen, 2013).

### 3.1.2 RESEARCH QUESTION 2

*What are the critical aspects of semiotic alertness and mobility practices that affect the travelling behaviour in an urban environment in relation to the traffic signs system?*

In everyday life, people remember accurate information about their surroundings, or to use the psychological term, their 'spatial environment' (Howard & Kerst, 1981). Since visual legibility is important in the urban and visual communication design fields, the findings related to the research question help to explain several different interpretations of visual qualities in the context of legibility of signs in urban spaces through people's experiences. The method of investigation used in this case was activity-oriented focus group interviews, with 16 participants from different backgrounds and cultures. At first, cultural background was not an important unit of analysis in this context, but in the analysis of the focus group interviews it was found that cultural background influenced the interpretations and perceptions of signs of the participants. As argued by Hall (1996), culture is an integration of shared conceptual maps, shared language systems and codes that are administered from within. Thus, these findings show that culture plays an important role in understanding specific codes governed by the authorities within urban spaces. In addition, the focus group interviews involved not only verbal discourse but also two integrated activities. The activities were influenced by the methods commonly used in the fields of psychology, geography, social sciences and urban studies. This activity-oriented technique is also derived from geosemiotics activities as outlined by Scollon and Scollon (2003).

The most challenging methodological aspect of this type of activity-oriented focus group is the duration of interviews. Planning longer interactions in order to gain more explicit data from the activity-oriented approach would provide a clear benefit to future studies. This is due to the time needed by participants to draw their travel journeys based on recalling and guessing at the locations and signs they encountered. As for the materials used in this study, it is best to project the manipulated images on a large screen instead of using a laptop, as there are some details in the images too small to be readily noticed on a laptop screen. In the future, an alternative way of improving this research method would be to adopt visual ethnography (Pink, 2013). As mentioned by Banks in Pink (2013, p.49), there are three visual methods: making visual representations, examining pre-existing

visual representations and collaborating with social actors in the production of visual representations. This method could provide an extension to the activity-oriented focus group interviews. In the current findings from the interviews, it was observed that some of the participants were aware of the regulated traffic signs according to their mobility practices. This can be seen through the drawn signs that were mapped. Thus, by implementing the extended visual methods for further research, expected outcomes could include photographs of signs that can be seen along participants' routes (by using the 'collaborating with social actors in the production of visual representations' visual method). Another significant technique that can be used in the future to extend the current visual method is through photo-elicitation by the participants. Young and Barrett (2001) suggest that the photo-elicitation methods can be analysed through the interpretations from the participants. Thus, it would be a turning point for me as a researcher to integrate the drawings, photos and onsite experience for the participants in the study of human behaviour within urban environment.

In addition, in future research, it might be more practical to conduct the go-along interviews in my own home town in Malaysia, working with people of similar cultural backgrounds. Kusenbach (2003) suggested that go-along interviews provide three main significant advantages: perception, spatial practices and biographies. As noted by Evans and Jones (2011), 'Being able to capture the distinctive characteristics of a place can help meet these challenges and one practical means for practitioners to achieve this is through undertaking walking interviews with community members' (p. 857). Thus, in future research, it would be best to ensure a good relationship with the community in order to obtain better public consultations. This could potentially produce data that could be presented to policy-makers as findings from conversations with the community to be considered before making any decisions in planning the public sphere, such as urban landscapes.

### 3.1.3 RESEARCH QUESTION 3

*How can visual data of onsite experiences be used in developing an urban streetscape sign design manual?*

In another empirical data collection, non-participatory observations were conducted in Glasgow, Scotland to experiment with the onsite mobile methods visual data. In investigating how pedestrians choreograph their movement, the bodily movements of selected individuals were documented using still images during non-participatory observations. However, since mobility practices involve more than simply moving from A to B, there are some connections to be made between a person's mobility practices (in this case, walking), the activities in which she engages (searching for shopping areas, restaurants, central stations or other points of interests in the city) and information from the environment that could lead a pedestrian to her final destination (in this case, street names, traffic lights, street maps, regulatory signs and place names). The methods of non-participatory observation and mapping travel flow among pedestrians conducted in Glasgow helped to develop a threefold concept of walking in downtown Glasgow. First, when pedestrians search for unfamiliar or specific places in the city centre, they tend to take a longer time to reach their unfamiliar destinations than when they are travelling to a familiar destination. Evidently, pedestrians tend to move slower when they are engaged in shopping or leisure activities. In the findings, they are found to stop for street performance acts during their journey. Second, pedestrians tend to walk faster with more anxious facial expressions when they are rushing to nearby train stations. Third, when searching for information in the environment, some pedestrians used printed maps (the use of the street map from Google Maps is frequent in this context) even though there was no personal contact with the pedestrians in inquiring about the map they used as a guide. The main challenge of this method of inquiry is speaking (impromptu) to the go-along interview participants. Thus, this difficulty could be ameliorated in the future by employing participants prior to data collection.

The onsite experiences such as the non-participatory observations conducted in Glasgow, Aalborg and other places visited during the process of completing this thesis have also contributed the development of the streetscape sign design manual. In relation to the theoretical aspect of geosemiotics and mobilities, the reviews from bodies of literature helped to cultivate methods of investigation that are appropriate for this study. However, there are also challenges and limitations

faced during the process of data collection. Thus, the experimental methods from data gathered in Glasgow and Aalborg on the visual documentation and tracking pedestrians contribute to the rich visual data for this study. Deriving from the data collected, especially the visual documentation, an Urban Streetscape Sign Design Manual is being proposed as a method of research through design practice approach. In **Paper#6,** the data from field studies and focus group interviews generated design principles in a more generic nature. This can be seen through the design thinking process outlined in Chapter 1. In the common design thinking process for developing a user-centred design product, understanding the empathy of users is very significant. Thus, as suggested by Bruseberg and McDonagh (2003), "designers need to widen *emphathic horizon* through contact with users and explorations of user needs" (p.59). The empirical data gathered, especially the activity-oriented focus group discussions, are not relatively new to designers. However, the activities used in the discussion differentiate the data obtained by other researchers. In my research, the activities are derived from the geosemiotics and mobilities theories, which emphasise visual data. This data were also supported by the onsite observations which gathered rich visual-oriented data. This data was used to provide case studies in the Malaysian Urban Streetscape Sign Design Manual.

In the future, the empirical data collected for this study could be a point of reference for conducting thorough scientific research within the design practices field. This thesis could inform an open discussion of what is to be included in the proposal for the Malaysian urban streetscape framework. The two main pieces of empirical data gathered through the lenses of geosemiotics and mobility practices could be used as guidelines. There are several elements of this research that could be used to improve the current *Guide Sign Design and Application* (Public Works Department Malaysia, 1987). In the next section, I discuss the relevance of the empirical evidence obtained in this study and the research contributions in the field of urban design and graphic design practices.

## 3.2 RESEARCH CONTRIBUTIONS

The qualitative methodological approaches in this study were not only rich in terms of data production but also challenged me as a researcher in selecting and organising the most appropriate experiences for the participants and in conducting the observations. This thesis examines the potential for linking empirical methods in geosemiotics and mobility research into future urban planning developments in Malaysia. In mobility research, space, objects and people/goods are the most significant contributors to theoretical and empirical practices. The study of meanings in materials, space and the 'interaction order', on the other hand, are relevant to the geosemiotic theory of Scollon and Scollon (2003) and are also key factors when dealing with mobility.

In the early stages of research, observations and explorations of mobile methods using digital technology helped the researcher to identify characteristics of people's behaviour in the real world. Willis (2007) argues that mobile technologies facilitate communication experiences within urban spaces (pp. 155–156). Thus, even though digital devices can be used as tools to gather, organise and analyse data, communication, either person-to-person or person-to-group, has different outcomes and possibilities. The purpose of the current study was to determine the rationales behind the actions of people moving between urban spaces. This study has found that, generally, most people will only remember signs that are pertinent to their mobility practices. Road signs play a very important role in urban traffic systems as they communicate information to road users for safety reasons. However, Hans Monderman, a Dutch traffic engineer, once removed unnecessary traffic signs, as he considered "most signs to be not only annoying but downright dangerous" (in McNichol, 2014). Monderman also argued that road designers failed to solve the problems in traffic systems because they reacted by increasing signs instead of removing them.

Traffic signs, signals and road markings are considered traffic safety guides for road users. There are countries, such as the Netherlands, Denmark, Germany and the UK, that have removed traffic signs (BBC News, 2010) as part of implementing traffic policy and improving the performance of shared spaces in small towns or areas of cities (Hamilton-Baillie, 2004; Pharoah & Russel, 1991). The onsite observations not only contributed to the 'mobile methods' illustrated by Büscher, Urry & Witchger (2010), but also to visual methods suggested by Pink (2012). The theoretical aspects from geosemiotics and mobilities are used as research methods

of investigations and the findings helped to enhance the proposed Malaysian Urban Streetscape Sign Design Manual.

The findings of this study suggest that there are recognisable and unrecognisable traffic signs that can be found in the urban spaces. Taking a formal traffic course is important to understanding the meanings of signs. Cultural background in terms of experiences and country of origin also had an impact on reactions to the questions and discussions. Although no specific study of cultural background was done during this research, the findings show significant influence of cultural background, especially the participants' countries of origin. This highlights the importance of including participants from different cultural backgrounds in focus group samples in order to obtain different perceptions of relevant travel journey experiences. The empirical findings of this study provide a new understanding of methods used in urban design studies and of the psychological processes emphasised in the two approaches in relation to the visual communication of traffic signs in the urban environment.

In the mobility paradigm, most of the literature focuses on the spatial environment and the objects within it. Geosemiotics, on the other hand, illustrates discourses of signs in place in the material world. I believe that empirical data gained through stories and visual activities could strengthen the previous data collected through observation of people's movement. From the point of view of semiotic alertness, one could argue that within the 'familiar' environment, all the sign-surfaces (building facades, traffic lights, billboards, traffic signs) more or less become one 'sea of signs', and one's semiotic alertness is not very high. However, the situation may differ when reading the familiar spaces. But either when the system fails (trying to conduct the study when the traffic lights are out of order!) or when one is in new territory, the level of semiotic alertness is different. As mentioned by Lynch (1960), the communication between observer and environment is two-way communication, or not just the environment communicating information to the observer. The methodological approaches discussed in this research have several features, both advantages and disadvantages, relevant for future research. Lynch also suggested that, as observers, we normally 'select', 'organise' and 'endow' the meanings of all we can take in when we move around an urban environment.

Schoenfelder and Axhausen (2010) argue that cognitive maps influence travel choice according to the individual's spatial knowledge, either in her daily life practices or when she travels to other places. In my research methods, the participants (through observations, interviews or focus group discussions) had their own ways of reflecting on their travel experiences. Using several qualitative methods of data collection to provide triangulation may make analysing the data time-consuming, but it also makes the outcomes of the data richer. The empirical evidence presented in this study consists of photographs of urban contexts, signs and the semiotic aggregates (Scollon & Scollon, 2003), pedestrians' behaviour in the urban settings, and map drawing, all of which can be considered rich data that can be applied to future research.

What can be gained from different methodological approaches in the study of design practices? In urban studies, most researchers focus on the policies, planning, structures and activities that influence urban design. Visual communication research, however, commonly focuses on the interpretations of how we look at visual representations. Thus, the interrelationship between the two fields is important in my research to fill the research gaps that can be connected through the empirical and theoretical framework of the mobilities and geosemiotic practices. Some characteristics of the theoretical and empirical research in geosemiotics and mobility can be illustrated as follows:

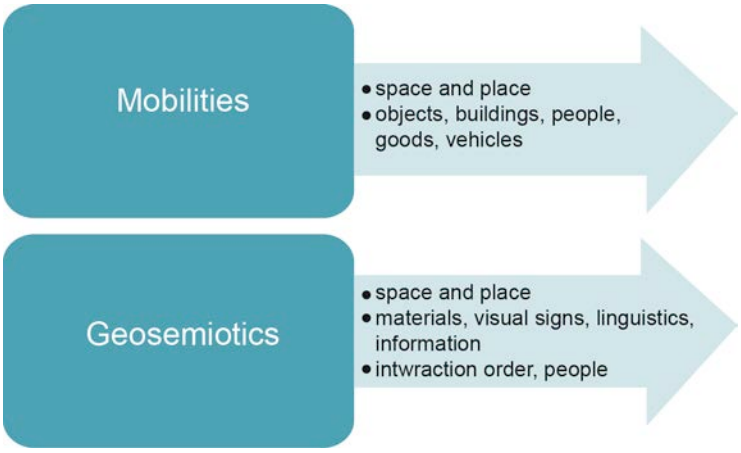


Figure 15. Characteristics of mobilities and geosemiotics theories

These are the characteristics that are relevant to the empirical data gathered throughout this research (Figure 15). The focus of this research is not on producing new theories dealing with philosophical aspects of mobility or geosemiotics, but on supplementing the other design practices fields such as urban and graphic design. Since I come from a graphic design background that is normally concerned with the beauty and functionality of computer application interfaces, printed materials and display materials, I intend to offer some insight from my empirical data as design guidelines for the Malaysian urban streetscape framework for future work. Currently in Malaysia, there are guidelines for the technical specifications of size, colour, illumination percentage, symbols used and spacing of signs at intersections (A sample of Current Malaysian Traffic Signs and Signal Manual can be found in **Appendix G**). Therefore, the Malaysian urban streetscape framework proposal outlines related case studies from this research project as examples from empirical data to be used as guides.

The most important contribution of this research to existing knowledge lies in the methodological approaches that integrate the conventional way of investigating the issues of road traffic signs from below (road user's perspective) with the perspective of policymakers. Using my methods of investigation, my research focused on the perspectives of the users and not the designers or policymakers (such as the police, city council and related authorities). In fact, it can be argued that some of the traffic signs placed in urban spaces are unnecessary. And when referring to the book *Know your Traffic Signs* (Department of Transport UK, 2007) or other theoretical road traffic test books, there are numerous signs that are not often seen or that individuals may never have seen before in the material world. Thus, policymakers play an important role in ensuring the safety of traffic users and at the same time preserving more sustainable urban spaces through efforts such as minimising the placement of signs to create more 'green spaces'.

Thus, through a new perspective, a proposed Malaysian Urban Streetscape Sign Design Manual looks into several sign design aspects which are common in Malaysia that can be utilised as part of understanding the road sign design system. Apart from that, the manual also looks into the semiotic aggregates which surround the urban streetscapes. This encompasses the traffic signs, road markings, billboards, advertisements and notices as well as the street names.

## 3.3 CONCLUDING REMARKS

During the research process, I focused more on methods of investigation from the perspective of road users (bottom-up) than on policymakers or even urban or graphic design practitioners. In terms of urban design practices, the empirical data in this thesis could help to relate the legibility of street signs in European countries such as Denmark and the United Kingdom to the motivation for more sustainable urbanisation in Malaysia. For instance, the city of Christiansfeld, Denmark used 'ambiguity and urban legibility' in street design to reduce high death rates at the town's central traffic intersection. Instead of erecting warning signs, road markings and traffic signals, Bjarne Winterberg and the engineering firm Rambøll removed traffic signals and road markings. No mode of mobility was given priority and pedestrians, buses, cars and trucks used eye contact to negotiate the junction.

Regarding the perspective of graphic design practice, I intend to include the design aspects of an urban streetscape framework in a proposal to the Malaysian government (**Paper#6**). In the future, the Malaysian government is planning to create a more sustainable and green urban township, as is being implemented by most countries in Europe. Thus, the design of the framework should not only propose the conceptual framework for what the designers, traffic engineers and enforcers of road signs should look at when implementing the regulation of street signs, but also integrate some common and uncommon elements of signs that will guide the enforcement. Further research from a top-down perspective is needed, along with the integration of bottom-up empirical evidence to support the future design practices of urban planning. In a recent development in Malaysian town planning in the state of Sarawak, the Chief Minister aspired to use Scandinavia's model of urbanisation in the future:

> *He said Sarawak would follow a different model of development by not aspiring to have a big city but rather concentrate on having smaller towns throughout the state. [He] said in Scandinavian countries, the towns maintained their heritage buildings as well as the surrounding nature so that people could enjoy a serene lifestyle. (Devindran, 2012)*

Thus, based on the research conducted in Glasgow and Aalborg, it is important to apply the advantages and disadvantages of urban development to future Malaysian urban planning. Working in a real environment through fieldwork observation was important in understanding human–object interaction within the

urban environment. This particular thesis does not deviate substantially from the common norms of investigation, and some findings were only discovered to be valuable at the end of the empirical process. For instance, observing the urban environments in Aalborg and Glasgow was meant to be the only means of documenting the spaces, people's interactions with the spaces and the signs found within the urban context. However, towards the end of this PhD journey, while compiling data for the appendices, I rediscovered images that were taken in different urban contexts. Photos of Glasgow signs and Aalborg signs had similarities in terms of the intended codes and how pedestrians should negotiate the space and the other elements that are placed together with the generic signs, as discussed in the reflections on being a marginal participant on page 41.

The complexities of signs and symbols in urban spaces may or may not have impacts on the society. As mentioned above, although some countries practice cluttered and some uncluttered emplacement of road signage systems, all individuals who negotiate the spaces will have different experiences and knowledge. Today, mobility studies are expanding significantly into different research paradigms, including urban mobility, mobility design and mobile semiotics. Thus, urban mobility is a term that has potential value in designing urban spaces through further research by urban designers and graphic design experts. In addition, future research could integrate the different methodological approaches of geosemiotics and mobilities in relation to the study of human behaviour towards urban spaces and their materialities. As a way of contributing new knowledge to urban and visual communication practices in Malaysia, the empirical data from this research will be part of the foundation used in developing a streetscape framework of urban streets and sign design. The framework is intended to focus on the practical issues of current urban and sign design in the cities of Malaysia using case studies from Aalborg and Glasgow.

In the future, further research will focus on the policymakers for the road signage system in Malaysia and on comparing Malaysia's system with systems in other Asian countries, such as Japan and Hong Kong. As found in the literature, Tokyo and Hong Kong have a complex way of placing their transgressive notices/signs (in other words, notices/signs that violate the conventional semiotic) in urban settings (Scollon & Scollon, 2003).

Currently, the regulated signs in some cities in Malaysia use regional languages, a practice which creates visually cluttered signs in the urban environment. Thus, studying these systems would help the Malaysian government to focus on important aspects of urban fabrics in its urban development efforts, not only on building structures and automobiles but also on visual legibility of the road signs placed on the streets. The rationale for using the cases (Glasgow and Aalborg) selected in this research is directly related to urban development; cities in Malaysia show many similarities. The Malaysian Economic Planning Unit projects the following urbanisation growth between 2010 and 2020:

> *Under current growth projections, urban areas in Peninsular Malaysia will need to accommodate six million new residents between 2010 and 2020. Land required for development is scarce, and demand will outstrip the supply of land available for development, especially in urban environments, such as in Greater Kuala Lumpur (Greater KL). In order to accommodate growth, compact urban development will be encouraged. For conurbations composed of multiple towns or cities, this means ensuring that each satellite city or town surrounding the core city centre is in itself a vibrant place to live, work and play. (Economic Planning Unit, 2010)*

Thus, portions of the empirical data from the case studies are included in the proposed Malaysian urban streetscape framework. This framework will be used as a guideline for practitioners in the field of urban design and visual communication in developing more sustainable urban spaces in Malaysia towards a more pedestrian friendly and shared streetscape. Currently, Malaysian urban street development, especially in city centres such as Kuala Lumpur, is developing more vehicular streets instead of pedestrian streets. Thus, at the moment, there are certain streets at the golden triangle of Kuala Lumpur that have been turned into car-free morning streets, a practice which was initiated to promote a greener city. However, this programme has its advantages and disadvantages for city dwellers and tourists. Even though the initiative is considered an alternative for promoting a greener city and a more sustainable city centre, there were also arguments for safer pedestrian walkways before implementing such a car-free day. In case studies conducted in Aalborg and Glasgow, both cities are known for pedestrian-friendly streets. Thus, there are also signs that are prone-to pedestrians and prone-to vehicles implemented in the streets. In order to create greener city streets, the mobility practices need to be improved in terms of developing more and safer pedestrian walkways and pedestrian-friendly streets. Apart from that, the use of

signs in the cities needs to be reduced and standardised, especially to differentiate between regulatory/prohibitory signs, warning signs and guide signs in terms of the colours, shapes and symbols used. This is very important for warning signs, which commonly use additional information to warn the pedestrians. For instance, in Malaysia, there have been warning signs that are used to warn drivers in certain lanes of pedestrians and also to warn the pedestrians of pickpockets in specific areas. However, since most of the text used for additional information is in the native language, which is Bahasa Melayu, it is difficult for foreigners to understand the sign. Examples of the signs are shown in **#Paper6,** Malaysian Urban Streetscape Sign Design Manual.

Visual data examples from non-participatory observations and activity-oriented focus group interviews provided relatively important interpretations and perceptions from the road users/participants. For instance, through the activities, a comparison between the UK's and Denmark's road traffic signs can be identified, especially the regulatory signs. Based on the photographic documentation, the UK uses a standard regulatory sign with a red round shape and pictograms of motorcycle and a car to prohibit the motor vehicles. The differences are illustrated below:

Figure 16 (a) No Motor Vehicle Sign in UK

Figure 16 (b) No Motor Vehicles Sign in Denmark


Figure 16 (c) No Parking Sign for Motorcycles

From the three different signs, the only significant aspect of design elements used are the colour and shape. In Malaysia, the red band (Figure 16 (c) ) represents prohibiting motorcycles to park at specific area, for which additional information is added at the bottom of the sign 'Dilarang Meletak Motosikal' (refer to **Paper#6** for some other examples). In terms of the use of design elements, the Malaysian sign uses both the common prohibitory signs and warnings signs design elements. This

shows that the sign strictly prohibits motorcycles from entering and at the same time warns the motorcyclists (through the use of yellow sign indication).

In relation to the activity-oriented focus group interviews, there are participants who interpreted the use of 'band' as prohibitory compared to without the 'band'. In addition, each country has its own regulations and policies that are governed by their respective institutions. The signs that are placed in specific urban areas are not only implemented for the vehicular drivers, but also for other road users such as cyclists and pedestrians. This is what I called the mobility practices that each of us experiences every day. The empirical data obtained in this study provided insight into the semiotic alertness between road users and their surroundings, which depends on their mobility practices. The empirical data gained from this investigation through stories and visual-based activities strengthens the previously collected data from observations of people's movement. This is also part of the emphathy design strategies suggested by Thomas and McDonagh (2013) for designers to take into consideration when designing human-centred design. In my previous study findings, people not only look for signs when they are driving but also when they are pedestrians. For pedestrians, street names and traffic lights are the most noticeable signs and are used as guides. For a traveller in an unfamiliar place, it is a common practice to search for signs to which he or she can refer according to his intended action.

This thesis limits the non-participatory observations to pedestrians since the behaviour of pedestrians is easier to document when they look at signs in the built environment. However, in the activity-oriented focus group interviews, the map drawings from participants showed significant value of research-through-design since the drawings illustrate participants' understandings of their surroundings. This activity also helped to support the non-participatory observations method, which only emphasised my own judgement and interpretation from looking at the behaviours of the road users. Thus, through combining multi-methods of investigations, the study of signs (geosemiotics) in the environment can used as one of the research methods to study the visual interpretations in urban design studies. The interrelation between visual communication and urban design studies not only involves signs and signals, but also the visual experience of a person when they are moving between urban spaces. Therefore, in future Malaysian urban planning, it is best to integrate the visual experiences of target audiences as part of the research data collection in the design thinking process. These tools from the participations of the target users ideated from geosemiotics and mobile methods

are among others that are recommended for future studies in visual communication research in urban spaces:

1. Sketches/Doodles
2. Photo-elicitation
3. Go-along interviews
4. Mobile video ethnography
5. Mapping 'real' places

To conclude, this thesis contributes new knowledge on potential qualitative research methods that can be integrated as part of design thinking process for designers. Geosemiotics and the mobilities paradigm serve as lenses that help to interweave the methods of investigation that study human behaviour towards their built environment. The theoretical and conceptual framework illustrated in Chapter 1 can be used as building block for future research on the study of people, built environments and road signs systems. The proposed Urban Streetscape Sign Design Manual not only presents the case studies on road signs in urban spaces, but also the recommendations for a future road sign design system in Malaysia.

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# PART 2
## PAPER PUBLICATIONS

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# Signs in Place: Choreographing Travel Flow in Urban Spaces

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*Abstract: Travelling in unfamiliar areas is usually very interesting; however, it can also be stressful. People travel or move around in an urban space according to their needs, and the environment can influence the way people move about from one place to another. If a person gets lost, a map or GPS can be an effective guidance tool. However, "signs in place" offer alternative or additional guidelines to help people with their journey. This paper, first, seeks to understand road traffic signs in terms of mobility in everyday life. It, then, attempts to distinguish the different perspectives of mobility and geosemiotic studies with regards to the road traffic signs used in urban spaces. The paper ends with a discussion on how people choreograph their movement in their everyday life from two different perspectives: above vs. below.*

Keywords: Signs in Place, Mobilities, Geosemiotic, Urban Space, Choreographing, Travel Flow

## Introduction

**THIS PAPER SEEKS** to explore ways in which to analyze and comprehend the interplay between traffic signs and mobility in everyday life. Here, it is considered that the metaphor of "choreography" is useful in helping to elucidate the dynamics of signs and mobility. However, rather than focusing only on ways in which to orchestrate movements from above, since mobile subjects organize themselves and travel more or less in accordance with officially inscribed traffic sign systems and regulations, this paper proposes a theoretical framework to connect mobilities studies with geosemiotics as a particularly fruitful way to explore the manner in which road signs mediate and facilitate daily mobility.

This paper consists of three main sections. The first section looks at the existing literature on understandings of road traffic signs among road users in different countries. In daily life, people usually have a routine for moving from one place to another. For instance, they might use the same route to go to work, restaurants and shops. In terms of modes of transportation, people use cars, bicycles or even just walk to their intended destinations. There are also studies on the comprehension of traffic sign symbols used in different countries (see Shinar et al., 2003 and Al-Madani & Al-Janahi, 2002). For instance, Shinar et al.'s study placed an emphasis on drivers' comprehension of road signs from different cultural backgrounds;

> As our world shrinks towards a global village, and as more and more of us crisscross this 'village', variations in signing among countries, poor sign design, and different levels of familiarity with signs used in different countries may all contribute to reduced

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> communications with drivers. This problem is of course exacerbated in a world where people are licensed in one country where they are required to learn one 'standard' set of signs, and then are expected to be able to drive in other countries with different sets of 'standard' signs (Shinar et al., 2003, p.1551).

The second section of this paper describes the theoretical contribution that this research makes to the extant literature, especially to studies of mobilities and geosemiotics in relation to the mobility practices of daily life. As argued by Sheller (2004a), "mobility is always located and materialised, and occurs through mobilisations of locality and rearrangements of the materiality of places". In conjunction with this, the term "signs in place" is based on Scollon and Scollon's (2003) studies of geosemiotics, which involves the semiotic elements in the environment. As mentioned by Scollon and Scollon (2003), "geosemiotics makes reference to the real, physical material world in which we live our lives", while Lynch argued that "… the importance of physical legibility that the human brain is marvelously adaptable, that with some experience one can learn to pick one's way through the most disordered or featureless surroundings"(1960, p.5). Travel behaviour research is about human movement patterns (Schonfelder & Axhausen, 2010), and pedestrians are likely to have more time to "orchestrate" their movements if there is a system of directed signs on which to base their actions. But how does a person plan, process and execute their travel flow in order to reach their destination safely and successfully? People navigate differently according to their level of spatial knowledge of the environment (Bovy & Stern, 1990; Golledge, 1999).

The final section of the present paper includes a discussion on "choreographing from above" versus "choreographing from below" in relation to future empirical research.

## Understanding Road Traffic Signs in Relation to Daily Mobility

An urban space is one which is intended to be experienced and shared by different people (Lynch, 1960). Harvey (2006, pp.125–126) questions whether "different human practices create and make use of different conceptualizations of space". When walking in such urban spaces, most people will encounter many road traffic and street signs. De Certeau (1988) suggests that the street is a place constituted by a system of signs. The European traffic sign system has been evolving since the 1908 International Road Congress in Rome through to the Vienna Convention on Road Signs and Signals 1968, which was amended in 2004:

> Countries thus decided to harmonise their domestic road traffic regulations so as not to restrain the professional or leisure activities of people worldwide. Most European countries signed the Convention of Paris of 1909 which was a first step towards the regulation of road traffic, followed by the European Agreement of 1971. The international leading step was the Convention on Road Signs signed in Vienna in 8 November 1968 which has since introduced in great detail, an international harmonization and standardization of the norms of road signage (Wagner, 2006, p.315).

In everyday life, people are observers and their surroundings are the information field that helps them to move around from one place to another. As explained by Salingaros:

> Human beings are information-processing machines whose existence depends on the ability to interpret the information present in their surroundings. We must be able to

> instantly judge and respond to environmental information, and our evolution has equipped us with the sensory and perceptive tools to do so; it is precisely this ability that makes us human (1999, p.32).

Most people have the ability to interpret whatever they see in their environment, including road signs. There are times, however, when some road signs are redundant (Tiffin and Kissling, 2007) in terms of their meaning to road users. For example, the road sign in Figure 1 is specifically intended to ensure that the lane is only used by bicycle users. The words "bike lane" and "bikes only" are used to convey the same message. However, at the same time, there is an additional sign beneath the information for bicycle users, which is intended to convey the message "do not litter during a certain period of time". As the people who such signs are aimed at are either drivers, cyclists or pedestrians, and are therefore moving at a certain speed, the time in which they can read traffic signs is limited; therefore, it could be said that the warning for bicycle users is not as clear as it could be, due to the additional sign beneath – as Ho et al. suggested, visual clutter can hinder sign acquisition and increase the time needed to process the information or the meaning of road traffic signs (Ho et al., 2001). This relates to a recent study by the Department of Transport UK, whereby councils were urged to "get rid of unnecessary signs, railings and advertising hoardings in a bid to make streets tidier and less confusing for motorists and pedestrians" (Department of Transport, 2010).


Figure 1: Road Traffic Sign in Manhattan, New York Indicating that the Lane is Intended Specifically for Bicycle Users

When driving a vehicle, one has to be aware of the road traffic signals and stop when they are red. Pedestrians must also be aware of traffic signals and signs that warn them of moving vehicles, including bicycles. In most countries, people learn to interpret road signs when they obtain their driving license. In fact, in many countries people are required to take a written test on traffic signs and signals and memorize or understand them as far as possible in order to pass the exam. Al-Madani and Al-Janahi (2002) stated that, "years of driving experience has no influence in improving comprehension of signs of the drivers who obtain their license after the age of 44". In their findings, only half of the participants can comprehend the meanings of symbolic traffic signs in their study. Bazire and Tijus (2009) also argue that "experience does not improve people's understanding of the meaning of road signs":

> Traffic signs play a vital role in directing, informing and controlling road users' behaviour in an effort to make the roads as safe as possible for everyone. This makes a knowledge of traffic signs essential. Not just for new drivers or riders needing to pass their theory test, but for all road users, including experienced professional drivers (Department of Transport UK, 2007, p.4).

Therefore, in our daily life, even if we are not drivers, or are people who do not require driving licenses, we will still need to know the law. By rights, when we are walking, cycling or jogging anywhere in the world, we still need to know the rules and regulations of the traffic. In particular, traffic signs are part of a more powerful regulatory system inscribing "correct mobility behaviour" into the subjects of the law. As suggested by Wagner:

> Road signage reflects a view of the world where people are considered and treated as experts in the law even though they are not. It thus becomes objective such that society and people are mutually reacting to this visual encoding (Wagner, 2006, p.314).

Smith (2005), on the other hand, argues that sometimes codes in visual media such as films have hidden meanings or are unnoticed by people. This type of coding, however, differs from the visual coding of regulatory systems such as traffic signs. Road traffic signs are meant to be understood from the first glance, especially by drivers. There are basically three different types of road traffic signs, as outlined by the Department of Transport UK: circular signs give orders, triangular signs issue warnings, and rectangular signs provide information. For countries that follow the Convention on Road Signs and Signals Vienna 1968, all triangular warning signs use a red border. However, some countries use different colour-coding systems and shapes, for instance in indicating pedestrian crossings (Figure 2). The "pedestrian crossing" sign is intended to warn drivers that pedestrians may be crossing the road ahead. Even though there are different characteristics of pedestrian crossing signs in different countries, they are universally recognizable.


Italy (Authors own photo 2011) | Honduras (Naylor 2006) | Laos (Ridgway 2006) | United Kingdom (Great Britain, Department of Transport 2007)

Figure 2: Warning Signs Indicating Pedestrian Crossings in Different Countries

| Property | Knowledge in the World | Knowledge in the Head |
|---|---|---|
| Retrievability | Retrievable whenever visible or audible | Not readily retrievable. Requires memory search or reminding. |
| Learning | Learning not required. Interpretation substitutes for learning. How easy it is to interpret information in the world depends upon how well it exploits natural mappings and constraints. | Requires learning, which can be considerable. Learning is made easier if there is meaning of structure to the material (or if there is a good mental model). |
| Efficiency of use | Tends to be slowed up by the need to find and interpret the external information. | Can be efficient |
| Ease of use at first encounter | High | Low |
| Aesthetics | Can be unaesthetic and inelegant, especially if there is a need to maintain a lot of information. This can lead to clutter. In the end, aesthetic appeal depends upon the skill of the designer. | Nothing need be visible, which gives more freedom to the designer, which in turn can lead to better aesthetics. |

Figure 3: Tradeoff Model between Knowledge in the World and in the Head (Norman, 1988)

A pictogram is better than a text label for road signs, because identifying an image is easier and faster than reading text (see Collins & Lerner, 1982 and Norman, 1988). Kolers (1969) suggests that it is important to study the kind of "instructions" that can be represented from a pictogram. However, Collins and Lerner (1982) also argue that pictograms "may not be interpreted correctly by all groups of consumers and across cultures". Most people come to understand road traffic signs by encountering them repeatedly during their day-to-day journeys. As mentioned by Golledge (1999), "most human wayfinding uses natural skills and abilities and memory-based spatial knowledge". Furthermore, Norman (1988) splits knowledge into two categories: "in the world" and "in the head". For example, as can be seen in the trade off model (Norman, 1988) in Figure 3, a person is likely to understand–or "retrieve"–a sign such as that depicting the message "no motor vehicles except solo motorcycles", whenever they see the pictogram-based prohibitory sign.


Figure 4: Prohibitory Sign from Different Countries, Indicating that no Motor Vehicles except Solo Motorcycles May Enter

Some countries have their own identity with regards to portraying the regulatory message "no motor vehicles except solo motorcycles", as depicted in Figure 4. For example, Austria uses a classic car as its pictogram, unlike other countries which use more modern versions. As argued by Bazire and Tijus (2009), a "car" in this instance refers to all vehicles with four wheels, and therefore the instruction must be followed by truck drivers, bus drivers, etc.–and not just cars *per se*. They elucidate this point with reference to designers, as follows:

> The first question a road user has to answer when facing a road sign is: Am I concerned by this message? So road signs have to express clearly the categories of road users. Designers use then a system based on metonymy: some icons stand for super-ordinate categories (for example, the car icon means all four wheels drivers and not only car drivers) (Bazire&Tijus, 2009, p.1237).

Significantly, in past research by Walker et al. (1965), it was argued that a "symbol system would circumvent a language problem for those who do not read English". Thus, a symbol system for road signs in English-speaking countries can be understood by those from non-English speaking countries (and vice versa), as long as there are certain characteristics that are similar or, in other words, as long as there is international uniformity in terms of the signs in question (Vienna Convention 1968, Article 1).


Japan (Road Signs in Japan n.d) | Colombia (Duque 2006) | Iraq (George 2006) | United States (Linderman 2006)

Figure 5: Stop Signs in Different Countries

Tiffin and Kissling suggest that traffic signs are universal and globalized in terms of the standard symbols used, though not the language (Tiffin and Kissling, 2007). However, as can be seen in Figure 5, "stop" signs vary across different countries not only with regards to the language, but also the shapes used; this is contrary to Tiffin and Kissling's claim. In terms of being identifiable, a precise understanding of how such signs can be recognized despite their differences has yet to be set forth, since no research has yet specifically analyzed road traffic signs such as these with reference to mobility practices in everyday life. In the next section, some understandings of "orchestrating mobility" will be discussed in relation to our research.

## Orchestrating Mobility

Orchestrating the movement of people and vehicles is obviously related to transportation and road engineering. However, the perspective we want to address in this paper is related to a broader field of understanding, namely the so-called "mobility turn" (Cresswell, 2006; Urry, 2007). Within the last decade or so a new cross-disciplinary research area under this label has emerged. The key point is that movement of all sorts and by all types of technologies and modes refers to much more than simply movement from A to B. Rather, we are dealing with social and cultural practices that shape our understanding of places, people and ourselves. Coming from such a perspective, practices relating to the creation of sign systems for directing mobility become much more than simply a question of regulatory frameworks, traffic safety or highway engineering. The semiotics affording particular movements become important cultural and social signifiers that create the communicative layer of the city, and thus, ultimately, the way we engage with the world. In other words:

> The first main point to observe is that even if we study the physical movement of 'objects' like people, cars, bikes, or goods we are simultaneously dealing with social issues of norms, power, identity and culture formation. It is fairly evident that mobility as a specific social practice may be related to cultural norms and regulations (as for example in the case of traffic regulations or local customs of movement). One might come to think of mobilities as determined by cultural contexts. However, more importantly, mobilities and culture are not external to one another. Rather performing mobilities is

> culture. So the claim is that the mobile practices are more than physical practices as they also are signifying practices (Jensen, 2009, p.xv).

This is very much an issue of relevance to mobilities, however we shall argue that one can gain even further insight by relating this to the discipline of "geosemiotics", to which we now turn.

## Geosemiotics and Cultural Constraints

An interesting aspect of geosemiotic theory by Scollon and Scollon emphasizes the visual semiotics in place based on the cultural background of participants (Scollon & Scollon 2003). According to Scollon and Scollon, geosemiotics is"the study of the social meaning of the material placement of signs and discourses and of our actions in the material world" (2003, p.211). Or more precisely:

> Geosemiotics is the study of signs as indices of discourses constituting this web of pathways through the material environment. There is a dynamic tension between the centrifugal forces by which discourses distribute themselves across time and space and the centripetal forces by which discourses converge in time and space to form semiotic aggregates (Scollon & Scollon, 2003, p.168).

The merging of geosemiotics and mobilities has been carried out by Jensen, who argues that we may speak of "mobile semiotics" in terms of "how signs (in their broadest possible sense) affords, processes and coordinate (or obstruct) the physical circulation and movement of people, vehicles, and goods in more or less codified systems of infrastructure" (Jensen, 2011, p.19).

Despite this, it is also important to consider some cultural constraints that are relevant to road traffic signs and geosemiotics. As mentioned by Norman (1988), as long as you know how to drive a car, there are no boundaries in driving any car, wherever you happen to travel. In relation to "standardization", as mentioned by Norman, most road traffic signs follow certain standards in terms of similarities between pictograms, colors and shapes. Some countries, as in the examples outlined earlier in this paper, use their own style, yet this is unlikely to cause much difficulty for drivers and other road users from foreign countries. Bowie and Bowie (2009) argue that information on road signs should communicate effectively with the road user despite the "interaction between of linguistic and non-linguistic content in brain processing behavior". This significantly relates to the common barriers between cultural or linguistic aspects that can be seen in the road traffic sign system of non-English speaking countries. In fact, Scollon and Scollon also draw upon Edward's T. Halls's statement that "culture is communication and communication is culture" (2003, p.48). The following section will consider the relationship between theories of mobilities and geosemiotics with relation to systems of road traffic signs.

## Relationship between Mobilities and Geosemiotics Studies

How can a person get disoriented or lost when trying to find their way to a specific destination? Some common reasons include insignificant signage posted at intersections, legibility

issues in reading street names, or misinterpreting information from a map. As mentioned by Passini (1996), it is the professionals who develop road signage systems that are responsible if users face difficulties in finding their specific destination. Fuller (2002, p.233) points out the importance of facilitating ease of movement in unfamiliar areas–especially, for instance, in airports, where people are often moving quickly to get to their boarding gates.

> Signage, known in the professional literature as wayfinding, is a spatial mode of interactivity. Graphical signage cools down the anxiety of unfamiliar terrains and replaces it with a familiar authority–the sovereign structures of transit systems. Within airports, managing spatial flows is crucial (Fuller, 2002, p.233).

According to Bazire and Tijus (2009), "well-known efficacy of images", which in this case refers to graphical signage, is "an advantage in finding your way where decisions have to be made very fast". In relation to wayfinding, the most significant aspect is the "interactivity" (Gibson, 2009) between humans and their surroundings. Wayfinding refers to human interaction with the materials that physically exist around them when they navigate within a space. In these spaces people may "find their way" in the existential sense, but they also become overwhelmed or disoriented if they physically lose their way. Wayfinding design provides guidance and means to help people feel at ease in their surroundings (Gibson, 2009, p.12). This important aspect has also been emphasized by Scollon and Scollon as part of geosemiotics, in that "human action must take place somewhere in the material world of the physical universe" (Scollon & Scollon, 2003, p.19). Mobilities research, on the other hand, "encompasses not only corporeal travel of people and the physical movement of objects, but also imaginative travel, virtual travel and communicative travel" (Urry, 2007). Therefore, in the next section, we will conclude this paper with a discussion on the process of choreographing a travel flow from two different perspectives.

## Discussion: Choreographing from Above vs. Choreographing from Below

This paper started out with the question of how we can best analyze and comprehend the interplay between traffic signs and mobility in everyday life. We argued that the metaphor of "choreography" is particular useful in bringing out the dynamics of signs and mobility, in a larger sense than simply orchestrating movements from above, since mobile subjects organize themselves and travel more or less in accordance with officially inscribed traffic sign systems and regulations. Moreover, this paper aims to test out a theoretical frame-work connecting mobilities studies with geosemiotics as a particularly fruitful way to explore the way road signs mediate and facilitate daily mobility.

Walking, cycling and jogging are among the most sociable or leisurely ways by which people move about from one place to another. Streets in towns and cities are normally used as settings for various activities and social functions (Mehta, 2009). This paper has shown that humans move from one place to another based on two different perspectives relating to road signage systems. The term "choreography" is traditionally defined as "the art of composing ballets and other dances and planning and arranging the movements, steps, and patterns of dancers" (dictionary.com). In this paper, however, the term is used in line with recent research by Jensen (2011) on his vocabulary on "mobilities choreography":

> As we look at how the environment's semiotic layer instruct and afford particular mobile practices it makes sense (to a certain extent) to think of these in terms of the 'choreography' as for instance when we study a busy street crossing or an airport space processing passengers (Jensen, 2011, p.20).

The "rulers" of road traffic signage systems, who are usually the people who are involved in implementing road signage systems and include graphic designers, urban planners, transport engineers and local authorities, are part of the "choreographing from above" perspective. As mentioned by Gibson (2009), "before starting the design process, the wayfinding consultant must anticipate visitor patterns, understand that logic, and apply it in the planning phase". There are numerous studies on pedestrian behaviour in urban design and planning (see Willis et al., 2004; Zacharias, 2001; Batty, 1997; Hoogendoorn & Bovy, 2004). It is critical for planners and designers to understand pedestrian behaviour when choreographing their daily routine, especially in public spaces. As stated by Hoogendoorn and Bovy:

> Understanding pedestrian behavior is essential in the planning and the design of airports, public transport stations, shopping malls, etc., but also in public transit timetable design. Modeling tools can support infrastructure designers as well as public transport planners to optimize their plans (Hoogendoorn & Bovy, 2004, p.170).

In daily life, walking in unfamiliar or familiar areas, especially in cityscapes, can be enjoyable. However, in order for us to move around, we consciously or unconsciously process our route in our heads. Similar to choreographing a dance movement, we normally find our own way–or choreograph our own travel movements. Therefore, road users who self-organize their movements as part of their daily routine are considered to be acting from the perspective of "choreographing from below". In an article by Zacharias (2001), it was suggested that "behavior in pedestrian environments can be distinguished from goal-directed behavior or way finding". Thus, the process of choreographing a route of travel can be based on the goal of moving towards specific destinations. If, for instance, we become lost along the way, we tend to seek out familiar landmarks, street names, road signs and any visual elements to help us. In terms of sense of direction, most people learn from training, current knowledge, and an "ability to stay oriented". As argued by Tuan, "Human beings are not endowed with an instinctive sense of direction, but under training the ability to stay oriented–even in unfamiliar country–can acutely developed" (Tuan, 1978, p.75).

Being lost, or losing one's way (Golledge 1999) in an unfamiliar environment is very common in everyday life. Golledge suggests that "training and experience help structure cognition", and that in a way everyone has their own spatial knowledge in orchestrating their movement within an environment. As mentioned earlier in this paper, road traffic signs vary from country to country. Despite this, if a person plans to travel to a foreign country, they often use information obtained from travel guides, maps, websites, etc. However, it may be interesting to consider whether people research the road signs of foreign country prior to visiting it in order to obtain an understanding of dos and don'ts when driving or walking in that country. However, a failure to obtain advance knowledge about the meanings of "signs in place" when traveling does not necessarily mean that people will be unable to find their way. In geosemiotic terms, "materials in the real world" are visible whenever or wherever we move from one corner of a street to another. Most research on road traffic signs has in-

volved the framework of cognitive spatial behavior, transport engineering and wayfinding, as well as semiotics. However, there is still a lack of research on the relationship between people's mobility practices in daily life, and theories relating to mobilities and geosemiotics. Through observations and interviews, further empirical insights into choreographing from below in selected case studies can be achieved. Thus, models from theories on mobilities and geosemiotics can be used to evaluate or as a guide for future interdisciplinary research in visual communication and urban studies.

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Paper

# 02

**Reading Signs in the Cities: Constructing Framework of Embodied Practices through Mobilities and Geosemiotics Approaches**

Submitted to Transfers: Interdisciplinary Journal of Mobility Studies

# Reading Signs in the Cities: Constructing Frameworks of Embodied Practices Through Mobilities and Geosemiotics Approaches

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ABSTRACT

In everyday life, people move from one place to another according to their needs. This paper explores the theories of mobilities that can be utilised as frameworks in urban studies. Within mobilities, materialities have always been among the artefacts that are articulated by people in their daily life practices. The mobilities turn gathers empirical and theoretical evidence that examines insights into the social and material phenomena. Through this paper, we also discuss empirical methods from geosemiotics and 'mobile methods' approaches inspired by Jensen, which is relevant to the road signs design system. The framework presented in this paper extends the knowledge of *Staging Mobilities* by Jensen (2013) to provide another new level of knowledge. In this respect, the framework is a significant step towards reducing the existing gap between social sciences research and design practices.

KEY WORDS: Embodied practices, mobilities, geosemiotics, urban spaces, road signs, human behaviour

## Introduction

In everyday life, a person moves from one place to another according to his or her needs. However, there are many additional elements that can influence that person's movement between spaces. The everyday life practices of people also include their experiences and the knowledge that surrounds them. Imagine yourself walking on the streets, passing by the familiar shops which you see every day as you move from your home to your work place. The shop signs can be recognised from the representation of the shop names or logos. The street signs, however, are signs that are regulated and enforced by authorities as a means of controlling the movement and behaviour of people walking, driving or cycling on busy streets. Thus, there are differences between the actions performed when looking 'for' signs and looking 'at' signs, and these vary according to intent. For instance, when one is unfamiliar with the streets, one will look for signs that can help identify the right path. If the time it takes to look 'for' a sign is too long, a person may become frustrated while searching for the right sign or street name. Conversely, when a person is looking 'at' a sign, he or she might take a longer glance depending on the other signs that were present at that particular moment. Giddens (1991) argued that 'many people have lost that knowledge of local routes and environments which enabled often quite extraordinary distances to be travelled by foot' (p.201). When moving between spaces within a specific amount of time, different people will have different knowledge and experiences. A person who drives will have one view of the space around him, while a person who walks, cycles or rides a bus will have another. The experiences or knowledge may also depend on observers' ages, nationalities, or personal backgrounds.

In the current research on mobilities, there have been numerous interpretations and arguments between the mobilities 'turn' and 'paradigm'.

Sheller & Urry (2006) suggested that the mobilities paradigm involves the 'embodied nature and experience' that relates with a person's activities within their spatial environment. In the mobilities turn, mobility goes beyond simply 'getting from A to B'. The mobilities paradigm integrates movement, meaning and culture. Numerous scholars of mobility focus on tourism (Burns & Novelli, 2008; Larsen, 2001; Sheller & Urry, 2004), virtual mobility (Büscher et al.; 2009), aeromobilities and automobilities (Featherstone, Thrift, & Urry, 2005; Jensen, 2013; Lassen, 2006; Merriman, 2014). Cresswell (2006) argued that mobility is produced through the interrelation of bodily movement, meaning and power. The author also suggested that:

> Transport geography has a lot to offer mobilities researchers when it comes to thinking about issues of infrastructure development and notions of accessibility, for instance, but less to say about the act of moving itself. Moving is about so much else besides, whether travelling in a car, on a bicycle or by foot... the mobilities turn motto may well be 'it's about more than getting from A to B'. All of these works attempt to think about the experience of moving by filling time spent on the move with significance… (Creswell, 2010: 554)

Within mobilities, materialities have always been among the artefacts that are articulated by people in their daily life practices. This paper describes aspects of mobility practices through examining everyday life experiences of urban spaces. In a previous study of staging mobility, Jensen (2013) highlighted the importance of signs and the way people look at them when walking, driving or cycling. Personally, I have encountered many diverse interpretations in the way people recall how they look at signs when they travel in different modes. Freudendal-Pedersen (2009) suggested that different levels of mobilities, such as slow and fast, quiet and noisy, and

vehicles-human activities, play important roles in meeting our needs in our daily lives. Laurier et al. (2008) suggested that mobility involves not only moving from A to B but also the activities that happen during movement. Their studies focused on video documentation through go-along interviews inside a car, which recorded daily conversations among the car's users and (some of) the environment that could be seen from inside the car. This use of video documentation as a research methodology is enlightening because of the insight it provides into daily life activities.

The mobilities paradigm is a significant aspect of research into the urban and visual communication phenomenon. In current mobilities research, there are numerous investigations of varying methodologies that overlap the fields of cultural geography, tourism and social sciences, as well as transport geography. In fact, in the research by Jensen (2009), the author explored 'mobile sense making' through a person's meaningful engagement and experience with the environment. The term 'mobilities turn/paradigm' will be used as a foundation of the studies of materialities between space and time. In addition, the background study of this paper is interrelated with the study of signs through choreographing the travel flow (Hamid, Jensen & Andrade, 2012). Thus, this paper tries to correlate the methodological aspects of mobilities and geosemiotics in relation to urban studies and design practices.

First, this paper will look into the materialities that act as objects which facilitate the interaction between a person and the urban settings: signs. Second, the discussion will focus on mobilities and geosemiotics approaches in relation to the space and time of a person's behaviour. Last, this paper will illustrate the relationship between the theoretical and empirical approaches in mobilities and geosemiotics that can be framed in design

practices. The aim of the paper is to suggest a new theoretical framework for the analysis of people's sensemaking of road signs in the urban environment.

## Signs in Cities

In contemporary city living, there are signs such as the traffic light and official traffic signs that permit or restrict the movement of road users. Apart from that, there are numerous street signs, advertisements or notices, which Scollon and Scollon (2003) define as semiotic aggregates that surround us. Most of us have experienced walking in unfamiliar cities while traveling for business or pleasure. Imagine yourself walking in entirely new streets, surrounded by unfamiliar road signs. Will that affect your journey? Each country has its own rules and regulations for their road sign system. In Figure 1, both images show different, regulated traffic signs for pedestrians. In Figure 1(a), both signs—the square white sign with additional stop sign, and the diamond shape with a pedestrian symbol—are official traffic signs referring to pedestrians. In Figure 1(b) is another pedestrian sign that can be found in the city of Kassel, Germany. In terms of the indexical element of the signs, both are using people (either a man about to cross or a woman holding hands with a child).

*(a)* *(b)*

*Figure 1. (a) features pedestrian traffic signs in Seattle, Washington (Author's photo).*

*(b) pedestrian and bicycle sign in Kassel city, Germany (Author's photo)*

Most regulated streets in the world have some variation of these signs, and the rules and regulations established for their coding are set by policymakers. On the civilian side, decoding is the process by which a person interprets the meaning of the signs. The purpose of road signs is to deliver information to the road users. However, in the development of a road traffic system, it is possible for the signs to be unhelpful to the users since 'an environment can aggravate constructing mental representations of that environment' (Hirtle, Richter, Srinivas, & Firth, 2010, p. 55), which may conflict with traffic and pedestrian safety. Being in a different country has its own advantages and disadvantages in terms of understanding the meanings of particular signs that we encounter. Ogunmola (2013) suggested:

> Sociological, cultural, topographic features of the space will determine how signs look and work, and signs will contribute to the organization and regulation of that space by defining addressees and imposing particular restrictions, articulating norms of conduct and so on. (Ogunmola, 2013: p.66)

Therefore, in our mundane activities or practices in urban spaces, we tend either to obey or disobey the restrictions articulated through the signs. However, there are multiple reasons that may contribute to our behaviour in terms of social interactions with the materialities around us. For instance, when we walk, we stop at the pedestrian stop sign (red light on traffic light) instead of the hexagon shaped 'STOP' sign which is regulated for vehicular drivers. Thus, the embodied practices are an important aspect of discussion in relation to the people in motion using sign sense-making in urban settings.

## Embodied Practices and Mobilities

Movement of people involves an embodied experience of material and sociable modes (Urry, 2007). Thus, as more people are commuting, the safety of road traffic mandates that urban development and city planners concern themselves with people's activities and performances. People need to be alerted to their surroundings irrespective of their modes of transport in order to perform their everyday life practices more efficiently. Taylor (2003) argues that 'our experience of the trafficked city is one of restless sensory stimulation combined with mental alertness and concentration as we focus on continually observing, assessing and taking action to avoid moving vehicles' (p.1622). Thus, this paper also takes into consideration the multidisciplinary field of research between human behaviours towards the urban environment. Jensen (2011) suggests,

> The arguments discussed in this article jointly add to a fuller understanding of how mobility is embodied as well as practised, perceived and imagined and how this embodiment can be worked on and be included in power's repertoire for making and shaping mobility. Seeing mobility as spatialised and including diverse ways of seeing may thus expand our language for engaging with questions of mobility, space and power. (p. 269)

Mundane embodied practices in specific spaces, especially in urban spaces, are found not only in our movements between home and the workplace, but also in other activities. For instance, it is common for each of us to walk through the same streets to go to our favourite grocery shop. However, what will we do if there is a new grocery shop that posted an advertisement of its discounted prices at the traffic light at which we normally stop? The experience of looking at the posted bills, advertisement, stickers and so forth while we move is also a part of mobility practices. On the other hand,

Edensor (2007) suggests that there is a ‘familiar practical engagement which contributes to the unreflexive apprehension through which performance becomes “second nature”’ (p. 6). This can be seen in how people, once familiar with a particular place, tend to go on ‘automatic pilot’ when moving through it.

People tend to ignore the common signs and buildings that they pass by every day, but they will notice a new building along their familiar routes. Even though people usually choose to drive, walk or cycle to travel in mundane practices, this paper looks into using a qualitative methodological approach in investigating pedestrians’ behaviour towards the signs in their cities. In research conducted by Watts and Urry (2008), the authors wove together methods including surveying, group and individual interviews, ethnography, recordings and observations in unpacking passengers’ experiences of travelling via public transport. In their findings, they argued that policymakers should not only emphasise travel time, but realise that ‘What passengers do and where they are located becomes the basis for decision making’ (p.871). Thus, it is important for policymakers and designers to consider providing a more appropriate design of public transport that considers not only travel time and punctuality, but also the other activities in which passengers partake. However, in relation to my research, the embodied practices between public transport passengers differs with individual practices such as walking, cycling and driving when travelling within spaces. In the next section, we will look into the urban mobilities that were influenced by the most prominent urban planner, Kevin Lynch, and the current research on mobilities that can be associated with urban settings.

*Urban Mobilities*

New modes of travel have provided additional ways of seeing, engaging with and forming mental images of urban environments, seen at different speeds and with different levels of engagement and focus. Drivers see the urban environment at high speed and through a windscreen, while concentrating on the road, other traffic and any signs or directions. Passengers, while also viewing at high speed and generally through glass, usually have greater scope to observe the environment than the driver, but they are equally unable to engage with it fully. By contrast, pedestrians (and cyclists) both see the urban environment differently and have more freedom to stop and engage with their surroundings (Carmona et al., 2010, p. 170). For years, Lynch (1960) was known as an influential urban planner and wayfinding expert. His research has greatly influenced the fields of urban planning and environmental psychology. In his book, *Image of the City*, he also emphasised the 'quality in a physical object which gives it a high probability of evoking a strong image in any given observer' (p. 9). Thus, this research also takes into consideration the multidisciplinary field of research concerning human behaviours towards the urban environment. The mobility turn has grown not only in the social sciences, but also in disciplines such as transport geography, migration and border studies, tourism studies and the anthropology of circulation (see Hannam, Sheller, & Urry; Sheller, 2012). There is no doubt that each person has his or her own understanding of the meanings of materialities in the environment. As argued by Freudendal-Pedersen:

> Mobilities will always play a significant role in our daily lives, but the challenge is now to find a level where many different types of mobility – both the slow and fast, quiet and the noisy, and motor – and human-driven – play together by meeting various needs in

everyday life. (2009, p. 116).

Jensen (2009) argued that the urban mobility not only emphasised 'being on the move' in the everyday life of a city-dweller, but also the social meaning and the cultures of movement. Generally speaking, car transport is the common urban mobility practice that eases the everyday movement of people throughout the world. However, bicycles and walking are common modes of transport in European countries and some areas of certain Asian countries (see Canzler, Kaufmann, & Kesselring, 2008). Different cities yield different experiences to citizens who are on the move; I saw unique systems of movement in each of the major cities I visited, which included New York, San Francisco, Melbourne, Amsterdam, Brussels and Glasgow. The time spent travelling without a technological guide (no local data plan or smartphone) made the differences in navigation particularly noticeable, as I was forced to rely on printed Google maps or cheap guidebooks. In modern times, being 'on the move' does not necessarily mean that you have to use any form of transport or vehicles; in contemporary mobile living, you are also considered on the move even when you are at home thanks to the emergence of innovative technology in smartphones, tablets, GPS tracking devices, and so forth. There are several mobile methods that contributed to the mobilities paradigm in the search for the social meanings of people on the move. As argued by Cresswell (2012):

> Most mobilities research to date has focused on the movements of people and things and the relations between them. The methodologies of mobile ethnography and 'follow the thing' have developed into sophisticated tools over a comparatively short period of time. There is also a clear sense of the role of mobility in the production of social hierarchies. (p. 651)

There have been several research methods and methodologies used in the search for meanings in mobilities research that contributed to the new knowledge of 'mobilities turn'. In relation to my research goal, the mobile methods are used as an empirical tool that could entangle encompass several aspects of investigations regarding the visual impact of road sign design system.and the system. This paper looks into some of the potential mobile methods that can be considered significant and worth integrating with the geosemiotics empirical tool used in investigating the relationship between people, urban settings and road signs. The next section illustrates the interpretation of mobile methods which were selected as guidelines for my empirical data collection for this research.

*Mobile Methods*

A more fundamental problem with a significant number of these calls for innovative and experimental 'mobile methods' is the frequent assumption that mobilities research is conceptualised and undertaken as a particular kind of social science research...Sociologists, anthropologists, and human geographers working within social science traditions have been at the forefront of research that constitutes the 'new mobilities paradigm'… (Merriman, 2014:171)

As mentioned by Merriman in his article, there have been numerous methods and techniques performed through experimentation and participation, and inspired by creativity in research practices. Understanding the materials and objects that communicate information in the spaces in which we are walking, cycling or driving is part of how we make sense of these places. We make sense of places through interest and attraction to the surroundings (Herzog, 1992:237). Taylor (2003) argued that, 'our experience of the trafficked city is one of restless sensory stimulation combined with mental alertness and concentration as we focus on

continually observing, assessing and taking action to avoid moving vehicles' (p. 1622). In recent studies of mobilities, social scientists explored numerous mobile methods and technologies in the intersections between social practices, space and time (see Laurier and Philo 2003; Ingold & Vergunst, 2008).

In relation to examining the performances of embodied practices in everyday lives, a few mobile methods (Büscher, Urry, & Witchger, 2010) were selected for use as research methods for this paper:

- Observing people's movements ('follow the people')
- Participating in patterns of movement (e.g. 'walking with', 'travelling with')
- Mobile Video Ethnography-Time-Space diaries
- Art and Design Interventions and experiments
- Mobile Positioning methods (e.g. GPS)
- Capturing 'atmosphere'
- Mapping 'real' places

These mobile methods were used as guidelines in collecting the empirical data. As argued by Hein, Evans and Jones (2008), the development of mobile methods is supported through the increasing development of technologies and tools. Some social scientists believe this to be complicated and expensive. However, I have found that there are applications for mobile devices that are considered user-friendly and free, albeit sometimes with limited functionality, which can also be used by researchers. Currently, GPS and GIS devices are used for tracking when analysing the tempo-spatial movement of pedestrians in the urban environment (see Koshak & Fouda, 2008; Shoval, 2008; Stauffer & Grimson, 2000; Van der Spek, Van Schaick, De Bois, & De Haan, 2009). Previous research by Bornoe, Barkhuus,

Brown and Hall (2011) introduced the TagPad as a support tool for interview studies. The TagPad application has recently been developed and is available for free on the iPad. There are also other potential applications that have been developed and could be used as qualitative research tools, such as FieldNotesPro, Timestamped Field Notes (paid app), EthOS and also MAXApp (free app). In addition, the mobile methods are very significant to researchers seeking to collect different kinds of data, such as images, audio, video, drawings and notes, and they also assist in tracking the movement of people and vehicles. These methods, however, need to be experimentally tested since some of the applications are relatively new to researchers.

The term 'mobility' has been established in scholarly articles and publications for years. However, 'geosemiotics' is still a relatively new term, which is why this paper seeks to establish it as providing a new level of theoretical approach that is relevant to design practices. While road signs are among the urban elements that exist for road users' safety, it is also important to look at the way signage systems influence human behaviour in the urban environment. Thus, the next section describes the interrelations between human behaviour and semiotics in general, as well as how geosemiotics play a role in this research.

## Human Behaviour and Semiotics

In sociology, human behaviour is very important, and is studied by examining how we behave in public spaces or in any kind of interactions between actors (Dann & Cohen, 1991; Goffman, 1963). From the perspective of semiotics, it is in human nature to interpret the meanings of signs that are familiar from appropriate sets of conventions (Chandler, 2002). Human behaviour is significant in the context of semiotics, as a person's actions are related to how he or she sees, interprets and then reacts

accordingly. Usually a person's behaviour is also influenced by spaces, as mentioned by Downs and Stea (2005):

> The most conspicuously active field of research in recent years has been in showing the very powerful influence upon human behavior in various practical situations, of space and distance. It is this work that is probably of most direct interest to the planner and architect, because it shows so clearly what effect his work is capable of having. He manipulates space, and space governs behavior. (p.100)

Thus, this paper looks into the significant aspect of geosemiotics, a term that was illustrated by Scollon and Scollon in their book *Discourses in Place.* The next section explains the meanings of geosemiotics in relation to the research context.

*Geosemiotics and Visual Discourse*

> Geosemiotics connect the visual signs to their physical placement in order to comprehend which actions and interactions are afforded and encouraged as well as which are prevented or obstructed. Thereby the approach bridges different academic disciplines (from linguistics to geography and urban design). (Jensen, 2013:59)

The term 'geosemiotics' comes from Scollon and Scollon (2003), who wrote that geosemiotics 'makes reference to the real, physical, material world in which we live our lives' (p. 111). In other words, the definition of geosemiotics is the meanings of signs in the environment or space according to their placement ('geo' meaning placement and 'semiotics' being the study of signs). There are three main attributes that are important in the study of geosemiotics: 'interaction order', 'visual semiotics' and 'place semiotics'. Interaction order relates to the social relationship between the actors and the

spaces (e.g., a sense of time, perceptual spaces, interpersonal distances and so on). Visual semiotics, however, involves visual representations and meanings in space (e.g., represented participants, modality, composition and interactive participants). Lastly, place semiotics is the contributed meanings from semiotic systems that exist in the environment (regulated or natural). In the context of this research, the investigations of the represented meanings involved are considered to be embodied in the semiotic spaces of place semiotics. In Scollon and Scollon's methodological research, regulatory signs and code preferences are all part of place semiotics. Denis and Pontille (2008) argue that in their geosemiotic analysis of the signs placed in the underground in Paris, it is essential to study the operational process of placing the signs through the understanding of signs and visual communication (p. 2). The authors also argued that:

> We examine some of the ways in which discourses come to organize the many spaces of the material world. … If we track the traffic regulatory discourse on an urban street we find it runs through all the streets of that municipality. The stop sign on this corner is the same as the one on that corner. (pp. 167–168)

The study of geosemiotics also involves the study of discourse analysis, as well as the geography of space for materials to be placed. In another interpretation, Jaworski and Thurlow (2010) framed the semiotic landscape as the integration of the network of meanings between human geography and semiotics. There are several different approaches and analyses for examining social behaviour and discourses in place; a useful reference work is *Discourses in Place: Language in the Material World* (2003), by Scollon and Scollon. People have different perceptions of the signs they see in their daily practice. Thus, investigations of different urban street environments

rely on ‘semiotic aggregates’, which Scollon and Scollon (2003) define as ‘separate realizations of different semiotic actions but which together form a composite meaning’ (p. 215). This research project emphasises the relevance of Scollon and Scollon’s theories on geosemiotics to the traveller’s perspective. My study also engages Lynch’s theories of wayfinding as seen in his book *The Image of the City* (1960), in which he introduced four elements of visual quality in an urban form of wayfinding: legibility, building the image, structure and identity, and imageability. The elements are also important aspects of geosemiotics theory, as it involves interactions between people and various surrounding objects. In addition to that, Scollon and Scollon have illustrated several activities that are relevant to everyday life’s social meaning and interactions:

*Geosemiotics Activities*

- Photo manipulation through the representation of real-world actions
- Drawings exercises
- Observations of strangers
- Modality through image comparisons

The above activities are part of what Scollon and Scollon outlined in their book *Discourses in Place: Language in the Material World*. The book describes numerous activities that can be integrated into empirical research methods of mobilities in investigating human behaviour towards a sign system. In their research, Frers and Meier (2007) suggested that visual materials such as photographs and illustrations are significant tools for discovering visual elements in the cities including the road signs. Visual methods have also been touted by scholars like Pink (2003) and Rose (2012), who both used photography documentation and photography

elicitation as part of research project and analysis tool in ethnography research. Since geosemiotics is relatively new to some scholars and researchers, there are potential aspects of research methods that can be integrated into visual communication research apart from the visual anthropology, multimodality and visual ethnography fields. The images or photographs of people, materialities, buildings and the surroundings of urban spaces are more or less representations of the real world. Another way of looking at visual methods is through using sketches that represent the real world, a practice commonly used by designers during their initial design process prior to product implementation. Thus, a conceptual framework of integration between mobilities turn and geosemiotics theories is the point of reference for the future empirical data collection for this research. In the next section, we will look into how the mobilities turn and geosemiotics can be used to analyse people's behaviour in urban spaces.

**Being mobile in the contemporary world of signs and symbols**

How can 'mobilities turn' help to analyse people's behaviour in urban spaces? As mentioned by Jensen in his *Staging Mobilities*, 'mobilities do not "just happen" or simply "take place"… being carefully and meticulously designed and planned "from above"' (p.5). We all have our own purposes when we want to go out, whether it is on dates, business meetings or appointments or even just taking a short break from the office to get some fresh air. In the mobile world, we are increasingly very attached to our gadgets such as smartphones or tablets, meaning that during downtime, such as waiting for traffic light to turn green, we are likely to turn to smartphones to check on our messages or social media accounts. It's not just pedestrians. Motorists driving vehicles are also engaged with electronic devices. In the process of being mobile, we commonly engage 'in social interactions of

staging mobilities' (Jensen, 2013). In relation to the interpretation of meanings, Jensen has pointed out another new understanding of social interactions through the perspective of geosemiotics, which can be used as another lens through which to frame a new knowledge of design practices. Jones and Merriman (2009) examined the banal nationalism between the Welsh and British in relation to bilingual road signs. They argued:

> Welsh nationalist organisations, as well as individuals and organisations involved in governing Wales, were adept at understanding these road signs in a multiplicity of ways: as symbols of (in)justice and as conveyors of information; as linguistic eyesores and as symbols of Britishness. Most significant, in this respect, was the way in which the effectiveness of road signs as conveyors of information also influenced their status as markers of identity politics in Wales, whether through the use of particular fonts or through the ordering of Welsh and English versions of place names (p.172).

In a country like Wales, the government has enforced bilingual road signs for highways and postings of information. These scenarios also commonly exist in countries like Japan, Belgium, Canada and New Zealand (Jamson, Tate & Jamson, 2005). In the authors' research findings, they discovered that drivers needed more time to read bilingual signs, especially those using the same alphabet. This is not the case with bilingual countries with differing alphabets; Japan, for instance, has its own distinct alphabet, but it uses the Latin alphabet for English, meaning that a tourist from a Western country will definitely know to read the English sign. Sheller and Urry (2000) argued that contemporary cities have transformed public spaces into 'flows of traffic' 'coercing', 'constraining' and 'unfolding' different

meanings and influences by the person who uses the space. Being on the move or being mobile is considered as ‘people become more reliant upon interdependent, digitized systems’ (Elliot & Urry, 2010:5). Thus, in relation to the contemporary world, there are increasing numbers of people who rely on technology to move from one place to another. However, the technology only works when there is Wi-Fi or a data plan for their smartphones, tablets or laptops to use to communicate, download, upload, search and so forth. For example, when I travel outside my country, especially for vacation, I normally turn off my data plan and rely on the Wi-Fi connection in public places. Unfortunately, not all public spaces provide free Wi-Fi, and thus I was occasionally unable to download the street maps of the area I was seeking. In addition, while I normally search for street names or informational signs that direct me to specific locations, there have been times when I have had difficulty finding the signs I needed due to the sheer number of signs in the urban streetscape. In relation to the clutteredness of signs in an environment, Scollon & Scollon (2003) suggested:

> [W]e believe that in order to understand how social actors act in the day-to-day world of crossing the street or in any of the very many other situations in which we find ourselves, we will need to give much closer examination to the semiotic aggregates within which we live. (p. 193)

In addition, different modes of travel provide different activities and social meanings depending on time and space. A driver will need to look out for vehicles ahead, as well as pedestrian or bicycle crossings, to avoid collisions. The driver also needs to look at the rear mirror to ensure that there is no other vehicle approaching too closely from behind. The side mirrors are also considered to be very important, especially in the cities, due

to the possibility of cyclists or motorcyclists weaving through traffic. In an 'eye movement analysis' conducted by Theeuwes (1996), concerning visual search at intersections by vehicular drivers, the author suggested that the road engineers need to reduce redundant signs, such as advertisements that compete with safety signs. This is due to the limited amount of time and space on which vehicular drivers can concentrate when involved with visually complex scenes such as intersections. Pedestrians and cyclists are also at risk when they are overwhelmed with cluttered signs and advertisements that may distract them when they are crossing the streets. However, in research conducted on pedestrian behaviour, Sisiopiku & Akin (2003) suggested that traffic engineers should focus on meeting pedestrians' needs when making decisions on crosswalk placement. Traffic engineers and local authorities imposed the rules and regulations in terms of placement of the traffic signs and signals that are appropriate for the road users. In relation to social sciences and visual communication design, the research focuses on the way people interact with other people, the environment, and their surroundings, which includes the road signs. Thus, in the next section, we will look at the way this research is framed in order to relate the subject matter and the theories that will be adapted for further empirical research.

*Conceptual and Theoretical Framework*

In illustrating the use of mobilities and geosemiotics approaches in relation to the empirical data collection of this research, an adaptation of Jensen's *Staging Mobilities* model is used as a foundation. In *Staging Mobilities*, Jensen argued:

> … we may envision a situation where we move in a built environment amongst other people and in some sort of mediated

> condition as well as when travel information is accessible via a mobile phone or directions are given by a GPS. (2013:8)

Thus, the *Staging Mobilities* model is adapted as a point of reference and modified accordingly to relate with this research. The mobilities and geosemiotics are used as lenses in relation to the sense-making a person puts toward his or her environment.

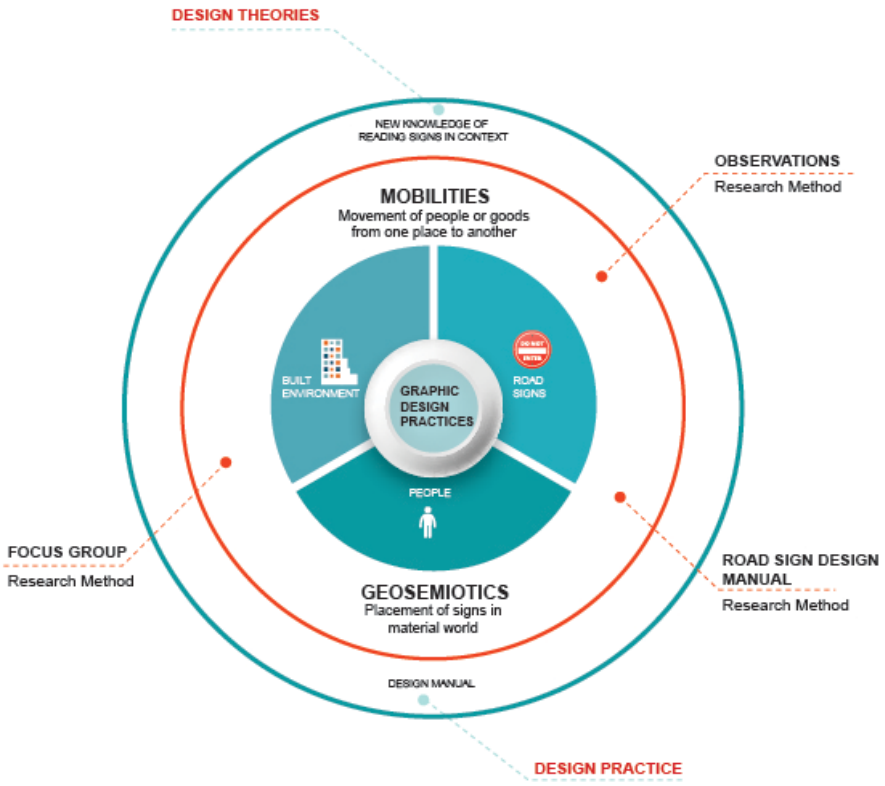


*Figure 2. Conceptual and Theoretical Framework (Adapted from Jensen's Staging Mobilities model, 2013)*

This revised model shows three areas of investigation that are significant in this study. The first area is that of the research domains, such as people, built

environment and the traffic sign system. The second area emphasises the theoretical frameworks that are used as building blocks in the empirical data collection. The third area is the implication of research gaps in design theories and practices. Thus, this theoretical and conceptual framework is meant to be used as a guideline in driving research methodologies. Several approaches from the mobilities and geosemiotics empirical techniques will be adapted in this study. Thus, the conceptual and theoretical framework (Figure 2) will be used as a guide in gathering the empirical data in relation to the research questions of ‘how do people make sense of traffic signs in urban settings’, and ‘how can this knowledge be utilised to inform the creation of better design policies and manuals?’

*Implication to Design Practices*

This framework will be used as a foundation for determining the relationship of designing a new road signs design manual that will integrate several aspects of studies from the mobilities and geosemiotics approaches. As can be seen in the framework, there are three elements that represent the research approach. The graphic design practices element (sign design, in this case) encompasses built environment, people and the traffic signs system. The empirical data will be gathered through a focus group, observations and the design manual. This research will help to generate new knowledge of reading signs in context into design theories. As mentioned by McDonagh (2006):

> Consulting users was perceived as a 'weakness', as designers are expected to 'shift culture' and create innovative solutions. There was resentment towards the prospect of changing the role of the designer when incorporating a number of new roles, such as

> moderating or communicating with users directly. (McDonagh, 2006)

Even though consulting the target users can be considered weak, I would argue that studying the natural behaviour of the users is essential. For instance, in relation to designing street signs, street maps, shop signs and so forth, it is best to look into how the users behave and acknowledge the signs. In visual communication research, theories of communication and social semiotic theory have always been used as points of reference (see Kress, 2009; Hall, 2007; Craig, 1999; Halliday, 1978). Both theories focus on the representations of meanings, culture and power. Thus, by integrating the methods from mobilities turn and geosemiotics, there are innovative and creative methods of investigation. Even though the methods used are common, including focus groups, interviews and observations, the techniques can be varied and multi-sensory. The use of mobile methods from mobilities turn and geosemiotics activities has widened the research through design practice. This will not only help to improve the current design research, but also apply the practice of design to one of the methods being researched (in this case through using a design manual as a method). Thus, this paper takes into consideration the integrating of mobile methods and geosemiotics activities as a research process for investigating the sense-making performed when people look at road signs that are familiar or unfamiliar to them. This will require more experiments and open discussion on the relevance of the literature and the methods that will be used to gather data forin my the PhD research on “Road Signs: Geosemiotics and Human Mobility”.

## Conclusion

In design practices, target audiences or clients are taken into consideration when designing products. This paper emphasises the relationship between the current mobilities turn and geosemiotics studies, which will be used as methods of investigation between people, built environment and the road sign systems. In mobilities turn, there has been plentiful research incorporating multidisciplinary fields, including transport policy, tourism and geography, as well as urban studies. Both mobilities and geosemiotics are interrelated in terms of the use of tools such as photography and drawings. Urry (2000), in his book titled *Sociology Beyond Societies: Mobilities for the Twenty-First Century*, discussed the travels of people, images, ideas and messages which influence our everyday experiences within time and space. He also argued that the visual sense of a person contributed to the mobilities paradigm in the twentieth century, amongst others. Photography and maps are considered significant aspects of visual representation from the eyes of the observer. In the geosemiotics activities outlined by Scollon and Scollon (2003), the authors used photography and illustrations as data collection tools for their research discourse. Thus, in extending the idea of generating data for this research, integration between mobile methods and geosemiotics activities are used as methods in relation to the main research questions, 'How do people make sense of traffic signs in urban settings?', and 'how can this knowledge be utilised to inform the creation of better design policies and manuals?'.

Mobilities turn has opened up broad perspectives of social interaction in social spaces, such as motorways, train or subway stations, airports, cosmopolitan cities, shopping complexes and so on. There has been much research on people being mobile in their everyday lives. Even social interactions such as meetings can be seen as 'mobile offices', as people can

now conduct their meetings in places other than their physical office buildings (Laurier and Philo, 2001; Laurier, 2002). In addition, the emergence of telecommunication platforms like Skype not only changed the way people interact with their loved ones anywhere in the world, but also increased the productivity of professional collaborations through online meetings. Thus, although mobilities turn has increasingly evolved in the social science research paradigm, geosemiotics is still considered new to certain researchers. The visual interpretation is relevant in this research, as road signs are considered the main artefact of research investigation. Therefore, it is also important to look into the semiotic value of the road signs' representations through the geosemiotics analysis. Having said that, this paper described the potential approaches that can be used to answer the research questions: 'How do people make sense of traffic signs in urban settings?', and 'how can this knowledge be utilised to inform the creation of better design policies and manuals?'

In current mobilities research, the researchers mostly focus on the behavioural aspects of people in relations to their mobilities practices. However, there are no researchers that discuss the interpretation of visual materialities such as road signs, advertisements or shop signs in the urban environment when people manoeuvre between spaces. Meanwhile, in geosemiotics research, the researchers focus on the understanding of signs' meanings in 'linguistic systems, visual codes, social and economic systems, and various systems of control'(Agnihotri & McCormick, 2010, p.27). Thus, as illustrated in the conceptual and theoretical framework, both mobilities' and geosemiotics' current theories and empirical evidence are used to frame the research methods by which one can describe the relationships between people, urban settings and traffic signs. The suggested methods include observations, focus groups and a design manual. In addition, more in-depth

approaches in terms of the mobile methods and visual interpretations will also be adapted.

For a traveller in an unfamiliar place, it is a common practice to search for signs to which he or she can refer according to his intended action. The experiences of a traveller are distinct from those of an every day person going about their normal activities, although both may employ similar modes of transportation such as walking, cycling or using the subway. But like the unfamiliar traveller, routine travellers engage in a variety of mobility practices with which they become comfortable. For instance, travellers employ different modes of transportation along one trip. For example, they may walk to the bus stop or underground station and then walk again to the work place. Additionally, while waiting for the bus, travellers may notice a new advertisement on the side of the bus stop. If the bus is delayed, a traveller will search for the bus schedule posted near the bus stop. If it seems that the bus schedule has been changed, a traveller may consult their mobile device to search for an online bus schedule. These are some common scenarios of traveling from home to a work place, or any other place with which we have some familiarity. The mobilities notion not only involves movement from home to the work place, but also the activities between the spaces and time.

Even though this paper includes the implication for design practices, the intention of this paper is to relate the theoretical aspects of mobilities and geosemiotics with design practice that can be taken into considerations by design practitioners when making decisions in designing the road signs system. The importance of the theoretical knowledge in this research is to identify the research gaps in design practices for communication materials such as the road signs. The conceptual and theoretical framework that I have proposed has certain practical implications for my empirical data collections.

Thus, this framework might be applied to identify the relevant methods to the context of research. There will be challenges in determining the most appropriate tools or instruments to be used and more experiments are required to enhance the current methods for future implications.

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Paper

# 03

**Walking in the City of Signs: Tracking Urban Pedestrians in Glasgow.**

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# Walking in the City of Signs: Tracking Pedestrians in Glasgow

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## Abstract

**This paper aims to determine the way in which materialities within the environment influence pedestrians' movements when searching for signs. The use of mobile methods to observe and track human interactions with the signs in a city contributes to the empirical data collection on everyday life practices of this study. This article presents the findings from non-participatory observations conducted in Glasgow. The observations took place in a selected area to explore the natural behavior of pedestrians in urban spaces when searching for signs. Random pedestrians were "unobtrusively" followed to investigate their natural pattern behavior when choreographing their travel flow. This study helps to determine the advantages and disadvantages of mobile methods for investigating the relationship between pedestrians, materials and the environment. The interdisciplinary approach developed in this article presents new perspectives on the way mobility and geosemiotics could contribute both theoretically and empirically with new knowledge in design practices.**

## Keywords

**Pedestrians, Non-Participatory Observation, Signs, Tracking Pedestrians, Mobile Methods**

## 1. Introduction

In a previous study by Hamid, Jensen and Andrade (2012), the authors discussed the importance of choreographing travel flow from above (policies and common traffic signs regulated in urban spaces). The authors also suggested that there are layers of communication between people, the city, as well as cultural and social signifiers of the materialities in place; practices relating to the creation of sign systems for directing mobility become much more than simply a question of regulatory frameworks, traffic safety or highway engineering. The semiotics affording particular movements become important cultural and social signifiers that create the communica-

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tive layer of the city, and thus, ultimately, the way we engage with the world (Hamid, Jensen, & Andrade, 2012).

Have you ever walked in your hometown in search of a new restaurant suggested to you by your colleagues? How do you get there if you are planning to walk? Fundamentally, you might ask your colleagues for directions or "Google" the locations on the Internet. In search of your destination, you might be overwhelmed by the multitude of existing "signs". The existence of "a constituted place of sign system space" (de Certeau, 1984) becomes increasingly accepted in mobility research and urban planning. I would suggest that users of the semiotic environment use different approaches to move about. This paper, which was conducted between March-April 2012, looks into several aspects of walking in a city.

The area of study was Glasgow city centre. Glasgow is the UK's "largest retail centre" outside London and is Scotland's largest city (Factsheets, 2012). The "pedestrian volumes" (Whyte, 1994) in Glasgow are higher than in the capital city of Scotland, Edinburgh. Given the large geographical scale of Glasgow, there are more activities in the city centre such as shopping or arts and cultural performances. In terms of the urban context, Glasgow is very "pedestrian-friendly". Therefore, most of the pavements are very broad.

In mobility research, both social practices and the environment play important roles in human daily life. This paper examines pedestrian mobility in the real "material world" (Scollon & Scollon, 2003) through a mobile ethnography method. Büscher and Urry (2009), in their study of "Mobile methods in the empirical", illustrates how important it is that the researcher adapts or experiments with new techniques to observe and record social settings. Therefore, this study also emphasizes the exploration of "mobile technology" and non-participatory observation to document pedestrian journeys in the observation area.

In this study, the empirical investigation into how signs influence human mobility in an urban environment was conducted through tracking pedestrians' routes on foot (Hill, 1984; Lee & Ingold, 2006; Van der Spek et al., 2009). As mentioned by Lee and Ingold (2006), walking is a "phenomenologically inspired fieldwork practice" compared to symbolic analysis commonly designed for traditional ethnography. In a study conducted by Millonig et al. (2009), the authors suggested that "In non-participatory, unobtrusive observations the researcher follows the subject at a distance, recording her movements by drawing a line corresponding to the subject's activities on a map of the investigation field" (p. 32). The authors also illustrated the advantages and disadvantages of pedestrians' "natural" behavior from this method of study. In this study, the investigation particularly focuses on the pedestrians' movement within the urban spaces. The research question tries to unfold the meaning of visible signs in urban spaces which are used by pedestrians when navigating the cityscape. This paper has two main objectives. Firstly, the study investigates how pedestrians behave when searching for directions in urban spaces. Secondly, this study explores the mobile methods applications used for tracking pedestrians' movements.

The paper is structured as follows. The next section introduces the theoretical framing of urban walks in terms of the rhythm of walking, signs in the city and the moving body. This is followed by a discussion of mobile methods and the data analysis obtained from the observation of pedestrian behavior in Glasgow. The paper concludes with a discussion of the limitations of mobile methods as well as suggesting future research on the cognitive understandings of "why" human behave and react to the signs or physical elements the way they do.

## 2. Framing Urban Walks

This section presents the theoretical framework which shapes our understanding of walking. Here we are working within the mobilities turn (Cresswell, 2010; Sheller, 2012; Urry, 2007). Importantly we link the basic understanding of mobility to the notion of "geosemiotics" coined by Scollon and Scollon (2003) in order to create an analytical framework which is sensitive to bodies in motion as well as sense making and interpretation of the semiotic environment.

### 2.1. The Rhythm of Walking

As suggested by Solnit (2001), walking is a dynamic process that humans think while they are walking at the same time. All human beings have a different rhythm of movement when they drive, walk, cycle, run, etc. However, as pedestrians, humans are directly involved in the environment and react to what they see, hear and touch. Halprin (1963) suggested that the speed and motion of pedestrians vary according to their senses and rhythm of walking within the built environment. Whyte (1994) on the other hand, argued that a pedestrian is part of a "social being" (Knox & Pinch, 2006), since no pedestrian can walk without being part of the environment at the same time. A person who walks is also "a transportation unit" but without the wheels or the steering to ma-

neuver the movement of a vehicle in the streetscapes. The way a pedestrian navigates within a space depends on the complexity of the space and how the pedestrian understands the space (Whyte, 1994).

As pedestrians, we have to decide which path or route we are going to take when we walk in urban settings. Sometimes, we might purposely choose the scenic route, walk past buildings that we are familiar with or decide to take the shortest route to our destination. Whatever the reasons behind our choice of route from point A to B, we will always see different things as we travel. Cullen (1961) discusses the "serial vision" which means that "the scenery of towns is often revealed in a series of jerks or revelations" (p. 11). We now turn to the signs in place which are viewed while walking in the city.

### 2.2. Signs in the City

In a study by Crundall and Underwood (2001: p. 188) on the "priming function of road signs", the authors concluded that "the UK road system often employs the repetitive use of road signs on the run up to a single hazardous road feature". In current urban scenarios, urban streetscapes are embodied with a linguistic landscape which includes not only signs to regulate traffic users but also advertisements, posters, notices, street names, wayfindings, as well as shop signs. In our daily life, traffic signs are important guides helping pedestrians, motorists and cyclists to avoid accidents. Borowsky, Shinar, & Parmet (2008: p. 1) suggested that "misplacing objects—specifically, traffic signs at intersections—can be a potential hazard to experienced drivers who fail to identify them". However, Fauque (1986) argued that motorists and pedestrians have different perceptions when using traffic space according to differences in the "flow of visual and auditory images". Drivers for instance took note of "pedestrian zone" street signs to avoid collisions with pedestrians. Thus, the regulated traffic sign prohibits motorists from entering the zone. On the other hand, the massive placement of traffic signs affects the driving performance of motorists as they can be distracted by cluttered signs (Edquist, 2008a) placed on streets. Pedestrians usually have more time to navigate within urban spaces in contrast to vehicle users. However, pedestrians do not search for street signs that are not relevant to them as the majority of traffic signs in urban spaces regulate vehicles. We now turn to how pedestrians move within the space to look at the performance of pedestrians within urban spaces.

## 3. The Moving "Body" vs. Moving through "Spaces"

With respect to the performance of pedestrians when walking in the streets of an urban space, orientation is one of the important elements that help to ease the movement of embodied travel. Orientation is defined by Rapoport (1977) as a combination of "physical elements" and "socio-cultural rules". According to Baers (Rapoport, 1977: p. 148), there are four main methods of orientation; (i) Signs and verbal aids (asking); (ii) Recognition of pattern of location; (iii) Habitual patterns of behavior and; (iv) Landmarks.

The city and other elements within the built environment influence pedestrians' movement and orientation. Duff (2010) suggested that "To walk is to be affected by place and to simultaneously contribute to the ongoing co-constitution of self and place" (p. 7). Therefore, pedestrians' behaviour depends on the individual's preferences regarding moving between spaces be they familiar mundane spaces or more meaningful spaces that bring back memories of particular places. As mentioned by Casey (2001), "The vehicle for being-in-place is the body" (p. 413) and therefore the human mind and body play important roles in determining the destination. As Jensen argues:

The mobile body is the entry point to understanding the individual's engagement with the world as well as it is the key to seeing the way meaning and norms are created in embodied cultures of mobilities (Jensen, 2013: p. 119).

Understanding bodily movement in urban spaces helps us to better understand social practices. As argued by Scollon and Scollon (2003: p. 182), pedestrians only refers to signs regulated them to walk instead of the legal markings on the pathways. How does a person navigate, orientate and make sense of this at times overwhelming milieu? This question has been articulated by scholars before us, e.g. Georg Simmel in his seminal essay "Metropolis and Mental life" (Simmel, 1950) where he argues that the senses are over stimulated and thus that the modern urbanite (1880s Berlin that is) reacts with a famous "blasé" attitude. Most urban dwellers who walk along the same streets in their daily lives tend to be more inattentive of their surroundings. They may ignore the elements in the built environment such as traffic signs, street signs, or even advertisements posted on traffic lights. Such analysis seems to still be highly relevant but here we shall turn our analytical attention from the in-

teraction and communication between mobile urbanites towards the individual and his/her attempt to navigate and make sense of the city and its semiotic layers. Next, an exploration of mobile methods inspired from Büscher, Urry and Witchger (2011) was carried out in the study areas to track the movement of pedestrians, through field notes, as well as still and video documentation using digital devices such as an iPad and DSLR camera. These explorations provide practical mobile ethnography methods that could contribute to the empirical study within the social sciences and urban design when looking at the interconnections between objects-environment-people.

## 3.1. Mobile Methods

In mobilities research, numerous empirical data methods are used to unpack everyday life practices. A previous study by Büscher, Urry and Witchger (2011: p. 7) presented ten practical mobile methods that can potentially be used to "capture, track, simulate, and mimic" the pedestrians' natural behavior within the urban spaces in search for their destinations. The next section presents a more detailed discussion of the study's empirical data collection process.

### 3.1.1. Tracking the Pedestrian

This section introduces the method of observing pedestrians' travel behavior within the selected urban spaces. In previous studies which tracked pedestrians, the researchers used GPS to track the movement of pedestrians or visitors (Shoval, 2008; Van de Spek, et al., 2009; Pettersson & Zillinger, 2011). However, the aim of this empirical study is to observe, analyze, and explain the relationships between signs in the urban spaces and pedestrian behaviour.

In 1984, Hill published a paper in which he described the comparative study of questionnaire techniques vs. tracking urban pedestrians' behavior in large-scale environment behavioral mapping. In my study, I adopted the "completed observation" point based on Hill's suggestion from which the subject arrived at the final location or the subject was idle for more than ten minutes at one place to avoid tracking the pedestrians for long period of time. This is however open to question as it depends on how the researcher observes the subjects within the selected area of study. In this study, the exploration of "on foot observations" was performed based on the tracking research conducted by Hill, observational methods from the geosemiotics approach adopted by Scollon and Scollon (2003) and mobilities practices conducted by Büscher, Urry and Witchger, 2011; Jensen, 2010a; Sheller and Urry, 2006.

This paper presents the results of field observations conducted in Glasgow, Scotland in March 2012–April 2012. The study applies the multi-methods in gathering data through observations as well as the behavioral mapping of pedestrians. Hill (1984) illustrated "behavioral maps" as an "observed behavior" within an environment. Thus, this study focuses on the performance of the pedestrians through the eyes of the researcher. As part of the mobile methods of investigation, the "mobile iPad" is used for field note taking, mapping movement, capturing photos as well as video documenting. However, since the iPad is a relatively new tool for collecting and documenting data, it has limited functions and capabilities. Thus, this tool was also used as a "time-space diary" as mentioned by Büscher and Urry (2009) which "can be textual, pictorial or digital or some combination" (p. 105) and which can also track pedestrians' movement with the help of GPS. This section consists of different investigations conducted at the location which emphasize the context, the study area, the instruments, participants and procedures used when investigating natural pedestrian behavior in city settings.

### 3.1.2. Research Area

The research area for this study includes the flow of pedestrians, the streetscape designed for pedestrians as well as the road signs within the perimeter of the urban context study. Therefore, in order to conduct the ethnographic investigations of how humans move within an urban cityscape, it is important to document people's reactions or human behavior towards the materials in place such as the road signs. In order to do this, the researcher documented most of the daily observations using the "penultimate" app on the iPad which allows one to write and include pictures at the same time. This is a very useful tool that can be used by ethnographers who wish to write down everything they see and hear with a single tool.

There are three main pedestrian areas in Glasgow city center (**Figure 1**). The highest pedestrian flow is in Buchanan Street where most of the main attractions such as shops and theatres are located. The average pedestrian flow area is located in Argyle Street which also includes expensive boutiques and shopping centers. The

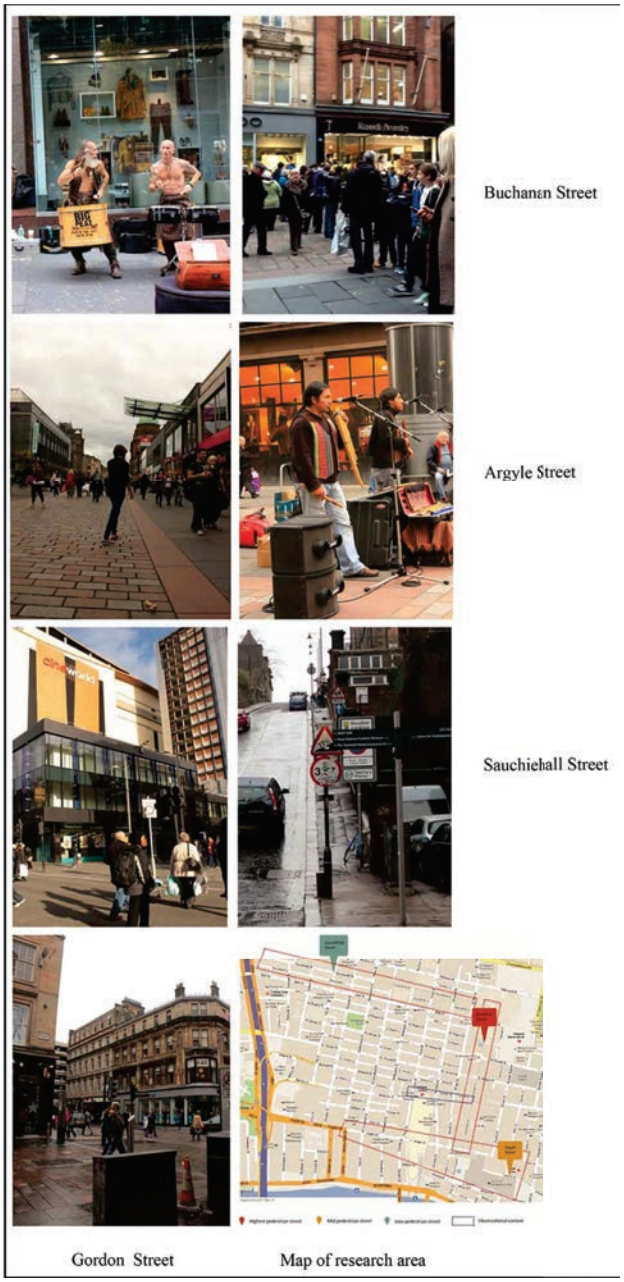


**Figure 1.** Glasgow pedestrian street.

lowest pedestrian flow is in Sauchiehall Street. However, Gordon Street is selected as the research area since it is considered to be the nearest street that is connected to other three main pedestrian shopping streets indicated

before. Besides that, the street is close to the Central Station which is commonly used by locals or foreign travelers when travelling from Glasgow to other places outside the city.

#### 3.1.3. Research Instruments

The tracking tool used was an iPad which was used to experiment with several free and paid-for applications for tracking, note taking, as well as audio-visual recording. The mapping tool used for tracking the movement of pedestrians from point A to point B was tested in terms of tracking the route and converting it into a "tracked map". Additionally, a DSLR camera and the iPad's embedded camera were used to take pictures of signs and the individual's behavior towards the signs in order to illustrate the relationship between the map and the participants' socio-economic and lifestyle status. Some pictures that are used in this paper had few marks and notes or drawings edited in the "Penultimate" application on the iPad which indicated that note taking and capturing the real situation of the targeted pedestrians can be done in "real-time" on digital device.

#### 3.1.4. Participants

The participants were randomly selected and could be single pedestrians or individuals walking in groups. The participants selected were diverse in terms of gender, age and ethnic background (locals or foreigners unfamiliar with the urban spaces). The participants who were tracked during this study were selected randomly from 10 different individuals/groups. However, in this paper, I will only discuss two of the tracked individuals.

#### 3.1.5. Procedure

As part of the non-participatory observation, the researcher had to stand on street corners within the perimeter of the study and observe people's behavior. Based on the observations, some of the individuals referred to the city map on the street in order to reach their destination while others used their mobile phone or printed map to search for their destination. Some of the travelers also asked other pedestrians the way to the Central Station which is located just one block away. As I was walking in the study area in Gordon Street, I noticed that the sign for the Central Station was not easily visible to pedestrians. This is one of the reasons why most pedestrians who were not from the area had difficulty finding the central station. This also supports the four orientation methods by Baers (1966) in Rapoport (1977) as previously mentioned. Bechtel and Zeisel (1987) define behavioral mapping as the interaction between human behavior and space and time. In order to track pedestrians' movement from point A to B, the mobile tracking software "Road Tripper" on the iPad was used. As well as tracking movement, images of visible road signs are captured along the way (**Figure 2(c)**). Several other apps were used and experimented with in the study in order to find the best for collecting in situ data. However, most of the maps available on Google Street Map were updated two years ago. Therefore, the maps had to be updated manually through observations.

## 4. Data Analysis and Experiences

Based on the observations and tracking conducted, it can be argued that most pedestrians considered few important elements when searching for directions. The elements that they normally looked at included street names, street maps, and also street signs for locations. Next, the paper discusses the empirical evidence into three main categories of findings which emphasized human behavior, materialities, communication and mobile search. The empirical findings were obtained through field data such as photographs, tracked maps, and field notes.

### 4.1. Human Behavior in Urban Streetscapes

The urban streetscapes are composed of street furniture such as traffic signs, advertisements, traffic lights, the pavement between vehicles and pedestrians, as well as street lighting. In the streets of Glasgow, the effects of pedestrians' social behavior can be seen through their actions and interactions with the elements in the built environment. The interaction between the pedestrians and the "materials in place" in **Figure 3** shows that even though the lights say "stop", the pedestrians still crossed the road. Even though crossing the road when the red light is on is not an offense in the UK, it is subject to a fine in other countries such as New Zealand and Australia. This also supports what was argued by Whyte in 1988 that people in cities like Boston and Montreal tend to cross the street when they feel safe without paying attention to the color of the traffic lights. During this study, most pedestrians gazed at cars and some gazed at others who crossed. The traffic lights function as an indicator


**Figure 2.** (a) View from the Observation location captured using the iPad. (b) Tracking pedestrians context of observation (c) screenshot of road tripper app for tracking pedestrian routes.


**Figure 3.** "Red light" crossings between mid-afternoon and evening.

for drivers to be more careful with the coming pedestrians at the intersections. Thus, the pedestrians negotiate the spaces also according to other objects that were not present at the particular time (other vehicles and not the red light). As argued by Jensen (2010b), people negotiate spaces as part of their social interactions in their everyday life. And as mentioned by Carmona et al. (2010), urban streetscapes are considered mental constructs which are commonly interpreted and valued differently by individuals. Thus, in reference to Lynch (1960), Carmona et al. also reflect that the crossing routes in urban spaces are considered the key nodes of cities.

### 4.1.1. Materialities and Communication in Place

Street map signs are the most important element in Glasgow to guide pedestrians to specific locations in the city centre. As argued by Vertesi (2008), maps serve as a "device" or a material for interactions between the pedestrians and the environment. The street maps are appropriately placed on the sidewalks in the pedestrian zones. In terms of gender, females spent more time reading the street maps compared to men. In the observation area located at Gordon Street, there are fifteen (15) traffic light signals, two (2) street maps, nine (9) regulatory signs and one (1) mixed regulatory and informational sign. Based on the observations through field notes, photographs and video recordings, most of the pedestrians searched for locations by looking at the street names (located on the corner of buildings) or by looking at the map or landmark buildings. However, in terms of the regulated traffic signs, most of the pedestrians were not obliged to follow the signs even though the signs are placed at the pedestrian zones.

The materialities in place are also very significant for the geosemiotics analysis (Scollon & Scollon, 2003).

The size of street signs, advertisements or stickers on regulated traffic signs affects the traveling behavior of pedestrians if they are not looking for specific signs when they move in the urban spaces. As can be seen in the **Figure 4(a)**, a number of Glasgow City Council's regulated traffic signs had been tampered with posters or stickers. The road traffic signs were also not "respected" by the road users as the signs were used to park their bicycle (**Figure 4(b)**). As for people who are familiar with their route and surroundings, they will certainly not pay attention to traffic signs which are considered irrelevant. However, pedestrians who are unfamiliar with the route will refer to specific visible cues such as buildings, signs or verbal aids from others. Next in turn we look at how pedestrians communicate in urban spaces when way finding.

As argued by Scollon and Scollon (2003), it is human nature to communicate and interact with living or non-living things. In this context of observation, some of the pedestrians, either locals or people from outside Glasgow, interacted with other people when searching for the "Central Station" which is just around the corner. The street map provides directions to the central station but since the font used is rather small, senior citizens tended to ask people around for directions instead. Hand gestures and conversations between the "lost person" and "guide person" played a very important role especially when senior citizens were involved. Therefore, as can be seen in **Figure 5** below, even though there is an informational sign nearby, it seems like "asking" is a more reliable and faster way of getting the required information apart from searching or looking for signs.

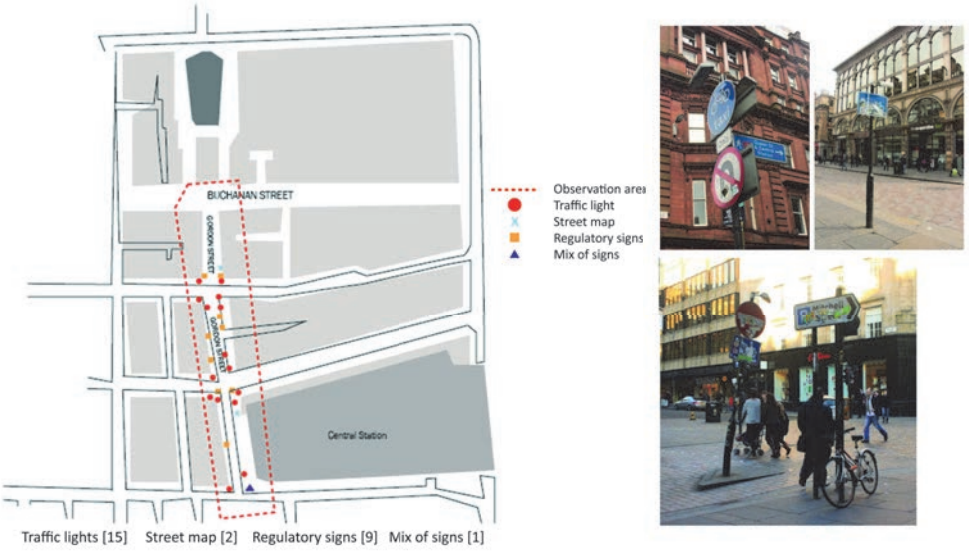


**Figure 4.** (a) Locations of "traffic signs" in the observational area (b) Images of signs located on Gordon Street.

**Figure 5.** Senior citizens asking for directions.

The observations were also conducted from the top of a building to get a different perspective of how the pedestrians orchestrated their travel behavior when searching for directions. These findings of observing the natural behavior of pedestrians from a distance inspired from the previous study by (Whyte 1988) who unobtrusively observed people without affecting their routine behavior. As mentioned earlier, this study not only unfolds the theoretical aspects of research in building block of materialities in urban spaces but also the empirical data tools that help to understand the interweaving of empirical methods in geosemiotics and mobilities. In contrast to earlier orientation methods in the introduction text by Rapoport (1977), the pedestrians in this study tended to look at signs (street maps) or resort to verbal aid (asking for directions) in order to find their destination. Li (2006) in his investigation of way finding suggested that route knowledge is an important factor when moving from one place to another and it includes "procedural descriptions, some landmarks and path elements".

In my research findings in this study, some of the pedestrians not only looked at the street maps, but they also asked other pedestrians for directions after they had looked at the maps, and tried to find their current location on the map by looking at buildings and street names. Even though Rapoport theoretical aspect of orientation is old, the human mind and perception of space remains the same according to individual cognitive mind mapping. Thus, with the emergence of mobile technology and location-based systems, we look at the importance of mobile technology regarding pedestrians and the mobile method used to track the pedestrians' behavior in the next section.

### 4.1.2. Mobile Technology vs. Street Map Search

Mobile technology vs. street map search in the context of this study means the use of devices or tools to search for specific destinations by the pedestrians. In order to obtain a better view of the movement and more accurate journey mapping, mobile applications on the iPad were used to track pedestrians' journeys from point A to point B and a digital camera (DSLR) was used to capture the movement of the pedestrians who were unfamiliar with the areas. As suggested by Büscher (2006), "By engaging carefully with the actual, moment-to-moment production of professional vision, it is possible to begin to understand the specifics of the practices involved" (p.297).

During her search for her destination from the train station, a lady with luggage used her mobile phone to search for directions from the station to "X". The lady seemed to be totally unfamiliar with the area since she stopped at a few places on the street to look at her mobile phone and the street map. However, it was hard to determine whether the woman was purposely looking for the information centre or asking for her specific destination. The most important aspect of knowledge here is that even with advanced mobile technology; sometimes a person needs to make sense of the place to become more familiar. It is a decision making process and knowledge structure of "cognitive representation" or "cognitive map" (Golledge & Stimson, 1997). Thus, the lady seemed to be finding her own way by following her technology based information (mobile phone), her sense making of landmarks and looking at the street map, which may have helped her locate her actual destination (See **Figure 6**).

With regards to a more challenging and time consuming behavioural mapping of pedestrians, the "Men in suits" tracking observation was relatively thought-provoking in terms of the way they navigated within the city spaces. During this study, two men who were selected randomly, started their journey at the shopping street near Bu-chanan Street and ended up at Bothwell Street. After almost 40 minutes of trailing the men, the researcher had some interesting experiences and collected data from the tracked map using the Road Tripper application on the iPad. The travel journey and visual data obtained through the observation is as follows:

An excerpt from the researcher's field note diary;

After almost 40 minutes of walking, they end up at a restaurant. Before that, they went into shops and build ings to ask for directions [my assumption anyway]. Even though the weather was really hot, they never seemed bothered by the weather and still laughed and engaged in normal conversation without becoming anxious. They also looked at buildings and street signs for landmarks. Most probably the address is not in their GPS settings [thoughts in the author's head at the moment] after almost an hour of trailing the men insuits (researcher Diary, 29 March 2012 at 12.45 pm - 1.33 pm).

Solnit (2001) suggested, "passage through a landscape echoes or stimulates the passage through a series of thoughts". Even though the researcher's attention was on tracking the movement of the "men in suits", the researcher had lots of thoughts in her mind about whether the "men in suits" were lost and had ended up in a restaurant due to frustration over not finding their actual destination or whether they had finally found the place. As mentioned by Vannini (2012), performances rely on movement and it seemed that the "men in suits" enjoyed their walking as they could still laughed despite their long and tiring journey. If we refer to **Figure 7**, Map of

**Figure 6.** A woman's sequence of movement and the tracking map (indications of 3 stops).


**Figure 7.** Map and photos of "Men in suits" trail from the street map location at Buchanan Street to end destination.

"Men in suits" trail, both men had difficulty in finding the exact location of their destination. Even though there were street maps and street signs on street corners, they became lost. However, in terms of their performance in movements, they seemed to be very calm since they did not have any arguments along the way. In other words, sometimes not everyone is patient when trying to find their way. This definitely is not considered as a "blasé attitude" since they were both unfamiliar with the urban spaces and this unfamiliarity affected their travel flow.

Despite all the observations and tracking the bodily movement of pedestrians in Glasgow, there is still a gap in terms of the cognitive understanding. How do we know that they understood the meaning of the signs in relation to the street maps, or whether there is a lack of informational guidance on the street which if present could ease the pedestrians' journey and destination search. As stated by Fiske and Taylor (1991), people interpret in-

formation around them either spontaneously or by recalling the information from their mind.

## 5. Discussion and Future Research

Despite the emergence of technology such as GPS navigation systems either in a car or in mobile phones, people nowadays still refer to physical maps, travel books or street maps. It is true that technology helps to ease the complicatedness of searching for directions in new or unfamiliar areas. However, in my own experience there have been times when I have had difficulty using my mobile phone unless the phone is connected to Wi-Fi or a high cost data plan charges for the use of GPS when abroad. Therefore, I normally print the map of a location that I wish to visit, especially the routes from the point of departure to the final destination. Thus, each person has his/her own way of getting directions if they are lost, even though there are signs placed in city streets to guide pedestrians and motorists.

The signs in Glasgow presented in this paper vary from informational signposts (street maps), advertisements to regulated traffic signs. In the observations, it was discovered that most of the traffic signs were posted with "transgressive notices" (Scollon & Scollon, 2003) which commonly ranged from graffiti to posted notes. As argued by Scollon and Scollon, these transgressive notices sometimes could only be read by the pedestrians due to the size and placement of the notice. In **Figure 8**, the "restriction notice for vehicles" was placed on the traffic lights so that it only be noticed by pedestrians who walked past the street. In fact, the notice which was meant for vehicles had been placed on the traffic light to temporarily prohibit use of the "no waiting" and "no loading" zone on Gordon Street at a certain period of time. Because of the way the notice had been positioned, only pedestrians could read it if they happened to be curious.

On the other hand, when examining the Google Maps, it was clear that other transgressive notices were not present on the signs, see **Figure 9(b)** Google Street View compared to **Figure 9(a)** which was taken in March 2012 during the study.

Based on the data collected from photographs of the signs, tracked maps, field notes, and video documentations, there are several key findings that can be used for future considerations on the role of traffic signs and also methods of investigation for social scientists. The findings could be used for future upgrading of the technological applications (iPad, or Android apps) as well as for future creative design research in urban studies or visual communication.

Most regulated traffic signs are designed to be used by drivers and not by pedestrians or bicycle riders. The most important element in guiding pedestrians in urban city planning is appropriate positioning and design of street maps and signs. An example of appropriate positioning and street maps for pedestrians are located in London which an implementation of Legible London project.

The paper focuses on walking as part of social practices in urban environments. In **Figure 10(a)**, the sign "no skateboarding" is located in different area and street and thus, the young teenage boys were not breaking any laws as well since it is not against the law to cross the road when it is red. If we are looking at the idea of geosemiotics, the "no skateboarding" was placed on a square which is a common space for youngsters to gather. Thus, since Gordon Street is known for being a busy street with pedestrians going to and from the Central Station, the placement of the "no skateboarding" sign may not be appropriate since there were not many skate-

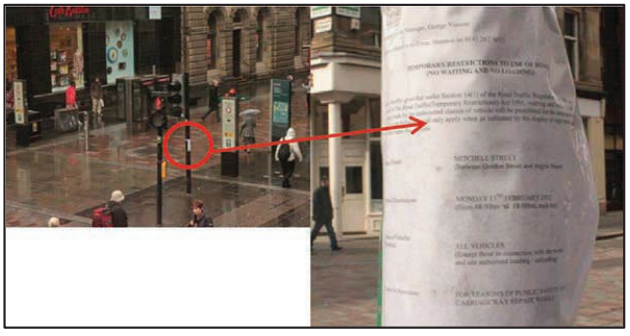

**Figure 8.** Council "transgressive" notice.

(a) (b)

**Figure 9.** (a) Regulated "No entry" and bicycle route ahead sign taken in March 2012 (b) current Google map street view of Gordon Street (image date on Google map is June 2008).

(a) (b)

**Figure 10.** (a) Two teenage boys were skateboarding on Gordon Street (b) a "No skateboarding" sign was located at the Royal Exchange Square.

boarders on Gordon Street. Thus, as can be seen in **Figure 10(b)**, the "No skateboarding or roller skating" sign was placed near a square (which is in front of the Museum of Modern Art). It is possible that the placement of the sign is because people use the square as a gathering place especially at night and if there was no sign forbidding skateboarding, teenagers and skaters would probably skateboard on the square.

However, by applying this method of non-participatory observations on site, it was impossible to determine whether the pedestrians or the skateboarders understood the meaning of the signs or whether the signs were placed inappropriately or whether the pedestrians referred to the signs for guidance. Even though several attempts were made to interview pedestrians, the pedestrians either ignored or rejected the requests due to time restraints or the presence of other "interviewers". Having to compete with other "interviewers" *i.e.* NGOs who interview street pedestrians, limited the applicability of "go-along" interviews suggested by Kusenbach (2003) for phenomenological research in this study. As mentioned by Rapoport (1977), men and women use signs or other physical elements differently. However, during this study, it was not possible to gain any insights into the pedestrians' thought processes when navigating the spaces.

Therefore, in order to get some feedback from the people within the site area, it would have been useful to conduct short interviews with the pedestrians using one of the tenth mobile methods outlined by Büscher, Urry

and Witchger (2011). The authors suggested that "real places are not necessarily fixed and can be mobile" (p.11). Thus, short interviews were conducted from the top view of the urban context. The researcher interviewed two individuals near the "on site location" instead of "go-along interviews" (Kusenbach, 2003; Anderson, 2004; Carpiano, 2009). Two of the individuals were selected randomly at the EAT cafe (**Figure 11(a)**) which was located above the observation site location. They were asked several questions related to the traffic signs and how they move around the city. When the participants were asked about the function of signs located on the streets, one of the participants, (Alexander, personal communication, March 6, 2012) stated that:

The signage is more for drivers than it is for pedestrians. Equally, cyclists don't pay a huge amount of atten tion to signage at times. If it says no entry, as a motorist, you won't go down there. A cyclist may do it because they feel like they're not the same as a motor car. That can be a hazard for pedestrians. I'm only familiar with all the signage because of being a motorist. It's the parking regulars that are more complicated. It doesn't really make sense. You have the smaller signs. People know the double yellows, you can park at all. The double red lines in London—you can park there at all. It's a priority route. It's a little confusing—are you able to park on the double yellows at nighttime? Can you park on a single yellow? It's never made clear. The traffic wardens rely on the fact that people don't know what's going on when they issue tickets (Alexander, personal communication, March 6, 2012).

As mentioned by Alexander, he argued that most road traffic signs are meant to regulate motorists. In Glasgow, there are a lot of parking signs that do not make sense in terms of size. As can be seen in the **Figure 11 (b)**, the parking signs can only be seen by motorists when they are very near to the signs.

Another limitation or drawback of these methods of investigation if only conducted by a single researcher is that they are very time consuming. As mentioned by Hill (1984) tracking pedestrian is "really time consuming and labor intensive". Technological tools such as DSLR cameras and iPad are significant devices for capturing and recording observational data. However, with the emergence of improved technological devices, there are potential applications for the "Android or Apple" that could help to ease the ethnographers or phenomenologist data collections. Apart from urban design, human behavior, geosemiotics, mobilities and visual communication field of research, the data collected in this study are also useful for computer application developers to design more effective user-friendly applications for future researchers. Thus, since this study also an exploration of the mobile methods used which is considered potential tools for ethnographers and design researchers, there are several advantages and disadvantages that can be identified:

This study not only explores the mobile methods outlined by Büscher, Urry and Witchger (2011) but also testing the relevancies between theoretical views and the practical implications during my empirical study. As can be seen in **Table 1**, the iPad is a useful tool for mobile methods# 3, 4 and 6 explorations. However, due to


(a) (b)

**Figure 11.** (a) Location of interviews at EAT (b) Parking signs that can be seen from the location of interview at Gordon Street.

**Table 1.** Advantages and disadvantages of mobile methods and tools used in the study.

| Mobile methods | Advantages | Disadvantages |
|---|---|---|
| **Mobile methods#6: Mobile technologies** | | |
| • Tracking the pedestrians' movement using "Road Tripper" application | • Real-time mapping capability in tracking movement<br>• The application could also track car and bicycle movement within urban spaces<br>• Could easily convert the tracked map into JPEG file and upload on social media | • Map used in the application not accurate but useable. |
| **Mobile methods#3: Mobile video ethnography** | | |
| "Anticipatory following" video documentation | Documenting real-time movement of pedestrian | • The recorded video are not in good quality especially the ones that were recorded while moving<br>• The outcome of recorded videos are portrait orientation which limited the view of the background environment |
| **Mobile methods#4: Time-space diaries** | | |
| Using Penultimate and Skitch for note-taking | Capability of taking notes similar to paper-pen methods but with added valued of embedded photos while writing the notes in real-time | The application only used for researcher's note taking but not for respondents |
| **Mobile methods#10: Mobile place** | | |
| Interview conducted in different setting | Making unfamiliar familiar when the interviewees were asked to looked at the signs from different angle of viewpoint instead of on the street | The EAT location is a café and therefore decrease the participations from the customers |

massive applications on the net, the researcher had to be selective in terms of the appropriateness of using the right application.

However, what are the main contributions of this paper? This paper helps to determine the natural behavior of pedestrians in their daily life through direct non-participant observations. From a methodological perspective, the mobile methods proved to be a valuable tool in urban space research. In fact, the "mobile technology" tool used can be a really significant instrument which can be used by all ethnographers if the applications are enhanced and developed further. The free tracking application (Road Tripper) on the iPad showed a potential way of tracking the "real-time" routes made by pedestrians. The experience of tracking the pedestrian's movement discreetly also improves the data compared to participant observation tracking which the observers might influences the data. This can be seen through the nature of human behavior when being observed and tendencies to react differently (Schwartz & Schwartz, 1955).

## 6. Conclusion

In conclusion, how pedestrians navigate within urban spaces depends on the way they communicate and interact with the environment according to their social needs. Therefore, an additional research method was needed to understand why and what people think and the relationship between the signs and place in a more dynamic approach and setting. Thus, in another stage of my PhD research methodology, multi methods of qualitative inquiry through focus group interviews were conducted to get some perceptions from individuals on their behavior towards the traffic signs. In addition, the method also used several approaches in terms of tools to investigate people's perceptions of their daily life practices. Consequently, new knowledge of qualitative data collections can be useful for creative design researchers who intend to broaden their options of conducting field research.

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Paper

# 04

**Reading Road Traffic Signs in Urban Spaces: Activity-Oriented Focus Group Interviews.**

Submitted to British Journal of Arts and Social Sciences (BJASS).

# Reading road traffic signs in urban spaces: Activity-oriented focus group interviews

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**Abstract**

The goal of this paper is to investigate people's perceptions of the signs in place by using several approaches and techniques for unfolding stories in focus group discussions. Activities and mobile methods such as drawings of journey maps and manipulated photos of traffic signs were integrated into the focus group discussions. These tools were used to unpack the participants' everyday social behaviour within an urban environment in an "unnatural setting" (Morgan, 1984). This study invites discussion of the importance of geosemiotics and mobility approaches in investigating people's travel behaviour and relationship to the urban environment, especially road signs. The findings of this study encompass stories from the participants about their daily life mobility elicited through verbal questions as well as mapping and photo-interviews. The analysis examines, through the activity-oriented questions, the everyday life activities and experiences of the participants as they relate to their understanding of meanings of signs in place.

**Keywords**: focus group, mobilities, geosemiotics, mapping, photo-interviews

## 1. Introduction

Focus groups have been used to collect important research data in the fields of education, sociology, communications, health sciences, organisational behaviour, social psychology and marketing (Stewart, Shamdasani, & Rook, 2007). Krueger (1998) indicated that "Questions can be more fun. Too often we get into a rut, but with a little help, our questions can be both enjoyable and productive" (p. 63). Activity-oriented focus group questions are defined by Colucci (2007) as providing "a different way to elicit answers and promote discussion and are particularly beneficial for those more reflective participants who are less comfortable with immediate verbal responses and need extra time for thinking or prefer to sketch out their ideas" (p. 5). This article explores the activity-oriented focus group questions that were used in gathering data on the experiences of participants when reading road signs in urban spaces.

Activity-oriented focus group questions are described in this article as exercises that participants are asked to do during discussions on a specific topic. Inspired by the framework of urbanism (Lynch, 1960) and geosemiotics (Scollon & Scollon, 2003), this study explores some of the activity-oriented questions suggested by Colucci (2007). Therefore, in this study, drawing maps and photo-related activities were integrated into the interviews with the participants as part of a qualitative research. Thus, this paper seeks to investigate the perceptions of people towards the road signs in place through verbal descriptions and drawings interpretations in order to encourage stories to be told in focus group discussions. The primary research questions used to unpack the stories of the participants' experiences and practices in this study are: (i) What is the relevance of the urban context when travelling in familiar or unfamiliar areas? (ii) How do people interpret signs and symbols in place? This paper discusses the activity-oriented focus group interviews that were carried out as part of research project. The next section explains the theoretical framework, which helps to guide the process of conducting the focus group discussions, involved in this study.

## 2. Theoretical Framework

This paper summarises the focus group findings that were conducted as part of a PhD project titled "Road Signs: Geosemiotics and Human Mobility". The focus group gathered different experiences of people from a wide variety of nationality and age backgrounds. There were 16 participants involved in this focus group. Interviews were conducted in different settings and at different times. The focus group questions related to aspects of the human-environment behavioural, which is related to the main research topic on the relationship between geosemiotics theory and mobility theory within the road signs system. Figure 1 is an empirical research framework that helps to frame the research questions and process of investigation through a focus group methodological approach.

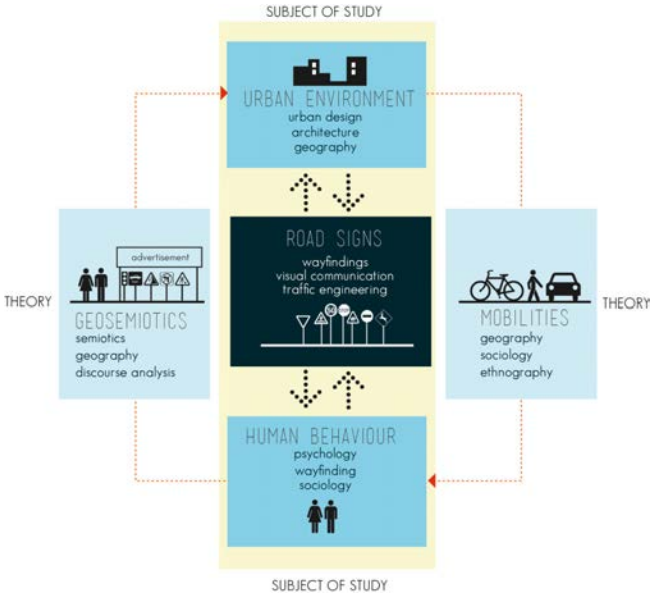



Figure 1. The theoretical and empirical framework (adapted and modified model of human-environment behaviour from Golledge (1997)).

In this study, the theories and methods in geosemiotics, mobility, urban environment, human behaviour and traffic signs are used as guidelines. Since geosemiotics emphasises the 'materials in place' and mobilities of 'goods or products and people', it is important to relate it to the environment where people are interacting. As can be seen in Figure 1, I suggest that in the five-point theoretical and empirical framework, human behaviours play important roles in relation to the actors that contribute to any new scientific knowledge. In both geosemiotics and mobilities research, most scholars (Urry, 2007; Van der Spek, Van Schaick, De Bois, & De Haan, 2009; Shoval, 2008; Kusenbach, 2003; Scollon & Scollon, 2003; Jensen, 2013) use observations, questionnaires, go-along interviews, individual interviews or virtual simulations as methods of investigation. However, there is still a lack of activity-oriented focus group discussions being conducted in relation to the study of r oad signs in urban spaces. In a previous study by Jensen (2011) on mobile semiotics (signs and mobilities), the author discussed the significance of "materials and physical movements in space" and the "flows of goods and people". The author particularly emphasised the mobilities and geosemiotic approach in the area of aeromobilities, especially at airports. In 2013, Jensen also illustrated a "staging mobilities model" (Figure 2) that takes into account the differences in the perspectives of planners and users. This model also helps to establish the relevance of participants as the 'everyday life' users who actively interact with their space and the roles of road signs that are embodied in the traffic sign system.

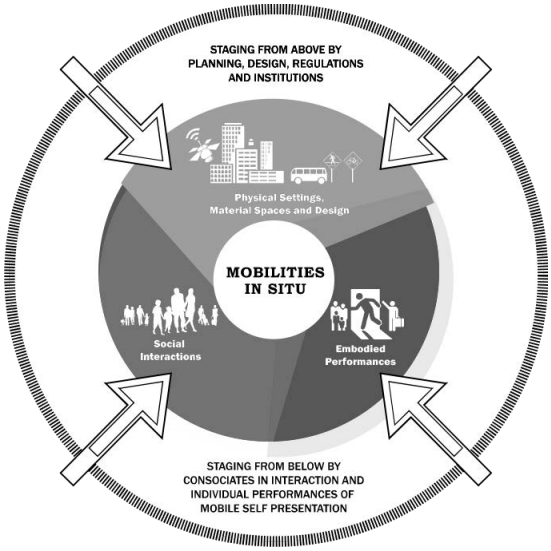



Figure 2. Staging mobilities model (Jensen, 2013).

As suggested by Sheller and Urry (2006), transport patterns are relevant to social experiences. In recent years, there has been an increasing amount of literature on the mobilities paradigm. Freudendal-Pedersen (2006) also suggested that the social sciences and transport research cover both theoretical and empirical work (see Freudendal-Pedersen 2006) in mobilities. Geosemiotics is another field of discourse that deals with the materials or objects in the environment or space. Scollon and Scollon (2003) introduced the term 'geosemiotics' as part of their sociological approach to investigating the materials in the real world. In contrast to mobile methods (Urry, 2007), there have been numerous methods of investigating the mobility of space, objects and people, both in the real world and virtually. Thus, a combination of methods and practices in the field of geosemiotics or mobilities approaches was implemented in this study.

Thus, in adopting this "staging mobilities" model helps to differentiate between staging everyday life from above (through policymakers or designers) and 'staging from below' (through daily road users). Carmona et al. (2010) suggest that "Perception involves gathering, organising and making sense of information about the environment" (p. 111). In a recent study by Abel (2013), the author argues that a person's experiences and perceptions of places are influenced by "psychological and cultural factors" of the areas. The present study's goals (Figure 3) help to gain insights into how road signs affect travel behaviour and what kind of information people search for when moving between urban environments. In this paper, perceptions from the participants are measured through their articulation of what they think whilst perceiving the material environment in their daily life practices.


Figure 3. Research goals

For instance, drivers need to know the signs that are in place in order to avoid getting tickets or summons. Cyclists need to know the signs that are relevant to them, as well, to ensure that they know where to go. Pedestrians also need to know the route and where their destination is in order to avoid becoming lost. In the previous stage of research, observations were done in the real setting that emphasised space (city environment), objects (signs in place) and people (movement). However, there was a lack of interaction with the subjects in a natural social setting for purposes of unpacking their perceptions and behaviour.

Focus group interviews have been widely used in data collection by researchers as a way of observing interactions among individuals in "unnatural social settings" (Morgan, 1997). In order to relate this study to geosemiotics theory for this study, the drawing method is integrated into the focus group discussion. As mentioned by Gountlett (2007) in Bagnoli (2009), drawing is "an activity that allows participants time to reflect about the issues being explored" (p. 548). In this study, participants were asked to use their daily life memories in order to draw their journey maps. They were asked to draw a map of their journey from their home to their work place and indicated locations of signs that they encountered during the journey. Another activity included in the focus group procedure was the discussion of participants' perceptions of manipulated and original images of traffic signs in place. Therefore, this paper tries to unpack two different types of focus group analysis: (a) text analysis from transcripts and (b) visual analysis from visual representations created by the participants and the moderator. Thus, a research context located between the urban environment, human behaviour, traffic signs and the main theoretical framework of geosemiotics is illustrated below as a guideline for this study.

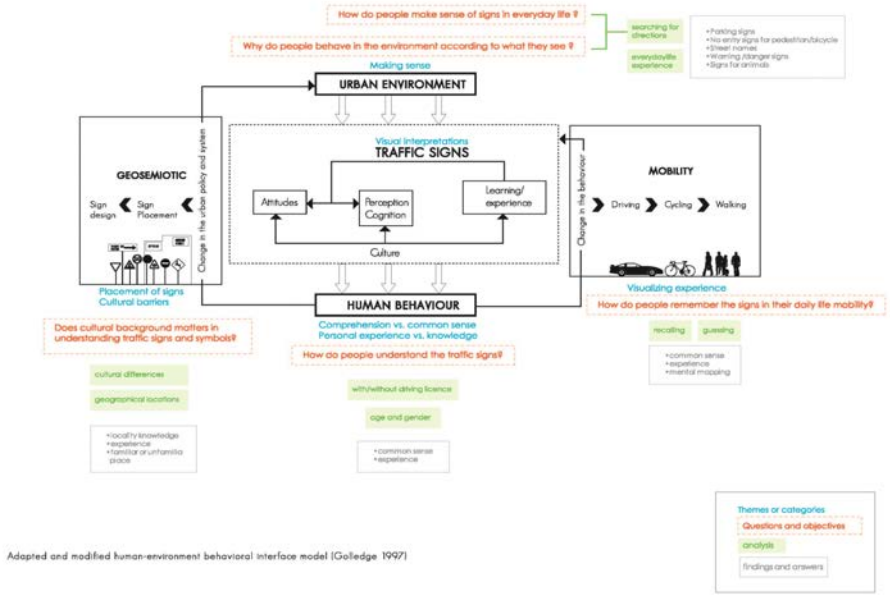



Figure 4. Proposed research context and theoretical framework for focus group interviews

As can be seen in Figure 4, the activity-oriented focus group discussions take into account the perceptions of participants through their visual interpretations and the way they visualise their experiences. Either directly or indirectly, the study focuses on the participants' sense-making in their daily lives when understanding signs, irrespective of their cultural backgrounds. Even though culture is not the main concern of this research, since traffic signs are practiced differently in different countries, there may be some indirect relevance in the data obtained.

## 3. Methodology

### 3.1 Choice of focus group methodology

Focus groups were chosen instead of surveys based on the idea that the data from interactions would be more detailed, valuable and relevant to real problems. In this study, the interaction between the participants and moderator will give more qualitative value in terms of the way the focus group discussions are conducted.

As explained by Adler and Adler (1994), "Social science researchers study their surroundings regularly and repeatedly, with a curiosity spurred by theoretical questions about the nature of human action, interaction, and society" (p. 377). Focus group interviews were used in order to determine participants' perceptions in terms of how they make sense of road signs in their daily life activities. As noted by Morgan;

> The main advantage of focus groups in comparison to participant observation is the opportunity to observe a large amount of interaction on a topic in a limited period of time based on the researcher's ability to assemble and direct the focus group sessions. This control is also a disadvantage, however, because it means that focus groups are in some sense unnatural social settings. If the goal is to collect data on other social actions, rather than just the discussion of these activities, then the increased naturalism of participant observation is necessary. (Morgan, 1997, p. 8)

Traditionally, focus group involves discussions in unnatural settings between participants and moderators, However, in order to compensate the unnaturalness of the focus group social setting, I have incorporated activity-oriented discussions-. The activities not only help to gather the experiences of participants from different cultural backgrounds and ages, but also to collect the perceptions of participants with and without driving licences when looking at road signs in their daily practices. In contrast to Morgan, Bloor et al. (2001) argue that focus groups provide collective articulation between the norms of each participant. Thus, the activities enabled this focus group to generate more distinctive data based on the participants' arguments/agreements rather than on their assumptions.

### 3.2 Selection of activities

> Activity-oriented questions can also be appropriate for talking about sensitive topics, which might look less threatening when discussed through practical and enjoyable tasks. (Colucci, 2007, p. 1424).

In recent geosemiotics and mobilities studies, there are multi-method means of investigation such as observations, interviews, GPS tracking, photo essays, content analysis and so forth. This article discusses the focus group interviews that were conducted between 10 May and 20 June 2012 in separate group discussions and locations in Aalborg, Denmark. Padilla (1993) suggests that focus group discussions help to reveal participants' everyday life experiences. More importantly, in conducting focus group interviews, researchers tend to gain insight into participants' thoughts (Krueger, 2000; Marková, Linell, Grossen, & Salazar Orvig, 2007) on a specific topic or problem in a way that can hardly be achieved through field observations. However, conducting focus group interviews should not be 'boring' for the moderators or the participants (Colucci, 2007). Thus, the interactions among participants should not be limited to examining experiences through dialogue between moderator and participant, but should also include more dynamic group interactions through other activities/exercises conducted during the sessions.

In developing relevant aspect of geosemiotics theory for this study, the drawing method was integrated into the focus group discussions. As mentioned by Bagnoli (2009, p. 548), drawing is "an activity that allows participants time to reflect about the issues being explored". In this study, the participants were asked to use their daily life memory in order to draw their travel journey map. There have been several methods of investigation used in previous research, which unpacked the everyday city experiences of ordinary people. Marling (2004) in her research on the Urban Songlines entailed by two theoretical approaches (Lynch, 1960; Bourdieu, 1984) and several other theories of urban life, and mapping experiences of urban architecture and urban landscape. Also, drawing was used as a means to gain more information about participants' visual analysis of their daily life experiences than could be obtained from transcripts of the interviews alone.

Another activity included in the focus group method was discussion of participants' perceptions of manipulated and original images of traffic signs in place. These activity-oriented focus group interviews have two main outcomes: text analysis from transcripts of verbal discussions and visual interpretations from visual aids made by participants and the moderator.

### 3.3 Selection of participants and procedures

Table 1. Participants' information

| Group No | Participant ID | Age | Citizenship | Driving License | Mode of Mobility to work place |
|---|---|---|---|---|---|
| | G1P1 | 26 | Denmark | Yes | Cycle |
| Group 1 | G1P2 | 25 | Denmark | Yes | Cycle |
| | G1P3 | 26 | Denmark | Yes | Cycle |
| | G1P4 | 26 | Denmark | Yes | Walk |
| | G2P1 | 28 | Denmark | Yes | Walk |
| Group 2 | G2P2 | 23 | Denmark | Yes | Cycle |
| | G2P3 | 24 | Denmark | Yes | Cycle |
| | G2P4 | 22 | Denmark | Yes | Cycle |
| | G3P1 | 29 | Malaysia | Yes | Cycle |
| Group 3 | G3P2 | 30 | Portugal | No | Cycle |
| | G3P3 | 30 | Pakistan | No | Cycle |
| | G3P4 | 26 | Malaysia | Yes | Cycle |
| | G4P1 | 39 | China | No | Cycle |
| Group 4 | G4P2 | 32 | Denmark | Yes | Drive |
| | G4P3 | 49 | Germany | Yes | Cycle |
| | G4P4 | 32 | China | Yes | Cycle |

Table 1 gives the relevant information for 16 participants from four different sessions. The participants were selected according to their email responses. The participants were selected from different academic backgrounds and nationalities in order to provide different perspectives on everyday life experiences. During the interviews, there were some differences in terms of how the participants interacted within specific groups. In the sessions where participants were all undergraduate students they tended to be more open and interacted more actively than participants of different academic and cultural backgrounds. However, the process of selecting participants from different nationalities, ages and academic backgrounds were limited by the available email responses from which to select participants.

A series of four open-ended focus group interviews was conducted in a controlled setting that involved Aalborg University's students and employees. The questions asked encompasses of the participants daily lives experiences of looking/searching for signs as well as their interpretation of road signs as part of the urban environment.

### 3.4 Data Collection

In this study, there were four different focus groups, with four participants in each group. The interviews were conducted in several different locations belonging to different departments on the Aalborg University campus.

Each session consisted of 1–1.5 hours of discussions led by a researcher/author of this study who focused on open-ended questions. Participants were recruited through emails dispersed by several departments at Aalborg University.

The interviews were recorded using an audio recorder as well as video recording tools. The recorded audio was then transcribed and analysed according to the themes present in the discussion. Videos were only consulted in order to determine participants' expressions and body language during the sessions. Each participant was given paper and markers for the drawing activity. Since manipulated images and other traffic sign photos were used in this study, a laptop was used to show these images to the participants.

Figure 5. Activity-oriented focus group setting.

## 4. Results and Analysis

There are numerous methods and strategies for analysing focus group data. The data analysis in this study was inspired by the psychological approach of 'an essentialist framework' (Wilkinson, 2003), which emphasises the participants' own ideas and the content of the discussion. Thematic analysis is one of the most commonly used analyses in focus groups, especially in the psychology field. My main motivation for using thematic analysis is that it it is a "useful method for working within participatory research paradigm, with participants as collaborators" (Braun & Clarke, 2006, p. 97). Wilkinson (2003) argued:

> Focus groups conducted within an essentialist framework, like most psychological research, rests on the assumption that individuals have their own personal ideas, opinions and understandings, and that the task of the researcher is to access or elicit these 'cognitions'. (p. 188-89)

The theme and sub themes of this study were selected based on several different categories and coded manually. Six main themes were selected for analysis. The themes emerged from either the raw data or from the theories popular in the field Boyatzis (1998) suggested that themes are generated either from raw

data or from theories proposed in prior studies. Thus, the themes in this study were mostly generated from the raw data, especially the interview transcriptions. However, the drawings and manipulated-image activities were adapted from Scollon and Scollon's (2003) "place semiotics emplacement". The results and analysis of the data are used as a later discussion emphasising the theoretical and empirical gaps in the mobilities and geosemiotics practices in everyday life. In selecting the themes, comparison (vs.) is used to create more dynamic interpretations of the selected data. Table 2 presents the list of themes selected in this study.

Table 2. Overarching focus group themes

| | |
|---|---|
| *Mapping and photo-interview theme* | 1. Mapping mobility vs. Google mapping<br>2. Manipulated vs. unmanipulated photos of signs |

### 4.1 Mapping and photo-interview themes

The theme for the analysis consist of two aspects of sub themes: 'mapping mobility vs. Google mapping' and 'manipulated vs. unmanipulated photos of signs' in place. The participants were asked to map their journeys. They also discussed the drawings and some sign-related photos. In geosemiotics theory, 'place semiotics' includes "all the other signs' equipment and their emplacement or location in time and space in the material world" (Scollon & Scollon, 2003, p. 166). In Scollon and Scollon's relation of situated materialities in the urban environment, they use the place semiotics discourse as a way of organising the interaction order and the built environment. Scollon and Scollon also assert that there is a different range of designed public spaces where only some social interactions may happen in between the spaces. In this mapping and photo-interview theme, place semiotic that are considered to be relevant in this study involves not only the regulated signs but also other elements in the surroundings that contributed to a meaning of a place by the participants.

Thus, this theme also looks into the relationship between the journey maps by the participants and the actual photographic evidences that were obtained from secondary sources such as the Google Maps and Streetviews. Most of the data gathered from the suggested themes come from the researcher's interpretation of the participants' understanding of their sense-making of signs in their everyday life. The open-ended questions asked during the discussions were either related to their experiences or their interpretations of the visual aids provided. As Krueger (1998) argues, "Questions can be more fun. Too often we get into a rut, but with a little help, our questions can be both enjoyable and productive" (p. 63). Therefore, I conducted activities such as map drawing and photo-related interviews with the

participants, using drawing and technological tools such as paper and pens, a laptop and visual aids of manipulated images of signs.

The two sub themes selected for this analysis are based on data collected from the interactions in the focus group discussions as well as related studies. The analysis examines, through the activity-oriented questions mentioned in the introduction, the everyday life activities and experiences of the participants as they relate to their understanding of meanings of signs in place. The data that elucidate these themes come from participants' mapping of their journeys on paper and from discussions of photo-related visual interpretations. These themes unfold participants' thought processes. The mapping mobility vs. Google mapping sub theme discusses the interrelation between the journey maps drawn by participants in comparison with the online Streetview from Google maps. In the photo-related interviews, manipulated traffic signs were used to solicit opinions on the placement of signs, as well as on the participants' understanding of the signs in place. The process of obtaining the results from each theme began with some description of selected themes, relevancies between transcripts of interviews or images and the themes, and supporting literature and resources.

Even though thematic analysis is mainly used in psychology, this method of analysis is beneficial for the humanities and social sciences fields, as well. Moderators/researchers play an important role in developing arguments, open discussions and new ideas related to the questions/activities conducted. In generating significant data from the discussions, the moderators need to include relevant ideas from past and/or current research on specific topics discussed as well as the ideas of the participants. The dynamic interaction between 'participant-participant' and 'moderator-participant' creates a rich data source for the specific topic discussed.

### *4.1.1 Mapping mobility vs. Google mapping*

This sub theme will help the reader to understand the role of drawing activities and the use of Google Maps. "Drawings have a lot to do with trying to make sense of the world as we know it, and what we have seen, thought about, or remembered. They are proposals and thoughts turned into vision" (Lord, 2005, p. 30). Google Maps has been widely used by researchers as a point of reference for geographical locations and street-view searching. Numerous methodologies for mapping travel behaviour have been developed in the field of urban planning and cognitive behaviour. Kuipers (1983) argues that there are problems with sketch-map representation from a human's cognitive mapping. Therefore, in this study I use a common online mapping application that consists of 'closest street views' of the present urban environment in Aalborg, Denmark (Google Map Streetview) and compare it with the hand-drawn maps from the participants. Below is the analysis from one of the participants. She is from Portugal, does not have a driving licence and has been cycling to work while she is doing her PhD in Aalborg. The participants were asked to place the signs that they recalled on their journey maps from home to their workplace by using the drawing

tools provided during the session. As mentioned earlier, some of the analysis was supported by other sources from the web, such as Google Maps, and other related literatures from the relevant field of environment and behaviour. The names of the participants are coded anonymously according to codes for each group and participant's number. In this paper, two of the participants are selected because both use bicycles as their means of transportation but travel different distances from their workplaces to their homes. The analyses are discussed below.

| (G3P2, Female, Portuguese, no driving licence, cycling) |
| --- |
| When I get out of the house, I live on a dead end road. It has that sign with a…[inaudible]—yes. But then when I get down in the [inaudible], there is a school. So that actually has the sign of the school and the two kids. There are also some signs that dogs should not poop here with a dog. It's not allowed to do that. Then there's—a crossroads—so there's a traffic light, and I always go straight down. It's the shorter way. Then I have this first round—the symbol that the ones that come from the left have priority, I think—at least if they don't I assume that. Then I get a second round a little bit, and it's exactly the same sign. Then I continue to go straight. There is some kind of symbol where no cars go, but the buses pass that. I'm not quite sure, but I have that idea somehow. Then once again, I have crossroads with a traffic light. In front, I always go straight, I don't turn left or right, I think there is some symbol, some sign there; but I honestly don't remember which sign. I think it's for cars, kind of forbidden to turn to go back or something. Then at this point, I'm almost close to a big park with a church [inaudible]. I actually have to cross. I go really close to the park, and there are these roads that go different ways. Actually there is a sign that I like very much that is "Give priority to bicycles." I always am kind of scared to go without thinking because some car and take me. |

Box 1. Participant's elaborated description of journey map

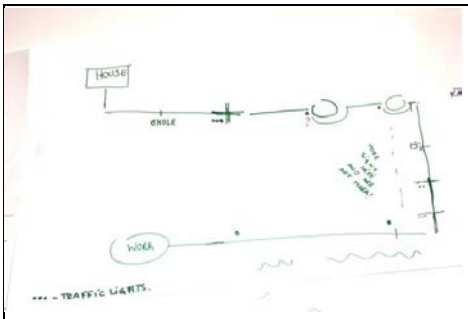



Figure 6. G3P2's visual mapping of signs in her daily experience

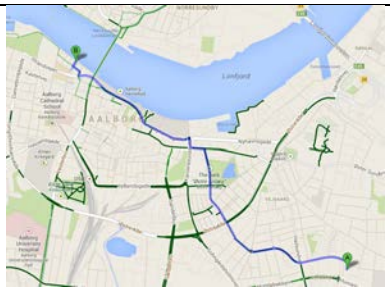


Figure 7. G3P2's Bicycle route mode of transportation on Google map (Image copyright of Google Map)

Although the participant's drawing did not actually show the location of each sign, she explained the signs according to her own understanding. Since she was cycling almost 4 km, she had simplified her way of drawing her journey, showing only the important routes and signs that she could remember. As can be seen in her drawing, most of the indicated signs marked on the map are the traffic lights. Traffic lights are important not only to vehicles but also to pedestrians and cyclists. In her sketch map, G3P2 was not particular about using north as a guide in drawing her map, and therefore, as can be seen in the Google map, her drawing is rotated 180° from its original view (see Figure 6 and 7).

As mentioned by Darley and Gilbert (1987), individuals tend to straighten the paths of their journey even though the routes they take are curved. Lynch (1960) illustrates that in the creation of an environmental image, each individual perceived the environment differently. He also added that "the human organism is highly adaptable and flexible, and different groups may have widely different images of the same outer reality" (p. 131). Downs and Stea (1977) argue that individuals tend to explain their mental images of environmental transformation either verbally or graphically. The authors added, "In a rendering of a limited area, the effect of a building on the remainder of a city can be easily obscured from view". G3P2 has eliminated most of the traffic signs, with the exception of some of the traffic lights, from her sketch map due to limited drawing space as well as uncertainty about the symbols or the meanings of the regulated traffic signs. Such elimination of other elements in her drawings is the necessary outcome of mobile pragmatics, as only crucial signs are remembered and marked.


Figure 8. Google map view of school traffic sign

Figure 9. One of the turning junctions with traffic signs guessed by G3P2

Figure 10. The other road signs that are placed along the journey

Figure 11. Bicycle lane

As can be seen in Figures 8, 9, 10 and 11, there are signs mentioned by G3P2 that were not marked or drawn on her map: 'from the left have priority', which is actually a prohibitory sign for vehicles to turn left. This shows that even though her drawings were not accurate, she did explain the signs she passed by almost every day. G3P4, who lives less than 3 km away from his workplace, described his everyday life experiences with signs differently.

| (G3P4, Malaysian, driving licence, cycling) |
|---|
| For me, there is not so much. Firstly there are the pedestrian signs. This pedestrian zebra crossing is only in front of our house, so I can remember that. Then the pointing arrow is the arrow that points to the specific lane of the road to say that you need to drive in this lane, not in that lane, that blue sign like this one. Last one, which is really prevalent to my eyes, is that triangle symbol in which a car is about to fall off in the field. So that is the first time for me to see it here. It's not in Malaysia. It really attracts me. The first time I saw it in Nørrebro, last time I see it, and I also can see it around here. So it shows that a car should be very properly parked so you never go forward in which your car can go inside the field. It's a good sign, I think, because I can remember these signs very well. |

Box 2. Malaysian participant from Group 3

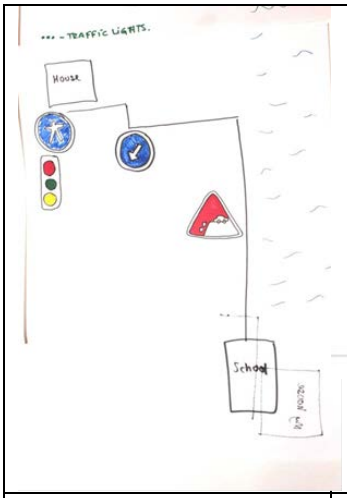



Figure 12. G3P4's mapping of signs in daily experience in comparison with G3P4's interpretation

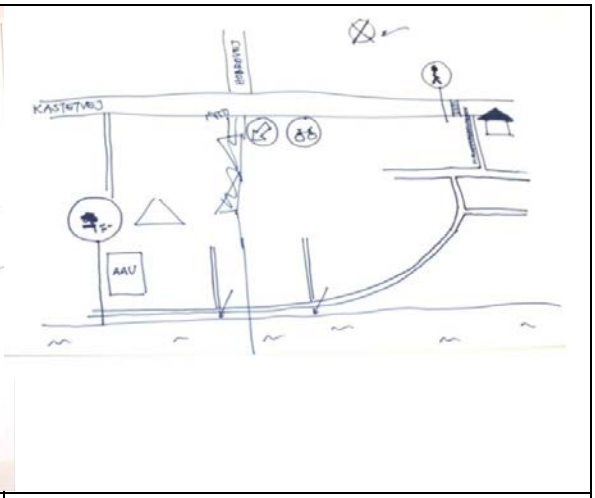
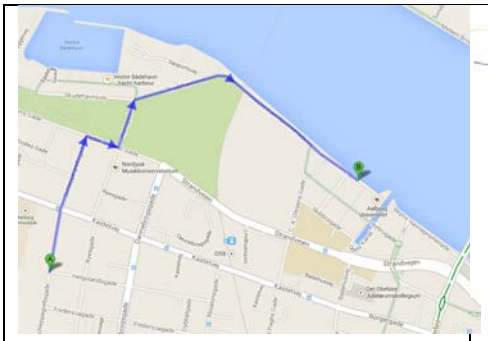
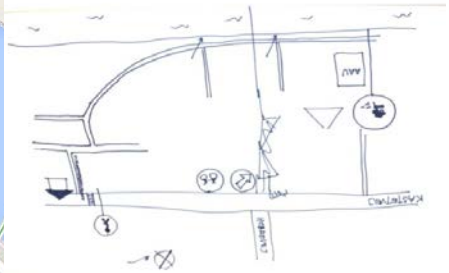



Figure 13. G3P1's visual mapping of signs in daily experience in comparison with G3P4's interpretation of 'riverbank' warning sign.

In G3P4's explanation of his journey map from home to his workplace, he has identified several significant traffic signs that are regulated specifically for pedestrians and some for motor vehicles, even though his mode of travel is cycling. Similarly to G3P2's map drawing, G3P4 uses simple lines, shapes, and symbols to indicate the route, and the landmarks along his journey from home and workplace. This participant recalled the signs that are most obvious to his eyes, especially the 'quayside or riverbank' warning signs (Figure 12). Another participant (Figure 13) also indicated similar symbols for 'a car and a riverbank' but with a different traffic sign shape. He indicated that the 'quayside or riverbank' warning sign was a prohibitory sign instead of to a warning sign by indicating the circle shape.





| Figure 14 (a). Google map of G3P4's biking journey | (b) Rotated view of G3P1 sketch map |
|---|---|

Figure 14 (a) shows the Google map of the bicycle route, while (b) shows the rotated view of G3P1's drawing, which looks more similar to its corresponding Google map than that of his peer, G3P4. This shows that map interpretations from the human mind differ from one individual to the next. Thus, two participants in the same focus group, G3P4 and G3P1, had different interpretations of the 'river quay sign' in terms of its actual shape and visual representation. However, after the moderator showed the actual image of the sign, all of the participants agreed that they had seen the symbol of a car and a riverbank but not the shape of the regulated sign.

In fact, as can be seen in Figures 15 and 16, both participants had the same understanding of the meaning of the regulated 'riverbank' warning sign, but they could not recall the exact elements of the sign (Figure 17).

Figure 15.

G3P4's drawing of riverbank warning sign

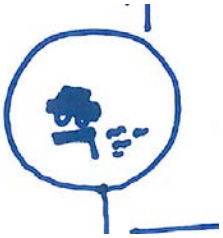


Figure 16.

G3P1's drawing of riverbank warning sign

Figure 17.

Actual traffic sign

There are more geographical and contextual differences that need to be looked at, apart from the common speed limit signs. Thus, in the case of the 'riverbank' warning signs, the place semiotic of the particular sign is significant to the road users. This particular sign is only placed in areas near rivers or beaches to prevent accidents.

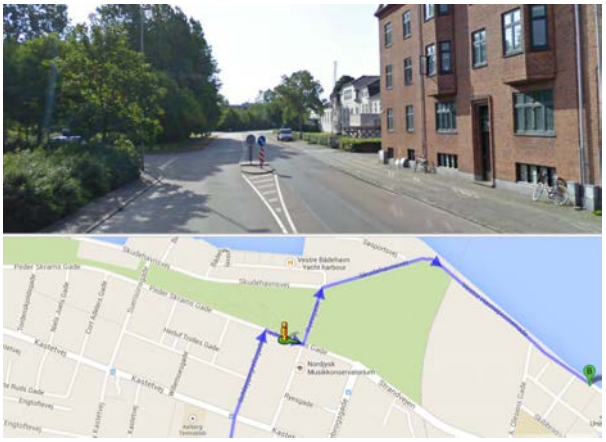


Figure 18. One of the traffic signs recalled by G3P4 along his journey.

As argued by Trullier et al. (1997) in Foo et al. (2005), navigation strategies depend on the way subjects recall their stored information and process it cognitively according to their needs and actions. Thus, each person has his or her own memory storage system for interpreting and recalling specific instances of objects in an environment. As can be seen by comparing G3P4's drawing and images captured from Google Maps, he has simplified his mental mapping. However, some significant signs are indicated in his drawing, such as the "pointing arrow" (see Figure 18)". As explained by Fuller (2002), the pointing arrow is used in various contexts, but especially in airports, to direct people to travel in the direction indicated by the arrow. Even though G3P4's drawing shows less information about his journey than the actual map does, his visual interpretations show his experience negotiating with space. Murray (2009) argues that;

> Visual images are not, therefore, considered any more or less reflective of experience than verbal descriptions, but at the same time can create knowledge of everyday experiences through this co-construction of data, which is as valuable as verbal descriptions in interviews. (p. 477)

Therefore, as part of mobile methods, it is important to gain information not only through interviews with participants but also from other resources. Thus, the data from interviews, visual mapping and images from Google Maps help to create a better understanding of the participants' everyday life embodied experiences of a place (Casey, 1996; Cresswell, 2004; Davidson & Milligan, 2004). This

methodological triangulation complements the information gathered from each of the participants. Readers unfamiliar with the Aalborg area can consult G3P4's drawing and Google mapping to gain insight into what he talks about when explaining his journey from point A to point B, rather than having to simply imagine the journey.

Visualising travel routes from one point to another may be a challenging task for some people. Thus, as part of the reflection from Scollon and Scollon's 'visual activities' and Adey's notion of mobility, the mapping mobility vs. Google mapping theme give a different perspectives on both geosemiotic and mobility theories in terms of roles of visual images. In geosemiotic perspectives, I could relate this method with the representation of images and the real world, as explained by Scollon and Scollon:

> In the first place we are interested in how images represent the real social world of people acting in the presence of others is represented, particularly in visual images. For example, here we move from asking how we recognise a 'with' in the real world to asking how a 'with' is depicted by means of a visual image such as a photograph, a painting, or a schematic diagram. (Scollon & Scollon, 2003, p. 84)

Thus, the methodological triangulation approach used in describing the visual interpretation made between the real world and the knowledge in a participant's brain is a potential tool for geosemiotics. Also, mapping mobility, which uses participants' map drawings of their journeys, gives an alternative interpretation to their verbal description of what they see in their daily lives. In supporting the visual mapping, images from Google Maps are required to ensure the readers of this article can visualise the route and compare the mental map of the participant with the real-world map. Even though not all participants visualise accurate locations for each sign, they tried to recall as much as possible on significant aspects if signs that occurred to them during their journey. As mentioned by Adey (2010), in "mobilities of the urban realm", eyes play an important role in walkers' journeys. Jensen illustrates mobilities as "being staged" either from above or from below, which relates to the work of Erving Goffman. He argued,

> The key idea is that mobilities are carefully and meticulously designed, planned and 'staged' (from above we might say). However, they are equally importantly acted out, performed and lived as people are 'staging themselves' (from below so to speak). 'Staging mobilities' is a dynamic process between 'being staged' (as for example when traffic lights command us to stop, or when timetables organize our routes and itineraries) and the 'mobile staging' of interacting individuals (as for example when we negotiate a passage on the sidewalk, or when we choose a particular mode of transport in accordance with our self-perception). (Jensen, 2011)

Including the theme of mobile mapping vs. Google mapping in this study should therefore be recognised as a practical method of unpacking the perceptions

from participants' minds. By using Google Maps and Google Streetview (copyright of Google Maps) in reference to the map drawings by the participants, I was able to virtually walk through the routes that were indicated by the participants. Even though the specific locations of the signs in place are not 100% accurate, Google Streetview gives a good 'eye-level view' of the environment. Even though Google Maps was not accurate in terms of its current photo and street views, it has been a useful tool for investigation of place and mobility. Currently, Google is updating its street views throughout the world. Google Maps is the tool that makes comparing signs globally possible. What is the relationship between this theme and the research question? It is found that there are important elements of signs that can be used as a guide for future designers, particularly in terms of the pictograms and colours used as well as the placement of signs.

In the next theme, we will examine manipulated vs. unmanipulated photos of traffic signs within the urban environment. This is another important theme that unfolded their perceptions of specific signs that were shown through visual aid.

### *4.1.2 Manipulated vs. unmanipulated photos of signs in place*

Using another mobile method (Büscher, Urry, & Witchger, 2011), integrated with Scollon and Scollon's (2003) activity, the sub theme of manipulated vs. unmanipulated photos of signs in place investigates manipulated sign images in an unnatural setting using computer visual aids. These "photo-interviews" (Schwartz, 1989) were used to promote dynamic interaction between the participants in discussing specific images. Mannay (2010) used visual methods of data production to make "the familiar strange". The rationale of this theme is to emphasise participants' awareness of their environment, especially in terms of their familiarity with the traffic signs in their daily lives. Photos of traffic signs were shown to the participants and discussed during the sessions. The photos of real traffic signs were manipulated in terms of the symbols, shapes and colours. The analysis for this theme examines different perceptions from the participants when the signs were shown to them in the form of photos on a laptop instead of on the streets. The inspiration for this method also came from several qualitative methods that investigate embodied experiences within a place (see Casey, 1996; Cresswell, 2004; Davidson & Milligan, 2004).

Thus, the methods used in this study emphasised on how participants interact with the manipulated traffic signs according to their knowledge and experiences. The analysis of the theme is based on the participants' observations on the images presented during the sessions. The photo-interviews conducted with the participants to identify the manipulated signs in place of the real ones was an important tool in this study. This tool is an experimental tool for collecting different perceptions of signs in place from the participants. In this particular experiment, the participants were tested on their ability to recognise with the manipulated traffic signs in contrast with the actual signs. Table 3 provides examples of the manipulation of images in the categories of symbols, shapes and colours.

Table 3. Categories and manipulations of images

| **Categories** | **Manipulations** |
|---|---|
| Symbols/pictograms | The universal symbols of road signs were manipulated by exchanging the original signs with others. |
| Shapes | The shapes of signs were manipulated by exchanging the triangular warning signs for circular prohibitory signs. |
| Colours | The colours were manipulated by exchanging the warning/prohibitory sign (red) for an informational sign (blue). |

Figure 19. Real warning sign of riverbank

Figure 20. Manipulated warning sign of riverbank into prohibitory sign

Participants were asked whether or not the traffic signs shown in Figures 19 and 20 looked familiar from their everyday travel experience. In the manipulated image of the sign (Figure 20), the circle and diagonal line were used instead of the warning 'triangle' shape of the sign. Below are some excerpts from the focus group interactions where the real vs. manipulated traffic signs were shown. During discussions of the manipulated signs, participants had different interpretations and perceptions of the signs shown. In this scenario, he only noticed the picture of the car falling into the river, paying no attention to whether the sign was a warning or

prohibitory sign. G4P2 and G3P2, on the other hand, emphasised the shapes and elements of design, such as line and colour, as part of their understanding of the signs. Shapes and symbols are two important aspects in the usage of traffic signs in the real world. Excerpts of the discussion relating to Figures 19 and 20 appear below.

| Excerpt from G3 and G4 participants |
| --- |
| I don't read the triangle. I read the picture. (G4P1, male, Chinese, no driving licence, cycling)<br><br>… tend to have a big red line across it then. Maybe it's a bit more warning. (G4P2, male, Danish, driving licence, driving)<br><br>But this I think is a warning sign. If it is forbidden, I don't know if it doesn't have to be round and then with a thing and red. Yeah. It is like that. (G3P2, female, Portuguese, no driving licence, cycling) |

Box 3. Interpretation of participants in terms of shapes and symbols in traffic signs

G4P1, who originally came from China, ascertained the meaning of signs through the picture (pictogram) instead of the shape of the traffic sign. This is related to the holistic reading practices that commonly involve reading a whole unit before interpreting its meaning. In another words, decoding the meaning of pictograms first, and the shapes later. G4P2 and G3P2 on the other hand associated red colour and crossed line as warning sign instead of forbidden. In reality, warning signs are commonly in diamond shapes or triangular with red border. In another question related to the manipulated photos, the participants were given a list of signs that were manipulated in Aalborg's urban space.

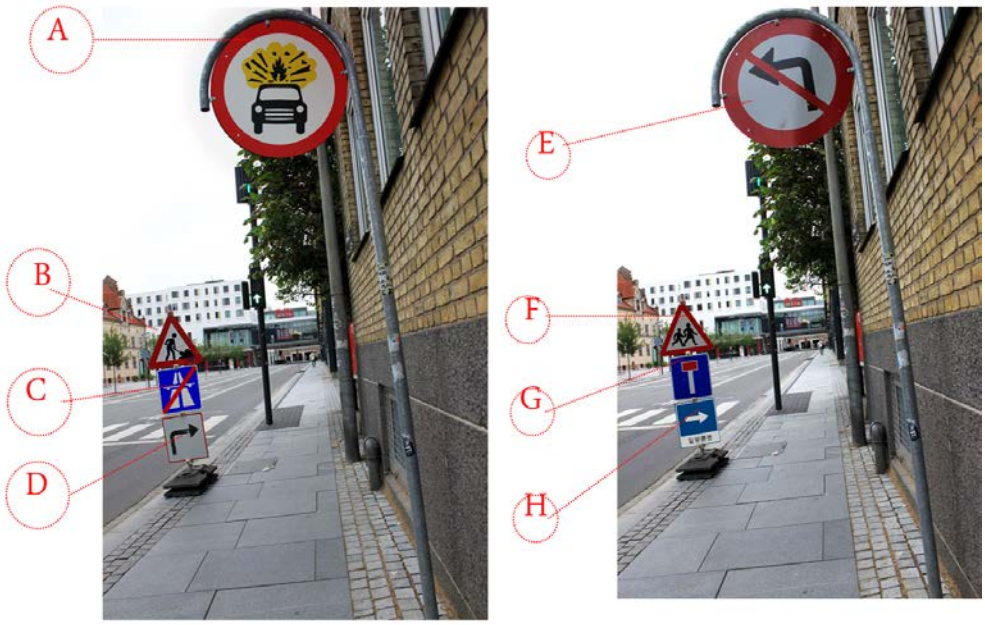



Figure 21. Manipulated signs in place

The manipulated photos above (Figure 21) were used to elicit the participants' perceptions of differences between the virtual and real-world signs in place. The participants were asked to identify the signs that are 'not in place' in order to test their alertness in noticing the signs. This particular question was then reviewed in the next group session, as the images were found to be confusing as they were unable to identify the signs out of place to the participants when they were asked to discuss them. The analysis is based on the overall discussion between the moderator and the participants. The objective for this question was to get points of view from the participants on signs that might not be used in Denmark.

During this particular activity, participants discussed signs that were not placed appropriately. The questions asked were related to their understandings and knowledge of listed signs from A-H in the shown photos. However, the participants mostly guessed at their answers. Guessing is considered a contextual interpretation which inserted into the respondent's cultural background, intellectual habits and instincts into their rationales of answering the sense-making questions. Most of them guessed the meanings of signs, especially the signs that are not used commonly in Denmark. For instance, one of the participants had identified the A (no vehicles carrying explosives) and C (highway speed limit ends) signs. Another interesting discussion was about the Korea's one-way sign (H) and the sign in Denmark (D) that forbids a right turn for vehicles. The actual signs that were in place are shown below. As can be seen, the 'roadwork ahead', 'no through road for vehicles' and 'no right turn' signs are temporary signs. The only permanent sign is

the ‘no right turn’ sign. However, in the discussion, the participants anticipated that the square shape with the thin red frame and ‘crooked’ right arrow meant turn right instead of prohibiting drivers from doing so. Martinet (1996) in Bazire (2009) suggests that shape and colour relate to the actions, and in this activity, the icons on the signs are the objects that are associated with the actual action.

Figure 22. Actual signs in place located on Nytorv/Slotsgade.

During this conversation with the participants, G1P4 emphasised that it is the ‘Danish way’ to use the crooked arrow to warn drivers that there is roadwork ahead on the right side of the road. When the participants were discussing the Korean ‘one-way street’, G1P2 assumed that the sign meant, “You’re allowed to drive this way”, while G1P4 assumed that it had the same meaning as D (crooked right arrow sign).

| (G1P4, Danish, driving licence, walking) |
| --- |
| All of this is just plain weird because if you look over here, it would make sense because if it’s roadwork, then that one would make sense and it’s on the right, into the right, and this is a different way of showing—I would assume that it’s just another way assuming that it’s in there on the right. And this is the Danish way, I think. Yeah, or the way we do in Denmark. I don’t know if they do it anywhere else, but, you know, making the crooked arrow or if they were just having. I would, yeah, I’ll assume that it’s the same as D. It’s the same meaning. |

Box 4. Participant’s interpretation of symbols and manipulated signs

In another sample of visual representations of road signs, participants demonstrated different perceptions of the 'no motor vehicles' sign, (shown in Figures 23 and 24). Research by Brozovic, Jurcovic and Kovacevic (2011) suggests that, "to avoid mistakes in designing pictograms, it is necessary to stress the case common in practice. Red round signs represent signs of prohibition even without a sign crossed out" (p.94). Their research emphasises the meaning and significance of signs in influencing the communication process regardless of differences in culture and language.


Figure 23. Aalborg No Motor Vehicle traffic sign


Figure 24. Glasgow No Motor Vehicle traffic sign

The two excerpts from the transcript below illustrate different perspectives that occurred between two participants when they were asked about the difference between Aalborg's and Glasgow's 'no motor vehicles' traffic signs. The feature of the symbol (diagonal/band) was the main point of the discussion in the activity as to ensure their understandings on the element of design in the signs.

| Excerpts from G3 participants |
| --- |
| No, it's totally different. It's actually—it has contradiction because this one is not allowed car and motorcycle. But the other one is only car and motorcycles can use this road, something like that from the sign. (G3P1)<br><br>In Portugal, it's also with the cross…Oh my God. You know what? What happens—people just go in the wrong direction, and someone starts to make signs. Then they figure it out—that's what happens, even in Portugal that happens. (G3P4) |

Box 5. Participant's interpretation of 'no motor vehicles' prohibitory sign

In their perspectives, the use of the diagonal line/band could actually confuse drivers, since the two participants have different perspectives in terms of the

meanings. In Malaysia, the signs are used differently, resulting in G3P1 perception being different from G3P4. Commonly in Malaysia, the signs (similarly with a red band and a motorcycle) are used as 'no parking for motorcycles' sign.


Figure 25. Malaysia's No Parking for motorcycles sign

Additionally, G3P4 found that people sometimes misinterpreted the sign (without the band) and went the wrong direction as a result of being unfamiliar with the sign and the place. Therefore, it is important to global harmonisation on the use of colours, shapes and symbols in traffic signs.

Convention theory (Kenney, 2005) holds that a picture conveys meaning by virtue of belonging to a symbol system, with rules or conventions linking marked surfaces of pictures with external things. The relationship between a picture and its subject is a result of custom and "almost any picture represents almost anything" (Goodman, 1976, p. 38). This does not mean that almost any picture can depict almost anything. At least some recognizable resemblance is necessary for depiction (see Drost, 1994; Kenney, 2005, p. 108). Thus, my approach of using manipulated images to discuss participants' perspectives was an experimental method combining convention theory and an imaginative representation of signs. In my approach, the pictures were related to the actual scene and place but were modified so as to test the geosemiotics and mobilities understanding of the participants. Each participant had his or her own way of depicting the meanings of signs, for both the real ones and the manipulated ones. Based on the discussion of manipulated vs. unmanipulated images of signs, it is also found that there are two different kinds of signs: self-explanatory signs and context-dependent signs (with text elaboration instruction).

## 5. Discussion

The purpose of this paper is to report the findings of focus groups' activity-oriented discussions focused on mapping and photo-related themes. This method of investigation into sense-making and perceptions of people from different backgrounds generated rich and dynamic data in transcripts, sketch maps, visual representations from secondary data and related images from other sources. In particular, the use of focus groups as a methodology is a complementary method to the observation and mapping of behaviour in an urban environment conducted in the previous study in Glasgow, Scotland. As mentioned earlier in this paper, Jensen (2013) posits that there are two main 'staging mobilities', theoretical frameworks

that link material spaces and mobile practices: staging from above, from the perspective of planning, policymakers and institutions; and staging from below, through the embodied performances in everyday life practices. In my empirical framework, there is relevance between the signs in place influence the interactions (drivers, pedestrians, cyclists). Reviewing the literature for this study involved involved not only the geosemiotics and mobilities paradigms, but also a wide range of literatures such as urban theories, wayfinding, environmental psychology and traffic engineering. Staging from below (Jensen, 2011) is an important aspect of investigation used in gathering information from the perspective of each participant, since the rationale of moving between places can only be obtained through the experiences of the person in question.

The major findings of this study are the different points of view, resulting from participants' different backgrounds, in making sense of signs through visual interpretations and verbal narrations. The findings examine, through the unpacking of their stories, how participants used multiple methods to reveal their experiences to others. Mapping mobility vs. Google mapping and manipulated vs. unmanipulated signs in place are found to be potential methods for illustrating these views in future research development in urban and visual communication design. The participants predominantly recalled mental images of their travelling experiences and guessed at the locations for the signs in place on their sketch maps. A few of the participants simplified their journey sketch maps by using shorter lines than appear on the Google map. These results are consistent with findings from Lynch (1960) and Golledge (1999) on travel-mapping behaviours.

Currently, there are a number of scholars of psychological or traffic engineering who use simulation methods to test perceptions of cognitive behaviours in a lab setting However, in the visual communications field, most scholars use questionnaires, one-on-one interviews and focus group interviews as their methods to investigate the meanings of both regulated and non-regulated signs. This study demonstrates that a mixed methodology of interviewing strategies in focus groups can be used to illuminate daily life practices of travelling behaviour in urban environments. The use of visual materials such as map drawings, signs in place and manipulated photos, as well as discussions of the materials, are essential in unpacking the research questions for this study.

This study has a range of both strengths and limitations resulting from its focus group interview methodology. In terms of strengths of this study, the use of manipulated photos and drawings has unpacked multi-dimensional views of the daily life practices of people from different backgrounds and personalities. However, there are also several limitations that need to be addressed for future research. The photo-interviews are time-consuming as a consequence of the importance of using visual materials. The majority of the participants were students and employers from the urban design, architecture and education departments at Aalborg University. Further research is needed using people with different age and educational profiles. In addition, the number of participants without driving licenses was limited. As for the tools used, further research will focus on the manipulated

images, as in the current method. This method is found to be more interactive and content-oriented than the verbal interviews and discussions of specific topics usually conducted in focus groups. A more interactive and content-oriented is considered more advantageous as visual methodologies such as photo-documentation, photo-elicitation interviews or photo essays (Rose, 2012) are becoming significant in urban exploration research projects.

The table below is a summary of sub themes from Mapping and photo-interview themes that are taken from the focus groups' analysed data. The summary consists of keywords that are relevant in each theme that help to illustrate the key elements in answering the research questions. The table shows a summary of themes and the related keywords that are derived from the data and analysis of focus group sessions through mapping and photo-interview themes.

Table 4. Summary of sub themes and keywords

| **Theme** | **Keywords** |
|---|---|
| Mapping mobility vs. Google mapping | Map drawing, recall, guess, street views, semiotic aggregate, urban environment, Google Maps |
| Manipulated vs. unmanipulated photos | Recall, guess, shapes, colours, convention theory, linguistic theory |

This study has found that most people remember signs that are pertinent to their modes of travel. The findings of this study suggest that some traffic signs are recognisable or unrecognisable dependant on the placement of signs. Having taken a formal traffic course is significant in understanding the meanings of signs. This is an example of "learning to see", whereby learning involves "modifications of the sensory representation in the brain" (Sagi and Tanne , 1994: 195). The empirical findings of this study provide a new understanding between the mobilities paradigm and geosemiotics in relation to visual communication of traffic signs in the urban environment. In the mobilities paradigm, most literature emphasises the spatial environment and the objects within. Geosemiotics explores the discourse of signs in place in the material world. I believe that the empirical data gained from this investigation through stories and visual-based activities strengthens the previously collected data from observations of people's movement. In my previous study findings, people not only look for signs when they are driving but also when they are pedestrians. For pedestrians, street names and traffic lights are the most noticeable signs and are used as guides. Even though some of the questions were relevant to participants' current mobility practices, they would sometimes refer to their previous experiences, from a different perspective of modes of mobility. For instance, even though in their daily life practice in Aalborg, the participants cycle

from home to work, the participants also have driving licences and drive as their means of transportation in their home countries.

In this study, the participants are not grouped according to demographic attributes such as gender, age, ethnicity, and amount of driving experience or modes of mobility. This is not only due to the difficulties in grouping strangers but also to generate general data from different demographic backgrounds. This paper helps to identify the effectiveness of activity-oriented focus group questions that are relevant for the urban and visual communications fields of research. This will help to identify the challenges in conducting more dynamic and interesting focus group interviews in the future. This paper also discusses some of the important issues focus on the most relevant characteristics: activity-oriented focus-group, and related to theoretical and empirical perspectives of geosemiotics and mobilities practices. This paper also emphasises “mapping photo-interview” themes, which created rich data from visual interpretations of road signs in daily mobility practices. The data gathered from participants in this study provides new knowledge of geosemiotics and mobilities methodological aspects of research. There are some drawbacks to the process of collecting data through activity-oriented focus group discussions. In the future, research will focus on the more practical approaches of using manipulated images, or else on a more virtual environment that encompasses urban setting, signs in semiotic aggregates and user feedback. This could be a potential use of virtual methodology for future urban and communications studies.

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Paper

# 05

**Qualitative Inquiry: Semiotic Alertness and Mobility Practices through Experiences in Urban Spaces.**

Submitted to FQS - Forum Qualitative Sozialforschung / Forum: Qualitative Social Research Journal.

# Qualitative Inquiry: Semiotic Alertness and Mobility Practices through Experiences in Urban Spaces

*Salmiah Abdul Hamid*

## Abstract

This paper outlines the daily life experiences of focus group participants in an attempt to investigate their semiotic alertness through their mobility practices within urban spaces. The concept of semiotic alertness, which is derived from the empirical data gathered from the study, gives a new perspective of geosemiotics theory and practice. Based on the findings, this paper explores the relationship between the theoretical and empirical framework of this study and the data gathered through the focus group interviews. The findings suggest that the sub-themes of this study–personal experience vs. knowledge, mobility practices vs. sense of semiotic alertness, recalling vs. guessing, and urban traffic signs vs. rural traffic signs–have provided rich data through storytelling by the participants. The notion of storytelling has uncovered the experiences of participants not only through their current experiences, but also through their childhood history. The paper also aims to explore the value of narrative inquiry through stories from personal experiences when moving between spaces.

**Keywords:**

Storytelling, semiotic alertness, daily life experiences, urban spaces, modes of mobility

## 1. Introduction

As a qualitative enquiry, storytelling is a very valuable methodology in the field of marketing. It is a “vehicle for interpretative listening and active insight mining that can help build brands”, as mentioned by (HOOPER, 2011:163). (MURRAY, 2003) acknowledged that people make sense of their surroundings by constructing their thoughts through narratives. As (GRANT, 2011) mentioned:

> Group dynamics, storytelling styles, and story content differed markedly between the extreme cases: a mixed group of professionals where the facilitator remained a supportive listener neutral on content, versus a group of planners facilitated by someone who identified closely with them (p.422).

When moving between spaces in a story, the interaction of urban experiences as told by the participants has reinforced the significance of the data collected for this study. This paper reports the focus group findings that were conducted as part of a doctorate project on road signs, particularly on geosemiotics and human mobility. The main aspect of the investigation emphasizes the personal experiences of the participants and their relationship with the framework. Figure 1 is an adaptation of Golledge's model (1997) that has facilitated the framing of the research questions and the process of investigations.

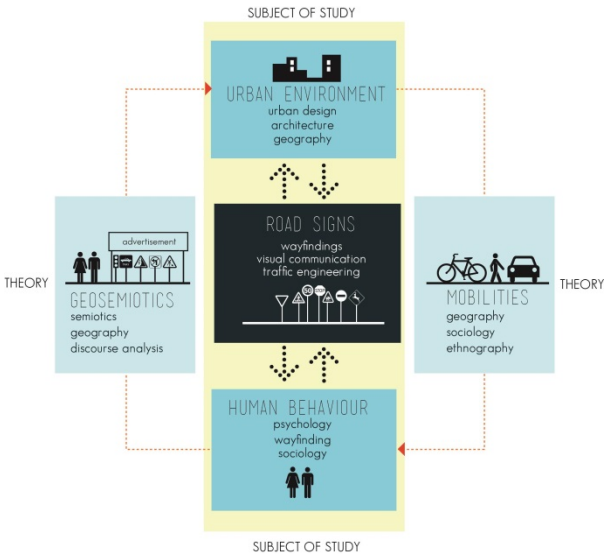



Figure 1. The theoretical and empirical framework (adapted and modified model of human-environment behaviour from (GOLLEDGE, 1997).

As shown in Figure 1, two main aspects of theories were framed for this study: geosemiotics and mobilities. To relate the participants' notions of everyday practices to the urban environment, road signs were selected as a point of departure for the questions under study. Thus, most of the questions have sought how the participants make sense of the signs in their daily lives. Since storytelling was used as part of the theme in the qualitative inquiry, the perceptions of each participant were considered significant in this study.

Figure 2. Research goals

(CARMONA ET AL., 2010) suggested: “Perception involves gathering, organising and making sense of information about the environment (p.111).” In a recent study, (ABEL, 2013) argued that a person’s experiences and perceptions of a place are influenced by the psychological and cultural factors of the area. Accordingly, the goals of this study (Figure 2) were to gain insights (perceptions) on how road signs have been affecting (learning/experience) the participants’ travel behaviours (action), and what kind of information the participants have been searching (filtered) when they move between urban environments. For instance, drivers need to know the signs in a place in order to avoid getting tickets or summons; bicycle riders need to know the relevant signs in order for them to know where to go; and pedestrians need to know the route to their destinations in order to avoid having to wander about specific routes over and over again. One scholar, (HAMID, 2014) conducted observations in a real-setting that emphasised on space (city environment), objects (signs in place) and people (movement). Nevertheless, in such a natural social setting, there is a lack of interaction with the people, particularly in terms of unpacking of their perceptions and behaviours.

In recent geosemiotic and mobilities’ theoretical and empirical reports, multi-methods of investigations were conducted, ranging from observations, interviews, GPS tracking, photo essays, and content analysis. Focus-group interviews have been widely used by researchers to observe the interactions between individuals and their unnatural social settings (MORGAN, 1997). This paper attempts to analyse the transcripts from the interviews with the participants.

### 1.2 The Concept of Modes of Mobility and Semiotic Alertness

In the context of this research, modes of mobility are derived from the literature that differentiates not only the means of transportation of people, but also their searching for signs. This concept is also derived from the valuable empirical evidences that relate to another study by (JENSEN, 2013), who investigated staging mobilities (see Figure 3). In staging mobilities, physical settings such as the urban environment and the signs in a place (such as road signs) are

considered ‘staging from above’. This is because regulations, policies and the planning and design process of implementing materials and immaterial in urban spaces are governed by institutions. Hence, it is also imperative to obtain an overview of the importance of people’s modes of mobility in their everyday activities and the way these people perceive the visual information of the road signs through their semiotic alertness.

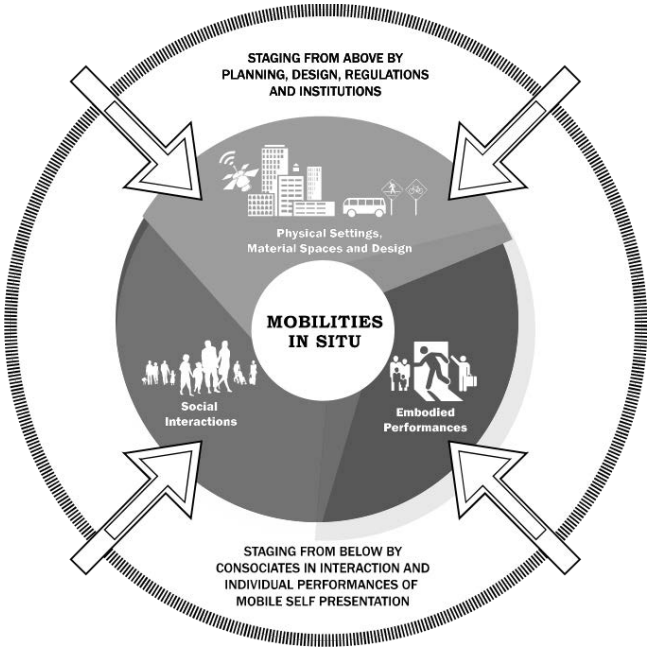



Figure 3: Model of Staging Mobilities (JENSEN, 2013)

Semiotic alertness is the term used in analysing empirical evidences, which is discussed in the findings of this paper. The terms modes of mobility and semiotic alertness are used in this context to show the different modes of mobility in the urban environment, which in turn, would limit the alertness of the visible signs and symbols that people could perceive. For example, a pedestrian is most alert when walking around an urban environment filled with signs (traffic, commercial shop signs), or in an environment of unorganized building structures, or in a traffic congested from different directions. A car driver, on the other hand, has restricted perception/alertness due to speed, limited visibility and systems’ complexity.

## 2. Research Design and Methodology

In this study, the interaction between the participants and the moderator has given more qualitative value in terms of the way the focus group discussions were being conducted. (On the contrary, surveys produce quantitative data that lack meaningful discussions of a certain topic under discussion). Several methods of investigations have been adopted in previous studies, and one of which was the Urban Songlines method (MARLING, 2003) which unpacks the everyday city experiences of ordinary people. The Urban Songlines method was inspired from two theoretical approaches (LYNCH, 1960 AND BOURDIEU, 1984) and several other theories of urban life in the metropolis and mapping experiences of urban architecture and urban landscape. In her research, MARLING (2003) had derived the term Urban Songlines from the idea of how "routes we follow in connection with our daily activities in the modern city" (p.9). Accordingly in this study, the use of narrative inquiry through stories from participants plays an important role in investigating the functions of signs in the daily practices of the participants.

### 2.1 The Participants

The participants were selected via email replies. Their ages ranged between 22 to 49 years. In particular, this study looked into the everyday life experience of people who have the experience of travelling not only in Aalborg, but also in other places or countries. Table 1 below is the summary of the demographic information of the participants, which helps to determine the relevant information that will be used later in this paper such as the participant's modes of transport as well as their country of origin.

| Group No | Participant ID | Age | Citizenship | Driving License | Mode of mobility to work place |
|---|---|---|---|---|---|
| Group 1 | G1P1 | 26 | Denmark | Yes | Cycle |
| | G1P2 | 25 | Denmark | Yes | Cycle |
| | G1P3 | 26 | Denmark | Yes | Cycle |
| | G1P4 | 26 | Denmark | Yes | Walk |
| Group 2 | G2P1 | 28 | Denmark | Yes | Walk |
| | G2P2 | 23 | Denmark | Yes | Cycle |
| | G2P3 | 24 | Denmark | Yes | Cycle |
| | G2P4 | 22 | Denmark | Yes | Cycle |
| Group 3 | G3P1 | 29 | Malaysia | Yes | Cycle |
| | G3P2 | 30 | Portugal | No | Cycle |
| | G3P3 | 30 | Pakistan | No | Cycle |
| | G3P4 | 26 | Malaysia | Yes | Cycle |
| Group 4 | G4P1 | 39 | China | No | Cycle |
| | G4P2 | 32 | Denmark | Yes | Drive |
| | G4P3 | 49 | Germany | Yes | Cycle |
| | G4P4 | 32 | China | Yes | Cycle |

Table 1: Participants' information

Figure 4: One of the focus group settings

## 3. Findings

The analyses in this study were based on two different categories: storytelling theme, and mapping and photo interview theme. The analysis in this paper was based only on the storytelling theme, which was further divided into four sub-themes. The themes selected for this analysis were based on the data collected from the focus group discussions as well as from the literature on mobilities and geosemiotics. The process of obtaining the results for each theme started by describing the selected themes; it was then followed by identifying the relevance between the interview transcripts and images within the themes, before interpreting them in relation to the literature and resources.

| Sub themes of Storytelling | 1. Personal experience vs. knowledge<br>2. Recalling vs. guessing<br>3. Mobile practices vs. sense of semiotic alertness<br>4. Urban traffic signs vs. rural traffic signs |
|---|---|

Table 2: Overarching storytelling theme and the sub themes

### 3.1 Themes

The main idea of collecting data from the storytelling lense was derived from the theoretical aspects in geosemiotics and mobilities. In mobilities' turn, analysis of empirical data produces a better understanding of the theories and actions of the actors or observed individuals (BÜSCHER & URRY 2009). (In this study, the mobilities' turn was from the focus group discussions). This particular theme has entangled the stories behind the interaction between the moderator and the participants in a more narrative way of analysis. Themes such as personal experience vs. knowledge, recalling vs. guessing, mobility practices vs. sense of semiotic alertness and urban traffic signs vs. rural traffic signs were derived mostly from the theories of mobilities and wayfindings, which have been leading the way for humans to navigate within a space according to the spatial environment and mode of travel. The analysis has also looked into the everyday life activities and experiences of the participants, which were related to their understanding of meanings of signs in a place. As suggested by (WILKINSON, 2003), participants may somehow raise several ideas about their personal daily experiences and childhood memories. While the questions were not specifically related to their childhood memories, the data tended to be an exploration of the participants' experiences when they were growing up.

The participants' stories of their everyday practices and experiences were analysed according to the following subthemes:

*3.1.1 Personal Experience vs. Knowledge*

As a point of departure in gaining the experiences of the participants in their daily lives, the questions asked have unfolded the participants' personal experiences in the urban environment. There has been much discussion on the participants' experiences of mobility practices during their process of growing up. Some of the participants associated their childhood memories with the current situations especially when they tried to recall some of the signs in a place that they were familiar with. This theme was selected as it reflects the 'information-processing' as mentioned by (GOLLEDGE, 1999), who considered the term as significant in people's mind when they retrieve their memory of navigating specific times and places. Knowledge and experience are also important in planning transportation systems as mentioned by (KENNEDY ET.AL., 2005), who argued the importance of having this kind of recognition from the system's users who are pedestrians and drivers as well as cyclists within the urban space. Therefore, in describing the participants' personal experiences, it was possible to relate to their knowledge, or even their familiarity with the information that they have acquired from other sources.

This theme was also influenced by the phenomenological approach which is unpacked mostly through an interview method of investigation in terms of participants' knowledge and experience about specific places and spaces. In one study, (HAYLLAR & GRIFFIN, 2005) mentioned: "Our data suggests that intimacy, authenticity and the general notion of place are the essential characteristics (or essences) of their experience" (p.526). (TUAN, 1977) also suggested the importance of objects and places within an urban space, which influences the 'experiential perspective' of street users. This is also important in geosemiotic theory that emphasises on 'materials' in place. As argued by (APPLETON, 1975:51), cognitive experience may affect travel behaviour within an environment either consciously or unconsciously. Sometimes, it is hard to control the thinking of one's actions whenever one is moving from one place to another. (GOLLEDGE & GARLING, 2003) also suggested that humans' travel behaviours are unpredictable, and they depend on their activities and the flow of traffic. Additionally, GOLLEDGE & GARLING claimed: "Cognitive mapping involves sensing, encoding, and storing experienced information in the mind." Thus, there is a need to obtain some valuable and meaningful experiences in comparison with

individuals' knowledge of signs. Therefore, this theme has tried to unfold the relationship between participants' daily life experiences in their travelling journeys and their knowledge of the regulated traffic signs that they could associate with. The transcripts of the interviews were related to the participants' knowledge of traffic signs that they have experienced in their daily lives. For example, (Refer Box 1), when asked about one participant's experience of the memorable signs in her life, she indicated:

| **Box 1. Excerpt from FG2** |
| --- |
| I think like when you're walking, like in my everyday life, I don't really notice the signs almost at all. But when I ride my bike like maybe in a new city or like if I drive a car in a new city, then I start noticing the signs, but I think it's because like here I just feel "Okay, I cannot walk here" or I don't know it's more about like you just go with the flow. But in a new city you're more aware and then you'll notice the signs. I think for me – (G2P1, cycling, with driving license) |

Box 1. Participant's experience of memorable signs

A possible explanation for this might be that except for the traffic lights, G2P1 never needed to be aware of other vehicles approaching whenever she walked. However, there are some people who tend to cross the roads inappropriately despite the indication of zebra crossings or traffic lights for pedestrian crossings. Needless to say, G2P1 was being more particular and cautious only when she travelled or moved about in a new environment that she was not familiar with. Another two participants suggested (Refer Box 2).

| Box 2. Excerpt from FG3 and FG4 |
| --- |
| I was quite afraid if I cannot understand because I don't have a driver's licence. < I was quite afraid of cycling and actually getting into some danger somehow because I'm not aware. Before I started cycling, I even asked if there were special courses or something that you have to take in order to know the signs. You don't. Then I saw the kids cycling – very young, like eight years old, cycling in the middle of the cars to go to school. Also I started to observe how people behave and how bicycles behave. Then when I felt secure enough, I started cycling, but I tend to always be in the same route because it's the ones I know. I don't go exploring the world. (G3P2, cycling, without driving license.<br><br>I think that many signs are very clear and symbolic, so you can understand them without really having to participate in a course… Sometimes, yeah, I remember when I was looking for a parking place. Then I will be doubtful. Is this from which distance you are allowed to park and then I'm looking at the sign, sometimes you are discussing what do you think and I think we are in the right place or so, yeah. Sometimes there can be – you can adapt, but not very often. It's mostly about parking. Not in other situations I think. (G4P3, cycling, with driving licence). |

Box 2: Other participants' experiences of memorable signs

The two participants were selected because they have different perceptions of the formal courses that should undertake in relation to traffic signs. G3P2, who is from Portugal, has never been involved in any formal driving lessons or courses either in her country or in Aalborg. Thus, she was really concerned about knowing the traffic signs through her own sense-making, particularly by practicing her own observation on the mobility practices of others. G4P3, on the other hand, seems to be more apprehending of the signs since she has more experience and knowledge in driving amid traffic signs.

In the personal experience vs. knowledge theme, there has been an intersection or overlapping way of 'learning an environment'. The present findings seem to be consistent with the one concluded by (GOLLEDGE, 1999):

> In general, it is accepted that the two most common ways of learning an environment are by (1) experiencing it through a travel process guided by sets of procedural rules, and (2) learning the layout either from an over-looking vantage point or via some symbolic, analogue, or iconic modelling (e.g., maps or photographs) (p. 9).

(BREWER & TREYENS, 1981), on the other hand, argued that "an individual's prior experience will influence how he or she perceives, comprehends, and remembers new information" (p.208). As could be seen in the interaction between

the participants, different perceptions can be learnt through personal experience and knowledge. In terms of learning traffic signs, two participants' perceptions contradicted: one had never gone through a formal driving course while another was an experienced driver. The former argued that she might need to learn how to recognise traffic signs in a course while the latter could understand the signs by just looking at the symbols; she has been driving for years and thus has more experience in understanding the traffic signs compared to the former.

Based on the analysis of this theme, similarities were found in terms of the participants' familiarity with traffic signs, space of movement, and their current knowledge of signs and space. As mentioned, familiarity with signs or places affects the travel behaviour of actors. Thus, the actions performed in moving around a specific space are influenced by how well a person knows the place either through new knowledge acquirement, past experience or his or her everyday practices. Accordingly, (GOLLEDGE, 1997) has presented components of spatial knowledge and the frequency of urban navigation model. In his model, he illustrated three main components of spatial knowledge between a tourist and a daily commuter: the components are global experiences, specific experiences and the information retrieved.

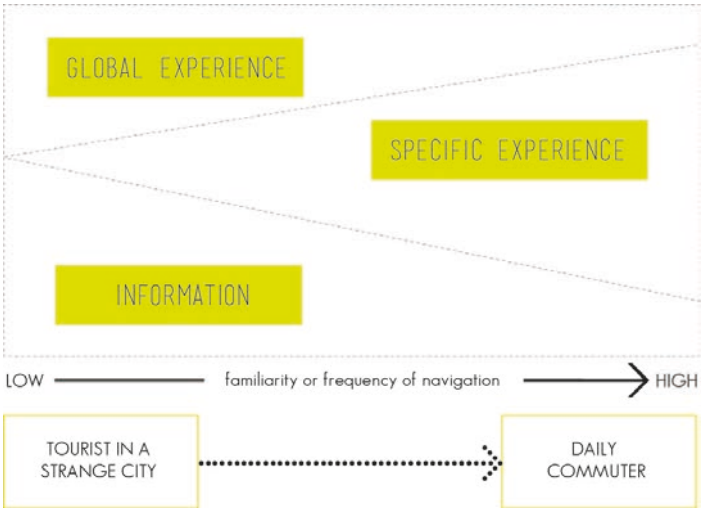



Figure 5: Components of spatial knowledge and frequency of urban navigation (GOLLEDGE 1997).

Figure 5 above is one of the models taken from GOLLEDGE'S (1997) work in relation to familiarity or frequency of navigation. From that model, I would illustrate that being a stranger to a specific city (tourist) or a daily commuter (local) who is more familiar with the city influence one's ability to navigate within a space. Having a global experience may give better decision-making ability in navigating the cities since most cities have similar structures of planning. Information on the other hand can be gained through new knowledge or even from learning.

### *3.1.2 Recalling and Guessing*

The Recalling and Guessing theme was chosen to reflect the data of interaction between the moderator and the participants in the different focus group settings. The extracted transcriptions were from the interviews with the three participants: G1P1, G3P4 and G3P2. Although the questions were targeted to obtain their spontaneous reactions from their current or previous experience, there seemed to be significant aspects of their answers: they responded either by 'recalling' or 'guessing' the signs and their meanings. Recalling or 'memory retrieval' is referred as "the subsequent re-accessing of events or information from the past, which have been previously encoded and stored in the brain" (MASTIN, 2010). Guessing, on the other hand, is defined as "speculations about recent encounters neither remembered nor known" (GARDINER, RAMPONI & RICHARDSON-KLAVEHN, 1998).

However, (HERVEY, 1988) argued that the iconic Highway Code of "traffic signals ahead", which graphically reflects traffic lights' shapes and colours, are not worth guessing. Since road signs are regulated as guides and as a way of preventing accidents between road users and possible objects within the environment, people will either remember or mostly guess the specific objects they encountered during their journey process. The goal of asking the participants to reflect on their most memorable road signs was to look at how the participants describe cognitive mapping of the signs they remembered or the possibility of guessed signs. (NG & CHAN, 2007) discussed the effects of guessability of 120 rated signs in Mainland China from the perspective of prospective-users of traffic signs. In their findings, they suggested that "cultural background was an important determinant affecting sign guessing performance" (p.1256). The relationship between recalling and guessing interpretations that were gained from the interactions between the moderator and the participants were then focused in this research.

| Box 3 Excerpt from FG1 |
| --- |
| Well, I don't know about official signs, but I think the Las Vegas Strip was pretty impressive for me because it's all of the signs I've seen in all the movies and stuff, so that kind refers back to a lot of things I saw in the past when I actually went there by myself, so I think maybe the sign was a symbol of my memories of that place before I had even been there. (G1P1, cycling, with driving licence) |

Box 3: Recalling and guessing interpretation

In the above quote, G1P1 was actually recalling what he had seen in the movies with regards to 'memorable road signs'. However, the recalling of signs was significant because objects related to 'neon signs' are normally associated with Las Vegas in movies. In terms of guessing, he was not sure whether the symbols he had seen were relevant to the road signs or the advertisements commonly used along the Las Vegas Strip.

Due to their semiotic function, the media encode and format messages becomes suitable for human perception and information processing (SCHULZ, 2004: 88). Although G1P1 did not specifically answer the questions on memorable road signs, he had particularly mentioned "neon signs", which according to (SCOLLON & SCOLLON, 2003), are part of the 'semiotic aggregate'; semiotic aggregate is the "result of the convergence, intentional or not, of multiple discourses in a particular place" (p. 194). As SCOLLON & SCOLLON argued, it is significant for visible discourses to involve not just the municipal regulatory discourses which control the traffic but other discourses as well. A good example of G1P1's narration of his memorable neon signs were the Paris street signs, which give a distinctive feeling to the city's visitors (SCOLLON & SCOLLON, 2003). This kind of semiotic layer also contributes to the ambience of the site. In UPTON's (2009) "Relearning from Las Vegas's Perspective", he indicated that 'words on signs' can also convey messages more easily than 'deformed buildings'; he stressed: "Architecture is text" (p.150). Thus, architecture plays not only an important role in forming the aesthetic value of buildings, but also the signs formed on the building itself. On the other hand, memories from movies (as mentioned by G1P1) is also relevant to DE CERTEAU'S (1988) perspective of credible and memorable things. He argued:

> What does travel ultimately produce if it is not, by a sort of reversal, "an exploration of the deserted places of my memory," the return to nearby exoticism by way of a detour through distant places, and the 'discovery' of relics and legends. (p.107)

As mentioned by DE CERTEAU, memories of places are relevant to places that are not commonly seen in everyday life. Therefore, in relation to G1P1's perceptions of the public advertisement at the Las Vegas Strip, he had used his cognitive memory of mediatisation through his experience of watching the exact same place in the movies.

Figure 6: An example of Las Vegas Strip 'semiotic aggregate' (source: https://maps.Google.com/)

In relation to outdoor publicity such as the Las Vegas Strip, (CULLEN, 1971) argued that street advertisements have a significant impact of visual incongruity as a valuable aid in townscapes. This particular public advertisement landscape is also seen in discourses in place by (SCOLLON AND SCOLLON, 2003). Thus, there are possibilities of connecting the semiotic aggregates in everyday lives' practice since semiotic values do lie behind street advertisements. While the advertisements are not used as guides or warning signs, the real traffic signs still need to be cautioned by the road users in order for them to avoid accidents or prevent unintended events. In another discussion, a participant from Malaysia emphasised a very iconic and significant sign that is still attached to his memory. The transcription is as follows:

**Box 4 Excerpt from FG3**

I still remember back in Malaysia. I don't think they used this sign already – the sign of a skull. Skull with a steering wheel to show that the area has frequent occurrence of fatal accidents. So I think it's a really good sign to remind people that in this area – you need to be extra careful because they have sharp corners or very small and narrow roads like that. I don't think it's still used now in our roads, but it's still valuable actually in the outskirts of my area. That sign is really attached in my mind, so I would really like it if the person who is responsible for the road signs still use that kind of sign because it really reminds us that we need to be careful when driving in that area because that is a fatal area and they used a skull as the symbol. I really like that actually. I remember that since my childhood. And the background is black. The background is black, but the skull is white in colour. (G3P4, cycling, with driving license)

Box. 4: Iconic significant of road traffic sign


Figure 7: The old 'skull' sign

G3P4 was recalling the symbol of a skull that warns vehicle drivers in accident prone areas in Malaysian highways. Although he remembered well the colour and symbol of the sign, he needed clarification by asking others in order to support memory retrieval from his past. Nevertheless, other participants seemed to be clueless except for the moderator and another participant from Malaysia. In his description of the skull sign, G3P4 emphasised the colours and symbols used as part of his childhood memories.

G3P4 was trying to recall the traffic signs that did not just influence his travel behaviour especially when driving. The symbol of the skull as mentioned by him can be seen in Figure 7. To G3P4, the symbol of the skull had more impact on drivers since it reflects the danger neglectful drivers would face in this area. The new sign (Figure 8) use text-based warning signs in Malaysia's national language, *Bahasa Malaysia*.


Figure 8: The new 'Beware of Accidents Area' sign (Author's photo taken in December 2012)

(DEJOY, 1999) in (WOGALTHER & MAYHORN, 2005) argued that cultural differences affect individual's warning comprehension even though the symbol of a skull and crossbones mean hazard. In G3P4's case, he recalled the skull with a steering wheel, and in black in colour; he also recalled the text "Kawasan Kemalangan" (accidents area) that warned him to be more careful when driving within that area. In Malaysia, black symbolises mourning or death (BORTOLI & MAROTO, 2001); this particular sign, which is designed for highways, is meant to warn drivers about the danger of speeding in that particular zone. G3P4 recalled seeing that particular warning sign when he was a child. He still remembers it now, even though years have passed and the sign has been replaced with other types of warning signs.

(ROGERS, LAMSON & ROUSSEAU, 2000) suggested that the effectiveness of warning signs is determined by the 'interactions between persons' variables (e.g. age, gender, vision, familiarity, risk-taking style) and warning variables (e.g. colour, font size, explicitness, use of symbols)" (p.184). Therefore, G3P4 has associated a skull to being a dangerous and terrifying 'familiar' symbol that influences his behaviour to be more careful when encountering the symbol in highways. Figure 8 is a new sign that was captured in October 2012. However, this particular sign was posted only at rural areas–areas with frequent accidents. JOHNSSON-KOZLOW, MATT & ROCK, on the other hand, have argued: "memory retrieval might be affected by culturally conditioned schemas and recalled based on the respondent's culture" (2008:433).

However, the routinization of everyday life practices and the naturalized environment sometimes makes us 'blind' with our ordinary surroundings. The picture was taken while I was a passenger in the car driven by my sister, who uses the road to travel from her home to her workplace. She claimed that she had never noticed or seen the sign until I mentioned it to her. Another interesting aspect of the new sign is the symbol used. In comparison, the skull symbol as remembered by G3P4 had been replaced with a skull and crossbones symbol, which is normally used for hazardous materials such as poisons or toxic materials. Despite different colours being used, I would assume that people may take it for granted when red is used instead of black because compared to black signs, there are relatively few red signs being placed on roads. Apart from that, black background is not an appropriate colour for warning signs since the colour is hardly visible at night.

**Box 5 Excerpt from FG3**

The third thing is I remember since I was young is this forbidden sign for tractors and cows on the highway. Because I'm from the countryside – I think you remember -- in five minutes, we had to get out of the highway, and in five minutes we are in my house. But it's fields on one side and fields on another side, and I was thinking it is forbidden for cows and tractors, how do they pass from one side to another? For me, it was kind of weird because I couldn't understand the cow and the tractor and the forbidden symbol. That's what I remember. Also, in the secondary street where nobody goes – a triangle inverted. What was the meaning of the inverted triangle? So it was misplaced. So somebody put the sign the wrong way. I imagined what the purpose of that sign was. (G3P2, cycling, without driving licence)

Box. 5: Recalled signs by another participant

Since G3P2 does not have her own driving licence, she tried to recall the sign she'd seen when she was young; in particular, it was the forbidden sign for tractors and cows which were located on both sides of the highways (Figure 9). She could still remember the sign because to her, the locations of each sign were awkward. On the other hand, she also guessed that the inverted triangle warning sign was inappropriately placed on the street. The sign actually warns drivers to be prepared in giving way to any approaching vehicle (Figure 10).

Figure 9: Warning signs for cattle within the area (Source: STEPHEN J. BODIO)

Figure 10: Yield sign located in Aalborg, Denmark (Source: AUTHOR)

Even though G3P2 has never obtained her driving licence, she managed to remember either the traffic signs that were meaningful to her or the ones that did not make sense to her at all. The warning signs of tractors and cows particularly, were only placed in the countryside areas. These kinds of signs can normally be found in farm areas, which are commonly occupied by farmers who breed cows and use tractors daily. It is very important to have such signs so as to warn vehicle drivers, local and outsiders alike, about incoming tractors and possibility of cows on the loose. In G3P2's interpretation of the 'inverted triangle', which is a warning sign for vehicles to give way to approaching vehicles, she could not possibly identify the rationale of placing the sign downwards as well as the grounds of knowing the actual meaning of the sign. I would expect that there are people who have driving licences and yet, misunderstand a few traffic signs that are irrelevant to their everyday living.

The Recalling and Guessing theme in this study was selected in order to obtain the participant's general perspective about the most memorable road signs they have encountered. As mentioned by (DOWNS & STEA, 1977), it is difficult to measure the accuracy between what is in our mind and what is in the real world. The authors also added: "The world in the head is constructed as it is for a simple reason. We represent the environment as we do because it pays us to do so in terms of spatial thinking and behaviour" (p. 101). When the participants were asked about their most memorable signs, three of them had identified with

experiences they had from watching movies, the significant symbol of a ‘skull’ and also the irrational placement of the ‘cow and tractor’ signs in the countryside. In their research, (SHINAR ET.AL, 2003) argued about the relation between drivers’ cultural differences and their ‘recall levels’ of the last sign they passed by when they were driving.

The participants’ perspectives have illustrated that G3P4 and G3P2 have recalled memorable signs either through childhood experience or by guessing the symbols and colours of the traffic signs. On the other hand, when G1P1 was asked about his memorable road signs, he mainly recalled the signs that he had seen on movies relating to the famous city, Las Vegas. Nevertheless, the signs he saw were more inclined towards the impressive neon signs of the Sin City, not the official signs. Thus, the recalling vs. guessing theme became a reflection of the cognitive behaviour of the participants when they were asked to explain their most memorable signs. Other scholars [FRANK, CAMPARI & FORMENTINI, 1995; MOAR & CARLETON, 1982)] suggested ‘recalling of experienced routes’ when explaining that connecting places is the relevant aspect of wayfinding. Furthermore, a clear perspective of human memory is drawn between experience and significant symbols of perceived objects in the environment. In relation to the research questions, the analysis from this theme has unfolded the significance of symbols and colours of traffic signs; these were the two aspects that have struck the minds of the participants when they were asked about memorable traffic signs. This will lead to another way of unpacking the participants’ way of interpreting their journeys and the signs in place in their everyday living.

In the next theme, we will look into the differences between modes of mobility and the sense of semiotic alertness among the participants. The theme will try to examine the relationship between the participants’ modes of transportation and their alertness of the surrounding signs. This theme was selected as the main concept of this research, in relevance to the framework indicated earlier in this paper.

### *3.1.3 Modes of Mobility vs. Sense of Semiotic Alertness*

What is mobility practices and sense of semiotic alertness in this context? Why is it really important to have this theme in relation to the discussion? The notion of mobility practices in the context of this study lies in the participant’s different ways of movement. The findings showed that despite a few participants having cycled to work from their homes in Aalborg, some parts of their stories of experiences were

related to either walking, driving or being a passenger on a public or private transport. Thus, this theme will help us to understand the importance of being alert with the semiotic of signs in place and the way people interact while driving, walking or cycling.


Figure 11: Relationship between mobility practices and driving licence

Figure 11 shows the different characteristics of the participants particularly in terms of their cultural background, mobility practices and possession of driving licenses. Out of the twenty participants, only one commuted from home to workplace by using car. The remaining thirteen participants cycled and only two walked to their work place/university. However, in the analysis of interaction, it was found that the participants had emphasised different modes of transportation used in their current or previous experiences apart from their daily life practices. The current method of investigation also revealed relevant semiotic alertness in the data of interaction between the moderator and the participants. In WIRTH-NESHER'S (1996) book *City Codes: Reading the Urban Novel*, he suggested that verbal environment refers to both written and spoken languages. He also adds that street names, places or other "visually inscribed into the cityscapes – advertisements, announcements, or graffiti" are part of the city codes. However, he does not specifically mention regulatory traffic signs with specific codes that command road users.

(CHANDLER, 2002) has illustrated the importance of the relationships between the understanding of specific codes (e.g. the traffic signs), the context of codes in place (e.g. city environment) and the member of a particular culture (e.g. society). In everyday living, people make sense of things they see after they have processed the information and knowledge in their mind. As mentioned by (KRIPPENDORFF, 1989), making sense is a cognitive process which ends with 'constructed meanings'. (DELEUZE & HARRISON, 2000), on the other hand, argued that making sense is the "problematisation of thought which

gives the enactment and disclosing of such new worlds." Thus making sense does not have to be learnt formally; rather, it can be learnt through previous experience, knowledge and common understanding in the society. In relation to the sense of semiotic alertness, this theme will focus on some semiotic aspects that are commonly found in signs in a place. In KEVIN LYNCH's book The Image of the City (1960), he emphasises 'legibility' as part of the visual quality in the building of a meaningful city.

(CSIKSZENTMIHALYI, 1991: 33) also argued: "Visual qualities obviously have a lot to do with how we react to an object or an environment. But our reactions are not direct "natural" responses to colour and form. They are responses to meanings attached to configurations of colour and form". Hence, another possible approach is to unpack the embodied practices of the participants in comparison with the modes of transports and their sense of semiotic alertness that are naturally at the back of their head at some point. (FREUDENDAL-PEDERSEN, 2009) discusses the strong correlation between modes of transportation in our daily mobilities:

> There is a strong correlation between the means of transport we use for daily life and where we feel it gives most community. The positive stories concerning a specific mode of transport come from those who use it and they are, in turn, more negative towards communities in respect to other types of everyday life mobilities. (p.102)

Alertness is defined as "a place of consciousness where one is alert and ready to respond to stimuli, versus when one is unaware or tired" (Psychology Dictionary). Semiotic alertness is a term that emphasises a participant's attentiveness of noticing the signs in a place in 'semiotic aggregate' (SCOLLON & SCOLLON, 2003), linguistic landscape (SHOHAMY & GORTER, 2008), semiotic landscape (JAWORSKI & THURLOW, 2010) or in general, the urban environment. Thus, by looking at this theme, this study examines the daily lives' alertness of the participants when they were asked about the signs in their daily life journey behaviour. This theme helps to determine the significant aspects between participants' mobility practices and their sense of semiotic alertness in daily life, particularly in terms of their observation of traffic signs as well as the visual cues they could relate to in their mobility practices. Below (Refer Box 6) are the experiences of three different participants with different modes of practices:

**Box 6. Excerpt from FG1, FG3, and FG4**

Rules are rules, but the things that I want to be engaged more with is with the society – the behaviour and how -- what's the behaviour when they are cycling. I just want to follow them first. Then after that I will go for the road signs. The second one is that I make sense of the signs depending on whether I'm driving or whether I'm the passenger. Before this, I was a frequent user of the bus because we travel from here to the main campus so regularly we use the bus. I'm aware of the special signs for buses, especially for the special traffic for the bus – the vertical line and the horizontal line. I was never aware about that when I wasn't a bus passenger but when I became a bus passenger regularly, I learned that this was a special sign for bus. (G3P4, cycling, with driving license)

Well, normally there are drawings, you know, but there's walking so there's people walking so. That makes sense and normally if I see the right colour, I might be a little more observant than the other places because I know that means some kind of warning probably the speeding limit or stop here or what else, but there's normally red involved if there's something. (G4P2, driving, with driving license)

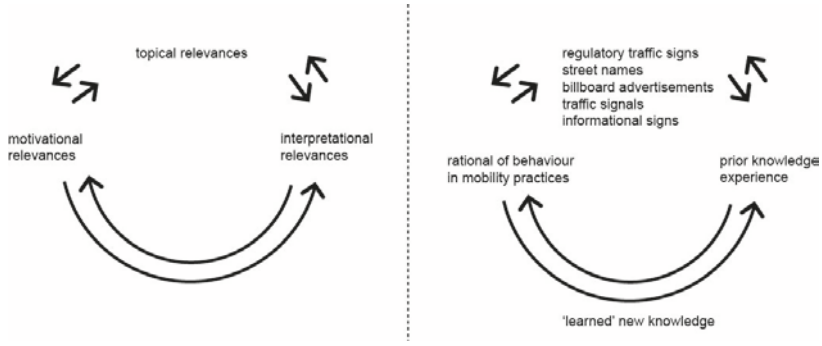
You have a reference of the stuff that you know and that you, yeah, there's some knowledge gained through being told that growing up and stuff, and then I think you just kind of use that and try to apply the same logic onto the new signs that you see and kind of make sense of that, if that makes sense. Yeah, I think that's pretty much, yeah, how I would perceive it because, you know, in a traffic situation whether you're walking because it's really, well, yeah. Not that often you have the time or the ability to ask someone what does this mean unless, of course, it's really important that you know and, yeah. (G1P4, walking, with driving license)

Box 6: Experiences between mobility practices and participants' sense of semiotic alertness

Based on the three participants' different modes of mobility practices, it was found that the participants tend to look at specific signs which they can associate with their previous experience or knowledge. G3P4 in particular, indicated that he only noticed the specific bus signs whenever he had to travel by bus. In other words, this participant tends to only search for specific signs that were related to his mode of travel. G4P2, on the other hand, claimed that he made sense of the signs when he travelled through the "drawings" or symbols of traffic signs with specific indicators of colors for the signs. This would better alert him when moving around: following his perception, he associated red as warning signs. The third participant, G1P4, walks to his workspace daily, and he stated that he sometimes used his own logical sense making in interpreting new signs. He also suggested that time is another factor that determines whether a person has the ability to ask other people around with regards to the meanings of signs.

Phenomenologists and social scientists view the system of relevance of unfamiliar experiences (interpretational) into familiar and understandable situations. The figure below encompasses (a) three systems of relevance as pointed by (SCHUTZ, 1970), and (b) my own interpretation of the relevance in relation to the theme of mobility practices vs. sense of semiotic alertness. Schutz's

three system of relevance emphasises (1) topical relevancies as concept of value; (2) interpretational relevancies as junction and meaning of methodology; and (3) motivational relevancies as a helpful analysis that correlates with personality structure. Thus, in my interpretation of relevances between semiotic alertness and mobility practices, I would illustrate that (1) topical relevancies include the signs in place; (20 interpretational relevancies are based on prior knowledge and experiences; and (3) motivational relevancies are the rationale of behaviour in mobility practices.




(a) (b)

Figure 12: (a) Three systems of relevances and relevance (SCHUTZ, 1970) (b) relevance with thematic analysis.

Perhaps we could assume that semiotic alertness has a situational and pragmatic dimension. For instance, in relation to “what does a particular person need to know in order to go to a specific location?” Then, there might also be a more individual’s sense of direction through a psychological dimension such as “what do I need to know in order to get to this place without having difficulties in finding the specific place?” Each of us has different spatial abilities and characteristics in noticing little details in the environment such as small printed notices on traffic signs, newly installed traffic signs for regulating ‘temporary work in progress’ and etc. Thus, semiotic alertness differs from one person’s perception to another, and it depends on individual’s characteristic and travel behaviours.

**Box 7. Excerpt from FG2**

The signs at the highway when I'm driving or when somebody else is driving and I'm in the car– those are good because when you're on the highway you lose that feeling with "Where am I?" because it's just road and road and road. So they – those signs are good to get to know where am I? So they are like the only -- how do you say? They are the only indication of where you are and as the others said, when I walk I don't notice the signs. It's only when I ride a bike and driving because there's a lot of signs, especially in town. In the town you can go anywhere, you can walk anywhere, but when you're driving or you're riding a bike they're certain restrictions to where you can go (G2P2, cycling, with driving license).

Box 7: Participant's semiotic alertness when looking for signs

In G2P2's experience of semiotic alertness, she had her own personal pros and cons for looking at the signs. In her opinion, road signs give an indication of her location besides guiding her through her travel journey. However, her opinions when looking at signs in the cities were different from the ones at highways. Looking at signs also depended on her mobility practices whether she was driving, cycling or even walking. There are limitations in terms of looking at signs in both urban and rural traffic signs.

Therefore, semiotic alertness also depends on the kind of signs in place that a person is looking for in search of a destination. For vehicular drivers, traffic signs are very significant in order for them to avoid restriction areas or getting a 'ticket'. Pedestrians, on the other hand, rely on signs in place that are part of the pedestrian signing system such as the informational way findings of street names, building directions and so forth. Thus, the mode (and other situational features) determines the 'alertness' of road users. Needless to say, part of semiotic alertness stems from 'external' stimuli (staging from above) whereas others are related to 'internal' factors (staging from below). This can be referred to the 'staging mobilities' model by (JENSEN, 2013).

**Box 8. Excerpt from FG3**

I don't have a driver's license. I remembered asking my father, "What is the meaning of the different triangles?" I think you actually have inverted triangles in some cases. My father actually explained to me that the triangle is different. If it's forbidden or more for taking care, it's red. If it's allowed to, then it's blue. If it is not forbidden, then it's crossed. I remember the thing of the cow and the highway. It's actually a circle with the red and the cow and triangle. That is strictly for people. (G3P2, cycling, without driving licence)

Box 8: Participant's interpretation of colours in road signs

As mentioned by (BARRY, 1997), 'visual common sense' is like a problem-solving process. Thus, in our daily life, our judgment in interpreting the signs in

place affects our actions or behaviour within a space. In G3P2's interpretation of making sense of the signs in her daily life, her knowledge of applying the signs in relation to her understanding of the meanings lies on the use of colours. To her, blue means "drivers are allowed to enter the road" while and red means "drivers are forbidden to enter the road". Despite G3P2's lack of knowledge in rules and regulations of traffic signs, she managed to interpret the design elements (such as colours and shapes) to guide her through her journey within familiar or unfamiliar areas. In KRAMPEN'S (1983) research on semiotic icons of roads, he suggested:

> The stance against the 'magic' of pictorial communication draws its strength from the assumption that not only conventional signs but also iconic signs must be 'learned'. Consequently, he who has not learned the code of pictographs used on the road or elsewhere in public will not 'understand' them (p.169).

G3P2 learned the meanings of signs from her father while she was growing up. However, she would also assume that the sign "a circle with the red and the cow and triangle" was strictly for people to be aware of. I would believe that G3P2 had come across these signs while she was growing up since she mentioned the signs a few times during the interview. Since she had not driven a vehicle, she would mostly assume the meanings of new symbols of traffic signs she came across. A possible explanation for this might be that G3P2 would not be bothered to know the meanings of the traffic signs unless she had to. The detail of the specific signs as mentioned by G3P2 will be discussed in mapping mobility vs. google mapping theme, in which I will discuss the visual representations of the signs. Thus, it is possible that G3P2's sense of semiotic alertness was more relevant to her cognitive behavior in filtering the information more psychologically than semiotically. She basically understood the roles of semiotic elements in the signs through her recalling of experiences instead of her own formal learning of traffic signs. Another interesting story by G3P2 emphasises the 'licence to cycle' in Portugal:

**Box 9. Excerpt from FG3**

There was – I came to a point – I was like 15 or 16 years old. I lived very close to the city. If I took a bicycle, in 10 minutes, I would be in the city centre. So I was not depending on cars and buses and walks and so on. I asked my father if I could do that. My father said, "Okay, but you know that you have to go to the city hall and ask for a licence." So you actually have to have a licence to cycle in Portugal. You know they give you a plate for your bicycle that you have to use. If you are caught cycling without a licence and without the plate, you are fined by the municipality police in control. So it's not the same as a driver's licence. They have a record that you are cycling in the city. It's more a record. We have the police, normal police, and then we have the traffic police and the control police, and then we have at the municipality some kind of police for control. It's only in the urban areas. They cycle because it's easier to go by this way than by actually using cars. (G3P2, cycling, without driving licence)

Box. 9: Participant's experience in Portugal

(GIDDENS, 1986) argued that while people may have knowledge of the real world, they may not always be aware of their practices. Therefore, at times, in influencing alertness to signs in place, knowledge of visual cues of the semiotic elements in the signs are necessary. Colours and shapes are among the important factors in determining the visual sense of everyday travel behaviours (LYNCH, 1960: p.9-10).

This thematic analysis of unravelling the evidence of modes of transportation vs. sense of semiotic alertness gives an overview of how people make sense in their everyday living. As a result, most of the participants tend to look at signs whenever they have to search for signs. For instance, G2P2 illustrated the importance of informational signs on a long stretch of highways in order to signify her location. One possible explanation could be that signs can be used as an indication of her location either when she is referring to maps or when she was just checking whether she was on the right track. The participants were found to be more attentive to signs whenever they were driving or cycling instead of walking. The potential for 'information processing' and 'reading the environment' must be assumed to be higher for low-speed modes such as walking compared to high-speed modes such as car driving. The explanation lies in the fact that as soon as one submerges oneself into infrastructural systems and technologies (such as cars and road spaces), the need for 'visual cues' increases.

I would suggest that the participants refer to legal traffic signs instead of common street names or informational signs. Another possible assumption of the relevance between mobility practices and semiotic alertness is that the traffic signs for drivers and cyclists are meant to reduce accidents or serve as safety precautions. In other words, the traffic signs are like order for the road

users other than the pedestrians. A pedestrian, on the other hand, is free to walk anywhere except in the middle of the road or except along the flow of the vehicles or cyclists.

In relation to my research questions, the interaction with participants will be relevant in answering the most common semiotic traffic sign meanings understood by the participants. It will also be relevant in determining whether the urban context affects travelling in familiar or unfamiliar areas. In the findings, the participants who had formal driving training were more alert of the traffic signs that were familiar to them in terms of shape, colours and relevance to their mobile activities. For instance, most of the participants described the visible cues of the signs that they were attentive to in their everyday life. The physical urban space has also affected their social behaviour when moving from one place to another. Whenever "construction work" signs are placed in the physical streets of the urban environment, pedestrians, drivers or even cyclists have to manoeuvre accordingly, depending on the additional instructions commonly placed together with the signs. If the instructions are specifically meant for pedestrians, additional information is added such as "diverted traffic" or "pedestrian access" (Fodgængere henvises til modsatte fortov in Danish).

The next theme will unfold the participants' stories of their memorable traffic signs in urban or rural spaces. This particular theme was suggested following the theoretical aspect of traffic signs as well as the interesting raw data gathered from the participants. As argued by (TAYLOR, 2003): "experience has to be one of heightened, even hyperactive sensory stimulation and cognitive activity" (p. 1622). In addition, there are differences between the experience in congested city (urban environment) and less traffic areas (rural). The next theme, *urban traffic signs vs. rural/highway traffic signs*, unfolds some important aspects of traffic signs that were found in both ecological spaces: urban and rural areas.

### *3.1.4 Urban Traffic Signs vs. Rural/Highway Traffic Signs*

In our daily practice of moving around spaces, two main ecological aspects of spaces were discussed during the sessions. In general, traffic signs are also regulated in rural areas other than in highways, which connect the urban environment with the rural areas; hence, this study also contributes to the rural areas. From the focus group discussion, the participants were asked about the most memorable signs when moving from one place to another. That was also the rationale of having urban traffic signs vs. rural traffic signs as part of this analysis.

| Group No | Participant | Memorable Signs | Locality |
|---|---|---|---|
| Group 1 | G1P1 | Billboard /advertisement | Urban |
| | G1P2 | Animal warning signs | Highway |
| | G1P3 | Animal warning signs | Highway |
| | G1P4 | Animal warning signs | Highway |
| Group 2 | G2P1 | House number signs | Rural |
| | G2P2 | Mountain area warning | Highway |
| | G2P3 | Animals warning sign | Rural |
| | G2P4 | Billboards/Advertisements | Urban |
| Group 3 | G3P1 | Warning sign of 'guys | Urban |
| | G3P2 | Highway sign and | Highway and urban |
| | G3P3 | Billboard | Urban |
| | G3P4 | 'Skull' warning sign | Highway |
| Group 4 | G4P1 | Parking signs | Urban |
| | G4P2 | Billboard | Urban |
| | G4P3 | Traffic lights and turning | Urban |
| | G4P4 | No specific road signs | Unidentified |

Table 3: Summary of Memorable Signs in Place

As shown in Table 3, the participants' memorable signs were mostly related to animal signs, which are commonly seen in highways and rural areas. During the sessions, most of the participants described the signs that they saw when passing through highways or rural areas. Commonly, highways signs are regulated to control speed and warn vehicle drivers of potential hazards ahead such as 'wild animals', 'falling rocks', and 'tunnel ahead'; the signs also warn of speed limits and inform on the directions to highway codes and so forth. In contrast, the urban streetscapes are dominated by warning signs such as "pedestrians ahead", "one-way street", and "no parking signs", which are considered as transgressive notices in geosemiotic terms; these terms in particular, refer to notices and advertisements as part of the semiotic aggregate of urban environment. Traffic signs systems are categorised according to traffic zones (HAMILTON-BAILLIE, 2004); they are either for highways/motorways or for the urban environment.

The theme was selected since a few similarities were anticipated by the participants during the discussions. There are differences in the implementation of traffic signs between urban space and rural areas or motorways. Most urban traffic signs are regulated by municipalities and police authorities. In urban cityscapes, the enforcement of traffic signs are more concerned with the

hazards for drivers, bikers and pedestrians. Therefore, the traffic signs and signals in the cities are relevant to motor vehicles and people. For instance, there are warning and prohibitory signs for motor vehicles, which are also located at pedestrians areas. In contrast, few signs in rural areas and motorways are placed to warn drivers about wild animals' crossing, ahead tunnels and falling rocks.

Thus, this theme was intended to obtain the participants' views of their memorable signs either in urban cityscapes or rural landscapes. In the history of cities, human behaviour is influenced by urban structures and planning as well as the function of the cities (GEHL, 2010). (BRIDGE & WATSON, 2010) suggested: "cities are about mobilities, about movement, connections and networks, which in most cases also have material and spatial effects" (p.97). In relation to that, this theme will help to determine the differences between urban traffic signs and rural traffic signs in terms of their functions and noticeability to the participants.

**Box 10. Excerpt from FG1 and FG2**

I think one time I went on a vacation in Sweden in the countryside and we had like – they had like these triangles with the moose on them like yellow and red I think and a black moose on a yellow background. And I think the first time I remember I saw that I was like very – what's it called – it just – I just remember I remember we talked about it, what is that sign, and also because in Sweden they have like small badges with that moose sign on souvenirs, so they had like a road sign for souvenirs. Yeah it kind of means Sweden somehow. (G2P4, cycling, with driving licence)

I think, I don't know where, it was in some foreign country where I know in Denmark you have to be aware of the cows road sign and it was something else. I think it was moose or something (G1P3,cycling, with driving licence)

When you're going into the mountain there's a sign that says – I can't remember exactly what 25 kilometres of tunnel or something and when we drove past it we went past this guy on a motorcycle he stopped his motorcycle and put his camera up like you had kind of – what's a good word? A tripod, and he was taking a picture of himself underneath the sign to say I've driven on my motorcycle through this tunnel, through this mountain (G2P2,cycling, with driving licence).

Actually, I saw one in the States that was at a pier, which basically had a pictogram of a pigeon on it with a big red mark on it, which is kind of, you know, trying to prohibit something that you can't really, you have no control over (G1P4, walking, with driving licence )

I think I'm on the animal signs realm. In Australia, they have in rainforests, these very strange huge birds. I don't remember the names for them but it's, I think it's the second largest bird in the world and they have... but they have these signs where they had actually painted them like dead so that you could see that it's dangerous for the car but it's also, you have to slow down because these birds are rare and keep aware of them. But the sign was like a bird on the road (G1P2, cycling, with driving licence)

Box 10: Participants' interpretation between urban traffic signs and rural traffic signs

Animal signs were the most memorable signs to the participants. Although the highway drivers have yet to see a real animal such as a deer crossing the highway, they were still aware of the signs' significance. When I was driving on Malaysian highway at one time, a monkey crossed the wide road out of nowhere. There was no sign to warn drivers about the possibility of monkey crossing that area. Nevertheless, how do traffic engineers determine the specific regulations on animal warning signs, particularly in highways and suburban areas? In Malaysia, the most implemented animal warning sign in highways or countryside is the 'cattle' sign. Unlike Malaysia, the commonly adopted animal warning signs in most European countries are 'wild animal' signs; these signs are commonly found in motorways, and they are categorised as deer, reindeer, or moose. As argued by (WAGNER, 2006): "any information given by road signs should immediately strike the mind and impose good road traffic behaviour" (p.319).

Hence, the traffic signs placed in city centres, rural areas or highways should give understandable information that can affect a driver's alertness while driving or cycling. Importantly, the traffic signs in place are supposed to instantly strike the mind of the road users regardless of the place they are driving or cycling at. In relation to that, (PLEJDRUP, 2002) has illustrated the importance of differentiating between cities and rural areas:

> It is also important to preserve the difference between Western Jutland and Copenhagen inner city area. They are not allowed to merge into each other, so that it's difficult to 'see' where you are. There must be a difference between wind-swept trees and the heart of the city. (p.18)

Thus, as part of the ecological spaces between urban and rural areas, traffic signs also play an important role in determining the rules and regulations of the different spaces. It is unlikely that one would find a warning sign for 'cows' in urban areas despite the nature of cows being located in rural areas. In the same way, parking signs, which are commonly found in urban cities, are unlikely to be found in rural or remote areas where people can park anywhere available.

When G1P2 was recalling her memorable road signs, she simply remembered her past experience while she was traveling to Australia. What strokes her mind was the symbol of uncommon bird signs that cannot be found elsewhere. In her memories, she either guessed the colors or the elements of the

sign such as (red) [Figure 13(a)); she also used the word “painted them like dead” which could be explained by Figure 13 (b).


Figure 13 (a): Critter sign (source: SIUDZINSKI, 2004).


Figure 13 (b): Before and after: Road signs warn drivers of the dangers they pose to the cassowary (Daily Mail, 2002).

The theme urban traffic signs vs. rural/highway traffic signs was found to be relevant, and it overlapped with the recalling and guessing themes, which unfolded the significant road signs remembered by the participants either in urban or rural spaces.

## 4. Discussion

The experiences described by the participants have resulted in several interpretations of the significance of signs and symbols in everyday living. The study found that semiotic alertness and mobility practices are useful concepts of investigations that can contribute to the knowledge of geosemiotics and mobilities. The participants noted substantial elements of signs and symbols through their knowledge and experiences in their daily lives. They were the eye opening perspectives obtained from different backgrounds, particularly when they derived from the participants’ responses when asked about their experiences when moving through spaces.

The perceptions of participants in this study have highlighted the importance of experiences and knowledge of traffic signs, either the ones regulated by authorities or the ones that commonly represent places (such as building signs and etc.) The idea of semiotic alertness was not only derived from the findings and transcripts, but also from the elements of visual semiotics from the idea of geosemiotics. SCOLLON & SCOLLON emphasised the materialities that we embodied in our everyday living. Table 4 summarises the themes that were taken from the focus group's analysed data. The summary consists of keywords that are relevant in each theme, which may help illustrate the key elements in order to answer the research questions. The table below shows a summary of themes and the related keywords that are derived from the data and analysis of the focus group sessions.

Table 4: Summary of themes and keywords

| **Theme** | **Keywords** |
|---|---|
| Personal experience vs. knowledge | Information processing, learning the environment, Emotion, affect, violating traffic, time |
| Mode of mobility vs. sense of semiotic alertness | Meanings, familiarity, codes, visual qualities, common sense, urban environment, staging mobilities |
| Recalling vs. Guessing | Current and previous experiences, familiarity, memory, |
| Urban traffic signs vs. rural traffic signs | Animal signs, parking signs, one-way street signs, hazards, motor vehicles, pedestrians, urban forms |

From the table, we can see that the themes have unpacked and examined several important aspects of interrelation between the human perceptions and the perceived environment mainly the road signs in urban spaces. In this study, the participants were not grouped according to demographic attributes such as gender, age, ethnicity, and level of driving experiences or modes of mobility. This was not only due to the difficulty of assembling strangers in a group; the purpose was also to generate more general data from the discussion based on different demographic backgrounds. However, after the analysis, interrelations between the levels of

semiotic alertness and modes of mobility were also found despite the knowledge or experience of understanding the formal traffic signs and signal codes.

Traffic signs and road safety education (AL-MADANI & AL-JANAHI, 2002; NG & CHAN, 2007) are important factors that need to be integrated by designers and traffic sign manufacturers in assisting the decision-making about traffic policies. It is impossible for all drivers to achieve a complete understanding of more than one hundred signs that are normally tested in traffic codes' examination. However, it is the role of the designers and engineers to ensure that the language (symbols and iconic representation) of the intended signs are placed appropriately, according to needs of the spaces, familiarity, and that the signs are communicate effectively with users. (SHELLER & URRY, 2000) suggested that driving creates a sense of quick communication in our daily lives. (BORDEN, 2005), on the other hand, argued that 'urban driving' is associated with the fast paced of an individual's urban way of living.

The most challenging aspect of this method was in gaining the adequate data from the participants through the analytical approaches in relations to different modes of mobilities. To some extent, the analytical process in this research has involved selected themes that were raised through primary data from the transcriptions as well from literatures of the subjected themes. The strengths of this method was in gaining the narrative storytelling from the participants that have revealed their life experiences from different backgrounds. Although this research did not intentionally investigate the cultural differences among the participants, the data gathered have proven that different cultures have significant value of interpretations. This can be seen through the individuals's understanding of signs that they noticed in their lives. However, I could argue that the rich data from this study, to some extent, has influenced the relevant approaches used to analyse the focus group interviews. Thus, this study has focused not only on the participants' experiences that were mainly unpacked in this paper, but also on the visual analysis of the data retrieved from the discussions and activities. This will be discussed further in another paper on the research.

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Paper

# 06

**Malaysian Urban Streetscape Sign Design Manual**
**“Towards Pedestrian Friendly Streets”**
To be submitted to Malaysian Road Works Department

# Malaysian Urban Streetscape Sign Design Manual

"Towards Pedestrian Friendly Streets"


A Draft Proposal to be Submitted to the Department of Road Works Malaysia
[2015]

This is a draft proposal to be submitted to the
Department of Road Works Malaysia
[2015]

# TABLE OF CONTENT


TRANSIT STAR PASAR SENI
PETALING STREET
TRANSIT LRT PLAZA RAKYAT
KWAN TI
SRI MAHA MARIAMMAN
TEMPLE DHEVASTHANAM
STESEN BAS
(PASARAMA
MASJID INDIA
MASJID JAMEK
DATARAN MERDEKA
129
129

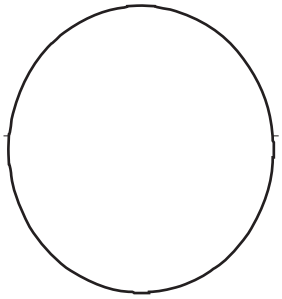

KLANG
KOTA)
TUN H.S. LEE
JALAN BANDAR
REGGAE BAR &
GUEST HOUSE
10M
LUAN SEHALA
I WAS HERE
JALAN TUN H.S. LEE
DRUNK

## The sequence of cognition

The science of perceptions examines how individuals recognize and interpret sensory stimuli. The brain acknowledges and remembers shapes first. Visual images can be remembered and recognized directly while words must be decoded into meaning.

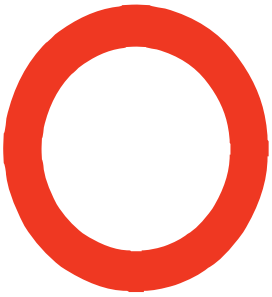
sequence of cognition

shape



The brain acknowledge distinctive shapes that make a faster imprint on memory

color



Color can trigger an emotion and evoke a brand association (traffic rules)

form

The brain takes more time to pro - cess language, so content is third in the sequence behind shape and color

# Preface

Road signs system in Malaysia is currently using the Arahan Teknik (Jalan) Guide Signs Design and Application by the Department of Road Works, Malaysia. The development of the signage under this approach focuses on three elements: regulatory signs, warning signs and guide signs reform.

The case studies used in this proposal of Malaysian Urban Streetscape Sign Design Manual consist of common road signs used in Glasgow, Scotland and Aalborg, Denmark. In addition, the Malaysian case study is a compilation of current practices of road signs design system in Malaysian cities.

This urban streetscape sign design manual is intended to be used as guidelines for policymakers, urban designers and graphic designers especially in planning the urban road sign system. This proposal is designed to be an information resource for administrators in the local authorities, whose role is to approve or administer signage issues, and the guidelines will be updated from time to time as policies are reviewed. The recommendations outlined in this proposal are not looking at the technical requirements as in the official guidelines by the Malaysian Government. Instead, it reports the case studies in Denmark and Scotland that focused on the current scenarios of the urban road signs system. This will be used as a point of departure for future case studies in Malaysian cities.

This sign design manual is based on current Ph.D research on Road Signs: Geosemiotics and Human Mobility. In the study, the data were gathered qualitatively using the photographic documentation which is part of "visual methods". Visual methods have been known by scholars like Pink (2003) and Rose (2012) who used photography documentation and photography elicitation as part of research project and analysis tool in ethnography research. Thus, through this research, data were gathered and captured in three different areas that are used as case studies. The case studies encompass of signs that are found in Glasgow, Scotland; Aalborg, Denmark; and cities in Malaysia, especially in Kuala Lumpur.

The research, used several approaches in investigating the relationship between the current mobilities turn and geosemiotics studies which were used as methods of investigation between **people**, **built environment** and the **road sign systems**. Thus, this draft proposal is an outcome that will be used a guide for future designers, urban planners as well as policymakers when making decisions in the implementation of signs design system.

Note:
*Mobility* involves the movement of people or goods from one place to another. The experiences of and interactions between actors in particular spaces include mediation and technologies that influence their behaviour.

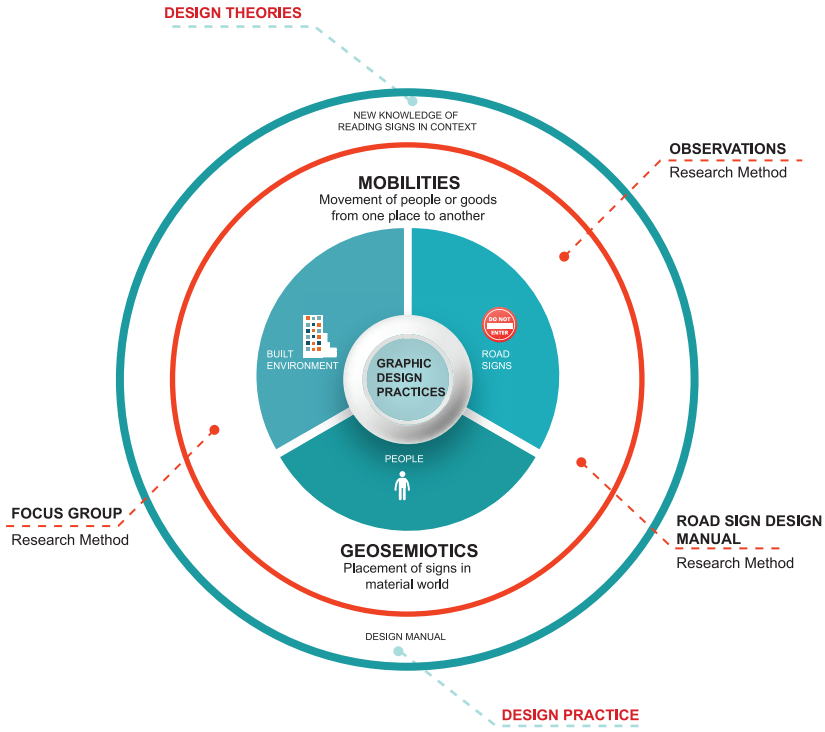
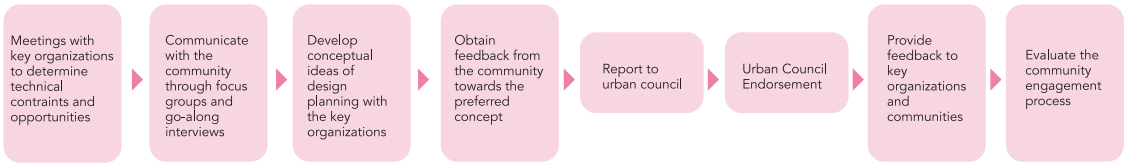



**Figure 1.** Conceptual and Theoretical Framework
(Adapted from Jensen's Staging Mobilities model, 2013)

This conceptual and theoretical framework is used in the research in order to conduct the methods of investigation. As can be seen, the road signs is a significant factor that can be related to people and the built environment. Thus, from this framework, the road sign design manual will be used as one of the methods to display case studies and design implementation for designers.

# Streetscape Framework

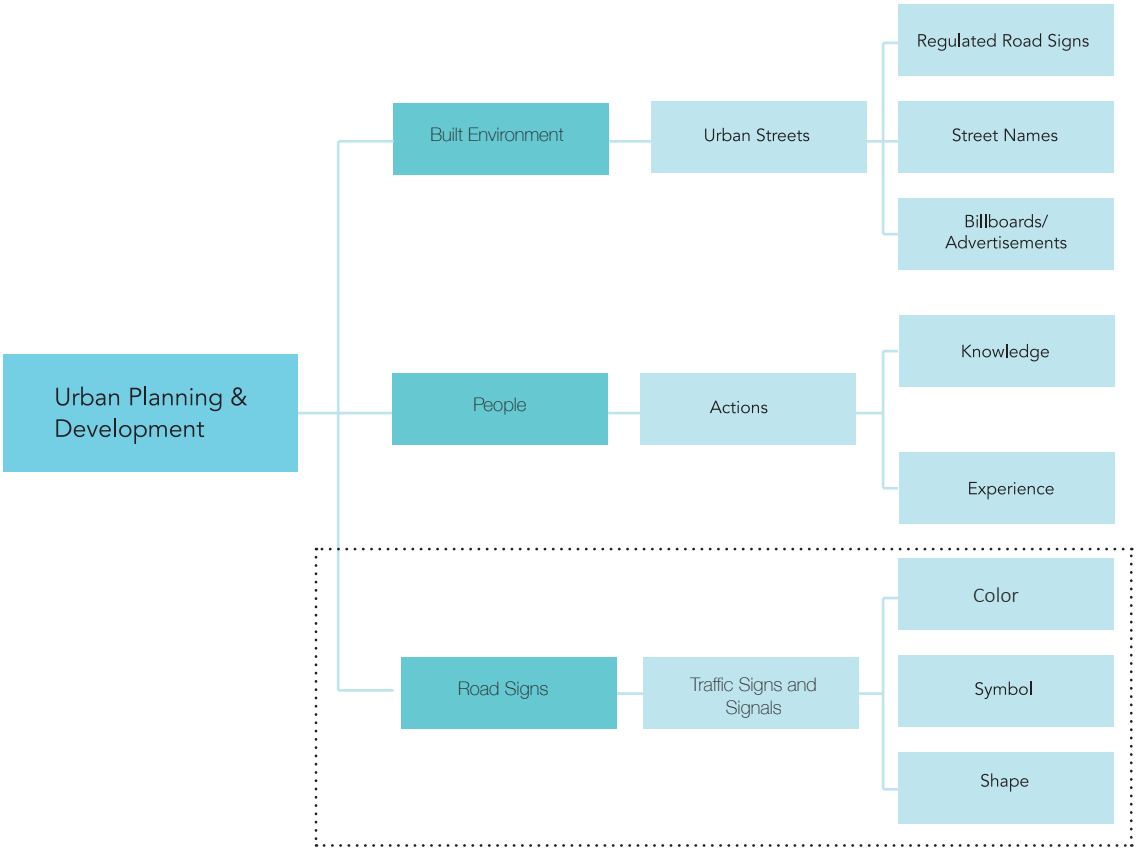



Streetscape Framework : Community engagement process

In the streetscape framework, community engagement is considered an important aspect when designing communication device such as the road signs. This is due to its needs and feedback from the target users especially the road users.

This proposal intends to be used as a guideline for designers in developing a more pedestrian-friendly streets in Malaysia. Two of the case studies; Aalborg, Denmark and Glasgow, Scotland are used since both cities are also known for their pedestrian friendly streets.

# Development of Streetscape Framework




This proposal focuses on the road signs that are very common in cities. The streetscape framework takes into account the main subjects; built environment, people and road signs. This framework aims to be used as guideline for desiging the traffic signs and signals for the road users. From the diagram, each subjects are divided into sub categories that are found from the findings of this research. Based on the findings, there are similarities and dissimilarities between the icons, symbols and also shapes of the road signs even though the road signs apply universal design.

# Functions of Traffic Signs

Traffic signs are used to regulate, warn, or guide road users. Signs should be used only where necessary and justified by facts and studies. Traffic signs are essential where special regulations are applied at specific places or at specific times only, or where hazards are not self-evident. They also give information on highway routes, directions, destinations and points of interest. Traffic signs are not ordinarily needed to confirm rules of the road. Functionally, they are classified as follows:

(a) Regulatory signs give notice of traffic laws and regulations (Refer to Section2A of 2B/85).

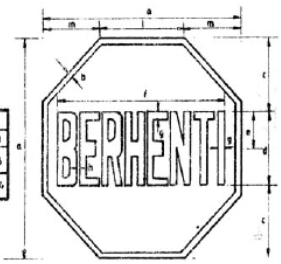
RP.1 STOP AT INTERSECTION

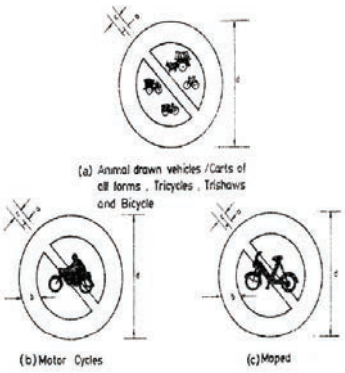
Used in cases where a driver shall stop before entering a priority or major road.

| SIGN | DIMENSION (millimeter) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | l | m |
| Minimum | 600 | 18 | 200 | 200 | 100 | 510 | 20 | 10 | 248 | 176 |
| Other Size | 900 | 24 | 300 | 300 | 150 | 765 | 30 | 15 | 372 | 264 |

COLOUR

Background – red
Border – white
Lettering – white



(a) Animal drawn vehicles /Carts of all forms , Tricycles , Trishaws and Bicycle

(b) Motor Cycles

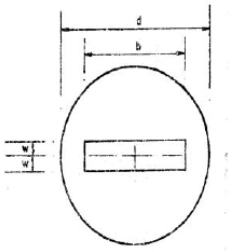
(c) Moped

RP.4 NO ENTRY FOR ANY VEHICLE

| SIGN | DIMENSION | | |
|---|---|---|---|
| | d | b | w |
| Minimum | 600 | 400 | 50 |
| Normal | 750 | 500 | 62·5 |

COLOUR

Symbol – white
Background – red



(b) Warning signs call attention to conditions on, or adjacent to, a highway that is potentially hazardous to traffic operations. (Refer to Section 2B of Arahan Teknik (Jalan 2B/85).

WD.22 TRAFFIC SIGNAL AHEAD

Advance approach sign to a signalised junction.

| SIGN | DIMENSIONS | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | j | k | r |
| Minimum | 600 | 10 | 10 | 150 | 60 | 15 | 300 | 900 | 80 | 20 | 35 |
| Normal | 600 | 10 | 15 | 225 | 90 | 20 | 300 | 900 | 80 | 20 | 50 |
| Other Sizes | 750 | 15 | 20 | 280 | 110 | 25 | 300 | 900 | 80 | 20 | 65 |
| | 900 | 15 | 25 | 335 | 135 | 30 | 300 | 900 | 80 | 20 | 75 |

COLOUR Background – yellow
Border/Lettering – black
Black symbol except that the discs are of red, yellow and green from the top.

LETTERING Series 2 with medium spacing.


WD.14 PEDESTRIAN CROSSING

Approach sign indicating a pedestrian crossing

| SIGN | DIMENSIONS | | |
|---|---|---|---|
| | a | b | c |
| Minimum | 600 | 10 | 10 |
| Normal | 600 | 10 | 15 |
| Other Sizes | 750 | 15 | 20 |
| | 900 | 15 | 25 |

COLOUR

Background – yellow
Border – black
Symbol – black

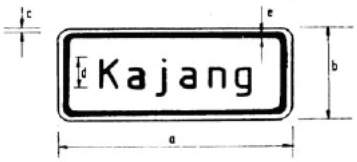
(c) Guide signs show route designations, destinations, directions, distances, services, and points of interest; they also show other geographical, recreational, or cultural information. (Refer to Section 2C of Arahan Teknik 2B/85)

GI.2 NAME OF TOWN OR VILLAGE
(Kajang is given as an example here)

DIMENSIONS:
a) Variable
b) Variable
c) 15 mm
d) 300 mm minimum
e) 20 mm minimum

COLOUR:
Background - white
Border - black
Lettering - black

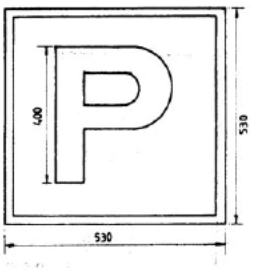
LETTERING:
Series 1 with medium spacing




GI.4 PARKING

Descriptions may be placed on a plate beneath the sign specifying :–
a) The hours during which parking is permitted
b) The days on which parking is permitted alternatively on one side or the other of the road.
c) The reservation of the parking place for particular classes of vehicles.

COLOUR: Traffic blue background with white border and letter.



In this proposal, the images of road signs that were gathered and presented were found in main streets of cities of Aalborg, Glasgow and Kuala Lumpur. The next section presents the common signs used in the case study areas.

# Case Study#1// GLASGOW

Panoramic view of Gordon Street, Glasgow

## Introduction

The case study in Glasgow was conducted in terms of the common sign system used in the urban areas. The signs include regulatory, warning and guide signs. Glasgow city, which is the largest city in Scotland, was also one of the highest ranking cities in the United Kingdom for quality of life. The flow of pedestrians within city centres like Glasgow is higher than that in the capital city of Scotland, Edinburgh. Given the larger scale of Glasgow geographically, there are also more activities in the city centre, in particular shopping, or other arts and cultural performances. In terms of the urban context, Glasgow is very 'pedestrian-friendly'. Thus, most of the street pavements are very broad for pedestrians to move about. However, due to the broadness of the pavements, higher densities of pedestrian flow can be seen, especially during peak hours and on weekends. In Glasgow, common activities around the city vary according to the season.


This is the guide sign used to indicate the direction of bicycle users' accessibility. However, as can be seen in the picture, the sign post is also commonly used as a bicycle parking place.

The placement and size of the sign is appropriate for bicycle users.

The sign ‘Pedestrian Zone Ends’ uses a different material instead of common metal post.


Combination of regulatory, warning and guide signs in one placement/location.


Street Sign Maps are placed in most main streets that are used by the pedestrians. The signs are standardized in terms of color, font, style and also in terms of the overall design of sign.


The guide sign is meant for motorcycle users to park within the street lanes.

# Case Study#1// AALBORG

Panoramic view of Gammel Torv, Aalborg

## Introduction

The case study in Aalborg was conducted in terms of the common sign system used in the urban areas. The signs encompass of regulatory, warning and guide signs.

For the past few years, Aalborg city has been transformed its waterfront into great place for culture and leisure. There are also specific pedestrian streets which prohibit vehicles from entering the streets except for loading and unloading purposes. Thus, the streets not only are safe for pedestrians to walk, but also great experience for shoppers and visitors.


The prohibitory sign for motor vehicles has additional information that allows only buses and taxis.


This guide sign allows vehicles to park within the designated lane. There is also additional information on the parking limit within specific time frame. However, as can be seen in the picture, the sign post is also commonly used as a bicycle parking place. The placement and size of the sign is appropriate for bicycle users.


This is the guide sign used to inform road users that the area is specifically a zone for pedestrians. There is also additional information at the bottom of the sign that indicates specific time for loading and unloading activities.


This guide sign specifically indicates the name of the place (Administration Centre) with a pointing arrow.



The street names are designed with specific font style, color and street historical background.



**1** Panoramic view of semiotic aggregates in relation to traffic signs, signals, road markings and other elements overlooking a pedestrian street on Slotsgade Street, Aalborg.

**2** Traffic signs, signals and road markings in Aalborg overlooking Slotsgade Street.

**3** Aalborg's city center has three main pedestrian streets: Algade, Gravensgade and Bispensgade. The streets are full of pedestrians which give an amazing experience for shoppers to enjoy their shopping spree while walking.


3

# CASE STUDY#3// MALAYSIA

# Introduction

The case study in Malaysia was conducted in terms of the common sign system used in the urban areas. The signs encompass of regulatory, warning, and guide signs. Since the research take into account the theoretical framework from geosemiotics approaches, the semiotic aggregate that are related to the surroundings of the signs are also included. This can be seen from the advertisement, notices, posters, and so forth. The case study will be used as a guide for the proposed sign design system for future urban planning in Malaysian cities.

Note:
Semiotic aggregates - Materialities that are embedded in their emplacement in spaces create meaning among the users of the spaces. These may include representations such as signs, graffiti art and turf boundaries.


Nando's
PERi-PERi Flame-Grilled Chicken
Zon bebas tol
Zon bebas tol
TIMES SQUARE
SUNGEI WAN
PAVILION
KLCC
HAVANA
CONCORDE
1
Tak sabar nak makan Ayam PERI-PERI?
Pergi Nando's tak payah bayar tol



**1, 2, 3** **AMBIENT ADVERTISING**

There have been numerous ambient advertisements along the streets of Kuala Lumpur.

**1** **ROAD MARKING FOR PEDESTRIANS**
The road marking uses a universal standard zebra crossing line

**2** **BROKEN PEDESTRIAN 'PUSH-BUTTON' TRAFFIC SIGNAL**
The push button traffic signal was tampered with graphic illustration

**3** **DILARANG BERHENTI DI PETAK KUNING: DENDA RM 300**
This sign prohibits vehicles to park at the designated yellow square and violaters will be fined RM300 if disobeyed

**4** **HOTEL SHANGRILA**
This sign leads to specific hotel direction which falls under tourist attractions sign (universal standard color for sign is brown)

**5** **HIGHWAY DIRECTIONAL SIGN**
The sign uses standard blue color directional sign for highways

**6** **GUIDE SIGNS**
This informational signs show specific directions to places of interest for pedestrians


fahrenheit
+AIRism
SEPHORA
1
2


Hotel Shangri-La
Jln. Ampang
Jln. T.A. Rahman
Jln. Kuching
(IRR)
3
4
5
6


## Temporary Signs

**1** **AWAS KENDERAAN BERAT KELUAR MASUK DI HADAPAN**
This sign warns the road users to be aware of heavy construction vehicles.

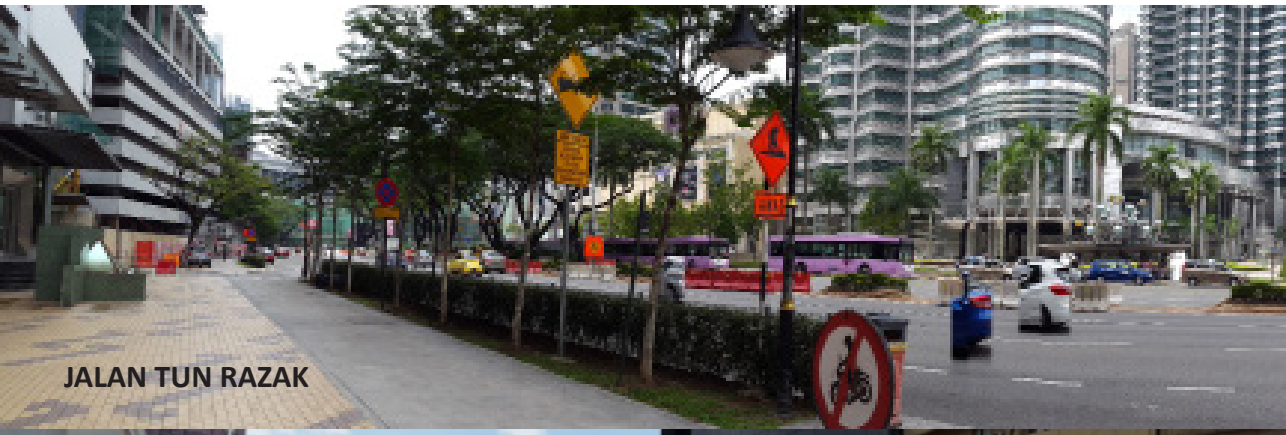
**2** **A SYMBOL OF PROHIBITORY SIGN FOR PEDESTRIAN WITH A GENERIC INSTRUCTION, "DILARANG MELINTAS"**
This sign prohibits pedestrians from entering the construction sites.

**3** **WARNING SIGNS FOR VEHICLES**
This sign warns the road users of only using the left lane.

**4** **PEDESTRIAN CROSSING**
This sign warns the vehicle drivers of pedestrians' zebra crossing ahead.


**5** **PEDESTRIAN ROUTE MAP**

This sign shows places of interests around Jalan Bukit Bintang.

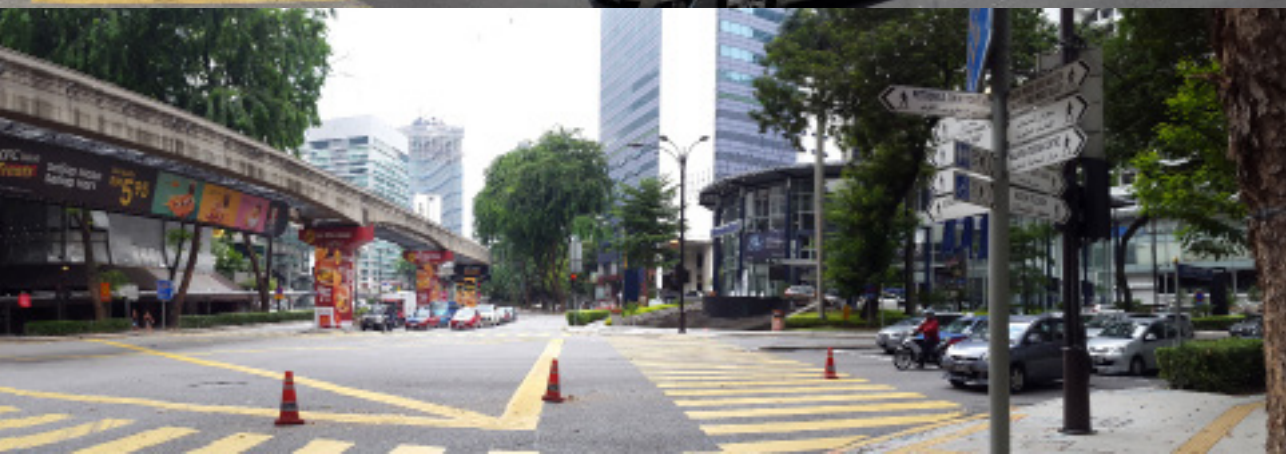


JALAN TUN RAZAK


JALAN BUKIT BINTANG


JALAN SULTAN ISMAIL


Ko Skin and Beauty Centre




Multiple signs on a street for vehicular drivers and pedestrians.


This sign warns the motorcycle users for trespassing the pedestrian lane.


Busy streets in Kuala Lumpur City Centre


1963
WISMA FUI
LAFODING

The location of pedestrian crossing is inappropriate and the material used are meant for temporary uses.


The informational guide signs are placed between the bushes of trees.


This image shows several prohibitory/regulatory signs that are placed within the same location (Penang).


The top image shows a guide sign for street information. The bottom sign indicates a Stopping Totally Prohibited sign. However, the sign was tempered with inappropriate painting.


The top image shows a warning sign for vehicles to be aware of approaching bicycles (additional information is placed at the bottom of the sign).




The three images represent warning signs on approaching pedestrians for vehicular drivers. However, it is a dangerous streets for pedestrians crossing.





The signs above are warning signs that warn pedestrians (instead of vehicular drivers) of snatch thieves. However, as can be seen, the **color**, **font style**, and **shape of signs** are not standardized.


This is a warning sign that warns road users of the horse riding/carriage zone that is normally used for tourist ride. This is only designated within the Merdeka Warisan area.

The symbol used for the warning sign above is a representation from the actual horse carriage that is used for tourism purposes in the city centre.



Generically, the signs use the standard symbols as the European traffic sign codes, which signify the prohibitive sign for motorcycle entry. However, as can be seen in the first and second image, at the bottom of the sign, the sentence 'Dilarang Meletak Motosikal' actually means "Do not park your motorcycle". These signs are common in Malaysian road traffic practice particularly in prohibiting motorcycles from parking at specific areas. The symbols of motorcycles also vary.


This prohibitory sign prohibits stall owners to sell within the designated area. However, the second image includes additional information–Zon Sita Dilarang Menjaja–which means Seize Zone No Hawk/Sell.

Both signs apply the prohibitory element of red band as to represent prohibitory. The symbol used for hawker's stall is not standardized.

# PROPOSED//ROAD SIGN DESIGN

# Conceptual Framework

The importance of Malaysian national policy and an institutional framework for promoting a pedestrian-friendly streetscape based on findings conducted through the report from case studies helps to outline several new proposed design executions. In the current research on mobilities, there have been numerous interpretations and arguments between the mobilities 'turn' and 'paradigm'. Sheller & Urry (2006) suggested that the mobilities paradigm involves the 'embodied nature and experience' that relates with a person's activities within their spatial environment. In the mobilities turn, mobility goes beyond simply 'getting from A to B'. The mobilities paradigm integrates movement, meaning, and culture. Thus, this proposal looks into how the movement of people contributes to the meaning of their surrounded signs and signals as well as the culture of the society. In addition, this proposal also looks into the context of geosemiotics that are relevant with the meaning of signs in place.

This proposal is intended to come out with a proper street signs design which use standard codification prescribed in the Vienna Convention 1968 with additional design elements adapted from the local context. This is to ensure that the signs are easily understood across culture. It is a complex process of understanding the meanings behind every movement of the road users. The case studies layout in this new strategy remains to be verified and tested after implementing the street system network. In current sign design system in Malaysia, codes and visual elements such as the symbols are added into the implemented signs system according to current issues or location context. For instance, in page (46), the symbol used for "Beware of Snatch Thieves" was implemented as a warning sign due to the increase of snatch thieves issues at the city centre.

In the original Sign Design Manual (Department of Road Work 1980), the signs were not regulated for the road users since there were no significant issues. In addition, the warning sign in Figure 2 below reflects the warning sign for a horse-drawn carriage ahead that was launched in February 2014. As mentioned by Federal Territories Minister Datuk Seri Tengku Adnan Tengku Mansor, "the horse-and-carriage ride was set to become the latest tourist attraction in Kuala Lumpur" (2014). In comparison in terms of the current UK-based horse carriage sign, the design elements used are a red triangular outline with a symbol of horse carriage (Image below).

**Figure 2** Horse-drawvehicles likely tobe in the road in UK

In relations to geosemiotics' theoretical concept, the signs that are governed in the two different countries show differences in terms of color and shape of the sign, but similarity in the symbol used. However, both signs indicate warning signs for road users of the incoming horse carriages. In terms on mobility practices, the road users need to be alerted to their surroundings irrespective of their modes of transport in order to perform their everyday life practices more efficiently. Thus, the horse carriage sign will affect their bodily movement through their understanding of meaning. This proposal also looks into the methods used in investigating the case studies conducted in Aalborg, Denmark, Glasgow, Scotland, and Malaysia.

Visual data examples from non-participatory observations and activity-oriented focus group interviews provided relatively important interpretation and perceptions from the road users/participants. For instance, through the activities carried out in the research, the comparison between United Kingdom and Denmark's road traffic signs can be identified especially the regulatory signs. Based on the photographic documentation, UK uses a standard regulatory with a red round shape and symbols of motorcycle and a car to prohibit the motor vehicles. The differences are illustrated below:

**Figure 3 (a)**
No Motor Vehicle Sign in United Kingdom

**Figure 3 (b)**
No Motor Vehicles Sign in Denmark


**Figure 3 (c)**
No Parking Sign for Motorcycles

From the three different signs, the only significant aspect of design elements used is the color and shape. Currently in Malaysia, the red band (Figure 3 (c) ) represents prohibiting motorcycles to park at the specific area which an additional information are added at the bottom of the sign "Dilarang Meletak Motosikal". In terms of the use of design elements, Malaysian sign uses both the common prohibitory signs and warnings signs design elements. This shows that the sign strictly prohibit the motorcycles from entering and at the same time warns the motorcyclists (through the use of yellow sign indication). Most importantly, this sign will be mistakenly understood by foreigners who do not understand Bahasa Melayu and would assume that motorcycles are not allowed to enter the street.

In order to relate the conceptual framework to the case studies and proposed road sign design, design issues guidelines are important aspect of consideration.

## Design Issues

Every planner or city official starts a project with one clear goal: To develop a quality program that fits the unique needs of the community. How that goal translates into specific decisions produces innumerable issues that should be explored before starting the design process:

- Planning
- Identity
- Design
- Legibility
- Materials and Technology

# Planning

The project team, which consists of the city councils, designers and community members, refines the scope and the strategic approach to the project. This part of the process can also result in preliminary design descriptions and recommendations. The planning process consists of the following elements:

## Research Process:

During this stage, best practices from the existing projects and case studies will be reviewed. The review includes analyzing pedestrian and vehicular routes, and analyzing the existing sign messaging protocols. The methods of research will include surveys on visitors and stakeholders as well as on activity-oriented focus groups.

## Strategy and Management Approach:

In this proposal, several drafts of ideas for future signs implementations are recommended. The strategy also helps to determine the recommendations for the design, implementation and management of the program.

## Preliminary Design Concept Proposal:

This proposal should articulate design elements through the descriptions or best practices. Examples from the case studies are used as guides and ideas on how to redevelop a new program for a streetscape sign system.

## Identity

The identity of the urban cityscape should reflect the national identity either through the symbols, color schemes, or elements of design.

## Design

The design stage is usually a two-part process that include schematic (or concept design) and design development. This approach allows greater ability to manage design, stakeholder review and approval processes. The two-part process is advisable for large urban areas or for complex streetscape program with multiple stakeholder groups.

The process can be combined in some circumstances in small communities where budgets and/or timeframes are restrictive and where the streetscape signs system is simple and more effective.

## Legibility

Legibility of a font type is determined by how easily it is to distinguish one letter from another in a particular typeface. Thus, in sign design, legibility involves readible fonts, symbols, and overall signs of specific length and also the constrast color.

## Materials and Technology

The project team must be up-to-date with more sustainable materials and technology.

# Types of Sign Design Improvisation

Based on the criterias outlined in the design issues, several improvisation on the existing signs in urban spaces in Kuala Lumpur are recommeded.The newly proposed sign design that are illustrated include:

- Street Map Design
- Informational Sign Design
- Street Name Sign Design
- Prohibitory Sign Design
- Warning Sign Design
- Guide/Informational Sign Design


## Existing Street Map Design

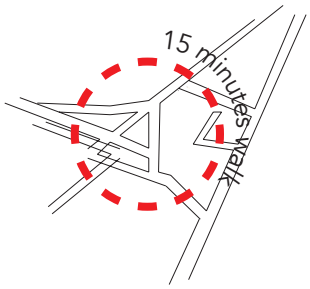
**Problem:**

No contrast between the map and the background.

The map is too small and hard to read.

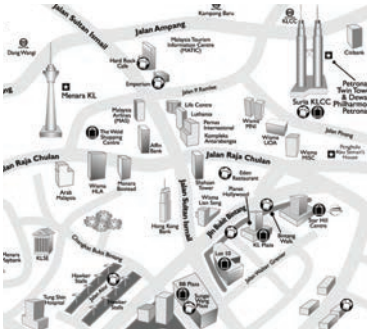
**Colour and contrast**

The signs and maps use high contrast colours for optimum legibility; a dark blue background with white or yellow text is used in conjunction with black text on a yellow background.




**Detail information**

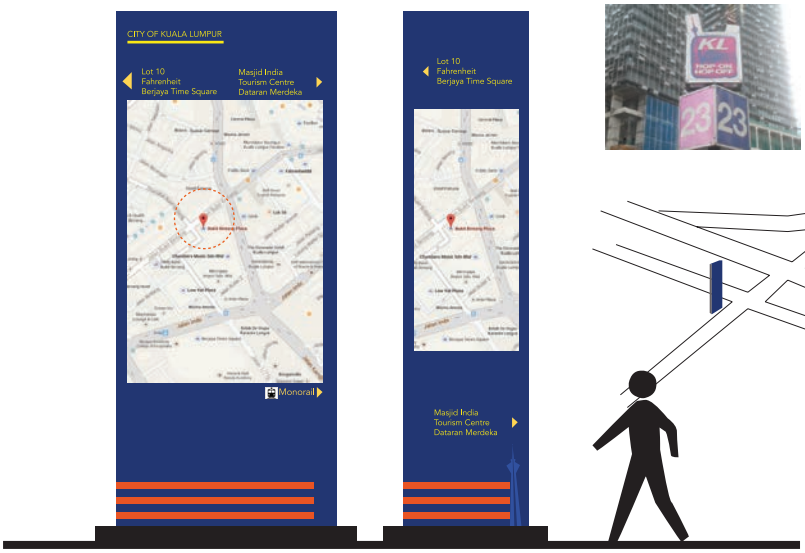
People with limited mobility including older people need to know how far it is to walk to a place, and if there will be any parks on the way in which they can find a seat to rest.



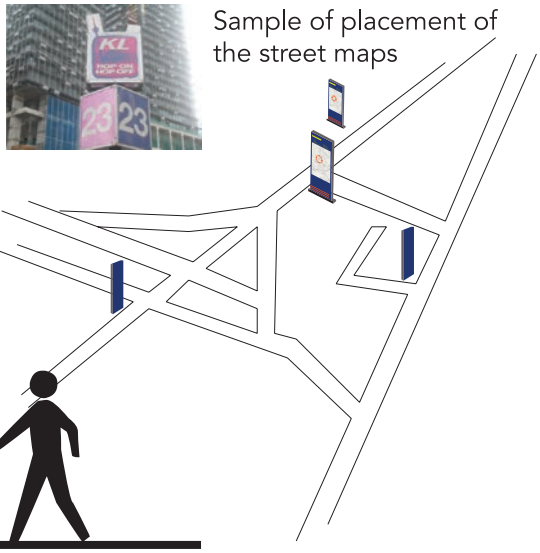
**3D landmarks**

People with limited mobility including older people need to know how far it is to walk to a place, and if there will be any parks on the way in which they can find a seat to rest.

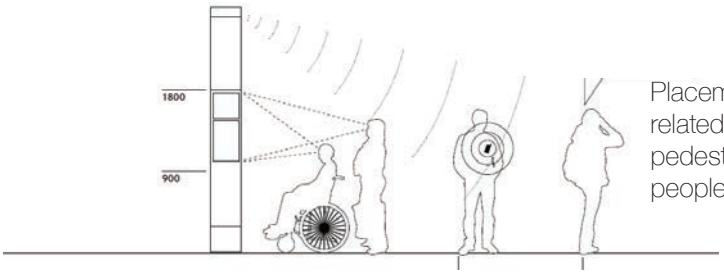
# New Street Map Design




Front view of street maps

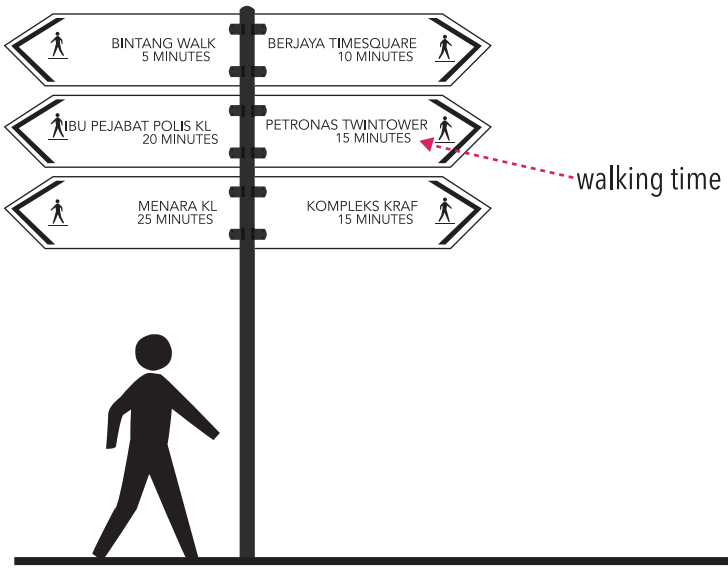


Sample of placement of the street maps




Placement of signs should be related to the standard visibility of pedestri- ans including the disabled people.

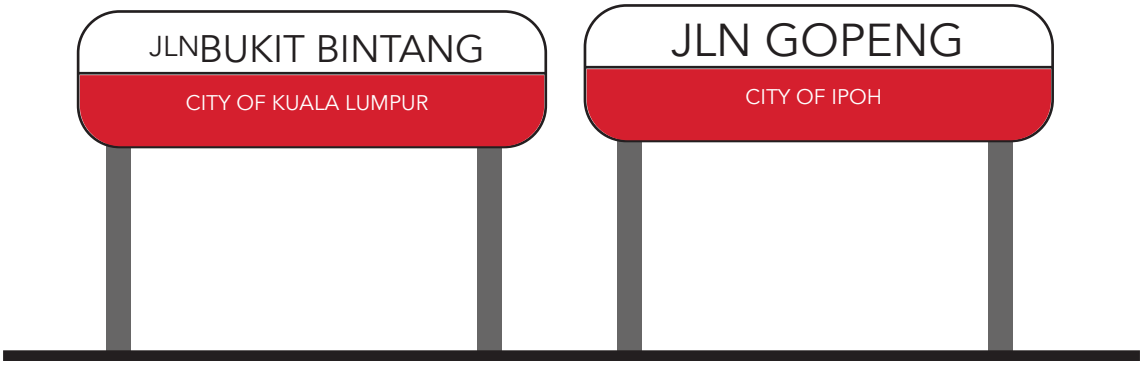
# Informational Sign Design

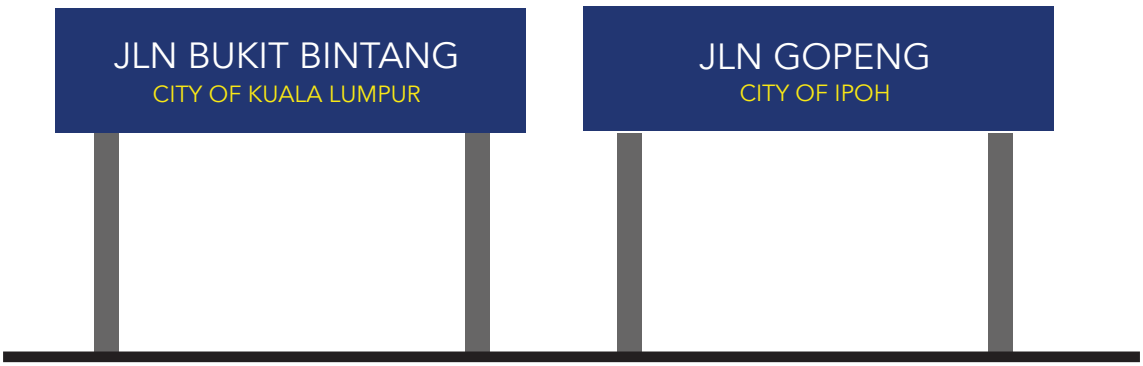


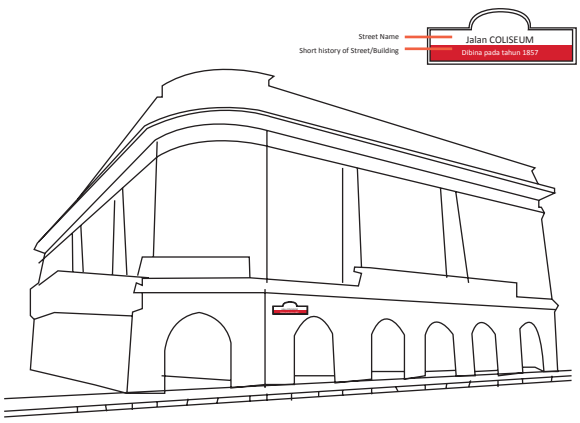


existing sign

# Street Name Sign Design




Building Street Name Sign

# Prohibitory Sign Design

MALAYSIAN STANDARD TRAFFIC SIGN FOR NO PARKING

PROPOSED NO PARKING FOR BICYCLE AND MOTORCYCLE

PROPOSED NO PARKING FOR MOTORCYCLE

Current No Parking for motorcycles sign

This is a regulatory sign for prohibiting the motorcycles from entering specific road/street and not a **NO PARKING SIGN**

# Warning Sign Design


BEFORE AFTER

The new propose sign limits the use of graphic elements as a way of alerting the pedestrians without them having to read so many texts and symbols on the sign.

BEFORE AFTER

The new proposed sign uses symbol of a lady and the expected crime attempt of snatch thieves.

# Guide/Informational Sign Design


BEFORE AFTER

The new propose sign uses the non-regulatory sign since the target users are not vehicular users/drivers. The placement of this kind of signs is common in parking spaces and street sides.



BEFORE AFTER

The new propose sign uses guide sign that only allows pedestrians in entering the pathway.

# Conclusion

As a conclusion, this proposal contributes new knowledge on potential visual research methods that can be integrated as part of design implementation process. Geosemiotics and the mobilities paradigm serve as lenses that help to interweave the methods of investigation on the of study human behaviour towards their built environment. The theoretical and conceptual framework illustrated in this proposal can be used as building block for future research on the study of people, built environments and road signs systems. This proposed **Urban Streetscape Sign Design Manual** intends to help the authorities and the stakeholders for future road sign design system that sustains the urban development. Thus, it is very important to take into account the street design development in the future in order to create a more pedestrian friendly streets for the society.

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# APPENDICES// SAMPLES FROM OTHER COUNTRIES

# Introduction

The appendices from other countries are examples that can be used as guidance in developing a better look and feel for the urban streetscapes in Malaysia. The signs and symbols, emplacement of the signs as well as the overall design of the street signs vary across countries. Thus, the samples of road signs in the urban streetscapes in other countries show different styles of symbols, yet, they still carry the same meanings. However, a few of the symbols are not relevant and appropriate to be used in our regulatory or informational signs. As can be seen in the samples, the signs are mostly positioned on wide pedestrian walkways. The regulated signs for pedestrians, as well as for cyclists are easy to understand since the symbols use simplified figures of human beings. As for the regulatory road signs, some signs require experiences or knowledge from traffic courses. In the US, some signs include text in a single traffic sign as to show the actions that should be taken by the pedestrians (refer samples from the US signages).

# Italy




Inappropriate symbol was tempered on the regulatory sign.

# Germany



Interesting graphic style of symbols for cyclist and pedestrians.

# United States of America




Interesting ways of conveying message through unique symbols on the road signs

**Malaysian Urban Streetscape Sign Design Manual**
"Towards Pedestrian Friendly Streets"

Prepared by
Salmiah Abdul Hamid
A draft proposal to be submitted to
Department of Road Works Malaysia
[2015]

# PART 3
## APPENDICES

The appendices (Appendix A-G) can be found in the USB flash drive attached together at the back of the thesis. The appendices are organised in folders according to different data collected.

**Appendix A: Interview guide**
- Pilot interview
- Focus group interview

**Appendix B: Transcripts**
- Interviews in Aalborg
- On-site interviews in Glasgow
- Focus group interview

**Appendix C: Video references**
- Focus group interviews
- Observations in Glasgow

**Appendix D: Sample of mobile methods explorations and field notes on iPad**

**Appendix E: Focus group drawings**

**Appendix F: Observational documentation photos**
- Glasgow
- Aalborg
- Malaysia

**Appendix G: Examples of Current Malaysian Traffic Signs Manual**


## SUMMARY

In order to provide an overview of the state-of-the-art developments, this thesis presents a theoretical lens that is used to anchor the subjects of the studies of 'people', 'road signs' and 'built environment' through the theories of geosemiotics and mobility. The fields of geosemiotics and mobility are important aspects of this research; they provide another theoretical challenge in the form of merging these two disciplines in the analysis in order to enhance a dialogue between the fields of urban design and graphic design practices. Thus, the interrelation between the two theories will help to answer the question of whether road signs have significant impact on human behaviour when moving in an urban environment. Selected cities in Denmark and Scotland were used as study areas in this research project. The methods were conducted within urban settings as well as controlled settings that emphasised the interaction between the participants and the visual representations of road signs. The key contribution of the findings in this research project is the methodological triangulations of qualitative data used in the field observations, photographic documentation and focus group interviews which were adapted from geosemiotics and mobility empirical studies. This thesis aims to be used as a guideline for the urban planning of a Malaysian road traffic sign system in the future.

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