

ROAD SIGNS: GEOSEMIOTICS AND HUMAN MOBILITY

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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 objekt, der bruges til at forankre temaerne indenfor forskning i 'urbane omgivelser', 'menneskelig adfærd' og 'færdselstavler'. I denne afhandling anvendes teorierne indenfor geosemiotik og mobilitet.

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.

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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.

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PART 2 | PAPER PUBLICATIONS

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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.

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- Pilot interview
- Focus group interview

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

Appendix C: Video references

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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.

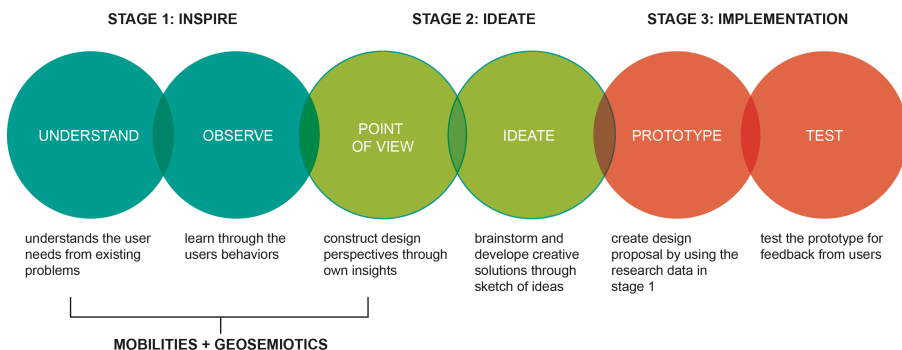


Figure 1. Design process thinking (Adapted from Brown, 2008)

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 (Plejdstrup, 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